NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: PEER CHECK OPERATOR LOGS

JPM NO.: A1

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	PEER CHECK OPERATOR LOGS
JPM No.:	A1
Rev. No:	0
STP Task:	30200, Review Operations Logs
STP Objective:	30200, Review Operations Logs IAW 0POP01-ZQ-0022, Plant Operations Shift Routines, to verify that all forms have been completed and Corrective Action initiated.
Related K/A Reference:	2.1.3 [3.7/3.9] Knowledge of shift or short-term relief practices.
References:	0PSP03-ZQ-0028, Rev. 131, Operator Logs
Task Normally Completed By:	RO
Method of Testing:	Actual performance
Location of Testing:	Classroom
Time Critical Task:	NO
Alternate Path JPM:	NO
Validation Time:	15 minutes

Required Materials (Tools/Equipment):

Handout copy of 0PSP03-ZQ-0028, Operator Logs

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU HAVE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is in MODE 1 at 100% steady state conditions. You are the Unit 1 Extra Reactor Operator.

INITIATING CUE:

You are directed to Peer Check the 0000-0200 hour logs on the attached three (3) pages (Pages 11, 12, and 13) of 0PSP03-ZQ-0028, Operator Logs, Logsheet 1. You are to identify any technical errors and/or any limits which have been exceeded.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

*Correctly identifies BOTH errors inserted into the three attached pages of the Operator Log*s.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Handout copy of 0PSP03-ZQ-0028, Operator Logs

NOTES:

An Answer KEY (Operator Log, Logsheet 1, Pages 11, 12 and 13) is provided for the evaluator. The ERRORS are highlighted in the KEY and are also described in the body of this JPM.

** DO NOT HANDOUT PAGES MARKED **"KEY"**. **

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 (C) **Start time:** _____

Locate errors on Logsheet 1.

Standard:

Locates BOTH of the Errors on Logsheet 1:

____ Logsheet 1, Page 12 - CHARGING PUMP PRESSURE PI-0204 and PI-0288B/87B/86B (line item 13) exceeds the acceptance limit of 200 psig maximum difference.

____ Logsheet 1, Page13 - LOOP DELTA-T TI-0411 (line item 6) is less than 5% below the OPDT SETPOINTS.

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time:** _____

VERIFICATION OF COMPLETION

Job Performance Measure: A1, PEER CHECK OPERATOR LOGS

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Unit 1 is in MODE 1 at 100% steady state conditions. You are the Unit 1 Extra Reactor Operator.

INITIATING CUE:

You are directed to Peer Check the 0000-0200 hour logs on the attached three (3) pages (Pages 11, 12, and 13) of 0PSP03-ZQ-0028, Operator Logs, Logsheet 1. You are to identify any technical errors and/or any limits which have been exceeded.

CR

UNIT: 1 DATE: Today

0000-0200 SHIFT	1200-1400 SHIFT
Start Time: 0006 Mode: 1 Finish Time: 0137	Start Time: Mode: Finish Time:
Temporary Logs: YES___ NO_X_ **IF** Yes, Number of Temporary Logsheets:_____ START__N/A_____ hrs. STOP ____N/A_____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.	**Temporary Logs:** YES___ NO___ **IF** Yes, Number of Temporary Logsheets:_____ START_____ hrs. STOP _____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.
OPERATOR:__Mark Donovan_____ (1) SUPERVISOR:_____	OPERATOR:_____ (1) SUPERVISOR:_____
(1) Supervisor signature includes responsibility for second review requirements per 0PGP03-ZE-0004, Plant Surveillance Program.	

REMARKS

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
PRT LEVEL	CP-004	LI-0670	74		65-75%	N/A	ALL	
PRT PRESS		PI-0669	2		< 6 PSIG			
RCDT LEVEL		LI-4901	48		8-92%			
RCDT PRESS		PI-4900	3		< 6 PSIG			
RCDT TEMP		TI-4902	82		< 187°F			
RCB SEC SUMP LEVEL		LI-7811	71		N/A %	N/A	1,2,3	
RCB NORM. SUMP LEVEL		LI-7812	73			3.4.6.1 3.4.6.2	1,2,3,4	
NORM SUMP DISCHARGE		FQI-7823	373566		N/A GAL			

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
BAT A LVL	CP-004	LI-0103	30,400		N/A GAL	TRM 3.1.2.6	1,2,3,4	(1) ONLY APPLICABLE IF BAT(S) IS DESIGNATED BORON SOURCE. (2) SUM OF OPERABLE BAT TANKS.
BAT A TEMP.		TI-0104	94		≥ 65°F (1)			
BAT B TEMP.		TI-0107	96		≥ 65°F (1)			
BAT B LVL		LI-0105	31,900		N/A GAL			
BAT VOLUME	N/A	CALC (2)	62,300		≥30,400 GAL (1)			
EXCESS LETDN HX 1(2)A OUTL TEMP	CP-004	TI-0229	100		≤ 110 °F (1)			(1) IF >110 F, THEN CONTACT SYSTEM ENGINEERING FOR AN EVALUATION OF IMPACT ON U1118 AND RCS LEAKAGE.
PRZR VAPOR	CP-004	TI-0607	N/A		N/A	TRM 3.4.9.2	ALL (2)	(1) TI-0607 MINUS TI-0126. (2) ONLY IF AUX SPRAY IN USE.
REGEN HX TEMP		TI-0126	N/A		N/A			
AUX SPRAY DELTA-T		CALC.	N/A		≤ 621°F (1)			
PORV 655A BLOCK VLV		MOV-0001A			OPEN (1)	3.4.9.3 (2)	4 ONLY	(1) IF PORVs ARE USED FOR COLD OVERPRESSURE PROTECTION. (2) IF ALT VENT PATH ESTABLISHED, THEN LOG VENT VERIF SAT PER TECHNICAL SPECIFICATION 4.4.9.3.2.
PORV 656A BLOCK VLV		MOV-0001B						
CHARGING PUMP PRESSURE	CP-004	PI-0204	2750		CHNL CHECK ≤ 200 PSIG BETWEEN PI-0204 AND PI-0288B/287B/286B	3.3.2 Table 3.3-3, Item 3d-2, Action 16	1,2,3,4	(1) COORDINATE THE READING OF RUNNING PUMP(S) DISCHARGE PRESSURE IN THE CONTROL ROOM (PI-0204) WITH THE READING OF THE MEAB WATCH INDICATION PI-0288B/287B/286B) LOCALLY.
	(1)	PI-0288B PI-0287B PI-0286B	2500					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
RCS TAVG	CP-005	TI-0412A	591		≥ 571°F (1) CHNL CHECK 5°F (2)	3.3.2, Table 3.3-3, Item 5f, Action 20 3.1.1.4	1,2,3	(1) IF < 571°F WITH TAVG-TREF DEV ALARM **NOT** RESET IN MODE 1 OR IN MODE 2 WITH KEFF ≥ 1, THEN COMPLETE Logsheet 7, Tavg Surveillance Logsheet (2) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS.
		TI-0422A	592					
		TI-0432A	592					
		TI-0442A	591					
RCS TAVE DNB PARAMETER	CP-005	CALC (1)	591.5		≤ 595°F	3.2.5	1	(1) AVERAGE OF ALL OPERABLE RCS TAVE CHANNELS (3 MINIMUM).
LOOP DELTA-T	CP-005 OR PLANT COMPUTER (1)	TI-0411	104		≥ 5% BELOW SETPOINT (2)	N/A	1,2 (3)	(1) IF PLANT COMPUTER USED, THEN COMPARE TO PLANT COMPUTER SETPOINT. (2) LOG ACTUAL VALUE. IF LESS THAN 5% BELOW OTDT OR OPDT SETPOINTS, THEN RESTORE MARGIN TO GREATER THAN 5%. (3) N/A IN MODES 3 AND 4. (4) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS DUE TO INSTRUMENT ERROR. LIMIT MAY BE EXCEEDED DUE TO DIFFERENT LOOP OPERATING TEMPERATURES.
		TI-0421	103					
		TI-0431	103					
		TI-0441	102					
OPDT SETPOINT		TI-0412B	108		CHNL CHECK 6% (4)	3.3.1, Table 3.3-1 Items 8,9 Action 6	1,2 (3)	
		TI-0422B	108					
		TI-0432B	108					
		TI-0442B	108					
OTDT SETPOINT		TI-0412C	118		CHNL CHECK 10% (4)			
		TI-0422C	117					
		TI-0432C	114					
		TI-0442C	118					
VESSEL FLANGE L/O TEMP	CP-005	TI-0600	60		N/A °F	3.4.6.2	1,2,3,4	

CR

UNIT: 1 DATE: Today

0000-0200 SHIFT	1200-1400 SHIFT
Start Time: 0006 Mode: 1 Finish Time: 0137	Start Time: Mode: Finish Time:
Temporary Logs: YES___ NO_X_ **IF** Yes, Number of Temporary Logsheets:_____ START__N/A_____ hrs. STOP ____N/A_____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.	**Temporary Logs:** YES___ NO___ **IF** Yes, Number of Temporary Logsheets:_____ START_____ hrs. STOP _____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.
OPERATOR:__Mark Donovan_____ (1) SUPERVISOR:_____	OPERATOR:_____ (1) SUPERVISOR:_____
(1) Supervisor signature includes responsibility for second review requirements per 0PGP03-ZE-0004, Plant Surveillance Program.	

REMARKS

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
PRT LEVEL	CP-004	LI-0670	74		65-75%	N/A	ALL	
PRT PRESS		PI-0669	2		< 6 PSIG			
RCDT LEVEL		LI-4901	48		8-92%			
RCDT PRESS		PI-4900	3		< 6 PSIG			
RCDT TEMP		TI-4902	82		< 187°F			
RCB SEC SUMP LEVEL		LI-7811	71		N/A %	N/A	1,2,3	
RCB NORM. SUMP LEVEL		LI-7812	73			3.4.6.1 3.4.6.2	1,2,3,4	
NORM SUMP DISCHARGE		FQI-7823	373566		N/A GAL			

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
BAT A LVL	CP-004	LI-0103	30,400		N/A GAL	TRM 3.1.2.6	1,2,3,4	(1) ONLY APPLICABLE IF BAT(S) IS DESIGNATED BORON SOURCE. (2) SUM OF OPERABLE BAT TANKS.
BAT A TEMP.		TI-0104	94		≥ 65°F (1)			
BAT B TEMP.		TI-0107	96		≥ 65°F (1)			
BAT B LVL		LI-0105	31,900		N/A GAL			
BAT VOLUME	N/A	CALC (2)	62,300		≥30,400 GAL (1)			
EXCESS LETDN HX 1(2)A OUTL TEMP	CP-004	TI-0229	100		≤ 110 °F (1)			(1) IF >110 F, THEN CONTACT SYSTEM ENGINEERING FOR AN EVALUATION OF IMPACT ON U1118 AND RCS LEAKAGE.
PRZR VAPOR	CP-004	TI-0607	N/A		N/A	TRM 3.4.9.2	ALL (2)	(1) TI-0607 MINUS TI-0126. (2) ONLY IF AUX SPRAY IN USE.
REGEN HX TEMP		TI-0126	N/A		N/A			
AUX SPRAY DELTA-T		CALC.	N/A		≤ 621°F (1)			
PORV 655A BLOCK VLV		MOV-0001A						Vs ARE USED FOR COLD RESSURE PROTECTION.
PORV 656A BLOCK VLV		MOV-0001B						VENT PATH ESTABLISHED, OG VENT VERIF SAT PER ICAL SPECIFICATION 4.4.9.3.2.
CHARGING PUMP PRESSURE	CP-004	PI-0204	2750		CHNL CHECK ≤ 200 PSIG BETWEEN PI-0204 AND PI-0288B/287B/286B	3.3.2 Table 3.3-3, Item 3d-2, Action 16	1,2,3,4	(1) COORDINATE THE READING OF RUNNING PUMP(S) DISCHARGE PRESSURE IN THE CONTROL ROOM (PI-0204) WITH THE READING OF THE MEAB WATCH INDICATION PI-0288B/287B/286B) LOCALLY.
	(1)	PI-0288B PI-0287B PI-0286B	2500					

Maximum allowed difference between these readings is 200. Readings should be circled with a note made in the remarks section of the cover page.

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
RCS TAVG	CP-005	TI-0412A	591		≥ 571°F (1) CHNL CHECK 5°F (2)	3.3.2, Table 3.3-3, Item 5f, Action 20 3.1.1.4	1,2,3	(1) IF < 571°F WITH TAVG-TREF DEV ALARM **NOT** RESET IN MODE 1 OR IN MODE 2 WITH KEFF ≥ 1, THEN COMPLETE Logsheet 7, Tavg Surveillance Logsheet (2) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS.
		TI-0422A	592					
		TI-0432A	592					
		TI-0442A	591					
RCS TAVE DNB PARAMETER	CP-005	CALC (1)	591.5		≤ 595°F	3.2.5	1	(1) AVERAGE OF ALL OPERABLE RCS TAVE CHANNELS (3 MINIMUM).
LOOP DELTA-T	CP-005 OR PLANT COMPUTER (1)	TI-0411	104		≥ 5% BELO SETPOINT (2)			(1) IF PLANT COMPUTER USED, THEN COMPARE TO PLANT COMPUTER UE. IF LESS THAN 5% OPDT SETPOINTS, ARGIN TO GREATER (3) N/A IN MODES 3 AND 4. (4) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS DUE TO INSTRUMENT ERROR. LIMIT MAY BE EXCEEDED DUE TO DIFFERENT LOOP OPERATING TEMPERATURES.
		TI-0421	103					
		TI-0431	103					
		TI-0441	102					
OPDT SETPOINT		TI-0412B	108		CHNL CHECK 6% (4)	3.3.1, Table 3.3-1 Items 8,9 Action 6	1,2 (3)	
		TI-0422B	108					
		TI-0432B	108					
		TI-0442B	108					
OTDT SETPOINT		TI-0412C	118		CHNL CHECK 10% (4)			
		TI-0422C	117					
		TI-0432C	114					
		TI-0442C	118					
VESSEL FLANGE L/O TEMP	CP-005	TI-0600	60		N/A °F	3.4.6.2	1,2,3,4	

Minimum difference between these values is 5. The TI-0411 reading should be circled with a note in the remarks section of the cover page.

NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: DETERMINE DILUTION REQUIRED FOR POWER INCREASE

JPM NO.: A2

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	DETERMINE DILUTION REQUIRED FOR POWER INCREASE
JPM No.:	A2
Rev. No.:	0
STP Task:	CRO 70050: Perform boron concentration dilution of the reactor coolant system.
STP Objective:	CRO 91471: Knowledge of how to determine appropriate water volume to lower the boron concentration.
Related K/A Reference:	2.1.7 [4.4/4.7] Ability to evaluate plant performance and make operational judgments on operating characteristics, reactor behavior, and instrument interpretation.
References:	Nuclear Design Report, Unit 1, Cycle 18 Unit 1 Plant Curve Book
Task Normally Completed By:	RO
Location of Testing:	Classroom
Time Critical Task:	NO
Validation Time:	25 minutes

Required Materials (Tools/Equipment):

Calculator

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK

INITIAL CONDITIONS:

Unit 1 is currently at 75% power and is preparing to raise plant power to 100% in accordance with 0POP03-ZG-0008, Power Operations.

The following plant parameters currently exist:

Reactor Power: 75%
RCS Boron Concentration: 1500 ppm
Core Life: BOL (150 MWD/MTU)
Normal Operating Temperature and Pressure

INITIATING CUE:

The Unit Supervisor directs you to calculate the volume of RCS dilution that will be necessary to offset the Power Defect for a power escalation from 75% to 100%. Note: Ignore the effects of Xenon.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Determines RCS dilution volume is 3030 gallons of Makeup Water ± 125 gallons.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Handout copy of NDR Figures 5-15, 5-16, and 5-17, and Tables 5-7 and A-22 and Plant Curve Book Figure 3.1.

NOTES:

A KEY is provided for the Evaluator to show where the needed values are obtained. **DO NOT HAND TO THE APPLICANT.**

Variations allowed on data results are based on interpretation of graphical information and possible interpolation of table values.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 (C) **Start time:** _____

Determine the Power Defect for power increase from 75% to 100%.

Standard:

Determines the Power Defect (as found in Table 5-7 in NDR) from 75% to 100 %

Initial Power defect (75%) = -1257.5pcm
Finial Power Defect (100%) = -1627.3 pcm

Change in Power Defect: -1627.3 pcm – (-1257.5 pcm) = -369.8 pcm ± 5.0 pcm

Comment:

Cue:

Provide Applicant with JPM Handout materials.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Determine the Differential Boron Worth for the power change from 75 % to 100% power.

Standard:

a) *Identifies Differential Boron Worth (DBW) (from Table A-22 in NDR)*

DBW (50%) = -6.40 pcm/ppm
DBW (100%) = -6.15 pcm/ppm

b) *Determines DBW for 75% power*

Average DBW (@75%)) = (-6.40 + -6.15) ÷ 2 = -6.275 pcm/ppm

c) *Determines Average DBW for power change 75% to 100% (@87.5%)*

Average DBW (87.5%) = (-6.275 + -6.15) ÷ 2 = -6.21 pcm/ppm ± 0.10 pcm/ppm

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C)

Determine Final RCS boron concentration at 100%.

Standard:

$$C_{100\%} = C_{75\%} - \left[\frac{-369.8\,pcm}{-6.21\,pcm/ppm} \right] = 1500\,ppm - 59.55\,ppm = 1440.45\,ppm$$

1440.45 ppm ± 2.0 ppm

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 (C)

Determine the volume of Makeup Water (gallons) to dilute the RCS (1500 ppm to 1440.45 ppm)

Standard:

Using Plant Curve Book Figure 3.1, Dilution equation, determines volume of dilution required:

$$V_w = \left(\frac{622,307}{8.318} \right) \times \ln \left(\frac{1500}{1440.45} \right) = 3030 \text{ gallons}$$

3030 gallons ± 125 gallons

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: **DETERMINE DILUTION REQUIRED FOR POWER INCREASE**

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU'VE COMPLETED THE TASK

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Unit 1 is currently at 75% power and is preparing to raise plant power to 100% in accordance with 0POP03-ZG-0008, Power Operations.

The following plant parameters currently exist:

Reactor Power: 75%
RCS Boron Concentration: 1500 ppm
Core Life: BOL (150 MWD/MTU)
Normal Operating Temperature and Pressure

INITIATING CUE:

The Unit Supervisor directs you to calculate the volume of RCS dilution that will be necessary to offset the Power Defect for a power escalation from 75% to 100%. Note: Ignore the effects of Xenon.

NRC JPM A2 STUDENT HANDOUT

Rev. 3
STI#31071833

TR# 1248
D070912

Figure 3.1
Boration / Dilution
Unit 1
(Source: Calculation 99-RC-009)

Boration

$$V_B = \left(\frac{M}{8.4298}\right) x \ln\left(\frac{C_{BAT} - C_{Init}}{C_{BAT} - C_{Final}}\right)$$

Where:

V_B = Volume of Boric Acid (gallons)

M = RCS Mass (lb_m)

C_{BAT} = Boron Concentration of BAT (ppm)

C_{Init} = Initial Boron Concentration (ppm)

C_{Final} = Final Boron Concentration (ppm)

Dilution

$$V_W = \left(\frac{M}{8.318}\right) x \ln\left(\frac{C_{Init}}{C_{Final}}\right)$$

Where:

V_W = Volume of MakeupWater (gallons)

M = RCS Mass (lb_m)

C_{Init} = Initial Boron Concentration (ppm)

C_{Final} = Final Boron Concentration (ppm)

Plant Condition	M RCS Mass (lb_m)
Hot Full Power	622,307
Hot Zero Power	624,461
T_{avg} = 350 °F	751,417
T_{avg} = 150 °F	828,264

Prepared By: _____ Date 3-23-00

Reviewed By: Roy S. Warren Date 3-23-00

Approved By: _____ Date 3-23-00

Reactor Engineering Supervisor

Table 5-7 Data for Figures 5-15, 5-16 and 5-17

Total Power Defects versus Power Level
at BOL, MOL, and EOL, FOP

Total Power Defects (pcm) at 150 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
2000	0.0	-447.7	-807.2	-1131.3	-1445.8
1500	0.0	-490.7	-887.8	-1257.5	-1627.3
1000	0.0	-545.1	-988.2	-1414.4	-1852.2
500	0.0	-616.5	-1116.9	-1613.9	-2134.4
0	0.0	-714.6	-1290.1	-1876.8	-2497.1

Total Power Defects (pcm) at 10000 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
2000	0.0	-541.3	-978.9	-1361.6	-1734.9
1500	0.0	-572.2	-1044.1	-1473.1	-1905.1
1000	0.0	-612.1	-1127.1	-1614.0	-2118.7
500	0.0	-661.0	-1229.1	-1787.7	-2380.3
0	0.0	-722.1	-1356.5	-2003.1	-2700.7

Total Power Defects (pcm) at 19450 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
1500	0.0	-718.5	-1303.3	-1810.1	-2309.4
1000	0.0	-754.0	-1379.4	-1940.6	-2511.3
500	0.0	-799.8	-1476.1	-2105.5	-2766.4
0	0.0	-858.6	-1598.3	-2314.0	-3087.0

Table A-22 Differential Boron Worth (pcm/ppm) as a Function of Boron Concentration and Power Level at BOL, MOL and EOL

Differential Boron Worth (pcm/ppm) at 150 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.29	-6.12	-5.91
1500	-6.60	-6.40	-6.15
1000	-6.94	-6.70	-6.41
500	-7.35	-7.05	-6.69
0	-7.86	-7.45	-7.02

Differential Boron Worth (pcm/ppm) at 10000 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.39	-6.24	-6.02
1500	-6.68	-6.51	-6.25
1000	-7.00	-6.80	-6.50
500	-7.35	-7.12	-6.76
0	-7.75	-7.47	-7.05

Differential Boron Worth (pcm/ppm) at 19450 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.63	-6.48	-6.25
1500	-6.94	-6.77	-6.50
1000	-7.28	-7.09	-6.77
500	-7.66	-7.44	-7.06
0	-8.10	-7.83	-7.37

NOTE: Data were generated assuming HFP equilibrium xenon conditions.

Figure 5-15 Total Power Defect Versus Power Level at BOL (150 MWD/MTU), FOP

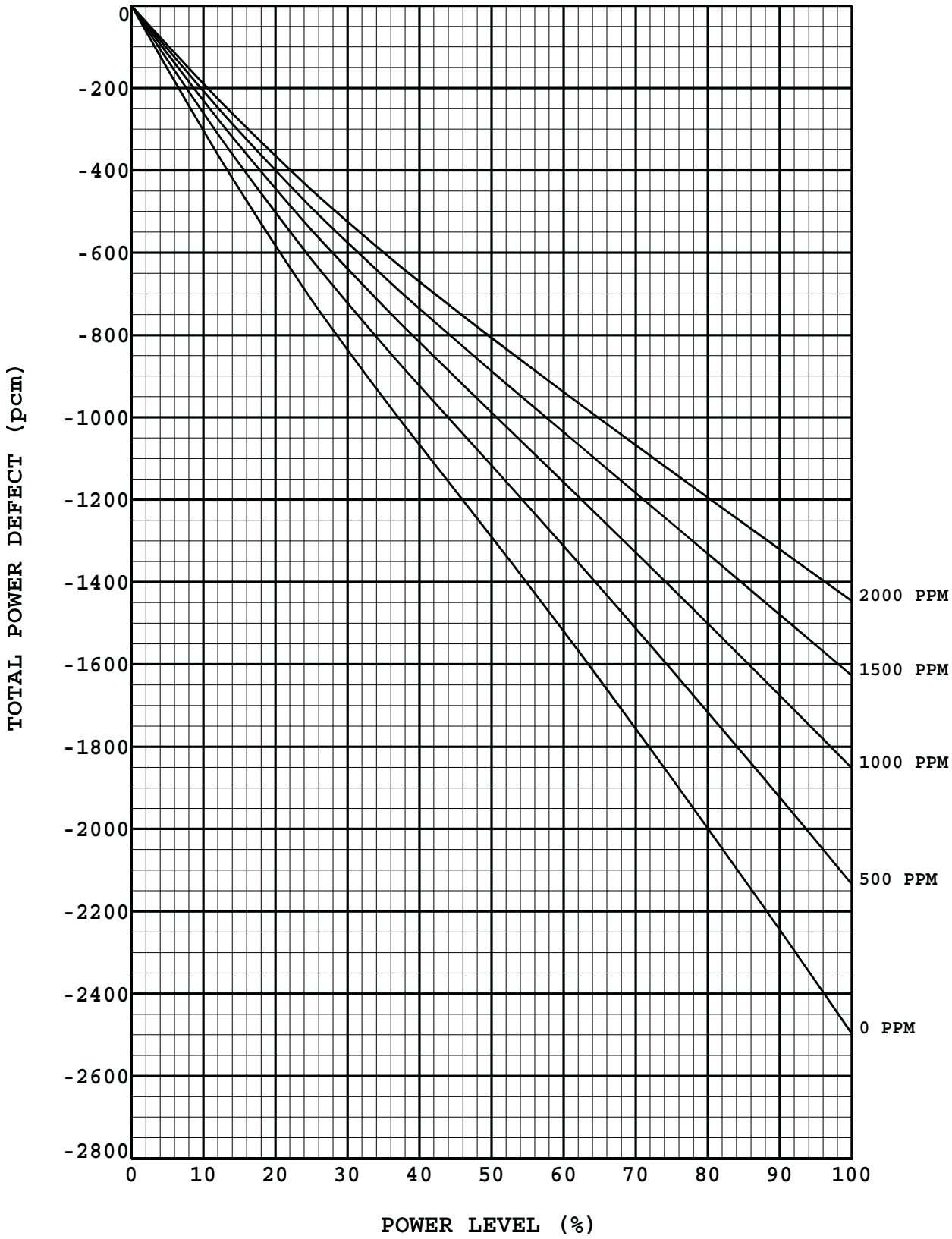


Figure 5-16 Total Power Defect Versus Power Level at MOL (10000 MWD/MTU), FOP

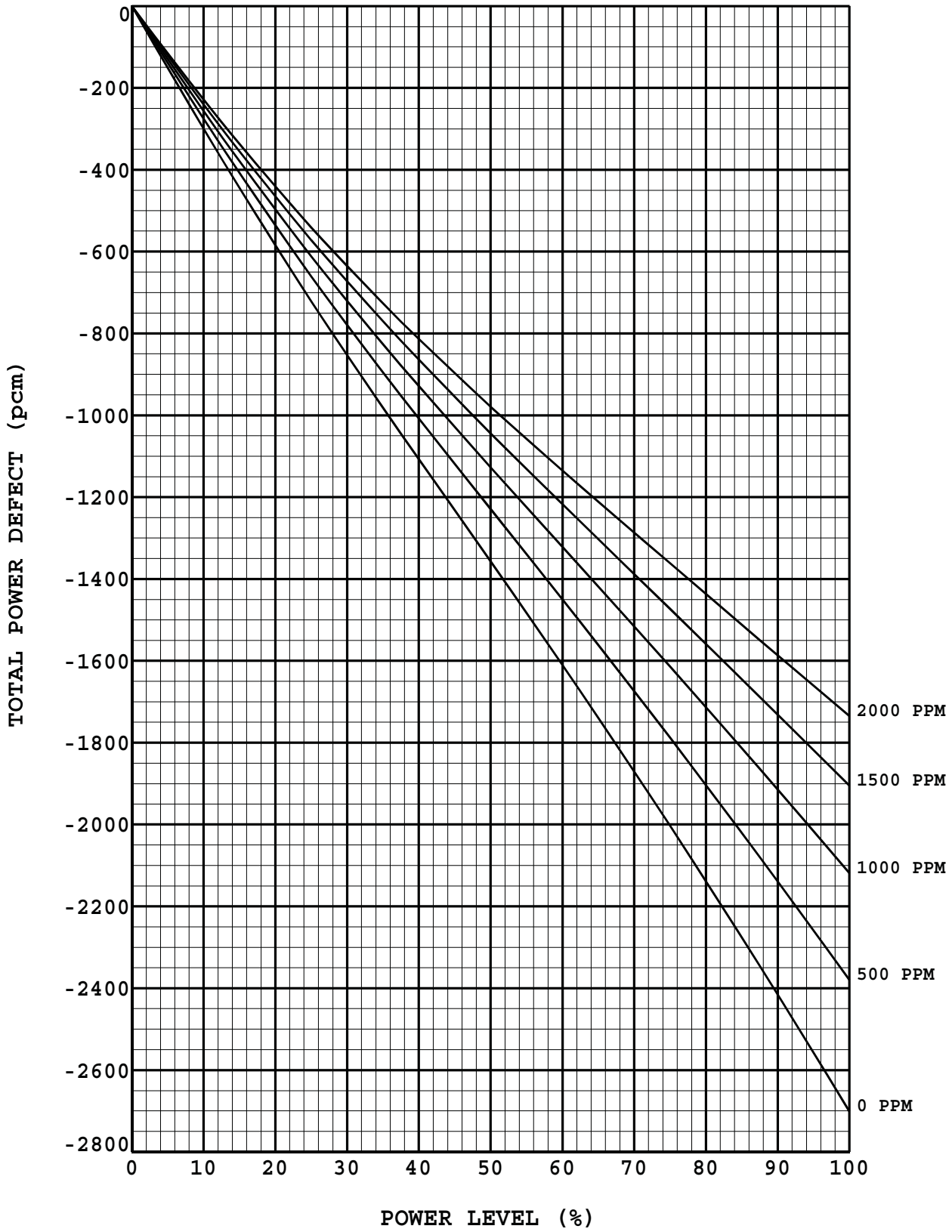
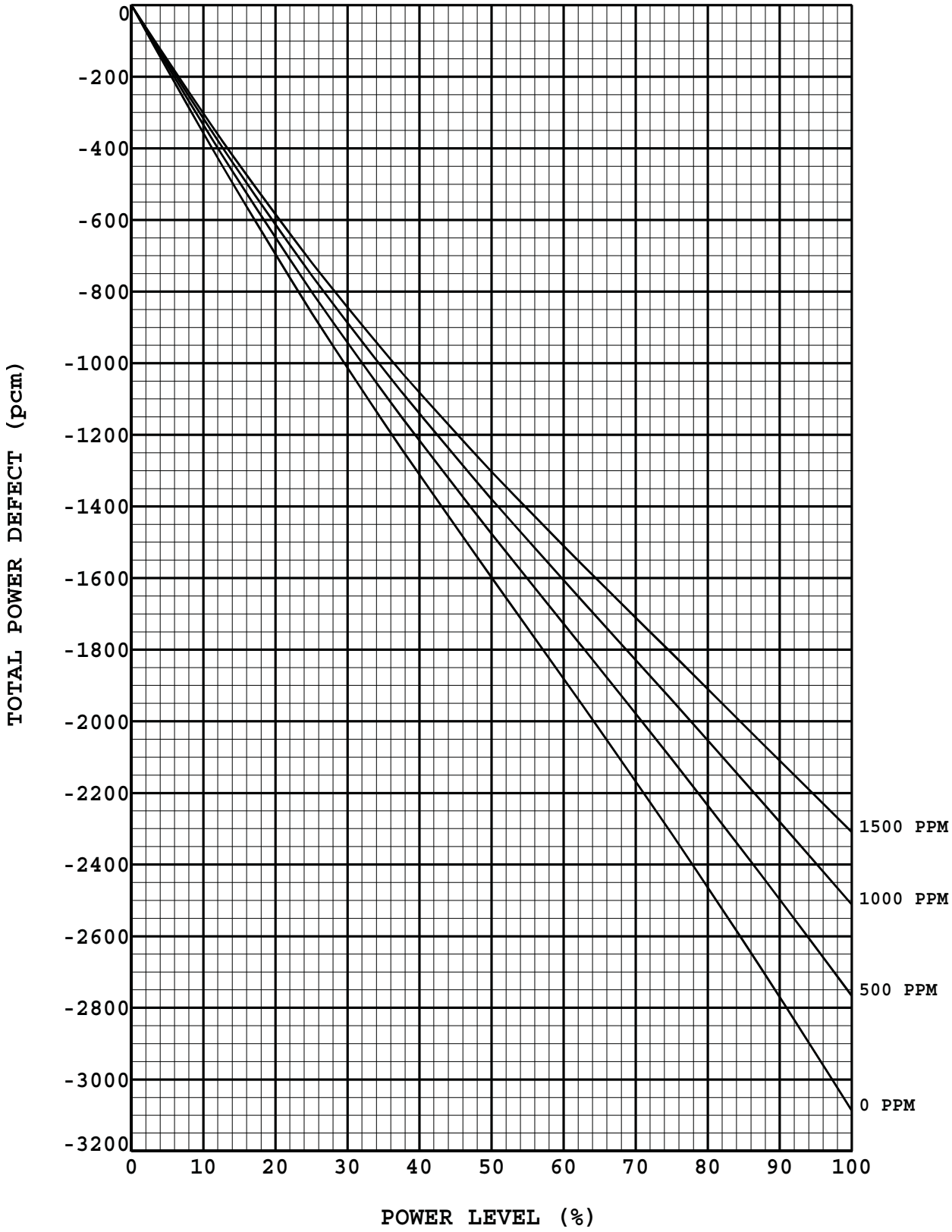


Figure 5-17 Total Power Defect Versus Power Level at EOL (19450 MWD/MTU), FOP



Rev. 3
STI#31071833

TR# 1248
D070912

Figure 3.1
Boration / Dilution
Unit 1
(Source: Calculation 99-RC-009)

Boration

$$V_B = \left(\frac{M}{8.4298}\right) x \ln\left(\frac{C_{BAT} - C_{Init}}{C_{BAT} - C_{Final}}\right)$$

Where:

- V_B = Volume of Boric Acid (gallons)
- M = RCS Mass (lb_m)
- C_{BAT} = Boron Concentration of BAT (ppm)
- C_{Init} = Initial Boron Concentration (ppm)
- C_{Final} = Final Boron Concentration (ppm)

Dilution

$$V_W = \left(\frac{M}{8.318}\right) x \ln\left(\frac{C_{Init}}{C_{Final}}\right)$$

Where:

- V_W = Volume of MakeupWater (gallons)
- M = RCS Mass (lb_m)
- C_{Init} = Initial Boron Concentration (ppm)
- C_{Final} = Final Boron Concentration (ppm)

Plant Condition	M RCS Mass (lb_m)
Hot Full Power	622,307
Hot Zero Power	624,461
T_{avg} = 350 °F	751,417
T_{avg} = 150 °F	828,264

See JPM step 4 for calculation

Prepared By: _____ Date 3.23.00

Reviewed By: _____ Date 3-23-00

Approved By: _____ Date 3-23-00
Reactor Engineering Supervisor

Table 5-7 Data for Figures 5-15, 5-16 and 5-17

Total Power Defects versus Power Level
at BOL, MOL, and EOL, FOP

Total Power Defects (pcm) at 150 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
2000	0.0	-447.7	-807.2	-1131.3	-1445.8
1500	0.0	-490.7	-887.8	-1257.5	-1627.3
1000	0.0	-545.1	-988.2	-1414.4	-1852.2
500	0.0	-616.5			
0	0.0	-714.6	-1290.1	-1876.8	-2497.1

See JPM step 1 for calculation

Total Power Defects (pcm) at 10000 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
2000	0.0	-541.3	-978.9	-1361.6	-1734.9
1500	0.0	-572.2	-1044.1	-1473.1	-1905.1
1000	0.0	-612.1	-1127.1	-1614.0	-2118.7
500	0.0	-661.0	-1229.1	-1787.7	-2380.3
0	0.0	-722.1	-1356.5	-2003.1	-2700.7

Total Power Defects (pcm) at 19450 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0.0	25.0	50.0	75.0	100.0
1500	0.0	-718.5	-1303.3	-1810.1	-2309.4
1000	0.0	-754.0	-1379.4	-1940.6	-2511.3
500	0.0	-799.8	-1476.1	-2105.5	-2766.4
0	0.0	-858.6	-1598.3	-2314.0	-3087.0

Table A-22 Differential Boron Worth (pcm/ppm) as a Function of Boron Concentration and Power Level at BOL, MOL and EOL

Differential Boron Worth (pcm/ppm) at 150 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.29	-6.12	-5.91
1500	-6.60	-6.40	-6.15
1000	-6.94	-6.70	-6.41
500	-7.35	-7.05	-6.69
0	-7.86	See JPM step 2 for calculation	

Differential Boron Worth (pcm/ppm) at 10000 MWD/MTU

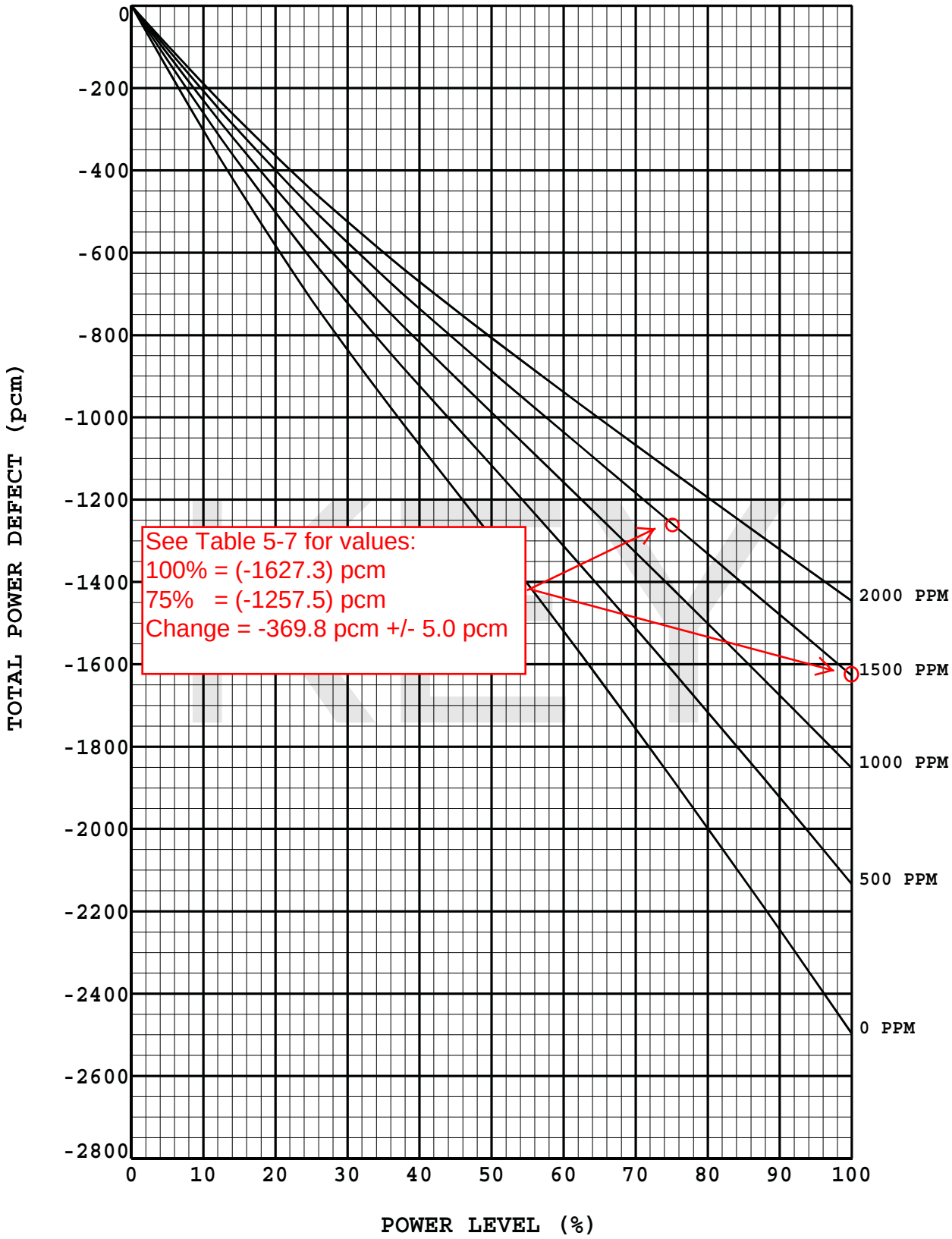
Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.39	-6.24	-6.02
1500	-6.68	-6.51	-6.25
1000	-7.00	-6.80	-6.50
500	-7.35	-7.12	-6.76
0	-7.75	-7.47	-7.05

Differential Boron Worth (pcm/ppm) at 19450 MWD/MTU

Boron Concentration (ppm)	Power Level (%) 0	50	100
2000	-6.63	-6.48	-6.25
1500	-6.94	-6.77	-6.50
1000	-7.28	-7.09	-6.77
500	-7.66	-7.44	-7.06
0	-8.10	-7.83	-7.37

NOTE: Data were generated assuming HFP equilibrium xenon conditions.

Figure 5-15 Total Power Defect Versus Power Level at BOL (150 MWD/MTU), FOP



NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: PREPARE ECO FOR SFP SKIMMER PUMP

JPM NO.: A3

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: PREPARE ECO FOR SFP SKIMMER PUMP

JPM No.: A3

Rev. No.: 0

STP Task: CRO68950, Prepare Equipment Clearances

STP Objective: CRO68950, Prepare Equipment Clearances per 0PGP03-ZO-EC01

Related K/A Reference: G 2.2.13 [4.1/4.3] Knowledge of tagging and clearance procedures.

References: 0PGP03-ZO-ECO1A, Rev. 19, Equipment Clearance Order Instructions
Fluid Drawing 9-F-05028 #2
Electrical Drawing 9-E-PFBA-01 #2

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: Classroom

Time Critical Task: NO

Alternate Path JPM: NO

Validation Time: 25 mins

Required Materials (Tools/Equipment):

0PGP03-ZO-ECO1A
Blank 0PGP03-ZO-ECO1A Form 3
Filled out ECO request Form 2
System Drawing 9-F-05028 #2
Electrical Drawing 9-E-PFBA-01 #2
MM PM for SFP Skimmer pump
0POP02-FC-0001 lineup 1 and 2

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:
I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 2 is at 100% power. You are the extra Reactor Operator on weekend duty. Mechanical Maintenance has requested that Spent Fuel Pool Skimmer pump 2A be tagged out for performance of scheduled PM # MM-2-89001619. This is a PM which replaces the pump assembly with a new unit.

INITIATING CUE:

You are directed to write the clearance for Spent Fuel Pool Skimmer pump 2A in accordance with 0PGP03-ZO-EC01A, Equipment Clearance Order Instructions, isolating it at the closest boundary valves for draining. The Oracle is unavailable. You are to take the following into account during your ECO preparation:

1) The ECO number will be 2-13-B 0001
2) Restoration positions and components listed solely for restoration purposes are NOT required.
3) Only one vent and drain path is required. The vent and drain path used should be as close to the skimmer pump as possible.
4) The enclosed work package is provided as a means of supplemental information only. It is intended to be used for determining the scope of the work and the ECO needed to facilitate that work.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Correctly writes an ECO which isolates Spent Fuel Pool Skimmer pump 2A in accordance with 0PGP03-ZO-EC01A, Equipment Clearance Order Instructions.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

1) 0PGP03-ZO-ECO1A procedure
2) Blank ECO Form
3) Work Order Package
4) System and Electrical Prints - as specifically requested
5) 0POP02-FC-0001 Lineups 1 and 2

NOTES:

1. A completed Answer KEY is provided for the Evaluator, Do Not Hand to the Applicant.

2. The purpose of the work package is to provide a means of work scope determination for the applicant, so he/she may determine the scope of the ECO needed for the job. It is not intended to be scrutinized as a document with the exact work instructions for performing the job (i.e. the applicant should not be wasting time looking for completeness or errors in the work package).

3. Unmarked copies of the required Fluid and Electrical drawings are provided for the applicant. They are to be passed out individually, and **only as specifically requested** by the applicant. This is to prevent leading the applicant to the correct answers. It is acceptable to hand out a print when requested either by print number or the general print name (i.e., I need the print for 480V load center E1B, etc.). Both the alphanumeric and noun name descriptions are located in the lower right hand corner of the print.

4. Unmarked copies of system procedure lineups are provided for the applicant for verification of component label nomenclature. They are to be passed out to the applicant if requested.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Review the work document.

Standard:

Reviews the work package to determine the scope of the ECO to be written.

Comment:

1) Provide copy of work package when applicant is ready to proceed.

2) The performer will manually write the ECO. Provide the blank copy of ECO form to him/her with the work package.

3) Provide copies of drawings as specifically asked for by general print name or number.

4) Provide copies of procedure lineups as requested.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Prepare administrative portion of ECO.

Standard:

Ensures applicable blocks are filled in for proper documentation of ECO.

Comment:

Evaluator has answer KEY in package for comparison. All appropriate blocks should be filled in.

Cue:

If asked, the ECO number will be 2-13-B 0001 (given in initiating cue)

Notes:

SAT/UNSAT Performance Step: 3

Correctly identify Spent Fuel Pool Skimmer Pump 2A handswitch.

Standard:

Ensures Spent Fuel Pool Skimmer Pump 2A HS is placed in STOP (OFF) position.

Comment:

The skimmer pump handswitch is located locally on ZLP-749 (FHB 22' elevation). The applicant may or may not list the handswitch number (2-FC-HS-1403). The handswitch number is not required. The handswitch may be Danger tagged, however; this is also not a requirement.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4(C)

Correctly identify and tag out Spent Fuel Pool Skimmer Pump 2A supply breaker.

Standard:

Ensures Spent Fuel Pool Skimmer Pump 2A supply breaker is danger tagged in OFF position, and correctly identified as 480 Volt MCC 2S1, cubicle C3.

Comment:

Compare with Answer Key.

Cue:

Notes:

SAT/UNSAT Performance Step: 5(C)

Correctly identify and tag out mechanical isolation boundary valves in the correct position.

Standard:

1) Danger tags CLOSED - FC-0104, SFP Skimmer Pump 2A discharge valve.

2) Danger tags CLOSED - FC-0001, SFP Skimmer Pump 2A suction valve.

Comment:

1) The applicant must provide the exact valve numbers and correct position. The valve name may be paraphrased or shortened as desired.

2) The applicant may also Danger tag the following valves closed to provide double valve protection since this system contains radioactive fluid, however; this is not a requirement:
- FC-0069, SFP Skimmer Pump 2A Suction from Fuel Transfer Canal Isolation Valve
- FC-0005, SFP Skimmer Filter Return Header Isolation Valve

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6

Identify correct boundary components on ECO with a "B".

Standard:

Identifies the following components as boundary devices by placing a "B" in the BDRY column on the applicable line item of the ECO:

1) 480 Volt MCC 2S1, cubicle C3 - Spent Fuel Pool Skimmer Pump 2A supply breaker

2) FC-0104, Spent Fuel Pool Skimmer Pump 2A discharge valve

3) FC-0001, SFP Skimmer Pump 2A suction valve

Comment:

Compare With Answer KEY.

Cue:

Notes:

SAT/UNSAT Performance Step: 7(C)

Identify, list and Danger tag one vent or drain valve in the correct position on ECO.

Standard:

As a minimum, opens and Danger tags vent valve FC-0053.

Comment:

1) The initiating cue directed the applicant to establish only one vent/drain path closest to the skimmer pump, therefore as a minimum, valve FC-0053 must be used.

2) Compare with Answer KEY.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: *8*

Document on ECO form that an adequate Drain path does not exist for the pump.

Standard:

Determines that no system drain valve exist inside ECO valve boundaries.

Comment:

Applicant should determine from P&ID that 2-FC-0064 is the pump skid drain and not a system drain and note that an adequate drain does not exist.

Cue:

Notes:

SAT/UNSAT Performance Step: 9

Determine proper execution sequence.

Standard:

Determines the minimum execution sequence as shown on KEY.

Comment:

Compare with Answer KEY. Generally the handswitch and breaker should be first, the discharge and suction valves should be second, and the vent and/or drain valve should be third.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10

Ensure ECO special requirements are satisfied.

Standard:

Ensures the following special requirements are met:

1) Marks "NO" in block for security to be notified.
2) Marks "YES" in block for Hazardous System.
3) Marks "NO" in block for Fire Protection notification.

Comment:

1) *** - denotes critical portion of step**.

2) There is no requirement for the ECO preparer to number the "EXEC SEQ" blocks for expected sequence, however, the applicant may fill the blocks out. By procedure, the SRO reviewer is expected to verify that the ECO is written in sequential order by line item or he/she may specify exact sequence by filling out the "EXEC SEQ" blocks (The ECO answer KEY does have the "EXEC SEQ" blocks filled out).

3) Compare with Answer KEY.

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A3, PREPARE ECO FOR SFP SKIMMER PUMP

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Unit 2 is at 100% power. You are the extra Reactor Operator on weekend duty. Mechanical Maintenance has requested that Spent Fuel Pool Skimmer pump 2A be tagged out for performance of scheduled PM # MM-2-89001619. This is a PM which replaces the pump assembly with a new unit.

INITIATING CUE:

You are directed to write the clearance for Spent Fuel Pool Skimmer pump 2A in accordance with 0PGP03-ZO-EC01A, Equipment Clearance Order Instructions, isolating it at the closest boundary valves for draining. The ECO Computer is unavailable. You are to take the following into account during your ECO preparation:

1) The ECO number will be 2-13-B 0001
2) Restoration positions and components listed solely for restoration purposes are NOT required.
3) Only one set of vent and drain valves is required. The vent and drain path used should be as close to the skimmer pump as possible.
4) The enclosed work package is provided as a means of supplemental information only. It is intended to be used for determining the scope of the work and the ECO needed to facilitate that work.

ECO Number: _____-_____-_____ **Unit:** 1 2 **Page ___ of ___**
Unit Year Number

Hazardous System? ☐ Yes ☐ No **Notify Fire Protection?** ☐ Yes ☐ No

Notify Security? ☐ Yes ☐ No

What Is Being Tagged? _____ **TPNS#** _____

Work Description:

Prepared By: _____ _____ _____
Signature Date Time

Tech Review By: _____ _____ _____
Signature Date Time

Approved By: _____ _____ _____
Signature Date Time

Notes:

ECO Number: _____-_____-_____
Unit Year Number

Page _____ of _____

Job Number	Work Document WAN / CR / Procedure	Work Group	Job Addition		Ready for Work Group Acceptance	Work Group Sign ON (Print, Sign, Date Time)	Work Group Sign OFF (Print, Sign, Date Time)
			Add	SRO			
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							

ECO Number: _____-_____-_____ Page _____ of _____
Unit Year Number

Line Number	Type	BOUNDARY	Component ID Or Instructions	Verification Required?	Action	Exe. Seq	Required Position	Performed By	Verified By

SOUTH TEXAS PROJECT NUCLEAR OPERATING COMPANY

ECO REQUEST FORM

Date: Today Pg 1 of 1

Craft: MM Wan No: 1068582 Activity No: 368582 CR No: N/A Unit: 2

Short Description:
Remove and Replace Spent Fuel pool skimmer pump 2A.

Original Description:

PROTECTION REQUIRED:	NO____	PERSONEL __X__	EQUIPMENT __X__
System Breach Required:	YES __X__	NO _____	
Mechanical Isolation:	YES __X__	NO _____	
Vented:	YES __X__	NO _____	
Drained:	YES __X__	NO _____	
Rotational Protection:	YES __X__	NO _____	

Is Electrical Protection Required for any of the Following?	YES __X__	NO _____	
Primary Power Source:	YES __X__	NO _____	WORK ENERGIZED _____
Space Heater:	YES __X__	NO _____	WORK ENERGIZED _____
Control/Instrument:	YES _____	NO _____	WORK ENERGIZED _____
Computer/Annunciator:	YES _____	NO _____	WORK ENERGIZED _____
Interlocks:	YES _____	NO _____	WORK ENERGIZED _____
7300:	YES _____	NO _____	WORK ENERGIZED _____
Other:	YES _____	NO _____	WORK ENERGIZED _____
Grounding Requirements:	YES _____	NO _____	WORK ENERGIZED _____

Requested By: Roy Hbear EXT: 7777

Special Tagging Instructions:

This form has no retention requirements

Importance Factor : 3B **System : FC**	**PMWO**	**PM : MM-2-89001619** **WAN : 1068582**	***MODEL # : 40297*** ***REV # : 04.0***

SECTION I

TAG / TPNS#: 7R212NPA202A - See Overflow Page **HISTORY REQ'D**

Component Description: SPENT FUEL POOL SKIMMER PUMP

Building:	FHB	CDA:	N	Lead Work Group:	MM
Room:	109	ZM-16:	N	Support Groups:	
Elevation:	21	OTC:	N	Area/Other:	

Dtl No: **Z1.1**

Activity Description: INSPECT/LUBE/REPLACE
Scope/Intent: REPLACE PUMP. HAVE OPERATIONS RUN PUMP AND CHECK FOR OIL LEAKS AND PROPER OPERATION.

SECTION II

QA/QC:	9	EQ Related:	N	Frequency:	204	Floorplug:	N
GQA Risk:	NRS	EOL Replacement:	N	Mode:	ALL		
PGR Risk:	NRS	ASME XI Replace:	N	MED Train:	N		
Quality Grade:		Seismic II/I:	N/A	Rx Mgmt Lvl:		RM WAL:	
Coordinate With:	WW11 FC05 (ANYTIME)						
Early Start Date:	01/25/13	Proj Start Date:	10/15/13	Otg Indicator:	AP24	Milestone:	
Late Finish Date:	09/20/14			Report Grp:		LCO:	N

SECTION III

WO Comments: MMRW, RHR 07/28/03 A/W 97992, 97989

SECTION IV

PERFORMANCE HISTORY

WAN	COMPLETED	STATUS	DEF
279522	05/24/06	70	

OPEN FEEDBACKS

FEEDBACK TYPE	COUNT
MASTER INDEX	0
CONDITION REPORT	0

OOS#:_____ **WAN #** *368582*

Work Start Authority: Reactor Operations **SECTION V**

Component must be returned to service by:

_____ _____
Time Date

2

Original _____ _____
1st Additional _____ _____
2nd Additional _____ _____
Signature Date

Work Supervisor or Craft:

PM Credit
Complete ☐ Partial ☐

Clearance/Permits Released: YES: ☐ NO: ☐ N/A: ☐
Work Area Clean/Tools removed: YES: ☐ NO: ☐ N/A: ☐
Hardware is secure and intact: YES: ☐ NO: ☐ N/A: ☐

Work Complete:

_____ _____
Work Supervisor Signature Date

PMT Complete:

_____ _____
Performer Signature Date

Operations Review Required? [YES] [NO]

_____ _____
Work Start Authority Signature Date

Importance Factor : 3B System : FC	**PMWO**	PM : MM-2-89001619 WAN : 1068582	*MODEL # : 40297* *REV # : 04.0*

(OVERFLOW PAGE) **SECTION VI**

Additional Text Overflow from Scope/Intent on Page 1
NONE.

TAG / TPNS

TAG / TPNS	CDA	ZM16	PG Risk	GQA Risk	QA/QC	Quality Grade	Service Description	Scaff	Insul	Coat
7R212NPA202A	N	N	NRS	NRS	9	N/A	SPENT FUEL POOL SKIMMER PUMP			

SUPPORT GROUPS

PENETRATION PERMITS

Importance Factor : 3B System : FC	**PMWO**	PM : MM-2-89001619 WAN : 1068582	*MODEL # : 40297* *REV # : 04.0*

PERMITS / DOCUMENTATION **SECTION VII**

Housekeeping Zone	IV		Scaffolding	N	Permit #:
Cleanliness Class	D		Insulation	N	Permit #:
Confined Space	N	Permit #:N/A	Coatings	N	Permit #:
Radiation Work Permit	Y	Permit #:	Charcoal Filter	N	Count: 0
Equipment Clearance	Y	Permit #:	Hot Work	N	Count: 0
Controlled System or Barrier Impairment	N	Count : 0	Transient Fire Load	N	Count: 0

M&TE Used (Documentation Required: N) **SECTION VIII**

Description	**ID Number**	**Cal. Due Date**
Range of Use:	Date Used:	
Range of Use:	Date Used:	
Range of Use:	Date Used:	
Range of Use:	Date Used:	
Range of Use:	Date Used:	
Range of Use:	Date Used:	
Range of Use:	Date Used:	

PERSONNEL PERFORMING MAINTENANCE **SECTION IX**

Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd
Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd
Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd
Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd
Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd
Name (Print)	Craft	Hrs Wkd	Name (Print)	Craft	Hrs Wkd

OPTIMUM CREW SIZE:_____ TOTAL HOURS:_____

SPARE PARTS / MATERIAL USED **SECTION X**

Parts Page Printed on: 07/01/2013 12:07:20

Stock Code	MCC	RIR/ISN MAF	L V	Qty Req'd	Spare Parts Description	ASME	Qty Used
501-24214	B2		3	1 EA	PLUG, PIPE, 3/8 IN NPT, SQ OR HEX HEAD (ASME CL-2)	2	
501-47082	C4		2	1 PT	LUBRICANT, OIL, MOBIL DTE HEAVY MEDIUM, (55 GAL DRUM)		
560-23008	F4		2	1 OZ	SEALANT, THREADED PIPE, LOW HALOGEN/LOW SULFUR, 50 MIL. TUBE, 10 TUBES		
560-27006	F7		2	1 EA	CLOTH, DIAPER, 10 PER PKG/6 PKG'S PER CS		

MATERIAL REQUEST

RPD # / New Part	RIR/ISN MAF	L V	Quantity Requested	Material Description	Qty Used
NONE.					

SECTION XI

1.0 PREREQUISITES

1.01 GENERAL

1.01.01 Perform Pre-Job briefing. _____/_____
Performer/ Date

1.02 SPECIAL TOOLS / EQUIPMENT

	CAL REQ
1.02.01 DRAIN PAN	N

2.0 PRECAUTIONS

NONE

Importance Factor : 3B **System : FC**	**PMWO**	**PM : MM-2-89001619** **WAN : 1068582**	***MODEL # : 40297*** ***REV # : 04.0***

**** S. T. A. R. **** **SECTION XIa**

PRIOR TO STARTING ANY WORK ACTIVIES, RECORD THE TAG / TPNS NUMBER(S), UNIT NUMBER, AND THE TRAIN / CHANNEL DESIGNATOR FROM THE COMPONENT(S) USING SELF-VERIFICATION TECHNIQUES AND ENSURE THE RECORDED INFORMATION MATCHES THE INFORMATION ON THIS DOCUMENT. UNUSED BLOCKS DO NOT REQUIRE N/A.

1) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
2) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
3) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
4) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
5) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
6) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
7) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
8) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
9) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
10) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
11) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
12) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
13) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	
14) UNIT # : _____	TRAIN/CH : _____	TAG/TPNS# : _____
INITIAL: _____	DATE: _____	

3.0 WORK INSTRUCTIONS

3.1 Drain oil from oil housing sump.

3.2 Replace pump per vendor manual.

3.2 Flush sump with new oil.

3.3 Fill oil sump using Trico Oiler with new oil.

> Note:
>
> The following steps are required for Post Maintenance Testing.
> (Ref. PMT Matrix 3.10)

3.4 While equipment is running, perform the following:

3.4.1 Verify no oil/piping/process leaks.

3.4.2 Verify proper oil level.

3.4.3 Verify no abnormal noises or excessive vibrations are present.

3.4.4 Verify no unacceptable external seal leakage.

3.4.5 Verify no abnormal bearing temperatures.

4.0 References

4.01 Implementation References

	Document Reference	Sheet	QCIP	Description
4.01.01	5R219F05028#2			P&ID SPENT FUEL POOL COOLING & CLEANUP SYSTEM
4.01.02	9E0PFBA#2			SINGLE LINE MCC 2S1

4.02 Source Documents

	Document Reference	Sheet	QCIP	Description
4.02.01	VTD-G200-0001			VTB-G200-7001 TAB 1, GOULDS VENDOR MANUAL

SECTION XIc

5.0 Documentation

Importance Factor : 3B **System : FC**	**PMWO**	**PM : MM-2-89001619** **WAN : 1068582**	***MODEL # : 40297*** ***REV # : 04.0***

CRAFT WORK SUMMARY SHEET

AS FOUND:

CORRECTIVE ACTION TAKEN:

WORK SUMMARY:

This form shall be retained in accordance with the Document Type List, unless Electronically filed.

Importance Factor : 3B **System : FC**	**PMWO**	**PM : MM-2-89001619** **WAN : 1068582**	***MODEL # : 40297*** ***REV # : 04.0***

DOCUMENT / RECORD REQUEST

REQUESTED BY :	WALKER, HORACE				DATE :	2013/09/01 12:53:15	
DEVISION / DEPT :	OPERATIONS	PHONE # :	8690		LOCATION :		
WORK ORDER # :	368582	PICK UP :	☒	MAIL OUT :	☐	MAIL CODE :	
EMERGENCY : ☐	URGENT : ☐	WIP : ☐	ROUTINE : ☒				
INFO ONLY : ☐	WORKING COPY : ☒	ALL AMENDMENTS ? ☒ YES ☐ NO					
LIST REQUIRED AMENDMENTS :							
SPECIAL INSTRUCTIONS : CURRENT REVISIONS							

Qty	Document Number	Sheet	Revision	Location	Description
1	5R219F05028#2			54953621	P&ID SPENT FUEL POOL COOLING & CLEANUP SYSTEM
1	9E0PFBA#2			55986145	SINGLE LINE MCC2S1

DC / RM PERSONNEL	
Date/Time Received :	Date/Time Completed :

STI - 32799273	**0PGP03-ZO-ECO1A**	**Rev. 19**	Page 1 of 107
Equipment Clearance Order Instructions			
Quality	Safety-Related	Usage: **Available**	Effective Date: 12/21/10

E. H. Hudson	H. Allgeyer	Site Personnel	Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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1.0 Purpose and Scope

1.1 This procedure provides instructions for preparing, reviewing authorizing, hanging, accepting, revising and releasing Equipment Clearance Orders (ECOs).

1.2 This procedure contains information and guidance on tags, audits and other administrative features of the Equipment Clearance Order (ECO) program.

1.3 ECOs are written to provide:

- Personnel Safety.
- Equipment Protection.
- Providing information to plant personnel.
- Alerting of unusual equipment conditions.
- Component operation with strict control maintained during component manipulation or maintenance.
- Temporary configuration control of plant equipment.

2.0 References

2.1 UFSAR:

2.1.1 Section 9.1.3.1.2 (USQE 92-0010)

2.1.2 Section 13.5.1.3, Procedures (LCTS# 8500374-936)

2.2 SPR/CRs:

2.2.1	870493	ECO Not Adequate For Employee Protection, MATS# 8800418-860
2.2.2	890043	Partial LOOP when Main Generator Breaker Inadvertently Closed
2.2.3	890256	Improperly Installed Fuse, LCTS 8900607-936
2.2.4	892626	Define Acceptor, Emergency & Issuing Authority
2.2.5	900265	Danger Tag Added To ECO Without Notification Of Acceptor, MATS# 9000651-936
2.2.6	900265	Failure To Notify Issuing Authority Upon Change To An ECO, MATS# 9000651-936
2.2.7	900407	Contract Mechanic Was Sprayed With Sulfuric Acid, MATS#9001040-936

2.2.8	900467	Minor RCS Spill During Flood Up, MATS# 9001269-936
2.2.9	910039	CVCS Spill Due to Inadequate Clearances
2.2.10	910039	Inadequate Clearance Resulting in Contaminated Spill, MATS# 9100143-936
2.2.11	910065	13.8 Auxiliary Bus 1G PT Fuses Inadvertently Pulled, MATS# 9100210-936/866
2.2.12	910120	Mechanics Sprayed With RSAR Water/Resin Mixture, MATS# 9100398-936/866
2.2.13	910283	Safety Valve Flange Unbolted For ECO
2.2.14	920586	Waive Requirements of Independent Verification
2.2.15	921035	Tag Lift Permit Problems During MOVATS Testing
2.2.16	921097	Acceptor to Ensure Adequate Component Draining
2.2.17	921359	Check Valves as BOUNDARY Valves for an ECO
2.2.18	931013	Procedure Usage Requirement for ECO Restoration
2.2.19	931682	IA System Jurisdictional Controls
2.2.20	931906	ECO Notification Form Deletion
2.2.21	931919	Review of Closed ECO-Procedural Direction for Blank Spaces
2.2.22	931945	Add Construction Potable Chlorine Injection System to Chemically Hazardous Systems
2.2.23	932054	Caution Tags Older Than 6 mo. (QA Audit 93-02)
2.2.24	930170	Use of Valve Wrenches Cracking MOV Actuators
2.2.25	932506	Security Incidents Caused by Inadequate Notice From Operations
2.2.26	932575	Loose Contacts of Buchanan-358 Fuse Blocks
2.2.27	932722	Adverse ECO Trend
2.2.28	932785	Acceptor Training Requirements
2.2.29	932946	Water Spill Due to ECO BOUNDARY Revision Problems
2.2.30	932996	ECO Tags Hung With Inadequate Information or Deteriorated

2.2.31	940117	Electrician Shocked by Bus Cleared for Work by ECO
2.2.32	940159	ECO Miscommunication Causes Damage to MOV Motor
2.2.33	933557	Security Inverter Not Put Back in Service Per Procedure
2.2.34	941284	ED-0382 is Not Included in a Procedure-Was Found in Incorrect Position
2.2.35	941401	ECO Adverse Trend
2.2.36	941673	Essential Chiller 12C Outlet Isol Valve 1-CH-0607 Found Out of Required Valve Position
2.2.37	958921	Clearance BOUNDARY Problems during change to WMT ECO
2.2.38	9714190	Fire Protection Valve IRC 1-FP-0945 Released in the CLOSED position during ECO revision
2.2.39	9718629	Tagout attachment devices and tags don't meet OSHA requirements
2.2.40	981409	Quality Audit of ECO Program Findings
2.2.41	982008	Acid Leak in Unit 1
2.2.42	9812247	Feedwater Heater 15B BOUNDARIES not properly tagged out
2.2.43	035914	Maintenance Improvement Team recommendations for CR 03-6291
2.2.44	036291	Condensate Pump 12 recoupled without BOUNDARIES isolated
2.2.45	043110	Danger tag revised to Test tag
2.2.46	043111	Trend in ECO Performance
2.2.47	049990	Degraded strings on ECO tags
2.2.48	0415251	Limit Number of ECO Tags in RCB
2.2.49	052079	SGFPT 23 Valves on SGFPT 21 ECO
2.2.50	053071	LER 02-05-0003 (SSPS ECO Error)
2.2.51	0511881	Mispositioned Components Adverse Trend
2.2.52	0512177	Evaluation of Adhesive Anchors
2.2.53	075744	Equipment Clearance Order (ECO) Hung on Incorrect Solid State Protection System (SSPS) Power Supply

2.3 SERs & SOERs:

2.3.1 SER 81-051, SFP Watertight Gate Seals

2.3.2 SER 81-064, Reactor Coolant Leak Due to Technician Error

2.3.3 SER 84-056, Mispositioning of Valves and Controls Disabled Safety Systems

2.3.4 SOER 85-02, Valve Mispositioning due to Human Error

2.3.5 SOER 83-09, Valve Inoperability due to Motor Operator Failure

2.3.6 SER 2-98, Recurring Electrical Shock Events

2.4 IENs:

2.4.1	79-035	Control of Maintenance & Essential Equipment
2.4.2	84-039	Inadvertent Isolation of Containment Spray Systems, MATS# 8502413-936
2.4.3	84-039	Inadvertent Isolation of CS System, MATS# 8500012-866
2.4.4	84-046	Verify Physical Condition of Breakers When Restoring Clearance, MATS# 8400055-860, 8402181-936
2.4.5	84-051	Independent Verification, MATS# 8402186-936
2.4.6	84-058	Inadvertent Defeat of Safety Function by Human Error
2.4.7	84-076	Loss of all AC Power, MATS# 8500129-936
2.4.8	85-051	Inadvertent Loss or Improper Actuation of Safety-Related Equipment, MATS# 8501546-936

2.5 OMRs:

2.5.1	81-008	De-energizing DC or AC SFAS, MATS# 8500279-936
2.5.2	86-298	Unmonitored Release From Boric Acid Hold Tank, MATS# 8600694-936
2.5.3	87-314	Steam Intrusion Into Main Condenser During Maintenance, MATS# 8700418-936

2.6 NRC & INPO Reports:

2.6.1 NRC Q032.42, Verify Position of Transformer Taps and Manual Bypass Circuit Breakers After Maintenance and Testing, MATS# 8601313-936

2.6.2 NRC Q640.13N, Corrective Actions Required for Instrument Setpoint Drift, MATS# 8601463-936

2.6.3 INPO 01-002, Guidelines For The Conduct Of Operations At Nuclear Power Stations

2.7 Miscellaneous Reports or References:

2.7.1 ANSI N.18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

2.7.2 Operations Quality Assurance Plan (OQAP)

2.7.3 DR 86-027, Combining Clearances, MATS# 8601037-860

2.7.4 ST-AE-HL-90904, NRC Inspection Report 86-05, MATS# 8601188-860

2.7.5 NOI 87-08-46, Authority to Release Equipment, MATS# 8700448-860

2.7.6 Response to ISEG Report 91-11, ST-HS-15135

2.7.7 ST-HL-AE-1950, Response to Electrical Systems Audit (LCTS# 8801605-936)

2.7.8 OTH 93-006, Containment Purge Valve Event

2.7.9 ST-HL-AE-4895, Response to NRC Inspection Report 94024

2.7.10 OTH 93-097, Clearance Release Problem

2.7.11 NTD027, ECO Acceptor Training

2.7.12 29 CFR 1910.269, Occupational Safety and Health Standards, Electric power generation, transmission and distribution

2.7.13 10 CFR 50 Appendix B

2.7.14 NRC Generic Letter 91-18

2.7.15 NTD028, ECO Plant Operations Training

2.7.16 Conduct Of Operations

2.7.17 PS-HND-002, ECO Guidelines

2.7.18 NOI 87-08-46, Authority to Release Equipment, MATS# 8700448-860

2.7.19 NTD027, ECO Acceptor Training

2.7.20 NTD028, ECO Plant Operations Training

2.7.21 CR 09-9630, Employee Received Second Degree Burns To Right Arm While Performing Work On Extraction Steam To Feedwater Heater 11B Drip Leg Drain Level Control Valve

2.8 Procedures:

2.8.1 0POP01-AE-0001 (Circuit Breaker Operation)

2.8.2 0PGP03-ZA-0010 (Performing and Verifying Station Activities)

2.8.3 0PGP03-ZA-0078 (Administration of the Radiation Monitoring System)

2.8.4 0PGP03-ZI-0007 (Confined Space Entry Program)

2.8.5 0POP01-ZA-0001 (Plant Operations Department Administrative Guidelines)

2.8.6 0PGP03-ZM-0021 (Control of Configuration Changes)

2.8.7 0PGP04-ZE-0312 (Design Change Implementation)

2.8.8 0PGP03-ZO-0003 (Temporary Modifications)

2.8.9 0PGP03-ZI-0001 (Personal Safety Program)

2.8.10 0PGP03-ZI-0021 (Electrical Safety)

2.8.11 0PGP03-ZA-0109 (Configuration Management Program)

2.8.12 0PGP03-ZA-0090 (Work Process Program)

2.8.13 0POP01-ZA-0015 (Plant Operations Quality Records)

2.8.14 0PGP03-ZA-0014 (Foreign Material Exclusion Program)

2.8.15 0PGP03-ZO-ECO2 (Facilities Management Equipment Lockout/Tagout Program)

2.8.16 0PGP04-ZE-0309 (Plant Modification)

2.8.17 0POP01-ZO-0002 (345 KV Switchyard Switching And Clearance Guidelines)

3.0 Definitions

3.1 ACCEPT (SIGN ON): To establish co-ownership or control of an ECO. By ACCEPTING an ECO or ECO Revision, the ACCEPTOR has verified that the ECO provides adequate personnel and equipment protection for the work being signed for, and has verified the ECO is implemented correctly (components tagged in required positions per ECO).

3.2 ACCEPTOR: A QUALIFIED INDIVIDUAL, designated by their Department or Division Manager, who is required to ACCEPT an ECO for a WORK GROUP. A designee MAY perform the responsibilities (e.g., ECO verification and walkdown) of an ACCEPTOR provided they are a QUALIFIED INDIVIDUAL from the same WORK GROUP. (Reference 2.2.4 and 2.2.28)

3.3 ALIGN: To place a component in a designated configuration. Permission to ALIGN a component is given by the OPERATIONAL AUTHORITY.

3.4 BREACH: The act of making an initial opening into a vessel or pipe through a bolted, threaded or welded connection or plate. Opening vent and drain valves to depressurize or drain a component is not considered a system BREACH for the purposes of this procedure.

3.5 BREAKER RACKING TAG: A tag controlled by 0POP01-AE-0001 (Circuit Breaker Operation) placed on the control room handswitch for load center or switchgear breakers to provide for personnel protection while racking operations are in progress.

3.6 BOUNDARY: A device or component that is required to isolate, block in, deenergize and/or depressurize a component for personnel safety or equipment protection. Items listed as a BOUNDARY will have a “B” in the “BDRY” field of the ECO.

3.7 BOUNDARY VERIFICATION DATASHEET FORM: Used by ACCEPTORS to document verification of ECO coverage each subsequent shift the ACCEPTOR is signed onto the ECO. An electronic version is located within the Electronic ECO. IF paper version is used, THEN it SHALL be kept with the work package through work completion, EXCEPT when an ECO Additional Job Listing Sheet is also used. If utilizing an ECO Additional Job Listing Sheet for multiple work documents on a single ECO, the ECO Worker Tracking Form and the applicable ECO Additional Job Listing Sheet may be kept in a central location as determined by the ACCEPTOR. The ECO Additional Job Listing Sheet can only be used when a paper version Boundary Verification Datasheet Form is used.

3.8 CAUTION TAG: A tag placed on or near a component to provide temporary operating restrictions, temporary configuration control, or information. This tag **SHALL NOT** be used where personnel injury or equipment damage could reasonably occur if the instructions on the tag were not followed. (Yellow Tag)

3.9 CONFLICT QUERY: A Query performed in the ECO database to identify conflicts between different ECO positions for the same component.

3.10 DANGER TAG: Prevents manipulation of a component or system to prevent personnel injury or equipment damage. DANGER TAGS are normally hung on the main control points and BOUNDARY control points to isolate equipment from sources of energy and permit work to be safely performed (e.g., close and tag suction/discharge valve, open and tag associated suction/discharge valve breaker). (Red Tag).

3.11 DOUBLE VALVE PROTECTION: The process by which the ECO program utilizes 2 valves in series to isolate the work area from a HAZARDOUS SYSTEM.

3.12 EQUIPMENT CLEARANCE ORDER (ECO): The administrative process, forms, reports, computerized ECO process, Manual process, and tags that control plant configuration and provide protection for equipment and personnel. (Reference 2.2.21)

3.13 ECO RELEASE REVISION: This revision is implemented when all Work Groups have signed off of the ECO. This revision will release all tags and restore the tagged out system/component(s) to the Operational Authority's control.

3.14 ECO REVISION: A requested change to a Reviewed ECO. Revisions are used to add or release tag(s) from hanging ECOs and require all acceptors to approve the revision prior to implementation.

3.15 ECO WRITER: A qualified individual designated by the Issuing Authority who prepares ECOs and ECO revisions.

3.16 ELECTRICAL PROTECTION: The electrical isolation control that is required when the craft is working on or in close proximity to equipment that would electrocute them if energized.

3.17 EMERGENCY: A condition that would cause any of the following (Reference 2.2.4):

- Significant hazard to personnel that can be avoided by the RELEASE of a clearance.
- Significant equipment damage.
- Failure to comply with a Technical Specifications Action Statement.
- Degradation of Engineered Safeguards Features.
- Further escape of effluents.
- The Shift Manager may declare that an emergency exists whenever, in their judgment, the plant conditions warrant it.

3.18 GROUND: Device(s) designed to maintain or reduce the potential of the conducting components of equipment equal to earth's potential. This includes any solid or stranded conductor, 18 AWG or larger, connected directly between the current carrying surface of electrical distribution equipment and earth GROUND. Conductors smaller than 18 AWG or connected to approved test equipment are not included in this definition.

3.19 HAZARDOUS SOURCES OF ENERGY: Energy sources (e.g., electricity, steam, high temperature fluids, acids, caustics, high pressure systems, cryogenic fluids, radioactive fluids, etc.) which pose a potential threat to the safety of personnel and equipment.

3.20 HAZARDOUS SYSTEM: A system that meets any of the following criteria:

- A System that is >150 psig or >200 ^{o}F and will be in service while the ECO is hung. (e.g., ECO boundary valve will have >150 psig or 200 ^{o}F on one side) These systems that operate at high pressure or high temperature should be isolated from the work area utilizing DOUBLE VALVE PROTECTION.
- A system or portion of a system containing HAZARDOUS SOURCES OF ENERGY within the boundaries of the ECO.
- WHEN performing maintenance on energized equipment, THEN that system or portion of the system SHALL be designated as a HAZARDOUS SYSTEM.
- A system designated as such by the TECHNICAL REVIEWER or ISSUING AUTHORITY.
- The following systems, or some portions of the following systems, are considered hazardous (the OPERATIONAL AUTHORITY should be contacted for identification of specific portions of systems that are to be considered hazardous): (Reference 2.2.22)
  - Acid Storage and Transfer (AD)
  - Caustic Storage and Transfer (CA)
  - Chemical Feed (CF)
  - High pressure and regeneration portions of Condensate Polishing (CP)
  - Electrohydraulic Control (EH)
  - Nonradioactive Chemical Waste (NC)
  - Sodium Hypochlorite (SH)
  - Hydraulic Fluid for the Feedwater Isolation Valves (FW)
  - Hydraulic Fluid for the Steam Generator PORVs (MS)
  - Chemical Feed portion of Liquid Waste Processing System (WL)
  - Regeneration portions of Demineralized Water System (DW)
  - Hydrogen (HY)
  - Liquid Nitrogen (NL)

3.21 ISSUING AUTHORITY: An individual possessing a Nuclear Regulatory Commission (NRC) Senior Reactor Operator (SRO) license for STPEGS who directs hanging and releasing ECOs. (References 2.2.4 and 2.7.5).

3.22 LOCKED COMPONENT: As defined in 0POP01-ZA-0001 (Plant Operations Department Administrative Guidelines).

3.23 MANUAL ECO: An ECO written on paper (using forms in this procedure). Manual ECO's are generated when ECO's are needed and the computer is not available.

3.24 OPERATIONAL AUTHORITY: The supervisor in direct control over the operation of a component or system. The OPERATIONAL AUTHORITY for the following are:

- Operations Equipment — Shift Manager/Unit Supervisor
- Facilities Management — Manager of Facilities Equipment Management or designee
- Chemistry — Chemical Technician Supervisor
- Maintenance Equipment — Applicable Maintenance Discipline Supervisor

3.25 PERFORMER: A QUALIFIED INDIVIDUAL designated by the ISSUING AUTHORITY who manipulates components and hangs/releases tags.

3.26 PREPARER: A QUALIFIED INDIVIDUAL designated by the ISSUING AUTHORITY who prepares ECOs and ECO revisions.

3.27 QUALIFIED INDIVIDUAL: An individual that has successfully completed a department training course in accordance with the Training Section of 0PGP03-ZO-ECO1 and is qualified by their Department or Division Manager for the task being performed.

3.28 RELEASE: The act of relinquishing control of an ECO or selected tags (i.e., removing the ECO or ECO tags protecting a WORKER's personal safety or protecting plant equipment).

3.29 REQUESTOR: The individual initiating or desiring a change to an ECO by filling out an ECO Request Form.

3.30 REQUIRED POSITION: The position the component is required to be in to support the ECO for personal protection, equipment protection, testing, temporary configuration control, or as determined by Operating Procedure when the ECO is being released.

- For examples of general positions used for Mechanical or Electrical Devices, see Addendum 6.

3.31 ROTATIONAL (or prime mover) PROTECTION: Required to protect personnel from equipment or component/device movement or rotation (ex: pump shaft spinning, MOV closing, Turbine rotating). Protection is provided by isolation of all sources of energy that can cause the component/device to move or rotate.

3.32 SEQUENCING OF TAGS: The order in which a component is removed or returned to service within an ECO.

3.33 SIGNIFICANT RADIATION EXPOSURE: Conditions that could result in a personnel exposure of 10 mRem or greater to complete a task.

3.34 SIGNOFF: The act of relinquishing control of an ECO or selected tags (i.e., removing the ECO or ECO tags protecting a WORKER's personal safety or protecting plant equipment).

3.35 SUPPORT GROUP: A Group that performs supporting activities for the lead maintenance activity covered by the ECO (e.g., Health Physics performing swipes on valve internals, Quality Control performing pump seal inspections, etc.). Support groups typically do not have their own acceptors and sign on the ECO as WORKERS under the lead WORK GROUP's Worker Tracking Form. Core maintenance shops such as EM, I&C, and MM are not a support group regardless of which shop is designated as the lead.

3.36 TECHNICAL REVIEWER: An individual possessing an NRC Senior Reactor Operator (SRO) License, SRO certification for STPEGS, **OR** a QUALIFIED INDIVIDUAL designated by Operations Management who reviews ECOs and ECO revisions for adequacy. For reviews of safety related equipment ECOs and ECO revisions, the reviewer SHALL possess an SRO License or SRO certification for STPEGS.

3.37 TEMPORARY MODIFICATION INDEX: An index of installed and approved Temporary Modifications and Temporary Leak Repairs that is maintained by Engineering and available on the STPNOC Bulletin Board.

3.38 TEST TAG: A tag placed on components when a position must be changed during the performance of troubleshooting, testing or maintenance activities. A TEST TAG shall be treated as a DANGER TAG for everyone except the person/Work Group to whom the tag was issued. (Blue Tag with a red border)

3.39 VERIFICATION: See 0PGP03-ZA-0010 for definitions of INDEPENDENT VERIFICATION, DIRECT INDEPENDENT VERIFICATION, INDIRECT INDEPENDENT VERIFICATION, and DUAL VERIFICATION. (References 2.2.14, 2.2.28, 2.4.5 and 2.7.11)

3.39.1 For the performance of unrestricted INDEPENDENT VERIFICATIONS as related to this procedure, an individual who has successfully completed NTD 028 and meets Conduct of Operations qualification requirements.

3.39.2 For the performance of hanging tags and restricted INDEPENDENT VERIFICATIONS as related to this procedure, for LLRTs only, an individual who is qualified to perform LLRTs (Certification 2200).

3.39.3 For the performance of hanging tags and restricted INDEPENDENT VERIFICATIONS as related to this procedure, for electrical grounding only, an individual who is qualified to install grounding devices (Certification 1039 or 6000).

3.40 VERIFIER: A QUALIFIED INDIVIDUAL designated by the ISSUING AUTHORITY who performs INDEPENDENT/DUAL verification as required.

3.41 WORK DOCUMENT: A document that provides for physical work at STPEGS. Examples can include a prepared work package, preventive maintenance package, condition report, surveillance or operating procedure that directs physical changes to the equipment under clearance.

3.42 WORKER: An individual being protected by an ECO.

3.43 WORK GROUP: The designation of the division or group performing work as allowed by a specific WORK DOCUMENT.

3.44 WORKER TRACKING FORM: This form is utilized to track all workers that are being protected by an ECO for a specific activity. An electronic version of the form is located with the electronic version of the ECO. IF a paper version is used, THEN it SHALL be with the work package, EXCEPT when an ECO Additional Job Listing Sheet, is also used. If utilizing an ECO Additional Job Listing Sheet for multiple work documents on a single ECO, the ECO Worker Tracking Form and the applicable ECO Additional Job Listing Sheet may be kept in a central location as determined by the ACCEPTOR. The ECO Additional Job Listing Sheet can only be used when a paper version ECO Worker Tracking Form is used.

3.45 WORK START AUTHORITY (WSA): (As pertains to the ECO program) The WSA is an SRO certified or SRO Licensed individual, who is authorized to perform Work Starts.

4.0 General Requirements

NOTE

- The Exemption Process of 0PGP03-ZI-0001 SHALL be used whenever compliance cannot be met with station procedures that involve the safety and health of employees.
- Notifying the WSA when ECOs are signed off **OR** Revisions approved, will promote plant safety by minimizing the time equipment is unavailable for service.

4.1 Violations of the ECO process MAY result in disciplinary action up to, and including, termination or denial of site access.

4.2 ALL WORK IS TO BE CONDUCTED IN A SAFE MANER. EACH WORKER IS ULTIMATELY RESPONSIBLE FOR THEIR PERSONAL SAFEY AS WELL AS THEIR FELLOW WORKER'S SAFETY.

4.3 All maintenance being performed on the Turbine Control Valves requires an ECO. IF an ECO cannot be utilized, THEN the Exemption Process of 0PGP03-ZI-0001 SHALL be followed. (Reference CR 08-16800)

4.4 When steps of this procedure call for documentation of ECO activities (e.g., creation of tags, documentation of reviews, approvals, comments, etc.), this may be accomplished by updating the ECO electronic copy or the official ECO paper copy (if used). Instructions for use of the ECO software are contained in PS-HND-002, ECO Guidelines.

4.5 During an emergency, the Shift Manager has the authority and takes responsibility for authorized deviations from the requirements of this procedure.

4.5.1 IF during an EMERGENCY the Shift Manager requires an ECO to be released AND the ISSUING AUTHORITY is unable to contact the ACCEPTOR or their immediate Supervisor, THEN the ISSUING AUTHORITY MAY release the ECO.

4.5.2 IF the ISSUING AUTHORITY releases an ECO for an ACCEPTOR, THEN the ISSUING AUTHORITY SHOULD make every attempt to contact all ACCEPTORS and/or their supervision. (Reference 2.2.4)

4.6 IF a discrepancy is found or any questions arise during execution, verification, acceptance or release of an ECO, THEN the following SHALL be performed:

- **STOP, IMMEDIATELY NOTIFY** the Issuing Authority AND **DO NOT** continue with the current task (e.g., reposition a component found in the incorrect position) until the Issuing Authority has resolved the issue.

4.7 Non-controlled databases are NOT an appropriate reference source for ECO generation/creation.

4.8 All WORK DOCUMENTS which require the protection afforded by the ECO Program **SHALL** be included on the ECO. It is vitally important to have the WORK DOCUMENT listed and signed for on any ECO used to provide safety for the activity. For activities being performed by outside vendors, this WORK DOCUMENT MAY be a purchase order or contract number.

4.9 WHEN a component is removed from service for maintenance AND tagged per this procedure AND ACCEPTED by the WORK GROUP, THEN the equipment **SHALL** remain tagged until the WORK GROUP approves the release of the ECO on the component. An active ECO may only be revised if the change is agreed to by the ECO ACCEPTORS and the ISSUING AUTHORITY.

4.10 The Revision REQUESTOR **SHALL** coordinate with the ISSUING AUTHORITY to ensure all affected ACCEPTORS for jobs in progress are notified of the pending revision for ACCEPTOR approval and to resolve any issues.

4.11 IF the ECO revision released the ECO for a WORK DOCUMENT that was controlling a TEST TAG, THEN the ISSUING AUTHORITY may release the TEST TAG at their discretion. Once the craft has approved the release of a Test Tag, then Operations has complete control of that component.

4.12 The use of Human Danger Tags (i.e., a person protecting other personnel/equipment by component observation) SHALL NOT be performed.

4.13 An ECO **MAY NOT** be required if you are in direct physical control of the energy isolation device, such that someone would be unable to manipulate the isolation. Some examples:

- An Electrician opening a breaker, meggering the load side and then reclosing the breaker is not considered as a human tag.
- A Mechanic rethreading the open end of a pipe just downstream of a closed isolation is not considered as a human tag.

4.14 IF a BOUNDARY does NOT exist, THEN plant conditions (e.g., Modes) or procedures (e.g., POP03's) may be used to protect personnel or equipment.

4.14.1 IF plant conditions or procedures are used as a BOUNDARY, THEN a documented method (e.g., WAN or ECO number listed on an OAS as a mode restraint, POP03 procedure step, etc.) SHALL be in place to ensure work is completed prior to changing those plant conditions.

4.14.2 The documented method SHALL be listed as a note on the ECO to notify the WORK GROUP of the special boundary requirement.

4.14.3 For freeze seal see Addendum 1 for requirements.

4.15 Ensure the ECO is prepared or revised in such a manner as to prevent the operation of Danger Tagged components (e.g., Motor Operated Valves **SHALL** have associated power supplies and handwheels tagged). Evaluate the need of also installing temporary restraining devices to prevent inadvertent operation.

4.16 Information provided in approved work packages or by the cognizant activity supervisor SHALL not be used as the sole source for clearance preparation. ECO Writers and Reviewers SHALL verify all information to ensure the ECO meets requirements of safety. (Reference 2.2.53)

4.17 Positionable components, covered by an ECO, that are removed, replaced or worked on; SHALL have a restoration position listed on the ECO.

4.18 ECOs should **NOT** use check valves, relief valves, fail open or fail indeterminate valves as BOUNDARIES.

4.19 ENSURE permission obtained from the applicable Unit Operations Manager and the applicable Maintenance Division Manager or General Maintenance Supervisor:

- Any check valves, relief valves, fail open, or fail indeterminate valves used as BOUNDARIES.
- Maintenance requiring system breach on piping or equipment containing steam or fluids GREATER THAN 140°F **AND** without any vents or drains available. (Reference 2.8.9, 2.7.21)
- Any backseated or mainseated valves used as a single isolation for work on that valve.
- Working on adjacent flange to a BOUNDARY valve.
- Use of Freeze Seal as a BOUNDARY.

4.19.1 This configuration SHALL be documented on the ECO

4.19.2 Consideration SHALL be given to using other components as a BOUNDARY or installing gagging devices to provide isolation.

4.19.3 This configuration authorization, including the date, time and method (phone, email, etc.), SHALL be documented in the ECO Notes.

4.19.4 The applicable WORK DOCUMENT must allow for maintenance on the valve on its backseat or mainseated, when that configuration is the only isolation utilized.

4.20 Components that are identified as BOUNDARIES on an ECO **SHALL NOT** be utilized to add energy to a system or component.

4.21 The administrative review of an ECO (Performed by ISSUING AUTHORITY when approving an ECO to be hung) does NOT require re-verification of all line items against controlled documents.

4.22 Every job may not require the walkdown of every BOUNDARY listed on the ECO. Each ACCEPTOR SHALL verify every BOUNDARY that supports their activity. Required components are those boundaries required to perform work safely.

4.23 The tagging of handswitches alone **SHALL NOT** be used to protect personnel from HAZARDOUS SOURCES OF ENERGY.

4.24 The tagging of handswitches alone SHOULD NOT be used to protect equipment from HAZARDOUS SOURCES OF ENERGY OR unsafe conditions (drained pump, etc.). If available, an energy isolation device (i.e., circuit breaker, relay disconnect, etc.) **SHALL** be used to protect equipment unless the handswitches are being tagged only for equipment protection due to unavailability of a support system(s) which will NOT cause immediate equipment damage. (Reference 2.2.42)

4.25 The ISSUING AUTHORITY may designate certain portions of the ECO as being "Ready for Work Group Acceptance" prior to an ECO being completed in its entirety (See Section 6.7.). Field walkdowns may be performed on these ECO sections prior to the ISSUING AUTHORITY statusing the entire ECO as “Ready for Work Group Acceptance”.

4.26 WHEN the Issuing Authority approves an ECO to be hung, THEN the Issuing Authority SHALL ensure the ECO Performers/Verifiers are notified on whether or not to STATUS the ECO to “HUNG” and whether or not to STATUS the ECO “Ready for Work Group Acceptance (per Section 6.7)

4.27 The electronic version of the BOUNDARY VERIFICATION FORM is not available for use until the whole ECO is hung. Paper BOUNDARY VERIFICATION FORMS will be required (as applicable) for activities that are approved to be accepted, prior to the whole ECO being hung.

4.28 Test Tagged components, other than handswitches, are required to be walked down.

4.29 Locked and throttled valves **SHALL** be clearly identified on the ECO.

4.30 Fuses removed from equipment MAY be verified correct for reinstallation in the Fuse and Relay Database.

4.31 IF the ECO does NOT have an execution sequence, THEN the ECO **SHALL** be performed in the order written.

4.32 Do NOT unscrew locking rings on handswitches or pushbuttons to facilitate the hanging of tags.

4.33 The person preparing the ECO or revision and the person who performs the Technical Review **SHALL** be separate individuals.

4.34 WHEN hoses or drain manifolds are used, THEN these components become an extension to the drain valve AND must be staged, routed, or lined up in such a way as to support the draining requirement of the ECO (i.e., strong assurance the hose is not kinked, pinched, etc.). IF drain manifolds are used AND have isolation valves, THEN the drains that hook up to it should NOT be listed as BOUNDARY Valves OR **DO NOT** STATUS the ECO "Ready for Craft Review" until the system is drained and the hose can be removed.

4.35 Operations ECO walkdowns are performed at the discretion of the ISSUING AUTHORITY. The decision to perform a walkdown should be based on the complexity of the ECO and potential issues that may be encountered while performing the ECO in the field.

4.36 The Shift Manager/Unit Supervisor may determine the level of detail needed for the pre-job briefing and may waive the requirement for the briefing based on the complexity, risk and coordination involved with performance of the ECO.

4.37 WHEN Operations is performing an ECO involving components that are not controlled by Operations, THEN the associated OPERATIONAL AUTHORITY SHOULD accompany Operations for component manipulations.

4.38 Restoration positions for components SHALL not be marked "Not Applicable/NA".

4.39 Additional WORK DOCUMENTS MAY be added to an ECO at any time, and without performing an ECO revision. However, the ECO must be verified to provide protection for the added work document per Section 6.3.

4.40 Systems or portions of systems requiring INDEPENDENT VERIFICATION to ensure alignment to a "ready" condition (e.g., able to perform its safety function) are listed in 0PGP03-ZA-0010, Performing and Verifying Station Activities. ECOs hung on these systems SHALL ensure all components within the boundaries of the ECO are verfied to be in the correct position when the ECO is released OR an OAS entry SHALL be used to ensure performance of applicable lineups prior to calling the system operable. Applicable procedure lineups may be used to align and verify these components are in their "ready" positions. Only the components within the boundary of the ECO need to be verifed, components outside the boundary of the ECO may be marked N/A on the lineup.

4.41 All grounding devices **SHALL** be Dual Verified following removal to prevent returning electrical power distribution equipment to service with a ground installed. (Refer to Addendum 4) This verification **SHALL** be performed by a member of the Operations Department. This requirement SHALL NOT be waived.

4.42 The use of multiple ECOs to provide protection for a single work activity is allowable. The WORK DOCUMENT is to be listed and accepted on each of the ECOs. Each ECO SHALL be listed on the WORK DOCUMENT. The WORK GROUP SHALL sign onto all applicable ECOs prior to commencing work.

4.43 IF completion of a job requires three WORK DOCUMENTS, THEN the WORK GROUP **SHALL** ACCEPT the ECO three times, once for each WORK DOCUMENT.

4.44 SUPPORT GROUPS may sign as WORKERS on the lead WORK GROUP's ECO Worker Tracking Form AFTER receiving permission and ECO briefing from the ACCEPTOR or designee.

4.45 An ECO MAY be ACCEPTED for the WORK GROUP by anyone meeting the requirements of ACCEPTOR.

4.46 A single WORK DOCUMENT MAY require several members of the same WORK GROUP to complete the job. There SHOULD only be one ACCEPTOR, per WORK GROUP, per WORK DOCUMENT on the ECO.

4.47 ECO DISCUSSION: The Issuing Authority or Work Start Authority SHALL have a discussion with the ECO ACCEPTOR prior to giving workstart or at a ONP. The purpose of this discussion is to ensure both parties agree and understand:

- The work to be performed (scope and what component)
- BOUNDARIES of protection provided by the ECO
- Any Hazards or special precautions associated with the ECO or the maintenance activity.

The Work Start Authority or Issuing Authority will determine the level of detail needed for this discussion, which will be based on the complexity, risk and coordination required to perform the activity safely.

4.48 The ACCEPTOR should be a person who is actually involved in performing the work activity covered by the ECO. Only in rare situations should a Supervisor or other ACCEPTOR not involved with the work activity sign for ACCEPTING the ECO. (e.g., outage work requiring contractor support, CTC directing vendors, RCB at power ECOs, Operations for configuration control or Technical Specification compliance). Typically a Supervisor will ACCEPT ECOs for jobs that do NOT have a WORK DOCUMENT assigned (e.g. Incore Detector storage at power, administrative ECO required).

4.49 A single WORK DOCUMENT MAY require support from other than the lead WORK GROUP. In this case, **EACH** WORK GROUP requiring the protection of the ECO Program **SHALL** ACCEPT the ECO separately for that document.

4.50 The ACCEPTOR may ACCEPT an ECO upon report from a qualified ACCEPTOR in the same WORK GROUP who has performed the field walkdown of the ECO.

4.51 A Temporary Supervisor may perform the functions of a Supervisor under the directions of this procedure ONLY while actively filling the Supervisory position. Having been a Temporary Supervisor in the past DOES NOT meet the intent of this procedure with regards to allowing Supervisors to release ECO Tags.

4.52 The WORK GROUP Supervisor MAY release the ECO Tag if the original ACCEPTOR is unavailable (e.g., dressed out in Radiological Controlled Area (RCA), etc.).

4.53 Any Supervisor releasing or revising an ECO for a work activity where the Supervisor is not the original ACCEPTOR SHALL verbally notify the original work activity ACCEPTOR prior to releasing the ECO Tag, unless the ACCEPTOR or designee is offsite.

4.54 IF the original ACCEPTOR for a work activity is onsite, THEN the original ACCEPTOR should RELEASE the ECO. Only in rare situations should a WORK GROUP Supervisor RELEASE the ECO (e.g., dressed out in RCA, etc.).

4.55 IF an Acceptor inadvertently ACCEPTS (SIGNS ON) the wrong work document on an ECO, THEN the ACCEPTOR should immediately RELEASE (SIGN OFF) the ECO for that work document **AND** notify the Issuing Authority or Work Start Authority.

4.56 IF an ACCEPTOR inadvertently RELEASES (SIGNS OFF) a work document on an ECO, THEN the ACCEPTOR SHALL immediately contact the ISSUING AUTHORTY or Work Start Authority and the affected Work Group. The WSA/IA will need to add the work document to the ECO and the Craft will need to stop work until the ECO has been accepted again.

4.57 WORKERS are required to sign on an ECO Worker Tracking Form when the ECO is utilized for personnel protection. ECOs for administrative purposes (i.e. radiological controls or Technical Specification compliance) are not required to use the ECO Worker Tracking Form.

4.58 WORKER Sign Off and Sign On signatures may be obtained per telecom for unique and specific situations (e.g., not on-site, dressed out in Contaminated Area awaiting PMT). A WORK GROUP supervisor SHALL enter the "per telecom" signatures on the Worker Tracking Form.

4.58.1 IF a WORKER is off-site and unavailable, THEN a WORK GROUP supervisor may sign a WORKER off of a Worker Tracking Form provided they:

- Ensure the WORKER's employment has been terminated and they no longer have access.

OR

- Place the WORKER's access/badge on hold until the WORKER is notified that they are no longer protected by the ECO.

4.59 The purpose of the ECO Worker Tracking Form is to inform the ACCEPTOR or designee of all the personnel who are relying upon the ECO for protection. The WORKERS are NOT required to walkdown/verify the ECO BOUNDARIES.

4.60 WORKERS are only required to sign on the Worker Tracking Form once per job.

4.61 IF the ACCEPTOR or designee is a WORKER for this job, THEN the ACCEPTOR **SHALL** also sign on as a WORKER on the Worker Tracking Form, for each applicable job.

4.62 Use either the computer generated Worker Tracking Form OR Form 5 to list all WORKERS. Using both may lead to errors when signing off a job item.

4.63 The required position as written on an ECO Tag may not always be a letter for letter match with the component labeling. The requirement is that the intent of the ECO Tag must be met. Examples of this are as follows:

- An ECO Tag with a position of "DO NOT DEPRESS" attached to a start pushbutton.
- An ECO Tag with a position of "AUTO/CLOSE" attached to a handswitch that spring returns to a centered position. In this case, "AUTO/CLOSE" requires that the valve be CLOSED and then tagged in the centered position.
- An ECO tag with a designation (e.g., CP-HS-5706D CSV D Condensate Inlet Valve Handswitch) attached to a handswitch labeled with the TPNS number of the component it operates and an abbreviated noun name (e.g., CP-FV-5706D CSV D Inlet Valve).
- IF the identification or position listed on the ECO Tag does not agree with the component label, THEN stop and contact the ISSUING AUTHORITY for resolution.

4.64 Checklists are provided as job aids for WORKERS performing ECO tasks. These checklists provide abbreviated instructions. Use of these checklists does not constitute or imply permission to deviate from the detailed ECO performance instructions contained in the body of the procedure.

4.65 Personnel performing ECO activities SHALL utilize the applicable checklist for ECO Preparation, ECO Technical Review, ECO Authorization, ECO Acceptance, and Acceptor Release of ECO Checklist. (Unless the applicable portion of the procedure is used.)

4.66 The use of BREAKER RACKING TAGS is controlled by 0POP02-AE-0001, Circuit Breaker Operation. These tags are not a component of the ECO program. However, these tags may be used in conjunction with ECO tags as described in Addendum 5.

4.67 Any maintenance requiring system breach on piping or equipment containing steam or fluids GREATER THAN 140°F **AND** without any vents or drains available requires the WORK GROUP to comply with the Task Safety Analysis contained in 0PGP03-ZI-0001 (Personal Safety Program). (Reference 2.7.21)

4.68 IF an activity may cause the ECO to be lost, contaminated, or unreadable, THEN a working copy MAY be used to perform the activity.

4.68.1 IF a working copy is used, THEN all persons SHALL:

4.68.1.1 Transcribe or reproduce all information that documents actions performed to the official ECO.

4.68.1.2 TRANSFER any additional information (comments, etc.) contained on the copy to the official ECO.

4.68.1.3 DISCARD the working copy when the activity is completed.

4.69 The need for an ECO is normally identified by each craft that needs protection by review of the authorized work schedule. An ECO Request Form SHALL be used to communicate the required condition of the system/component to support the activity and any other pertinent information (e.g., where to hang tags, or install grounds, etc.). (References 2.2.12 and 2.8.12)

4.70 ECO Request Forms can be created in the electronic version of the WORK DOCUMENT (in ORACLE) and is the preferred method (otherwise use Form 2).

4.71 An ECO Request Form is not required if the ECO requirements are contained in a procedure or the activity is being directed or performed by the ISSUING AUTHORITY. ECO Request Forms shall be used for all other activities.

4.72 IF any special instructions or information are contained in the Work Package (i.e., this component affects operability), THEN it should be listed under special instructions on the ECO Request Form.

4.73 Addendums 1 and 2 provide requirements and guidance on mechanical isolation and electrical isolation.

4.74 Refer to PS-HND-002, ECO Guidelines, for additional guidance on software usage techniques for computer based ECO Preparation, Reviews, Approval, Acceptance (Signing on), Release (Signing off), Performing, and Verifying.

4.75 Systems outside configuration control are delineated in 0PGP03-ZA-0109, Configuration Management Program.

4.76 Refer to Addendum 3, MOV Manual Seating Requirements, for guidance on positioning MOV's during ECO performance.

4.77 Refer to Addendum 4, Grounding Power Distribution Equipment, for guidance on placing ECO tags on grounding devices.

4.78 IF releasing an ECO prior to any job items being accepted, THEN PLACE a note in the ECO Comments to explain the occurrence.

4.79 IF the ISSUING AUTHORITY is reviewing the ECO and signing for Approval AND has performed an Technical Review, THEN the Technical Reviewer block can be signed at the same time.

4.80 WHEN the first ECO tag for an ECO is hung, THEN an ECO becomes a quality document and the retention requirements stated on the ECO apply.

4.81 IF utilizing an ECO Additional Job Listing Sheet for multiple WORK DOCUMENTS on a single WORKER TRACKING FORM, THEN the ACCEPTOR is responsible for verifying that all WORKERS for all jobs are listed on the WORKER TRACKING FORM.

4.82 An ECO Additional Job Listing Sheet may be utilized to track multiple WORK DOCUMENTS on a single WORKER TRACKING FORM or ECO BOUNDARY Verification Datasheet Form in a central location as determined by the ACCEPTOR.

4.83 When utilizing a CNP Clearance, as defined in 0POP01-ZO-0002 (345 KV Switchyard Switching and clearance Guidelines) as a BOUNDARY for work, the CNP clearance number(s) SHALL be listed as a BOUNDARY on the ECO. For this type of BOUNDARY, the STP Designated Qualified Person (DQP) SHALL sign onto the ECO.

5.0 ECO Administration

5.1 **ECO TAG REQUIREMENTS**

5.1.1 Tag and attachment devices SHOULD be evaluated for compatibility with the environment or locations where used: (Reference 2.2.47)

5.1.1.1 Paper tags MAY be used for applications that are protected from harsh environments or environmental elements (e.g., a DANGER TAG used to tag a 480 VAC molded case circuit breaker or control panel handswitches). (Reference 2.2.39)

5.1.1.2 Hard plastic tags SHALL be used in the Reactor Containment Building (RCB), chemically harsh environments and applications where the tag would be susceptible to being exposed to the environmental elements (i.e., rain, bright sunlight, etc.). (Reference 2.2.39)

5.1.1.3 The number of ECO tags hung in the RCB at any one time while the plant is in Modes 1 – 4 SHALL be limited to 100 (one hundred). (Reference 2.2.48)

5.1.1.4 Self-locking Ty-wraps SHALL not be used to attach tags inside the RCB unless specifically approved for that application (i.e., Ty-wrap does not have a metal tab).

5.2 **ECO TAG PLACEMENT AND ATTACHMENT DEVICES**

5.2.1 The method of attachment for ECO tags to be hung on energy isolation devices SHOULD be: (References 2.2.39 and 2.7.12)

- of a non-reusable type
- self-locking and non-releasable
- have a minimum breaking strength of no less than 50 pounds
- a device that must be physically destroyed to remove the tag (e.g., using self-locking Ty-wraps or 12-ply natural linen cord tied with a knot and removed by cutting/breaking)

5.2.1.1 Red Ty-wraps are the preferred device for hanging ECO tags.

5.2.1.2 Where it is NOT feasible to use a self-locking device, other means of attachment MAY be used.

5.2.2 IF a component outside the RCB does not have a suitable attachment point for an ECO tag, THEN a "base mounting" adhesive anchor (Class BIN 501-16194) may be used.

5.2.3 ECO tags SHALL be placed in the following manner:

5.2.3.1 Tags SHOULD be placed such that they do not interfere with or obscure indications, switches or controls.

5.2.3.2 Tags SHOULD be placed on a component such that they are readily visible.

a. IF needed protective barriers (e.g. weld blankets, FME covers, etc.) for work activities in the area will obscure an ECO tag(s), THEN the cognizant WORK GROUP supervisor SHALL be notified of this condition AND SHALL determine if the energy isolation device needs to be restrained.

5.2.3.3 Tags SHALL be affixed directly to the energy isolation device, whenever possible.

a. WHEN a tag cannot be attached directly to the energy isolation device, THEN the tag SHALL be placed as close as safely possible to the device.

b. For 13.8KV and 4160V breakers the tag SHOULD be affixed to the racking mechanism.

c. For situations where an electrical circuit breaker will be removed for maintenance, the tag SHOULD be placed on the cubicle door in a conspicuous position.

5.2.4 IF an ECO tag is required to be moved from the original hang location to a new location on a device, THEN the following actions SHALL be taken:

5.2.4.1 The ISSUING AUTHORITY SHALL evaluate the proposed new hang location to ensure comparable control of the device is maintained (An ECO revision is not required to change the location of a tag on a device).

5.2.4.2 For a MANUAL ECO the ISSUING AUTHORITY SHALL authorize tag movement by annotating the new tag hang location on the ECO (paper) and the ECO PERFORMERS SHALL re-initial on the ECO (paper) for rehanging and verification, as required.

5.2.4.3 For a computer generated ECO: the ISSUING AUTHORITY SHALL place a note on the ECO (computer) with the following information:

- A description of the tag hang location change.
- Who rehung the tag and date.
- Who verified the tag (if applicable) and date.
- ISSUING AUTHORITY name and date.

5.2.5 IF an ECO tag is found detached from the component listed on the tag, THEN the tag SHALL be delivered to the ISSUING AUTHORITY. The ISSUING AUTHORITY may rehang or issue a new ECO tag.

5.2.5.1 IF the ECO tag is rehung, THEN Operations personnel SHALL re-initial on the ECO (manual/paper) for rehanging and verification, as required OR the ISSUING AUTHORITY SHALL place a note on the ECO (computer) with the following information:

- Who rehung the tag and date.
- Who verified the tag (if applicable) and date.
- ISSUING AUTHORITY name and date.

5.2.6 IF a tag is found to be missing for an active ECO, THEN the ECO SHALL be revised to create a replacement tag as the next available line item and RELEASE the original tag with a note describing the circumstances. (Reference 2.2.30).

5.2.7 IF an ECO tag is found deteriorated, THEN the ISSUING AUTHORITY may issue a new ECO tag (same tag number as the original tag).

5.2.7.1 When the new ECO tag is hung, Operations personnel SHALL remove the deteriorated tag and re-initial on the ECO (manual/paper) for rehanging and verification, as required OR the ISSUING AUTHORITY SHALL place a note on the ECO (computer) with the following information:

- Who rehung the tag and date.
- Who verified the tag (if applicable) and date.
- ISSUING AUTHORITY name and date.

5.3 RESTRAINING DEVICES AND LOCKS

5.3.1 Temporary restraining devices (e.g., Ty-Wraps, meter seals and breaker restraining devices) may be used in conjunction with an ECO to provide assurance of component positions. Temporary restraining devices SHALL be removed when the ECO is released. The use of these devices shall be documented on the ECO in the Notes field or line item.

5.3.2 Temporary restraining devices provide extra protection from inadvertent operation. These devices should be used in high traffic areas where tagged components could be: kicked, bumped or stepped on.

5.4 DANGER TAGS

5.4.1 The removal of a component with a DANGER TAG attached is a violation of the ECO program. The DANGER TAG **SHALL** be RELEASED prior to removing the component.

5.4.2 The position of a component identified on the DANGER TAG **SHALL NOT** be changed. The following are specific exceptions for illustration purposes. Not all possible scenarios are presented here: (Reference 2.2.27)

- When a valve is tagged closed, the valve MAY be repositioned (by Operations) in the closed direction ONLY as necessary to stop any seat leakage.
- The positions of valves being VERIFIED or checked during ACCEPTOR field walkdowns MAY be repositioned in accordance with Conduct of Operations, Chapter 9 (Valve Operations) ONLY to check the actual position of the component being verified.

NOTE

G. E. Magne-Blast breakers are located in 4160VAC SWGR 1D(2D) and 13.8 KV Buses 1F(2F), 1G(2G), 1H(2H), 1J(2J), 1K(2K) and 1L(2L).

- **(ALL BREAKERS <u>EXCEPT</u> G.E. MAGNE-BLAST BREAKERS)** The breaker MAY be removed from or placed into a breaker cubicle for troubleshooting, testing or maintenance with a DANGER TAG hung on the breaker's door or racking mechanism with a DANGER TAGGED position of RACKED OUT or OFF. Placing a DANGER TAGGED breaker in the TEST, CONNECT, or ON position is prohibited.
- **(G.E. MAGNE-BLAST BREAKERS ONLY)** A G.E. Magne-Blast breaker MAY be removed from or placed into a breaker cubicle for troubleshooting, testing or maintenance with a DANGER TAG hung on the breaker's door or racking mechanism with a DANGER TAGGED position of RACKED OUT. For testing purposes, G.E. Magne-Blast 13.8KV and 4.16KV circuit breakers are considered racked out with the elevator in the raised or lowered position as long as the breaker remains in the racked out condition (breaker on the floor). Placing a breaker in the RACKED IN position is prohibited.

- A grounding buggy/breaker can NOT energize the load side of a cubicle; therefore, installing a grounding buggy/breaker into a cubicle does NOT conflict with a DANGER TAG on the cubicle door requiring a breaker position of RACKED OUT.

5.4.3 A DANGER TAG MAY be hung on a valve with the position of backseated or mainseated to prevent packing leakage.

5.4.3.1 The DANGER TAG **SHALL** be RELEASED prior to the performance of maintenance.

5.4.4 WHEN a gagging device is used as an ECO BOUNDARY, THEN a DANGER TAG **SHALL** be hung on the gagging device with the position of "GAGGING DEVICE INSTALLED".

5.4.4.1 Removing a valve actuator with a gagging device installed and DANGER tagged on a valve stem is NOT considered removing or working on a DANGER tagged component.

5.4.5 A DANGER TAG **SHALL NOT** be removed without the permission of the signed on ECO ACCEPTORS and the ISSUING AUTHORITY.

5.4.6 A DANGER TAG and a TEST TAG **SHALL NOT** be issued for the same device.

5.4.7 A DANGER TAG **SHALL NOT** be used as an administrative lock in place of a mechanical locking device on a LOCKED COMPONENT to meet the control requirements of 0POP01-ZA-0001, Plant Operations Administrative Guidelines. (Reference 2.7.9)

5.5 TEST TAGS

CAUTION

A TEST TAG DOES **NOT** provide the level of restraint and safety equivalent of a DANGER TAG.

5.5.1 A TEST TAG is placed on components when a position must be changed during the performance of troubleshooting, testing or maintenance activities.

5.5.2 A TEST TAG **SHALL** be treated by everyone as a DANGER TAG except the person or WORK GROUP to whom the tag was issued.

5.5.3 A TEST TAG **SHALL NOT** be used for configuration control.

5.5.4 A TEST TAG and a DANGER TAG **SHALL NOT** be issued for the same device.

5.5.5 A device **SHALL NOT** be assigned more than one TEST TAG.

5.5.6 The OPERATIONAL AUTHORITY is the owner of the TEST TAG whenever the ACCEPTOR is not signed on the ECO.

5.5.7 Each TEST TAG **SHALL** be tied to specific WORK DOCUMENT and WORK GROUP. This information **SHALL** be listed on the TEST TAG prior to the ISSUING AUTHORITY approval.

5.5.7.1 A TEST TAG is "owned" by the individual responsible for the WORK DOCUMENT listed on the tags. This person **SHALL** be in the WORK GROUP listed on the tag.

5.5.8 IF the reason for a TEST TAG should change (i.e. different WORK GROUP or WORK DOCUMENT), THEN the existing TEST TAG **SHALL** be RELEASED and a new TEST TAG **SHALL** be issued.

5.5.9 A REQUIRED POSITION of "Tag Hung" should be used unless otherwise requested.

5.5.10 Test Tagged components, other than handswitches, are required to be walked down.

5.5.11 WHEN a component has been removed from service by a Test Tag ECO, THEN component manipulations are NOT allowed without the permission of the OPERATIONAL AUTHORITY.

NOTE

IF the ECO job item associated with the WORK DOCUMENT listed on the TEST TAG is signed on, THEN the OPERATIONAL AUTHORITY **SHALL NOT** reposition components when hanging or removing TEST TAGS unless specifically requested by the ACCEPTOR (or designee). (Reference 2.2.32)

5.5.12 IF a component covered by a TEST TAG requires operation, THEN the TEST TAG owner (ACCEPTOR OR designee) **SHALL** achieve operation of the component by one of the following methods:

- Request the OPERATIONAL AUTHORITY to perform the operation.
- Obtain permission from the OPERATIONAL AUTHORITY to operate the TEST TAGGED component for a predetermined duration.
- IF authorized by the OPERATIONAL AUTHORITY, THEN obtain permission from the ISSUING AUTHORITY to operate the TEST TAGGED component for a predetermined duration.

5.6 CAUTION TAGS

5.6.1 CAUTION TAGS **SHALL NOT** be used for personnel safety or equipment protection.

5.6.2 CAUTION TAGS used for providing operator information SHOULD list a REQUIRED POSITION of Tag Hung and/or Tag Removed.

5.6.3 CAUTION TAGS that list a REQUIRED POSITION other than Tag Hung or Tag Removed **SHALL** be INDEPENDENTLY VERIFIED unless the INDEPENDENT VERIFICATIONS are waived per the provisions of Section 5.8 of this procedure.

5.6.3.1 Components tagged with CAUTION TAGS listing REQUIRED POSITIONS may be manipulated with permission of the ISSUING AUTHORITY.

5.6.4 CAUTION TAGS **SHALL** NOT be used as a configuration control device without meeting one of the following criteria:

- The component being placed in a controlled position is associated with a material deficiency (e.g., 1-MD-0238 is closed due to LV-7928 failing open) AND a Condition Report has been written to correct the deficiency.
- The component is being placed in a controlled position to support preventative or corrective maintenance activities (0PGP03-ZA-0090).
- The component being placed in a controlled position is included in the scope of a Plant Modification (0PGP04-ZE-0309) or Temporary Modification (0PGP03-ZO-0003).
- A License Compliance Review (LCR) (0PAP01-ZA-0103) is completed for the component's controlled position. The completed LCR form SHALL be retained with the ECO.

5.7 OPERATIONS ECO WALKDOWN

5.7.1 IF desired to perform an ECO walkdown, THEN the Issuing Authority will assign an ECO PERFORMER to perform a walkdown of the ECO using an ECO Walkdown Checklist.

5.7.1.1 Ensure ECO Notes are reviewed.

5.7.1.2 Ensure any discrepancies noted by the ECO walkdown are identified and resolved on ECO Walkdown Checklist.

5.7.1.3 The completed ECO Walkdown Checklist should be retained with the ECO until the ECO is hung.

5.8 **ECO VERIFICATION REQUIREMENTS** (References 2.4.3, 2.4.5, 2.4.6, and 2.4.7)

5.8.1 INDEPENDENT VERIFICATION is required for:

5.8.1.1 ALL ECO tagging activities unless otherwise designated as Dual Verified **OR** if criteria to waive IV is met. (Reference 2.4.2, 2.6.3)

- This includes components where a Caution Tag controls a component's position.

5.8.1.2 All components in the LOCKED COMPONENT program. This requirement **SHALL** NOT be waived.

- Locked components **SHALL** be positioned in accordance with Conduct of Operations (i.e., LIP throttle valves dual verified for position and then independently verified locked-in-place).

5.8.2 DUAL VERIFICATION is required for:

5.8.2.1 All grounding device removal to prevent the return of electrical power distribution equipment to service with a GROUND installed. This verification **SHALL** be performed by a member of the Operations Department. This requirement SHALL NOT be waived.

5.8.2.2 Opening disconnects, removing fuses, or installing fuses.

5.8.3 PEER CHECKING is required for OPENING breakers.

5.8.4 WHEN restoring a 480V LC BKR or above, direct or indirect independent verification **SHALL** be performed.

5.8.4.1 IF indirect INDEPENDENT VERIFICATION is performed (e.g., breaker continuity start of equipment), THEN a step **SHALL** be listed on the ECO to document performance.

5.8.5 IF Significant Radiation Exposure, Personnel Safety Reduction or Emergency conditions are met, THEN the Issuing Authority may waive Independent Verification. (References 2.2.14and 2.2.28)

5.8.5.1 WHEN possible to observe remote indicators or component/system conditions, THEN use an INDIRECT INDEPENDENT VERIFICATION to satisfy the requirements for INDEPENDENT VERIFICATION.

5.8.5.2 IF INDEPENDENT VERIFICATION is waived, THEN record the reason for the waiver on the ECO.

5.8.6 IF the ISSUING AUTHORITY waives the requirement for INDEPENDENT VERIFICATION during restoration of an ECO, THEN perform the following:

5.8.6.1 The applicable Unit Operations Division Manager or designee must concur with waiving the INDEPENDENT VERIFICATION prior to restoration of the ECO if the INDEPENDENT VERIFICATION was waived for reasons other than those listed in Step 5.8.5.

5.8.6.2 For systems listed in 0PGP03-ZA-0010, an entry **SHALL** be made in the Operability Assessment System (OAS) to ensure that the respective system lineup, to include, as a minimum, the portions of the system that were manipulated under the ECO for which INDEPENDENT VERIFICATION was waived, is completed prior to declaring the system operable or returning it to service.

5.9 **INFORMATIONAL ECO LINE ITEMS AND NOTE REQUIREMENTS**
(These are in addition to the other requirements prescribed by this procedure.)

5.9.1 The primary purpose of a clearance and tagging program is to protect personnel from injury. In nuclear electric generating facilities, the clearance and tagging program is also designed to serve the purpose of protecting equipment from damage. Therefore measures to protect the individual worker must be integrated with the operation and control of the plant.

5.9.2 ECOs shall be written to comply with operating procedures when removing or restoring equipment to service. ECOs SHALL NOT give directions that violate Operating Procedures for systems/components that have not been isolated/removed from service for maintenance.

5.9.3 IF a procedure exists for removing the component/ System from service, THEN the ECO shall be written to comply with that procedure OR to be performed in conjunction with the procedure. Incorporating the use of these procedures into the ECO will ensure the system/component is in a known state that supports the performance of the ECO.

5.9.4 IF a procedure exists for restoring the component/ System to service, THEN the ECO shall be written to comply with that procedure **OR** to be performed in conjunction with the procedure. This will ensure the component/system configuration control is controlled by the Operating procedure when the ECO is released. (For INOP systems, an OAS may track required Lineups to restore to Operating Procedure configuration.)

5.9.5 WHEN writing ECO's in advance, THEN the Authorized Work Schedule or Outage Work Schedule will determine plant conditions that will be assumed for the period the work is to be performed, the clearance writer/reviewer should use those assumptions when writing the ECO. ECO's can have line items to ensure the assumed plant status or condition is correct.

Examples:

- Verify plant is in Mode 5.
- Ensure component XXXX is secured per XXXX.

5.9.6 The clearance writer/reviewer may list supplemental activities to ease the flow of work. These activities might involve verifying access to equipment, or they might involve compensatory measures, radiological controls, or initializing confined space entry procedures, for example.

5.9.7 Clearances may have special instructions to support the implementation or removal of a clearance. Examples of helpful information or directions that should be considered for inclusion into the ECO notes field or line items, are the following:

- Prerequisites for implementing the clearance (e.g., modes, plant status, component secured by POP02 xxxx, etc.)
- Availability and locations of temporary equipment required for the clearance (temporary sump pumps, heaters, coolers, etc.).
- Departments/groups to be notified.
- Information that supports the field implementation of the ECO.
- Management approval to use check valves, freeze seals, etc. for boundaries.
- Instructional steps should typically be used to amplify or augment the equipment manipulations required to establish or restore clearance controls (e.g. - "ensure the drain rate does not exceed the floor drain capacity in the next step" or "contact control room prior to performing next step").
- List the Hazards as applicable in the ECO Notes section.
- IF ECO requires coordination between groups, THEN the required coordination should be listed.
- Instructions required for performance (i.e., hazards, automatic actuations and effects on plant).

5.9.8 **DO NOT WRITE AN ECO IF the clearance (SSC alignment, SSC configuration) creates a condition that adversely affects the design function of the rest of the facility as described in the FSAR. These configurations require a 50.59 screening. Request a CROE for these items.**

5.9.9 PARTIAL HUNG ECO's: ECO's that are not initially to be hung fully (e.g., hung in stages: isolate and de-energize….stop until system cools down, then drain, etc.) require controls to prevent proceeding farther than is planned. One control is to have line items in the ECO directing when to stop hanging the ECO. Another control is to only print and handout the TAGS you want hung. (Do NOT give the ECO Performer ALL the ECO tags. Provide only the tags you want hung.)

- IF a work activity only needs the ECO partially hung, THEN the ECO may have a line item when enough of the ECO is hung to support the safety of that activity.

5.10 ECO AUDIT AND REVIEWS

5.10.1 The ISSUING AUTHORITY or designee **SHALL** perform a Quarterly Review of ECOs which are greater than 31 days old. (Reference 2.5.2)

5.10.1.1 Print out a "Walkdown" copy of each ECO to be audited to verify tags in the field.

5.10.1.2 Verify an ECO tag exists for each applicable line item.

5.10.1.3 Ensure all tags are legible and attached properly.

5.10.1.4 Verify designated components are in their correct position.

5.10.1.5 Document performance of the audit by signature and date on the "Official" copy of the ECO.

5.10.1.6 The Issuing Authority SHALL resolve all noted discrepancies.

5.10.2 Record the results of the Quarterly Review on the Preventive Maintenance (PM) document directing the review.

NOTE

The intent of these requirements is to correct the unusual condition. IF the ISSUING AUTHORITY determines that the tag or ECO is still needed, THEN it may be left in place at the discretion of the Shift Manager.

5.10.3 IF a TEST TAG was issued greater than one month ago, THEN contact the TEST TAG Owner to release the tag.

NOTE

- IF the job item listed on the ECO is scheduled for upcoming work (i.e. scheduled in the future, planned for upcoming outage), THEN the ECO MAY be left in place and management notification is not required. Subsequent audits should address any issues.
- Corrective actions should include, as a minimum, having the responsible WORK GROUP ensure the ECO is still required for safety to support work.

5.10.4 IF an ECO has been issued for greater than six months, THEN the Unit Operations Division Manager **SHALL** be notified to evaluate and determine corrective actions as appropriate.

- Document this on a Condition Report with an Event Code of 2B15A.

5.10.5 IF an ECO has been issued for greater than 12 months, THEN the Operations Department Manager **SHALL** be notified to evaluate and determine corrective actions as appropriate.

5.10.6 IF any ECO was issued more than 16 months ago, THEN a Condition Report **SHALL** be initiated in accordance with 0PGP03-ZX-0002 (Condition Reporting Process) to evaluate if the applicable ECO affects the STPEGS Licensing Basis if the ECO is to remain active. Document the CR number on the ECO.

5.10.6.1 IF an evaluation is not performed, THEN release the ECO.

5.10.6.2 IF the evaluation determines a change to the facility is required, THEN initiate a Condition Report for Engineering to request a Design Change Package as per 0PGP04-ZE-0312, Design Change Implementation.

5.10.6.3 IF the evaluation determines a change to the facility is NOT required, THEN verify a plan of action (tracked by a Condition Report) exists to address the condition.

CAUTION

ECO greater than 18 months old **SHALL** NOT be released and then hung again for the same component or device to reset the ECO clock. To extend the 18-month time limit for an active ECO an evaluation must be performed to determine if the applicable ECO affects the STPEGS licensing basis. (Reference 2.7.14)

5.10.7 IF any ECO was issued more than 18 months ago, THEN the Plant Manager SHALL be notified.

5.11 ECO FILE CONTROL

5.11.1 All ECOs **SHALL** be controlled from one of the following two files:

File 1: ECO for Unit 1 and common power equipment under the jurisdiction of Unit 1 Operations. (Controlled by Unit 1 Operations Manager)

File 2: ECO for Unit 2 and common power equipment under the jurisdiction of Unit 2 Operations. (Controlled by Unit 2 Operations Manager)

5.11.2 The ECO **SHALL** be maintained in the ISSUING AUTHORITY'S file for as long as the ECO remains active. Where paper reports are being used to perform ECO related activities, the following applies:

5.11.2.1 The original ECO MAY be removed from the ISSUING AUTHORITY'S file while it is being used to hang tags, remove tags or during tag ACCEPTANCE/VERIFICATION.

5.11.2.2 The original ECO **SHALL** be returned to the ISSUING AUTHORITY'S file as soon as possible upon completion of the above functions.

5.11.3 IF Facilities Management Personnel are NOT available to isolate (lockout or tagout) equipment under the jurisdiction of 0PGP03-ZO-ECO2, Facilities Management Equipment Lockout/Tagout Program, THEN the Unit 1 or Unit 2 Shift Manager has the authority to issue an ECO in File 1 or 2, respectively.

5.11.3.1 The Shift Manager issuing an ECO into File 1 or 2 **SHALL** notify Facilities Management personnel as soon as possible.

5.11.3.2 Facilities Management **SHALL** isolate (either lockout or tagout) equipment that encompasses the ECO scope written for File 1 or 2.

5.11.3.3 WHEN the Facilities controlled equipment is isolated per 0PGP03-ZO-ECO2, THEN the File 1 or File 2 ECO **SHALL** be released.

5.12 VOIDING AN ECO

NOTE

- WHEN the first ECO TAG for an ECO is hung, THEN an ECO becomes a quality document and the retention requirements stated on the ECO apply.
- An ECO MAY be voided by the ISSUING AUTHORITY at any time prior to the hanging of a tag.
- After the first tag is hung, an ECO **SHALL** NOT be voided. It **SHALL** be RELEASED.

5.12.1 To void an ECO perform the following:

5.12.1.1 Record "VOID" on the ECO.

5.12.1.2 Ensure the ECO is recorded as "VOID" in the Manual ECO Log, if applicable.

5.12.1.3 Discard the ECO.

6.0 Instructions

NOTE

- ECO Requests SHALL NOT be changed until the applicable Work Start Authority, Issuing Authority, or Technical Reviewer have been notified.
- ECO Request Forms can be created in the electronic version of the Work Document (ORACLE) on Page 4 **AND** is the preferred method.

6.1 **REQUESTING AN ECO** (Performed By ECO REQUESTORS)

6.1.1 Complete an ECO Request Form to describe the scope of the work and the required condition of the system/component necessary to perform the activity safely. Sufficient information SHALL be on the ECO request form to enable the ECO preparers to determine the type of boundaries required, and which sources/types of energy must be isolated. (See Step 6.1.3.)

6.1.2 IF the ECO Request Form does not provide information for **ALL** WORK GROUPS requiring protection under the WORK DOCUMENT, THEN a separate ECO Request Form **SHALL** be submitted for each WORK GROUP. (Reference 2.2.12)

6.1.3 The following can be used to provide sufficient information on the ECO Request Form for generating an ECO:

- Identify the Required Maintenance State (i.e. deenergized, drained, depressurized, etc.)
- Identify the specific component and its position
- Identify the required protection needed (rotational, electrical, mechanical, drained, etc.)
- Identify what energy can remain (electrical power to limit switches, alarm power, space heater, etc.)
- Identify required Grounds
- Reference drawings
- Applicable comments/instructions (e.g., This component affects Operability, troubleshoot first then hang tags, special tagging instructions, etc.)
- Request multiple ECOs for a single work order and boundaries for each
- Point of Contact for questions.

6.2 **REQUESTING AN ECO REVISION** (Performed by REQUESTORS) (Reference 2.2.6)

6.2.1 IF an ECO change is required to support an activity, THEN the WORK GROUP SHALL communicate the changes to the ISSUING AUTHORITY, Work Start Authority, or the ECO TECHNICAL REVIEWER, as appropriate, by submitting a new ECO Request Form.

6.3 ECO JOB ADDITIONS

NOTE

Adding a WORK DOCUMENT to a reviewed ECO requires the same scrutiny and verifications as writing an ECO.

6.3.1 The ECO Preparer will perform the following:

6.3.1.1 Determine ECO requirements for the activity by reviewing the ECO Request Form and the ECO.

6.3.1.2 Verify the ECO provides adequate personnel and equipment protection for the activity (Reference Section 6.4).

6.3.1.3 WHEN the ECO has been verified adequate, THEN the ECO Preparer will approve the job addition.

6.3.1.4 Notify the Technical Reviewer to review the job addition for approval.

6.3.2 The Technical Reviewer will perform the following:

6.3.2.1 Determine ECO requirements by reviewing the ECO Request Form and the ECO.

6.3.2.2 Verify the ECO provides personnel and equipment protection for the activity (Reference Section 6.5).

6.3.2.3 WHEN the ECO has been verified adequate, THEN the Technical Reviewer will approve the job addition.

6.3.3 The Issuing Authority **OR** Work Start Authority will perform Section 6.7 to change the status of the WORK DOCUMENT to “Ready for Work Group Approval”.

6.4 **PREPARING AN ECO** (Performed by ECO PREPARERS)

NOTE

Action/steps to prepare an ECO can be done out of order. However, all applicable steps SHALL be done prior to approving the ECO as "Prepared".

6.4.1 Determine the scope of the ECO.

6.4.1.1 Review all pertinent ECO preparation information such as the WORK DOCUMENTS, the ECO Request Form, etc.

6.4.1.2 Ensure the ECO Request provides enough information to determine ECO requirements. If necessary contact the activity Supervisor to add the required information on the ECO request.

6.4.2 Ensure the ECO provides adequate personnel and equipment protection for all activities listed on the ECO.

6.4.2.1 As a minimum, isolate and tag all HAZARDOUS SOURCES OF ENERGY necessary to ensure safety of personnel and equipment. IF all energy sources are not isolated and tagged, THEN the system SHALL be treated as a HAZARDOUS SYSTEM and a note placed on the ECO identifying the HAZARDOUS ENERGY still present.

6.4.2.2 Refer to Mechanical Isolation Requirements and Electrical Isolation Requirements (Addendum 1 and Addendum 2) for requirements pertaining to ECOs written on HAZARDOUS SYSTEMS and non-hazardous systems.

6.4.2.3 IF a system or component can NOT be depressurized OR adequately drained prior to breaching the system, THEN treat the system as a HAZARDOUS SYSTEM AND perform the following: (Reference 2.2.35, 2.7.8)

a. Notify the appropriate Maintenance Supervisor so the appropriate changes to the work package can be made (if necessary) prior to work start. (Reference 2.2.12)

b. Record a comment on the ECO stating that the system or component can NOT be depressurized or drained.

6.4.2.4 Review the ECO for any impact on Fire Protection, Security, Health Physics, Chemistry or other group that should be given notification of the ECO to be hung.

a. Place line items/notes on ECO to contact affected groups as applicable.

6.4.2.5 Determine the appropriate ECO sequence.

a. IF the ECO is NOT written in sequential order, THEN number the line items so the desired sequence is indicated.

6.4.2.6 IF the ECO will be hung in LESS THAN 24 hours, THEN review the ECO against the TEMPORARY MODIFICATION INDEX to identify any conflicts between the ECO and approved or installed Temporary Modifications and Temporary Leak Repairs.

6.4.2.7 Prepare the ECO using one or more of the following appropriate reference sources:

- Level 1 Controlled Documents—preferably P&IDs, electrical single line drawings, and elementary diagrams.
- For systems or equipment outside of configuration control, drawings or sketches provided by the Contract Technical Coordinator (CTC) or System Engineer which accurately reflect the "as-built" condition.
- Drawings or sketches contained in approved plant procedures.
- Component configurations and information contained in system operating procedures.
- A field walkdown of the equipment or system to be tagged out.
- Information provided by approved work packages. (Must be used with an additional reference source not to include the cognizant activity supervisor)
- Information provided by the cognizant activity supervisor (e.g., ECO Request Form, etc.). (Must be used with an additional reference source not to include the work package)

6.4.2.8 IF the ECO will be prepared using drawings or sketches of a system outside of configuration control, THEN a note should be annotated on the ECO stating that the CTC or System Engineer ensures adequacy of these drawings.

6.4.2.9 IF a field walkdown is required for ECO preparation, THEN a note should be annotated on the ECO stating that the field configuration may not match the system drawing and that a field walkdown was required.

6.4.2.10 IF the ECO contains SSPS components, THEN contact the SSPS System Engineer to get input on ECO requirements and effects (Determine actions to take to prevent actuations or component trips, Technical Specification implications). (Reference 2.2.50)

6.4.2.11 The following conditions require permission from the applicable Unit Operations Manager and the applicable Maintenance Division Manager or General Maintenance Supervisor:

- Any check valves, relief valves, fail open, or fail indeterminate valves used as BOUNDARIES.
- Any backseated or mainseated valves used as a single isolation for work on that valve.
- Working on adjacent flange to a BOUNDARY valve.
- Use of Freeze Seal as a BOUNDARY.

a. This configuration SHALL be documented on the ECO.

b. Consideration SHALL be given to using other components as a BOUNDARY or installing gagging devices to provide isolation.

c. This configuration authorization, including the date, time and method (phone, email, etc.), SHALL be documented in the ECO Notes.

d. The applicable WORK DOCUMENT must allow for maintenance on the valve on its backseat or mainseated, when that configuration is the only isolation utilized.

6.4.2.12 Prepare the ECO using the ECO Database software or manual forms.

6.4.2.13 Perform a review of the final draft of the ECO. Ensure each required component is listed and positioned correctly as an ECO line item.

6.4.2.14 Approve the ECO as “Prepared”.

6.4.2.15 Forward the ECO and the ECO Request Form (if paper version used) to the TECHNICAL REVIEWER

6.5 **TECHNICAL REVIEW OF AN ECO** (Performed by the TECHNICAL REVIEWER) (References 2.2.1, 2.2.4, 2.3.1, 2.3.2, 2.4.8, 2.5.1, 2.7.6))

NOTE

Steps can be done out of order. However, all applicable steps SHALL be done prior to approving the ECO as "Reviewed".

6.5.1 Review the ECO to ensure adequate personnel and equipment safety is provided for the listed activity(s). This review SHALL be performed using the ECO Request Form, and other documents as applicable, and one or more of the following appropriate reference sources:

- Level 1 Controlled Documents—preferably P&IDs, electrical single line drawings, and elementary diagrams.
- For systems or equipment outside of configuration control, drawings or sketches provided by the Contract Technical Coordinator (CTC) or System Engineer which accurately reflect the "as-built" condition.
- Drawings or sketches contained in approved plant procedures.
- Component configurations contained in system operating procedures.
- A field walkdown of the equipment or system to be tagged out.
- Information provided by approved work packages. (Must be used with an additional reference source not to include the cognizant activity supervisor)
- Information provided by the cognizant activity supervisor (e.g., ECO Request Form, etc.). (Must be used with an additional reference source not to include the work package).

6.5.2 The following conditions require permission from the applicable Unit Operations Manager and the applicable Maintenance Division Manager or General Maintenance Supervisor:

- Any check valves, relief valves, fail open, or fail indeterminate valves used as BOUNDARIES.
- Any backseated or mainseated valves used as a single isolation for work on that valve.
- Working on adjacent flange to a BOUNDARY valve.
- Use of Freeze Seal as a BOUNDARY.

6.5.2.1 This configuration SHALL be documented on the ECO

6.5.2.2 Consideration SHALL be given to using other components as a BOUNDARY or installing gagging devices to provide isolation.

6.5.2.3 This configuration authorization, including the date, time, and method (phone, email, etc.), SHALL be documented in the ECO Notes.

6.5.2.4 The applicable WORK DOCUMENT must allow for maintenance on the valve on its backseat or mainseated, when that configuration is the only isolation utilized.

6.5.3 IF the ECO will be hung in LESS THAN 24 hours, THEN review the ECO against the TEMPORARY MODIFICATION INDEX to identify any conflicts between the ECO and approved or installed Temporary Modifications and Temporary Leak Repairs.

6.5.4 IF a system or component can NOT be depressurized OR adequately drained prior to breaching the system, THEN ensure the system is treated as a HAZARDOUS SYSTEM and ensure the following:
(References 2.2.35 and 2.7.8)

- The appropriate Maintenance Supervisor has been notified of the system status so appropriate changes to the work package (if necessary) can be made prior to work start. (Reference 2.2.12)
- A comment has been entered on the ECO stating that the system or component can NOT be depressurized or drained.

6.5.5 Ensure ECO addresses all HAZARDOUS SOURCES OF ENERGY necessary to ensure safety of personnel and equipment.

6.5.5.1 IF all energy sources are not isolated and tagged by the ECO, THEN ensure the ECO treats the system as a HAZARDOUS SYSTEM and a note on the ECO identifies the HAZARDOUS ENERGY still present.

6.5.6 Ensure ECO complies with Mechanical and Electrical Isolation Requirements (Addendums 1 and 2) for Hazardous Systems and non-hazardous systems.

6.5.7 IF the ECO contains SSPS components, THEN notify the SSPS System Engineer PRIOR to authorizing the ECO. (Ref. 2.2.50)

6.5.8 Review the ECO for any impact on Fire Protection, Security, Health Physics, Chemistry or other group that should be given notification of the ECO to be hung.

6.5.8.1 Ensure line items or Notes are in the ECO to contact affected groups as applicable.

6.5.9 Ensure each required component is listed and positioned correctly as an ECO line item.

6.5.10 Verify the ECO sequence is correct.

6.5.11 WHEN the requirements of this section are complete, AND the TECHNICAL REVIEWER has performed the second review of the ECO, THEN the TECHNICAL REVIEWER **SHALL** perform the following:

6.5.11.1 Approve the ECO as “REVIEWED BY” block.

6.5.11.2 Forward the ECO to the ISSUING AUTHORITY, as applicable.

6.6 **AUTHORIZING AN ECO** (Performed by the ISSUING AUTHORITY)

6.6.1 Review the ECO for regulatory requirements (e.g., Technical Specifications, TRM, ODCM, etc.).

6.6.1.1 An ECO **SHALL** NOT be authorized that will place any part of more than one safety related train in an inoperable status without specific approval from the Shift Manager. (Reference 2.4.1)

6.6.1.2 Prior to intentionally placing any safety system, sub-system, train, component, or device out of service, the Technical Specification Limiting Condition for Operation **SHALL** be reviewed. (Reference 2.4.1)

6.6.2 Review the ECO against the TEMPORARY MODIFICATION INDEX to identify any conflicts between the ECO and approved or installed Temporary Modifications and Temporary Leak Repairs.

6.6.3 IF the ECO is being hung in support of installing a Temporary Modification OR performing a Permanent Modification to the plant, THEN ensure the Modification or Temporary Modification will not conflict with previously hung ECOs (e.g. the Mod or T-Mod will not add energy to a system or component that is already isolated for maintenance)

6.6.4 IF the ECO reduces the cooling capability of the Spent Fuel Pool Cooling System, THEN ensure all compensatory requirements of 0POP02-FC-0001 (Spent Fuel Pool Cooling) are met.

6.6.5 Review ECO and ECO Notes for special requirements, HAZARDS, and required notifications.

6.6.6 IF the ECO contains SSPS components, THEN notify the SSPS System Engineer PRIOR to authorizing the ECO. (Ref. 2.2.50)

6.6.7 Ensure the following notifications are made PRIOR to issuing the ECO for performance in the field:

- IF the ECO involves a Fire Service System interruption, THEN notify the On-Duty Fire Protection Coordinator **AND** comply with FP requirements in 0POP01-ZO-0011 and 0PGP03-ZF-0018. For pre-planned ECO activities, notification can be made to the Fire Protection Mailbox.
- IF Plant Outside Lighting, Emergency Lighting Diesel Generator, Security Communications, or flood barriers/security barriers are affected by the ECO, THEN notify the Security Force Supervisor. (Reference 2.2.25)
- IF the ECO will impact Chemistry or other group outside of Operations, THEN notify the affected group.
- The ISSUING AUTHORITY should ensure that the affected groups have compensatory measures planned or in place to compensate for the system interruption or impact caused by the ECO.

6.6.8 Perform a final administrative review of the ECO:

- Review that the ECO remains valid for plant conditions.
- Perform an ECO Conflict Query

6.6.9 Print and review ECO tags:

- IF using direct print tags, THEN review to verify the number of ECO tags matches the number of tag line items on the ECO.
- IF using tags with printed labels OR hand written tags, THEN review each ECO tag's information to verify tag is properly completed.

6.6.10 Authorize the ECO by completing the "APPROVED BY" block.

6.6.11 IF the system/component will be made inoperable by executing the ECO AND an OAS entry is required, THEN ensure an OAS entry is made.

6.6.11.1 Record the OAS number on the ECO.

6.6.12 WHEN the ECO is ready for performance in the field, THEN perform the following:

- Assign an ECO PERFORMER to perform the ECO per Section 6.8.
- Perform a pre-job brief (if required) using Form 8, ECO Performance Pre-job Briefing.
- Notify ECO Performers/Verifiers: Whether OR NOT to STATUS the ECO as "HUNG".
- Notify Performer/Verifier: Whether OR NOT to STATUS the ECO as "Ready for Work Group Acceptance" in accordance with Section 6.7.
- IF you do NOT want the ECO Performer/Verifier to STATUS the ECO as "Ready for Work Group Acceptance", THEN the Issuing Authority will need to do this in accordance with Section 6.7

6.7 **"READY FOR WORK GROUP ACCEPTANCE" APPROVAL** (Performed by Issuing Authority/Work Start Authority OR Performers/Verifiers)

NOTE

An Activity/WORK DOCUMENT may NOT require the entire ECO to be completed for protection to be provided.

6.7.1 For partially hung ECOs, the Issuing Authority or Work Start Authority SHALL review the completion status of the ECO to ensure the following:

6.7.1.1 Enough (if not all) of the ECO has been performed to support safe performance of the activity.

6.7.1.2 The required verifications are completed.

6.7.1.3 The equipment tagged out is in a zero energy state (where applicable) – deenergized, depressurized, drained, etc., AND the work can be performed safely.

6.7.1.4 WHEN the above steps are complete, THEN STATUS the WORK DOCUMENT as "Ready for Work Group Acceptance".

6.7.2 For completely hung ECOs: The Issuing Authority, Work Start Authority, Performers, or Verifiers shall ensure the following:

6.7.2.1 The required verifications are completed.

6.7.2.2 The equipment tagged out is in a zero energy state (where applicable) – deenergized, depressurized, drained, etc. AND the work can be performed safely.

6.7.2.3 STATUS the ECO to "HUNG" per Work Start Authority/Issuing Authority direction.

6.7.2.4 WHEN Steps 6.7.2.1, 6.7.2.2, and 6.7.2.3 are complete AND the Work Start Authority/Issuing Authority has given permission, THEN STATUS the ECO WORK DOCUMENT as "Ready for Work Group Acceptance".

6.8 **PERFORMING AND DUAL VERIFYING AN ECO** (Performed by ECO PERFORMERS/DUAL VERIFIERS)

6.8.1 Verify that the "APPROVED BY" block has been completed.

6.8.2 Ensure the ECO is the "Official" copy or a working copy.

6.8.3 Review ECO line items and Notes for special requirements, HAZARDOUS SOURCES OF ENERGY, and notifications.

6.8.4 Ensure they are briefed on (as applicable) and understand the operational requirements, effects, and hazards associated with the implementation of the ECO.

6.8.5 IF during performance of the ECO, additional actions are determined to be required, THEN perform the following:

6.8.5.1 Obtain permission from ISSUING AUTHORITY to perform the additional action.

6.8.5.2 Document the additional action on the next available line(s) on the ECO.

6.8.6 IF manipulation of disconnects, or fuses is required for hanging an ECO, THEN perform DUAL VERIFICATION for each disconnect, or fuse manipulation.

6.8.7 IF manipulation of breakers is required for hanging an ECO, THEN perform a PEER CHECK for each breaker manipulation.

6.8.8 Verify that the information recorded on the ECO tag agrees with:

- The information on the ECO.
- The information on the component or equipment plant label (if component of equipment is labeled).
  - The ECO Tag's TPNS number identically matches the component's TPNS number (if component or equipment label has a TPNS number).
  - The ECO Tag's service description functionally matches the component's service description (if component or equipment is labeled).
  - IF component or equipment does not have a label, THEN contact the ISSUING AUTHORITY for resolution. (Refer to Conduct of Operations Chapter 2.)

6.8.9 Align each component to the specified position in the sequence listed on the ECO.

6.8.9.1 Install any required restraining device as directed by the ISSUING AUTHORITY/ECO. Document installation of restraining device in ECO Notes field or line item.

6.8.10 Attach the correct tag to the component (using an attachment device per Step 5.2) in a location that is easily observed.

6.8.10.1 IF necessary, THEN contact the ISSUING AUTHORITY for guidance when hanging a tag on a component that has no location from which to hang the tag (e.g., valves with removable reach rods, underground valves with no valve stem, etc.).

6.8.11 Re-verify that the information recorded on each ECO tag agrees with the information on the ECO and the information on the component or equipment plant label (if component of equipment is labeled). Document each item positioned in the "HUNG BY" block on the ECO.

6.8.12 IF applicable, THEN monitor the system or component for adequacy of drainage.

6.8.13 IF a system will not depressurize or stop draining, THEN notify the ISSUING AUTHORITY.

6.8.13.1 The ISSUING AUTHORITY **SHALL**:

- Notify the activity supervisor of ECO status and HAZARDOUS SYSTEM.
- Determine if the work can be performed safely with the existing conditions.
- IF the work can be performed safely, THEN document this on the ECO.
- IF the work can NOT be performed safely, THEN take appropriate actions to place the equipment in a safe state (e.g., tighten BOUNDARY valves, expand BOUNDARIES, etc. . .) or defer the activity.

6.8.14 IF a working copy of the ECO was used, THEN ensure documentation of tagging activities is transferred to the ECO official copy and the ECO database is updated.

6.8.15 STATUS the ECO to “HUNG” per Work Start Authority or Issuing Authority direction.

6.8.16 STATUS the ECO “Ready for Work Group Acceptance” per the Work Start Authority/Issuing Authority direction and in accordance with Section 6.7.

6.8.17 IF required, THEN arrange for any required Independent Verifications OR return the ECO to the Issuing Authority.

6.8.18 **THE INDEPENDENT VERIFIER** SHALL perform the following:

6.8.18.1 Verify that the "APPROVED BY" block has been completed.

6.8.18.2 Ensure the ECO is the "Official" copy or a working copy.

6.8.18.3 Review ECO line items and Notes for special requirements, HAZARDOUS SYSTEM, and notifications.

6.8.18.4 Verify that the information recorded on the ECO tag agrees with:

- The information on the ECO.
- The information on the component or equipment plant label (if component of equipment is labeled).
- The ECO Tag's TPNS number identically matches the component's TPNS number (if component or equipment label has a TPNS number).
- The ECO Tag's service description functionally matches the component's service description (if component or equipment is labeled).
- IF component or equipment does not have a label, THEN contact the ISSUING AUTHORITY for resolution. (refer to Conduct of Operations - Chapter 2)

6.8.18.5 Verify that each ECO tag is hung properly.

6.8.18.6 Verify each component positioned by the ECO is in its proper position.

6.8.18.7 Document in the "VERF'D BY" block to indicate that the component has been VERIFIED.

6.8.18.8 IF a working copy of the ECO was used, THEN ensure documentation of verification activities is transferred to the ECO official copy and the ECO database is updated.

6.8.18.9 STATUS the ECO to "HUNG" per Work Start Authority or Issuing Authority direction.

6.8.18.10 STATUS the ECO "Ready for Work Group Acceptance" per the Work Start Authority/Issuing Authority direction and in accordance with Section 6.7.

6.8.18.11 Return the ECO Official copy to ISSUING AUTHORITY.

6.9 **ACCEPTING AN ECO** (Performed by all ACCEPTORS)

6.9.1 Verify the following for the job being performed:

6.9.1.1 The scope and BOUNDARIES of the ECO are adequate to protect personnel working on the job.

a. The ECO provides for adequate de-energization, draining and/or depressurizing to support the WORK DOCUMENT. (References 2.2.12 and 2.2.35)

6.9.1.2 The ECO line items and Notes have been reviewed for HAZARDOUS SYSTEM, special requirements, and notifications.

6.9.1.3 The REQUIRED POSITION for the required components that provide protection for the specific job are correct on the ECO.

6.9.2 Perform a field walkdown of the ECO to verify that the required components have been positioned and tagged correctly.

6.9.2.1 The ACCEPTOR **SHALL** obtain a paper copy of the ECO PRIOR to walkdown to aid in verifying BOUNDARIES and tags. (Reference 2.2.43)

6.9.2.2 Verifying the position of a DANGER or TEST tagged component SHALL be a visual verification. Except as listed below, NO ONE is allowed to manually position a DANGER or TEST tagged component.

a. IF the position of a component cannot be determined by visual means, THEN contact the ISSUING AUTHORITY.

1. The ISSUING AUTHORITY will dispatch an ECO PERFORMER to perform DUAL VERIFICATION with the ACCEPTOR to verify the position of the tagged component.

b. Alternate methods of determining valve positions are listed in Addendum 6.

6.9.3 WHEN the required review and walkdown are complete AND ECO Status is "Ready for Work Group Acceptance", THEN sign onto the ECO to ACCEPT the ECO for the job item.

6.9.4 ACCEPTORS SHALL ensure the following:

6.9.4.1 WORKERS are briefed on ALL the ECO BOUNDARIES prior to signing on to Worker Tracking Form.

6.9.4.2 IF the ECO has TEST TAGGED components, THEN ensure WORKERS are briefed on the requirement to obtain permission PRIOR to operating these components. (Reference Step 5.5)

6.9.4.3 Ensure ALL WORKERS (including the ACCEPTOR if also performing as a WORKER) are signed on the ECO Worker Tracking Form.

6.9.4.4 Ensure ALL WORKERS are briefed on the applicable HAZARDOUS SYSTEM, special requirements, and notifications.

6.9.5 Each subsequent shift, before starting work on a job covered by an ECO, ACCEPTORS SHALL verify that the ECO still provides coverage for the job.

6.9.5.1 IF the ECO has NOT been revised, THEN update the BOUNDARY VERIFICATION FORM to indicate that the BOUNDARIES are intact prior to starting the work activity.

6.9.5.2 IF the ECO has been revised since the last BOUNDARY verification AND the revision affects the job item, THEN perform the following:

a. Obtain a copy of the revised ECO, Review the ECO and perform a field walkdown of the ECO BOUNDARIES to ensure the ECO still provides coverage for the job.

b. WHEN the ECO BOUNDARIES have been determined to be adequate, THEN perform the following:

1. Update the BOUNDARY VERFIFICATION FORM to indicate that the BOUNDARIES are intact prior to starting the work activity.

2. Ensure the revision was accepted.

6.9.6 IF the ECO has been revised since the last BOUNDARY verification AND the revision does NOT affect the job item, THEN perform the following:

6.9.6.1 Ensure the revision was accepted.

6.9.6.2 IF not completed, THEN update the BOUNDARY VERIFICATION FORM to indicate that the BOUNDARIES are intact prior to starting the work activity.

6.10 **PREPARE AN ECO REVISION** (Performed by ECO Preparers)

NOTE

This section is for partial release of an ECO **OR** changing an ECO. Section 6.15 is for the release of all ECO tags.

6.10.1 Determine the scope of the ECO Revision.

6.10.2 Ensure the ECO Request provides enough information to determine ECO requirements. If necessary contact the activity Supervisor to add the required information on the ECO request.

6.10.3 Ensure the ECO Revision provides adequate personnel and equipment protection for all activities listed on the ECO.

6.10.4 Ensure each affected WORK DOCUMENT is listed on the ECO Revision.

6.10.4.1 IF releasing a Danger tag, THEN ALL Signed On Job Items **SHALL** be listed for Revision Approval.

6.10.4.2 IF releasing a Test Tag, THEN only the owner of the Test Tag needs to be listed.

6.10.4.3 IF adding a Danger Tag will affect a Work Group, THEN ensure that Work Group is listed on the ECO revision.

6.10.5 IF the ECO revision reduces the ECO BOUNDARY, THEN ensure components between the original ECO BOUNDARY and the revised ECO BOUNDARY are restored by the revision to an approved procedural lineup position for the procedure in effect. (References 2.2.29 and 2.2.37)

6.10.5.1 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the boundaries of the ECO are listed as requiring restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.10.5.2 IF restoring a system that was drained or partially drained, THEN ensure the ECO release sequence minimizes the effect to the plant and will be in accordance with fill and vent procedures

6.10.6 Components that are NOT restored per Step 6.10.5 **SHALL** be re-listed as untagged line items to ensure the component is returned to its REQUIRED POSITION upon RELEASE of the ECO. (Reference 2.2.38).

6.10.7 Perform Conflict Query.

6.10.8 Ensure the ECO Revision meets ECO preparation requirements of Section 6.4 and ECO release requirements of Section 6.15 (as applicable).

6.10.9 Fill in the Rev Prepared Block.

6.10.10 Inform Technical Reviewer that the ECO Revision is prepared.

6.11 **REVIEWING ECO REVISION** (Performed by the TECHNICAL REVIEWER)

NOTE

This section is for partial release of an ECO **OR** changing an ECO. Section 6.15 is for the release of all ECO tags.

6.11.1 Determine the scope of the ECO Revision.

6.11.2 Ensure the ECO Request provides enough information to determine ECO requirements. If necessary contact the activity Supervisor to add the required information on the ECO request.

6.11.3 Ensure the ECO Revision provides adequate personnel and equipment protection for all activities listed on the ECO.

6.11.4 Ensure each affected WORK DOCUMENT is listed on the ECO Revision.

6.11.4.1 IF releasing a Danger tag, THEN ALL Signed On Job Items **SHALL** be listed for Revision Approval.

6.11.4.2 IF releasing a Test Tag, THEN only the owner of the Test Tag needs to be listed.

6.11.4.3 IF adding a Danger Tag will affect a Work Group, THEN ensure that Work Group is listed on the ECO revision.

6.11.5 IF the ECO revision reduces the ECO BOUNDARY, THEN ensure components between the original ECO BOUNDARY and the revised ECO BOUNDARY are restored by the revision to an approved procedural lineup position for the procedure in effect. (References 2.2.29 and 2.2.37)

6.11.5.1 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the boundaries of the ECO are listed as requiring restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.11.5.2 IF restoring a system that was drained or partially drained, THEN ensure the ECO release sequence minimizes the effect to the plant and will be in accordance with fill and vent procedures.

6.11.6 Components that are NOT restored per Step 6.11.5 **SHALL** be re-listed as untagged line items to ensure the component is returned to its REQUIRED POSITION upon RELEASE of the ECO. (Reference 2.2.38).

6.11.7 Perform CONFLICT QUERY.

6.11.8 Ensure ECO Revision meets ECO Technical Review requirements of Section 6.5 (for writing an ECO) and Section 6.16 (for releasing an ECO), as applicable.

6.11.9 Technically approve the Revision by filling in the Rev Reviewed Block.

6.11.10 Ensure affected ACCEPTORS are notified to review the ECO revision.

6.12 ACCEPTORS/WORK GROUP APPROVAL OF THE REVISION

6.12.1 Each affected ACCEPTOR signed on the ECO **SHALL** perform the following prior to approving a Revision:

6.12.1.1 Review the revision to determine if BOUNDARIES are affected for the job.

6.12.1.2 IF BOUNDARIES are affected, THEN ensure the ECO revision provides adequate protection for work activity when the revision is performed/completed.

6.12.1.3 IF Revision affects a WORK GROUP'S BOUNDARIES, THEN the WORK GROUP must cease work until a Revision is implemented and the new BOUNDARIES are walked down and verified by ACCEPTORS.

6.12.1.4 IF revision ADDS another BOUNDARY, THEN the revision must be approved, implemented, and the new BOUNDARY walked down and verified by the acceptors PRIOR to commencing work that requires that BOUNDARY.

6.12.1.5 WHEN the BOUNDARIES have been satisfactorily reviewed, THEN approve the revision.

6.12.1.6 IF the revision only adds or releases a TEST TAG, THEN only the WORK GROUP ACCEPTOR that owns the TEST TAG needs to review and approve the revision.

6.12.1.7 IF a job item was affected by the ECO revision, THEN BRIEF **ALL** active WORKERS on the revision changes to the ECO.

6.12.1.8 It **SHALL** be **mandatory** that an ACCEPTOR or designee approving the release of Danger Tags for a revision to an ECO fully understands that this approval means:

- The devices listed on the ECO may be repositioned by the OPERATIONAL AUTHORITY.
- The ACCEPTOR agrees that the Operation of the listed components will have NO adverse effect on the safety of any remaining work currently being performed under the WORK DOCUMENT. (Reference 2.2.42)

6.12.1.9 WHEN performing a revision to partially release an ECO (e.g., an uncoupled motor run), THEN proper human performance techniques (e.g. peer checking) should be utilized to ensure that remaining BOUNDARIES provide adequate protection for ongoing and/or recommencing work prior to restarting the actual work. (Reference 2.2.43)

6.13 **APPROVING ECO REVISION** (Performed by Issuing Authority)

NOTE

This section is for changing an ECO. Section 6.17 is for the release of all ECO tags.

6.13.1 Ensure the ECO REVISION has been TECHNICALLY REVIEWED and ACCEPTOR Approved.

6.13.2 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the boundaries of the ECO are listed as requiring a restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.13.3 For systems that were drained or partially drained, ensure the ECO release sequence minimizes effects to the plant and is in accordance with fill and vent procedures.

6.13.4 Ensure the item/tag number restoration positions and sequence are consistent with existing plant conditions and Technical Specification requirements. (Reference 2.2.36)

6.13.5 Ensure system lineups or procedures performed for system restoration are entered as line items in the ECO.

6.13.6 Perform an ECO TAG Conflict Query.

6.13.7 Approve the revision.

6.13.8 WHEN the ECO is ready for performance in the field, THEN perform the following:

- Assign an ECO PERFORMER to perform the ECO.
- PRIOR to performing the ECO, perform a pre-job brief (as applicable) using Form 8, ECO Performance Pre-job Briefing.

6.14 **ACCEPTOR RELEASE OF ECO (SIGNOFF)** (Performed by ACCEPTORS)

6.14.1 ACCEPTORS shall NOT Release (Sign off) on ECO until personnel protection is not longer required for that WORK DOCUMENT.

6.14.2 ACCEPTORS SHALL NOT sign off the ECO if their job item leaves the equipment in a state that is unsafe for unattended operation **OR** if operation of the equipment will be unsafe to any remaining work under the WORK DOCUMENT.

6.14.3 ACCEPTORS SHOULD not sign off the ECO if any checks, verifications, readings, observations, special tests, or other PMTs are required to be completed prior to releasing the equipment to the OPERATIONAL AUTHORITY.

6.14.4 It **SHALL** be **mandatory** that an ACCEPTOR signing off a job item fully understands that this approval means:

6.14.4.1 The devices listed on the ECO may be repositioned by the OPERATIONAL AUTHORITY.

6.14.4.2 Equipment may be operated without restrictions by the OPERATIONAL AUTHORITY.

6.14.5 ACCEPTORS **SHALL** review the job item(s) and determine if the equipment is in a state that is safe for unattended operation AND if required checks, verifications, readings, observations, special tests, or other PMTs may be completed after release of the equipment to the OPERATIONAL AUTHORITY.

6.14.5.1 IF the equipment is NOT safe for unattended operation OR PMT is required prior to release of the equipment to the OPERATIONAL AUTHORITY, THEN coordinate with the ISSUING AUTHORITY to develop an ECO Revision that will protect equipment and support testing.

6.14.5.2 The ECO revision required by Step 6.14.5.1 SHALL have a DANGER or TEST tag on at least one component (e.g., breaker, handswitch, valve, etc.) to protect the equipment until it is proven that equipment is safe to operate. Some examples of when a DANGER or TEST tag SHALL remain to protect equipment include: 1) Phase rotational check required, 2) Electrical circuit replacement, 3) Major pump overhaul, and 4) Large pump packing replacement.

6.14.6 ACCEPTORS **SHALL** ensure the following has been completed prior to signing off the job item:

- All safety devices and guards are in place, IF all post maintenance or modification testing is complete.
- Any restraining devices, blocks or gags have been removed from the equipment.
- All personnel, tools, equipment, and other material are clear of the equipment
- Electrical connections are properly made (i.e., tight) and junction boxes are closed if all post maintenance or modification testing is complete. (Reference 2.2.4)
- ALL WORKERS are signed off the ECO Worker Tracking Form (Form 5 or computer).

6.14.7 Verify the job item(s) is complete and no longer requires an ECO for personnel or equipment protection.

6.14.8 Release (sign off) the Job Item.

NOTE

Notifying the WSA when ECOs are signed off **OR** Revisions approved, will promote plant safety by minimizing the time equipment is unavailable for service.

6.14.9 The WSA (IWMC/OSS or Control Room) should be notified.

6.15 **PREPARING AN ECO RELEASE REVISION** (Performed by ECO Preparers)

NOTE

This section releases all ECO tags. Section 6.10 is for partial release of an ECO **OR** changing an ECO.

6.15.1 System restoration during release of an ECO is accomplished by at least one of the following methods:

6.15.1.1 Components aligned as specified by the ECO during tag removal (restoration positions must comply with current procedure requirements for that system/component)

6.15.1.2 Components aligned using applicable portions of a system lineup contained in an approved plant procedure during tag removal

6.15.1.3 Components aligned using steps of an approved plant procedure following tag removal.

6.15.2 Ensure the item/tag number restoration position and sequences are consistent with existing plant conditions and technical specification requirements.

6.15.3 Ensure system lineups or procedures performed for system restoration are entered as line items in the ECO. (Reference 2.2.33)

6.15.4 Ensure restoration position for locked and throttled valves is per the applicable lineup consistent with existing plant conditions. (Reference 2.2.36)

6.15.4.1 IF a Locked-in-Place Throttled Valve is listed on the ECO for "Restoration Only" (e.g., the valve position was NOT changed when/while the ECO was hung), THEN the locking device installed **SHALL** be the only thing that is checked and verified.

6.15.5 Perform Conflict Query to identify any tag conflicts that may affect component restoration and note these on the ECO. (e.g., multiple tags hung on the same component)

6.15.6 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the BOUNDARIES of the ECO are listed as requiring a restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.15.7 For systems that were drained or partially drained, ensure the ECO release sequence minimizes effects to the plant and is in accordance with fill and vent procedures.

6.15.8 Prepare the ECO using the ECO Database software or manual forms.

6.15.9 Perform a review of the final draft of the ECO.

6.15.10 Forward the ECO to the TECHNICAL REVIEWER.

6.16 RELEASE REVISION TECHNICAL REVIEW

NOTE

A release revision releases all ECO tags. Section 6.11 is for changing an ECO

6.16.1 System restoration during release of an ECO is accomplished by at least one of the following methods:

6.16.1.1 Components aligned as specified by the ECO during tag removal (restoration positions must comply with current procedure requirements for that system/component)

6.16.1.2 Components aligned using applicable portions of a system lineup contained in an approved plant procedure during tag removal

6.16.1.3 Components aligned using steps of an approved plant procedure following tag removal.

6.16.2 Ensure the item/tag number restoration position and sequences are consistent with existing plant conditions and technical specification requirements.

6.16.3 Ensure system lineups or procedures performed for system restoration are entered as line items in the ECO. (Reference 2.2.33)

6.16.4 Ensure restoration position for locked and throttled valves is per the applicable lineup consistent with existing plant conditions. (Reference 2.2.36)

6.16.4.1 IF a Locked-in-Place Throttled Valve is listed on the ECO for "Restoration Only" (e.g., the valve position was NOT changed when/while the ECO was hung), THEN the locking device installed **SHALL** be the only thing that is checked and verified.

6.16.5 Perform CONFLICT QUERY to identify any ECO component tagging conflicts and note these on the ECO. (e.g., multiple tags hung on the same component)

6.16.6 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the BOUNDARIES of the ECO are listed as requiring a restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.16.7 For systems that were drained or partially drained, ensure the ECO release sequence minimizes effects to the plant and is in accordance with fill and vent procedures.

6.16.8 WHEN Technical Review is SAT, THEN ensure the Revision Reviewed block is approved.

6.17 **RELEASE REVISION APPROVAL** (Performed by the ISSUING AUTHORITY)

6.17.1 Review the ECO release revision:

6.17.1.1 Ensure all ACCEPTORS have released their respective job items.

6.17.1.2 IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the boundaries of the ECO are listed as requiring a restoration position verification OR that lineups be performed and verified to ensure these components are in the required positions.

6.17.1.3 For systems that were drained or partially drained, ensure the ECO release sequence minimizes effects to the plant and is in accordance with fill and vent procedures.

6.17.1.4 Ensure the item/tag number restoration positions and sequence are consistent with existing plant conditions and Technical Specification requirements. (Reference 2.2.36)

6.17.1.5 Ensure system lineups or procedures performed for system restoration are entered as line items in the ECO.

6.17.1.6 Perform CONFLICT QUERY to identify any ECO component tagging conflicts that may affect component restoration.

6.17.1.7 Approve the release revision.

6.17.2 WHEN the ECO release revision is ready for performance in the field, THEN perform the following:

- Assign an ECO PERFORMER.
- PRIOR to performing the ECO release revision, perform a pre-job brief (as applicable) using ECO Release Pre-job Briefing form.

6.18 **PERFORMING ECO RELEASE REVISION** (References 2.2.9, 2.2.34, and 2.4.4)

6.18.1 The PERFORMERS and DUAL VERIFIERS (when required) **SHALL**:

6.18.1.1 Ensure the ECO Release Revision is the "Official" copy or a working copy.

6.18.1.2 Ensure the requirements of 0PGP03-ZM-0021 (Control of Configuration Changes) are met for any fuses removed from equipment and stored in a central location.

6.18.1.3 Ensure DUAL VERIFICATION is utilized to verify the correct fuses are installed. The closing of disconnects can be INDEPENDENTLY VERIFIED.

6.18.1.4 Locate correct component by verifying ECO information matches component label and ECO tag information.

6.18.1.5 Remove the tag and align each component by:

a. Sequence specified.

b. Position specified.

1. IF the "REQUIRED" position of a component needs to be changed after the revision has been approved, THEN the ISSUING AUTHORITY **SHALL** update the "REQUIRED" position on the ECO.

6.18.1.6 Ensure any temporary restraining devices associated with the ECO are removed.

6.18.1.7 Document in the "PERFORMED BY" block on the ECO to state that each item has been positioned.

6.18.1.8 Collect the removed ECO tags and ensure they are given to the INDEPENDENT VERIFIER or ISSUING AUTHORITY. IF a tag is chemically or radiologically contaminated, lost, or physically unsuitable to be collected, THEN inform the ISSUING AUTHORITY **OR** INDEPENDENT VERIFIER why the tag was not collected.

6.18.1.9 IF a working copy of the ECO was used, THEN ensure documentation of tagging activities is transferred to the ECO official copy.

6.18.1.10 Arrange for any required Independent Verifications **OR** return the ECO Official copy to the ISSUING AUTHORITY.

6.18.2 The INDEPENDENT VERIFIER (when required) **SHALL** perform the following:

6.18.2.1 Ensure the ECO Release Revision is the "Official" copy or a working copy.

6.18.2.2 Verify the correct tag was removed for each component listed on the ECO.

6.18.2.3 Ensure that all tags, except those excused per Step 6.18.1.8, for the released clearance have been removed properly by verifying the removed tags against the ECO. (Reference 2.2.35)

6.18.2.4 INDEPENDENTLY VERIFY each component positioned by the ECO is in its proper position.

6.18.2.5 Document in the "VERF'D BY" block to indicate that the component has been INDEPENDENTLY VERIFIED. (refer to Department Instruction)

6.18.2.6 Return the ECO Official copy to the ISSUING AUTHORITY after completing restoration of the ECO. (Reference 2.2.35)

6.18.3 The ISSUING AUTHORITY **SHALL** perform the following:

6.18.3.1 Review ECO notes to ensure compensatory actions that were required for hanging the ECO are restored from, as applicable.

6.18.3.2 Also notify other groups as necessary about restoration of equipment (Security, Fire Protection, Chemistry, etc.). Fire Protection notification can be made via the Fire Protection Mailbox.

6.18.3.3 Ensure that the MANUAL ECO LOG is updated to reflect the closed status of MANUAL ECOs.

6.18.3.4 IF NOT performed by the INDEPENDENT VERIFIER, THEN ensure that all tags, except those excused per Step 6.18.1.8, for the released clearance have been removed properly by verifying the removed tags against the ECO. (Reference 2.2.35)

6.18.4 ECO Preparers SHALL archive or transmit the completed ECO package to RMS for retention, per 0POP01-ZA-0015.

6.19 MANUAL ECO REQUIREMENTS

6.19.1 Manual ECOs are ECOs that are written/created manually on Forms 1, 2, 3, and 4 due to lack of Computer Based ECO Database availability.

6.19.2 Manual ECOs have the same requirements as computer generated ECOs and SHALL be written to the same standards.

6.19.3 The ECO LOG is the mechanism used to track the status of Manual ECOs.

6.19.4 ECOs that are manually written during computer outages will be assigned temporary tracking numbers. WHEN the applicable computer application becomes available, THEN the ECOs with temporary tracking numbers should be rewritten and hung in the applicable computer database and the manual version of this ECO released as soon as possible.

6.19.4.1 Once the computer generated ECO is hung AND accepted by all signed on acceptors on the ECO with a temporary tracking number, THEN the ECO with the temporary tracking number **MAY** be released.

6.19.4.2 IF the manual ECO is not entered into the ECO database, THEN the ECO **SHALL** be transmitted manually in accordance with 0POP01-ZA-0015 once the Manual ECO is released.

6.19.4.3 Manual ECOs that are hung and released manually do NOT require an ECO database entry.

7.0 Supporting Documents

7.1 Addendum 1, Mechanical Isolation Requirements

7.2 Addendum 2, Electrical Isolation Requirements

7.3 Addendum 3, MOV Manual Seating Requirements

7.4 Addendum 4, Grounding Power Distribution Equipment

7.5 Addendum 5, Breaker Racking TAGs

7.6 Addendum 6, Component General Positioning and Verification

7.7 Form 1, Manual ECO Log

7.8 Form 2, Equipment Clearance Order Request Form

7.9 Form 3, Equipment Clearance Order Form

7.10 Form 4, Equipment Clearance Order Revision Form

7.11 Form 5, ECO Worker Tracking Form

7.12 Form 6, ECO Boundary Verification Datasheet

7.13 Form 7, ECO Additional Job Listing Sheet

7.14 Form 8, ECO Performance Pre-Job Briefing

7.15 Form 9, ECO Release Pre-Job Briefing

7.16 Form 10, ECO Preparation Checklist

7.17 Form 11, ECO Technical Review Checklist

7.18 Form 12, ECO Authorizing an ECO Checklist

7.19 Form 13, ECO Performer/Dual Verifier Checklist

7.20 Form 14, ECO Verifier Checklist

7.21 Form 15, ECO Acceptor Checklist

7.22 Form 16, Acceptor Release of ECO Checklist

7.23 Form 17, Revision Acceptance Checklist

7.24 Form 18, ECO Walkdown Checklist

7.25 Form 19, Reviewing ECO Revision Checklist

7.26 Form 20, ECO Performer/Dual Verifier RELEASE Checklist

7.27 Form 21, ECO Verifier RELEASE Checklist

1. The following conditions require permission from the applicable Unit Operations Manager and the applicable Maintenance Division Manager or General Maintenance Supervisor:
   - Any check valves, relief valves, fail open valves, or fail indeterminate valves used as BOUNDARIES.
   - Maintenance requiring system breach on piping or equipment containing steam or fluids GREATER THAN 140°F **AND** without any vents or drains available. (Reference 2.8.9, 2.7.21)
   - Any backseated or mainseated valves used as a single isolation for work on that valve.
   - Working on adjacent flange to a BOUNDARY valve.
   - Use of a Freeze Seal as a BOUNDARY

   1.1 This configuration SHALL be documented on the ECO.

   1.2 Consideration **SHALL** be given to using other components as a BOUNDARY or installing gagging devices to provide isolation.

   1.3 This configuration authorization, including the date, time and method (phone, email, etc.), SHALL be documented in the ECO Notes.

   1.4 The applicable WORK DOCUMENT must allow for maintenance on the valve on its backseat or mainseated, when that configuration is the only isolation utilized.

2. At a minimum, a single vent or drain path **SHALL** be tagged open and marked as a BOUNDARY on the ECO to maintain the system depressurized in the event of leakby. Exceptions to this **SHALL** be documented on the ECO by the ISSUING AUTHORITY, PREPARER, or TECHNICAL REVIEWER. Additional vents and drains may be opened with the permission of the ISSUING AUTHORITY to facilitate draining provided that they are subsequently listed on the ECO for restoration. (Reference 2.2.35)

NOTE

- Instrument air (IA) valves are not routinely danger tagged closed
- The intent of this addendum is to maintain the normal source of air available to a component for use by the WORK GROUP during maintenance.

3. IA valves **SHALL** be DANGER TAGGED for the following reasons:
   - The IA valve is a BOUNDARY for work on a section of IA piping.
   - The IA valve must be closed to maintain the operated component in the failed position or deactivated condition.

4. Freeze Seal:
   1) Freeze Seals are installed and controlled by 0PMP04-ZG-0113.
   2) IF an ECO will require a Freeze Seal as a BOUNDARY, THEN the ECO SHALL have a line item “Freeze Seal installed” and this line item SHALL have a “B” in the “BDRY” field. This line item will require verification by ECO Performers and Acceptors.
   3) Verification of “Freeze Seal installed” shall be performed by notification that the Freeze Seal is in place and being maintained (notification = communication with applicable craft installing Freeze Seal). This verification method should be noted in the Notes section of ECO.
   4) Notify ACCEPTOR to periodically verify status of Freeze Seal.

5. Motor Operated Valves (MOV's) used as BOUNDARIES, vents or drains for an ECO **SHALL** be tagged as follows (Reference 2.2.42):

   - The MOV handswitch shall be danger tagged in a position to prevent operation of the valve while the power supply is being deenergized
   - The MOV power supply shall be danger tagged in the deenergized position.
   - The MOV local handwheel shall be danger tagged to prevent local operation of the valve (the "required position" for this tag should be "tag hung" or "do not operate").
   - See Addendum 3 (MOV Manual Seating Requirements) for additional requirements if the MOV must be mainseated.

6. Motor Operated Valves (MOV's) inside the BOUNDARIES of an ECO SHOULD NOT be DANGER TAGGED solely for the purpose of draining the system.

   - MOV's may be positioned open and powered off.
   - A CAUTION TAG may be used to identify the reason for this lineup.

NOTE

The SFP return line contains an anti-siphon hole just below the low water level to prevent gravity drainage due to an open drain valve or due to all credible breaks (non-seismic one -inch piping). During certain maintenance activities, the possibility exists for inadvertent draindown should a large system BREACH in the SFP discharge piping be required. The potential for this non-design basis event is small and would be immediately recognized by plant personnel. To further reduce the possibility of a draindown during maintenance on SFP return line piping, double valve protection should be used. (Reference 2.1.1)

7. Double valve protection SHOULD be used, if feasible, in the following conditions: Fluid conditions of greater than 150 psig or greater than 200 °F.

   - SFP discharge piping.
   - Systems containing radioactive fluids.
   - On the portions of systems containing chemically hazardous fluids.

8. WHEN double valve protection is used, THEN the inner isolation valve SHALL be considered the BOUNDARY component.

9. ECOs on HAZARDOUS SYSTEMS SHALL have notes describing the HAZARDOUS ENERGY. These ECOs should ensure, where possible, that the HAZARD is minimized by using double valve isolation, flushing chemical systems, purging hydrogen gas, cooling off hot systems prior to breach, etc.

10. WHEN double valve protection is used, THEN precautions SHOULD be taken to minimize the potential for thermal expansion of any fluid trapped between the outer and inner isolation valves (e.g., depressurize pulsation dampers, sequence tags to CLOSE outer isolations, drain and vent, then CLOSE inner isolations, etc.) Whenever possible, a telltale vent or drain valve between the isolation valves should be opened. (Reference 2.2.41)

11. The motive force of a pump (e.g., turbine, motor, etc.) SHALL be disabled prior to isolating a pump.

12. The discharge and recirculation valve of a pump should normally be closed before closing the suction valve.

13. ECOs that provide ROTATIONAL PROTECTION, support maintenance on the non-electrical parts of a component or system (eg- maint on the pump impeller, maint on the motor would require ELECTRICAL PROTECTION) and may need electrical power removed to provide safety by preventing component movement.

14. IF draining a pump, vessel, heat exchanger, pipe OR other component; THEN CONSIDER performing the following:

    - ISOLATE component from all other systems.
    - NOTIFY CR prior to draining any large system or ANY oil from system
    - OPEN vent and drain valves until draining is complete. ALSO: OPEN vent first to prevent vacuum collapse of system/component.

1. The ECO line item description for a potential transformer fuse and the label in the field **SHALL** be a verbatim (letter for letter) match.

2. WHEN electrical drawers (i.e., Potential Transformer fuses) or large fuses (i.e., 480 VAC or higher) NOT routinely operated by Operations are included AND specifically listed on an ECO, THEN an Electrician SHOULD be requested to assist in hanging the ECO. (Reference 2.2.11)

3. For ECO associated with maintenance on a breaker, IF the work instructions include VERIFICATION steps for restoration of the breaker and any associated control, closing or tripping power fuses, THEN ECO tags on the breaker are not required.

4. There is no requirement to include the control power fuses for 480V load center breakers on the ECO unless work is to be performed on the control power circuit. On some 480V load center breakers, the control power fuses are located near an exposed energized bus.

5. 4160V and 13.8KV breakers **SHALL** have their closing and tripping fuses included on the ECO to ensure configuration control upon RELEASE of the ECO.

6. Relay rack disconnect switches (i.e., fuse blocks such as Buchanan-358 or similar) should NOT be used as an ECO BOUNDARY unless the fuse block is the only available BOUNDARY. IF a fuse block is used as a BOUNDARY for an ECO, THEN remove the fuse from the block per 0PGP03-ZM-0021, Control of Configuration Changes, AND TAG the fuse block.
(Reference 2.2.26)

7. It is permissible for a breaker to be removed or placed into the cubicle (but not connected) with a DANGER TAG, TEST TAG or CAUTION TAG attached to the cubicle door.

8. It is permissible for a grounding buggy to be installed in a cubicle with a DANGER TAG or CAUTION TAG attached to the cubicle door for cubicles for which the breaker has been removed.

9. Electrical equipment **SHALL** be considered energized until proven and verified otherwise.

10. Metal clad high voltage switchgear SHOULD have covers removed only after the equipment has been deenergized.

11. All doors SHOULD be closed and fully fastened before energizing any metal-clad high voltage switchgear.

12. IF an ECO is used to provide electrical safety for work on an electrical bus, THEN the appropriate electrical prints for both the supply side and the load side of the affected bus **SHALL** be reviewed for the ECO preparation and authorization. (Reference 2.2.31)

13. DANGER TAGS SHOULD be hung on component handswitches to alert the Operator to the status of equipment when removed from service for maintenance or personnel or equipment protection.

14. WHEN tagging remotely operated breakers (e.g., breakers with power lockouts), THEN a tag should be hung locally on the breaker cubicle door to control local operation (i.e., DO NOT OPERATE).

15. ECOs on HAZARDOUS SYSTEMS SHALL have notes describing the HAZARDOUS ENERGY.

16. For ECOs which support work that requires ELECTRICAL PROTECTION (not rotational protection), ensure all sources of electricity inside the work area BOUNDARIES are removed or identified on the ECO. (ex: space heaters, interlock power, limit switch power, alarm power) These sources need to be isolated or the ECO SHALL identify what type and where this energy is still present while the ECO is hung.

17. Battery Cables:

    - Only members of the Electrical Maintenance organization **SHALL** install or remove Battery Cables.
    - Electrical Maintenance personnel are the preferred personnel for hanging and INDEPENDENTLY VERIFYING ECO tags on Battery Cables.
    - WHEN Operations Department personnel hang ECO tags for Battery Cables, THEN Electrical Maintenance personnel **SHALL** be solicited to provide assistance.

CAUTION

- MOV's should be manually seated (handwheel) with minimum applied force to prevent exceeding the compensating spring pack deflection.
- Valve wrenches SHALL NOT be used on MOV's for manual seating. (Reference 2.2.24)
- Manually seated valves should be returned to normal position prior to a thermal cycle on the valve.
- For Technical Specification required cooldown, manually seated MOV's SHALL be returned to normal position as soon as possible.
- Any safety-related MOV that is manually seated, SHALL be evaluated for operability by the Shift Manager/Unit Supervisor for entry into OAS.
- Declutching and manually closing an MOV is NOT the normal method of isolating equipment AND requires notification of the Field OR Unit Supervisor. This action will allow some MOV's to OPEN due to system differential pressure AND requires the valve to be manually unseated prior to energizing the MOV motor upon restoration.
- Whenever possible, the MOV should be de-energized prior to manual operation.
- Concurrent manual and remote operation of an MOV SHALL NEVER be attempted.

1. Motor Operated Valves (MOV) Manipulation:

   1.1 MOVs should normally be opened or closed using the motor handswitch. IF the MOV has a handswitch in the Control Room, THEN the Control Room handswitch should be used for valve positioning.

   1.2 Any time an MOV must be declutched and manually closed for ECOs (to stop system leakage), the Field or Unit Supervisor will be informed and the applicable ECO noted. This is to ensure the MOV is manually unseated on ECO restoration prior to energizing the motor. Also see Chapter 9 of Conduct of Operations Manual for MOV manipulation.

2. The backseat of a valve may be used as a BOUNDARY for maintenance provided that:

   2.1 The applicable WORK DOCUMENT allows for maintenance on the valve on its backseat.

   2.2 The applicable Unit Operations Manager and the applicable Maintenance Division Manager or General Maintenance Supervisor have authorized performance of maintenance on the valve on the backseat. This authorization MAY be delivered verbally to the Shift Manager.

   2.3 This authorization, including the date, time and method (phone, email, etc.), SHALL be documented in the ECO Notes.

3. IF a MOV must be manually seated (mainseated) to perform its normal function, THEN the Shift Manager/Unit Supervisor SHALL perform the following:

   3.1 EVALUATE the operability of the MOV.

   3.2 DISPATCH an Operator to hang a Caution Tag on the applicable MOV controls.

   3.3 INITIATE a CR for an Engineering Review of the manually seated MOV to ensure MOV malfunctions are corrected. (Reference 2.3.5)

4. IF an MOV is backseated electrically to perform its normal function, THEN perform the following:

   4.1 Evaluate the operability of the MOV.

   4.2 Contact the On-Duty Electrical Supervisor for assistance in performing the electrical seating operation.

   4.3 Dispatch an Operator to hang a Caution Tag on the applicable MOV controls.

   4.4 Initiate a CR for an Engineering Review of the manually seated MOV to ensure MOV malfunctions are corrected. (Reference 2.3.5)

5. IF a manually seated MOV must change positions to perform its intended safety function, THEN the MOV SHALL be declared "INOPERABLE" until motor operation can be verified, and an entry SHALL be made in an OAS to track inoperability. (Reference 2.3.5)

   5.1 To return a manually seated valve to normal operation, the Shift Manager/Unit Supervisor SHALL perform the following:

      5.1.1 Release the ECO per this procedure.

      5.1.2 IF valve was entered into OAS, THEN ensure the following is performed:

         5.1.2.1 Satisfactory Post-Maintenance Testing has been performed (i.e., stroke-tested).

         5.1.2.2 The manually seated valve is returned to normal configuration.

         5.1.2.3 The associated system is in its proper safety configuration.

         5.1.2.4 Declare the valve OPERABLE.

         5.1.2.5 Close-out the associated OAS entry.

1. Requirements for installing GROUNDS:

   - Only members of the Electrical Maintenance organization **SHALL** install or remove GROUNDS or Grounding Buggies.
   - Electrical Maintenance personnel are the preferred personnel for hanging and INDEPENDENTLY VERIFYING ECO tags on GROUNDS.
   - WHEN Operations Department personnel hang ECO tags for grounding, THEN Electrical Maintenance personnel **SHALL** be solicited to provide assistance.
   - ONLY members of the Operations Department **SHALL** remove ECO tags from GROUNDS.
   - Personnel installing/removing GROUNDS **SHALL** be on an ECO.
   - Each grounding device installed on power distribution equipment **SHALL** be tagged (Danger Tag or TEST TAG) to maintain the ability to verify the removal of the grounding device. The tag **SHALL** remain attached to the grounding device until the respective ECO line item is released.
   - The WORK GROUP may request more than one DANGER TAG on each grounding device. A single grounding device will NEVER have more than one TEST TAG **OR** a TEST and DANGER TAG hanging on it.
   - Terms to identify where the ground will be hung on SWGR and LC's: Bus (identifies hard copper bus) and Line (identifies the line coming in or leaving).
   - The WORK GROUP SHALL identify on the ECO REQUEST form where the grounds will be hung. For LC or SWGR, the grounds location will state if it's Line side or Bus side.
     - For MCCs and XFMR's (typically) the location will be described "**MCC xxxx ground 1 of 3**".
     - For XFMR high or low side grounds are usually called "**XFMR high side ground 1 of 6**".
   - An ECO **SHALL NOT** be written if specific information on where to install grounds is NOT provided on the ECO Request Form.
   - The grounding device **SHALL** only be placed on equipment that has been tested and proven deenergized and maintained in that condition by the ECO that lists the ground.
   - During maintenance, the grounding device that is TEST tagged, may be moved to other parts of the deenergized equipment (with permission from Issuing Authority/Operational Authority).

2. Directions for installing GROUNDS:

   a. Electrical Maintenance personnel SHOULD place and verify tags on grounding devices. IF Operations personnel will be performing ground tagging operations, THEN Electrical Maintenance personnel **SHALL** be present to assist.

   b. The grounding device **SHALL** be placed as needed and then tagged.

   c. WHEN a grounding device has been installed or attached, THEN the Electrical Maintenance or Operations personnel PERFORMING or INDEPENDENT VERIFYING **SHALL** document this on the ECO per Section 6.8 of this procedure.

3. WHEN the need for the grounding device no longer exists AND prior to lifting any tag that could allow energizing equipment, THEN the grounding devices **SHALL** be removed from the equipment as follows:

   a. Operations will revise the ECO allow removing the tag using the ECO Revision or ECO Release Revision process, as appropriate.

   b. When the ECO Revision or ECO Release Revision is approved, the Operations SHALL coordinate with Electrical Maintenance to ensure the following:

      - (Operations) REMOVAL of Danger OR Test Tag(s) (The grounding device may have already been removed if the ground was tagged with a Test Tag.)
      - (Electrical Maint.) REMOVAL of grounding device

   c. An Operator SHALL DUAL VERIFY:

      1) The ground device is removed.

      2) The tag is removed.

   d. Operations SHALL document the ground and ECO Tag removal on the ECO.

BREAKER RACKING TAGS are used during the actual racking of load center or switchgear breakers that have handswitches in the main control room. This addendum describes the use of these tags and how they fit into the ECO program. 0POP01-AE-0001 (Circuit Breaker Operations) directs the use of these tags.

1. A BREAKER RACKING TAG does not conflict with any other tag in this program. It may be placed over a DANGER, TEST or CAUTION TAG.

2. While attached to a control room handswitch the operation of that switch is prohibited.

3. The name of the person in the field controlling the evolution **SHALL** be written on the tag.

4. BREAKER RACKING TAGS are placed and removed when directed by 0POP01-AE-0001.

5. In the event a BREAKER RACKING TAG remains on the control room handswitch and the owner can not be contacted for removal, the Shift Manager/Unit Supervisor may direct that another Operator go to the breaker, inspect the area and report the status to the Shift Manager/Unit Supervisor. The BREAKER RACKING TAG MAY then be removed.

Component General Positioning

1. A hand control switch position (e. g., OPEN, CLOSE) **SHALL** NOT be used as a “REQUIRED" position on an ECO unless the switch can maintain that position.
2. The following electrical positions apply to Motor Control Center (MCC) breakers, lighting and distribution panel breakers and carriage type control power, closing and tripping power fuses:
   - OFF implies the state in which electrical current flow is not allowed. This applies to any two position electrical device.
   - ON implies the state in which electrical current flow is allowed.
3. The following electrical positions apply to relay rack disconnect fuses:
   - REMOVED implies the state in which electrical current flow is not allowed. This applies to any two position electrical device. REMOVED means disconnect is open and fuses removed.
   - INSTALLED implies the state in which electrical current flow is allowed. INSTALLED means fuses installed and disconnect shut.
4. The following electrical positions apply to load center and switchgear breakers:
   - RACKED OUT OR DISCONNECT implies the state in which electrical current flow is not possible.
   - PTL (PULL TO LOCK) implies the associated breaker remote operating switch position.
   - RACKED IN OR CONNECT implies the state in which electrical current flow is allowed.
5. The following mechanical positions apply to valves and similar mechanical devices:
   - OPEN: To change the physical position of a mechanical device to permit fluid flow.
   - CLOSED: To change the physical position of a mechanical device to prevent fluid flow.
   - THROTTLED: To position a valve in an intermediate position.
   - LOCKED OPEN/CLOSED: To fasten or secure open or closed.
   - LOCKED IN PLACE (LIP): To fasten or secure in a throttled position.

Component Verification

1. The following methods should be used to aid in determining the position of a tagged component (this list is not all inclusive and is NOT positive indication of valve position):
   - Checking the valves local or remote valve position indicator
   - Checking system parameters affected by the valve position (flow, pressure, etc.).
   - CHECK stem position of rising stem valves by looking inside the yoke.
     - IF the threads of the stem are down to the packing gland, THEN this is an indication the valve is closed or almost closed.
     - IF the stem is smooth up to the operating bushing, THEN this is an indication the valve is open or almost open.

Temp ECO Num. (Unit-Year-Seq #)	Revision Number	Sys	Component ID	Work Description (Wk Doc # or brief Summary)	Hung	Revised	Restored	Trans. To RMS
					Check as performed			

SOUTH TEXAS PROJECT NUCLEAR OPERATING COMPANY

ECO REQUEST FORM

Date: Pg of

Craft: Wan No: Activity No: CR No: Unit:

Short Description:

_____

_____

Original Description:

_____

_____

_____

_____

PROTECTION REQUIRED:	NO____	PERSONEL _____	EQUIPMENT _____
System Breach Required:	YES _____	NO _____	
Mechanical Isolation:	YES _____	NO _____	
Vented:	YES _____	NO _____	
Drained:	YES _____	NO _____	
Rotational Protection:	YES _____	NO _____	

Is Electrical Protection Required for any of the Following?		YES _____ NO _____	
Primary Power Source:	YES _____	NO _____	WORK ENERGIZED _____
Space Heater:	YES _____	NO _____	WORK ENERGIZED _____
Control/Instrument:	YES _____	NO _____	WORK ENERGIZED _____
Computer/Annunciator:	YES _____	NO _____	WORK ENERGIZED _____
Interlocks:	YES _____	NO _____	WORK ENERGIZED _____
7300:	YES _____	NO _____	WORK ENERGIZED _____
Other:	YES _____	NO _____	WORK ENERGIZED _____
Grounding Requirements:	YES _____	NO _____	WORK ENERGIZED _____

Requested By: EXT:

Special Tagging Instructions:

This form has no retention requirements

ECO Number: _____-_____-_____ **Unit:** 1 2 **Page ___ of ___**
Unit Year Number

Hazardous System? ☐ Yes ☐ No **Notify Fire Protection?** ☐ Yes ☐ No

Notify Security? ☐ Yes ☐ No

What Is Being Tagged? _____ **TPNS#** _____

Work Description:

Prepared By: _____ _____ _____
Signature Date Time

Tech Review By: _____ _____ _____
Signature Date Time

Approved By: _____ _____ _____
Signature Date Time

Notes:

ECO Number: _____-_____-_____ Page _____ of _____
Unit Year Number

Job Number	Work Document WAN / CR / Procedure	Work Group	Job Addition		Ready for Work Group Acceptance	Work Group Sign ON (Print, Sign, Date Time)	Work Group Sign OFF (Print, Sign, Date Time)
			Add	SRO			
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							

ECO Number: _____-_____-_____ Page _____ of _____
Unit Year Number

Line Number	Type	BOUNDARY	Component ID Or Instructions	Verification Required?	Action	Exe. Seq	Required Position	Performed By	Verified By

ECO Number: _____-_____-_____ **Unit:** 1 2 **Page ___ of ___**
Unit Year Number

Revision Number _____ **Revision Reason** _____

Prepared By: _____ _____ _____
Signature Date Time

Tech Review By: _____ _____ _____
Signature Date Time

Approved By: _____ _____ _____
Signature Date Time

Notes:

ECO Number: _____-_____-_____ Rev No.:____ Page ____ of _____
Unit Year Number

Job No.	Work Document (WAN/CR/Proc)	Work Group	Revision Approval (Sign/Phone)	Revision affects BOUNDARIES? (Yes/No)	Ready for Rev Com (Initial)	Revision Completion Signature (Sign/Phone)

ECO Number: _____-_____-_____ Revision Number _____
Unit Year Number

Page _____ of _____

Line Number	Type	BOUNDARY	Component ID Or Instructions	Verification Required?	Action	Exe. Seq	Required Position	Performed By	Verified By

ECO#_____ Work Document#_____ Work Group_____ Page _____ of _____

Dept. or Company	Badge No.	Printed Name	Signature	Sign ON Date/Time	Sign OFF Signature/Date/Time	Comments

RETAIN THIS FORM WITH WORK PACKAGE THROUGH WORK COMPLETION.

ECO#_____ Work Document#_____ Work Group_____ Page _____ of _____

Acceptor or Designee Printed Name	Acceptor or Designee Signature	Date/ Time ECO BOUNDARIES Verified	Current ECO Revision Number	Previous ECO Revision Number

RETAIN THIS FORM WITH WORK PACKAGE THROUGH WORK COMPLETION.

ECO# _____ Work Groups _____ Page ____ of ____

WAN	Short Description

WAN	Short Description

- Discuss the work activities supported by the ECO. _____
- Review the ECO Walkdown Checklist, if available. _____
- Ensure ECO and ECO Notes reviewed and discussed for special requirements, HAZARDS, and notifications/communications.
- Discuss applicable requirements of 0PGP03-ZI-0021, Electrical Safety, are addressed. _____
- Discuss coordination efforts including HP, Chemistry, Security, or MOST that will be required for performing the ECO. _____
- Discuss which procedures will be used during ECO performance. _____
- Discuss anticipated or potential effects on the plant. _____
- Discuss if Performers/Verifiers will update the ECO status to "HUNG" or "Ready for Craft Acceptance" **OR** if the Issuing Authority will do this. _____
- Identify if and when DUAL VERIFICATION will be implemented (opening disconnects, removing fuses). _____
- Discuss LCO time requirements (if any), plant risk items, etc., AND how we will comply with these. _____
- Discuss what specific tools, ladders, or PPE will be used. _____
- Identify how the system will be drained and vented, where it will be drained to, and flooding concerns. _____
- Identify any permits (fire door, etc.) or ZM-0021 (configuration control) documentation required for the ECO performance. _____
- Discuss specific Human Performance Tools, and how they will help prevent errors. Identify critical steps. _____
- Discuss Operating Experience that may provide additional guidance. _____
- Discuss use of 360^{o} for safety. _____

Take Away Notes: _____

_____

_____

_____

- Review the work activities supported by the ECO and identify if there is any post maintenance testing that will need to be coordinated with the ECO release. _____
- Ensure applicable requirements of 0PGP03-ZI-0021, Electrical Safety, are addressed. _____
- Discuss coordination and communications with HP, Chemistry, Security, OPS, or MOST that will be required for releasing the ECO. _____
- Discuss which procedures will be used during ECO release. What equipment will be operated and how the system will be filled and vented (if required). Identify and flooding concerns. _____
- Identify if and when DUAL VERIFICATION will be implemented (ground removal, locked valves, installing fuses, etc.). _____
- Discuss LCO time requirements (if any), plant risk items, etc. _____
- Review ECO and ECO Notes for special requirements, HAZARDS, and notifications. _____
- Identify any permits (fire door, etc.) or ZM-0021 (configuration control) documentation required for the ECO removal. _____
- Discuss specific Human Performance Tools, 360 for Safety and Operating Experience. _____
- Discuss the fundamentals of restoring the system, anticipated or potential effects on the plant. (Are we in rule base or knowledge based space?) _____
- Ensure roles and responsibilities are discussed (each action has an owner). _____

Take Away Notes: _____

_____

_____

_____

_____

ECO Preparation Checklist

(Reference Procedure Section 6.4)

NOTE

Steps may be done out of order. However, all applicable steps SHALL be done prior to approving the ECO as "Prepared".

1. Use the ECO Request Form provided by the WORK GROUP to determine the scope of the ECO. Document the ECO number:

   ECO Number _____ _____

2. Ensure appropriate reference sources are utilized: T-MOD Index, controlled drawings, current revision of procedures, etc. RECORD a note on the ECO if any special references (i.e., CTC drawings, etc.) were used for preparation. _____

3. Prepare the ECO so it provides protection to personnel and equipment for all activities listed on the ECO. _____

4. Ensure the ECO isolates all sources of energy (rotational, electrical, chemical, pressure, temperature, etc.) to the work area **OR** there are notes on the ECO describing the HAZARDS that are still present. _____

5. Review the ECO for any special requirements:

   5a) Double Valve Isolation is required _____

   5b) ECO is on a HAZARDOUS SYSTEM _____

   5c) The ECO uses a BOUNDARY that requires Management permission (check valve, relief valve, FO or FI valve, Freeze Seal) _____

   5d) NO vent or drain available, component cannot be depressurized or drained prior to system breach. _____

   5.1 Ensure requirements of ECO1A are met and notes made. _____

6. Does the ECO impact Fire Protection, Security, SSPS, Health Physics, Chemistry or another group that should be given notification of the ECO to be hung. _____

   6.a IF yes, THEN ensure there are notes on the ECO to notify the applicable group **AND** ensure the applicable notification prompts are enabled in the ORACLE ECO Database. _____

7. Is the ECO sequenced correctly? _____

8. WHEN the ECO has been prepared, THEN click in the "PREPARED BY" block and forward this checklist to a TECHNICAL REVIEWER. _____

ECO Technical Reviewer Checklist

(Reference Procedure Section 6.5)

NOTE

Steps may be done out of order. However, all applicable steps SHALL be done prior to approving the ECO as "Reviewed".

1. Ensure ECO Preparation Checklist was filled out by ECO writer. _____

2. Review the ECO Request Forms to determine ECO Requirements. _____

3. Ensure the ECO provides protection to personnel and equipment for all activities listed on the ECO. _____

4. Ensure appropriate reference sources are utilized: T-MOD Index, controlled drawings, current revision of procedures, etc. RECORD a note on the ECO if any special references (i.e., CTC drawings, etc.) were used for preparation. _____

5. Ensure the ECO isolates all sources of energy to the work area OR are there notes on the ECO describing the HAZARDS that are still present? _____

6. Review the ECO for any special requirements:

   6a) Double Valve Isolation is required _____

   6b) ECO is on a HAZARDOUS SYSTEM _____

   6c) The ECO uses a BOUNDARY that requires Management permission (check valve, relief valve, FO or FI valve, Freeze Seal) _____

   6d) NO vent or drain available, component cannot be depressurized or drained prior to system breach. _____

   6.1. Ensure requirements of ECO1A are met and notes made. _____

7 Does the ECO impact Fire Protection, Security, SSPS, Health Physics, Chemistry or another group that should be given notification of the ECO to be hung. _____

   6.a IF yes, THEN ensue there are notes on the ECO to notify the applicable group AND ensure the applicable notification prompts are enabled in the ORACLE ECO Database. _____

8. Is the ECO sequenced correctly? _____

9. Will the ECO cause the system/component to be made inoperable or non functional? IF yes, THEN add notes as applicable. _____

10. WHEN the technical review has been performed, THEN SIGN the "REVIEWED BY" block and forward the ECO to the ISSUING AUTHORITY. _____

Authorizing an ECO Checklist (Performed by Issuing Authority)

(Reference Procedure Section 6.6)

1. Review the ECO to ensure it is valid for current plant conditions and to understand ECO's impact to the plant. _____

2. Review ECO to determine Operability and/or Functionality affects. Ensure TS, TRM, ODCM, RICTCAL, RAsCAL, etc. are reviewed prior to hanging the ECO. Ensure Shift Manager is notified if ECO will make 2 trains inoperable. Note OAS number on ECO. _____

3. Review the ECO against the TEMPORARY MODIFICATION INDEX: ensure the Approved or Installed T-Mods do not affect or conflict with this ECO. _____

4. IF this ECO supports installation of a Temp Mod or a Permanent Mod, THEN ensure this MOD will not violate previously hung ECOs (e.g.- the Mod will not add energy to a system or component that is already isolated for maintenance) _____

5. IF the ECO reduces the cooling capability of the FC System, THEN ensure all compensatory requirements of 0POP02-FC-0001 (Spent Fuel Pool Cooling) are met. _____

6. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. Ensure all applicable permits or compensatory actions to support the ECO are in place (fire watch, flood breach, Security, etc.) PRIOR to hanging the ECO:

   6a) Notify SFS if ECO is on: outside plant lighting, LTG DG, security comms, flood barriers/security barriers. _____

   6b) IF ECO affects FP, THEN notify FP Coordinator AND comply with 0POP01-ZO-0011 and 0PGP03-ZF-0018 requirements. _____

   6c) Notify SSPS System Engineer if ECO affects SSPS. _____

7. Perform CONFLICT QUERY. _____

8. Ensure that the number of ECO Tags matches the number of tag line items on the ECO. _____

9. Review ECO Walkdown Checklist, if applicable. _____

10. Approve ECO when review is complete and ready to hang ECO. _____

11. Brief ECO PERFORMER if applicable. Notify PERFORMER/ VERIFIERS: Whether OR NOT to STATUS the ECO as "HUNG" **AND** "Ready for Work Group Acceptance". _____

12. Once the ECO is hung and verified: Ensure the tagged out equipment is in a energy state (e.g., de-pressurized, drained, etc.) that supports safe performance of all affected activities (This can be performed by the ECO Performers/Verifiers). _____

ECO Performer/Dual Verifier Checklist (For Hanging)

(Reference Procedure Section 6.8 and PS-HND-002, ECO Guideline)

1. Verify that the "APPROVED BY" block has been completed and the ECO is the "Official" copy or a working copy. _____

2. Review ECO Walkdown checklist (if applicable). _____

3. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. Are the requirements for implementing the ECO fully understood? _____

4. IF additional actions are required, THEN obtain permission from the ISSUING AUTHORITY to perform the additional action and document the additional action on the next available line(s) on the ECO. _____

5. Ensure required FME devices are installed per 0PGP03-ZA-0014, Foreign Material Exclusion Program. _____

6 Review a-h for expectations on performing ECO line items. WHEN a-h have been reviewed, THEN perform the ECO. *These expectations do not need to be reviewed during the ECO implementation unless questions arise.* _____

   a) Perform line items per indicated sequence order.
   b) IF manipulation of a fuse or disconnect is required, THEN perform DUAL VERIFICATION prior to manipulating the component.
   c) IF manipulation of a breaker is required, THEN perform a PEER CHECK prior to manipulating the component
   d) Verify that the information recorded on the ECO tag agrees with the information on the ECO and the information on the component or equipment plant label (if component of equipment is labeled).
   e) Align the component or device to the Position specified.
   f) Attach the correct tag to the component in a location that is easily observed.
   g) Re-verify that the information recorded on each ECO tag agrees with the information on the ECO and the information on the component or equipment plant label (if component of equipment is labeled).
   h) Document each item positioned in the "HUNG BY" block on the ECO.

7. IF a system will not depressurize or stop draining, THEN notify the ISSUING AUTHORITY. _____

8. STATUS ECO as "HUNG" per Work Start Authority/Issuing Authority direction. _____

9. STATUS the ECO as "Ready for Work Group Acceptance" per Work Start Authority/Issuing Authority direction in accordance with Section 6.7. _____

10. Update the ORACLE ECO database. _____

11. Arrange for any required Independent Verifications. _____

12. Return the ECO Official copy to the ISSUING AUTHORITY. _____

ECO Verifier Checklist (For Hanging)

(Reference Procedure Section 6.8 and PS-HND-002, ECO Guideline)

1. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. _____

2. Review ECO Walkdown Checklist (if applicable). _____

3. Review a-e for expectations for Independent Verification of ECO line items. Once a-e has been reviewed then perform the Independent Verification. *These expectations do not need to be reviewed (checked off) while performing the Independent Verification unless questions arise.* _____

   a) Verify that the information recorded on each ECO tag agrees with the information on the ECO and the information on the component or equipment plant label (if component of equipment is labeled).

   b) INDEPENDENTLY VERIFY that each ECO tag is hung properly.

   c) INDEPENDENTLY VERIFY each component positioned by the ECO is in its proper position.

   d) Document in the "VERF'D BY" block to indicate that the component has been INDEPENDENTLY VERIFIED.

   e) Repeat Line Item steps as required for additional tags.

4. IF a system will not depressurize or stop draining, THEN notify the ISSUING AUTHORITY. _____

5. Update the ORACLE ECO database. _____

6. STATUS ECO as "HUNG" per Work Start Authority/Issuing Authority direction. _____

7. STATUS the ECO as "Ready for Work Group Acceptance" per Work Start Authority/Issuing Authority direction in accordance with Section 6.7. _____

8. Return the ECO Official copy to the ISSUING AUTHORITY. _____

ECO Acceptor Checklist

(Reference Procedure Section 6.9 and PS-HND-002, ECO Guideline)

1. Ensure ECO ACCEPTOR qualification is current (Qual. King). _____

2. A paper copy of the ECO SHALL be used to perform the walkdown to aid in verifying BOUNDARIES and tags. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. _____

3. Verify the scope and BOUNDARIES of the ECO are adequate to protect personnel working on the job under his/her specified craft. Ensure the ECO provides for adequate de-energization, draining and/or depressurizing to support the WORK DOCUMENT. _____

4. Perform a field walkdown to determine that the required components have been positioned and tagged correctly:

   - Every job may not require the walkdown of every BOUNDARY listed on the ECO. Each ACCEPTOR SHALL verify every BOUNDARY that supports their activity. Required components are those BOUNDARIES required to perform work safely. _____
   - Compare each ECO tag to the paper copy ECO. Verify Unit, TPNS, and Component description are a match. IF any discrepancies are found, THEN notify the ISSUING AUTHORITY immediately. _____
   - For Test Tagged components, check that the WAN is correct. Only the Energy Source Isolation component (e.g., Breaker or isolation valve) is required to be walked down. _____

5. Accept the ECO by signing the computer generated ECO job item:

   5.a. Log into ORACLE. _____

   5.b. Query the ECO on the ECO Main Form. _____

   5.c. Find the applicable Job/WAN on the Job Items page. _____

   5.d. Click in the "Craft Sign On" block for each WORK DOCUMENT being accepted. _____

   5.e. Click the “SAVE” button and enter your e-sign password. _____

6. Ensure all active WORKERS on the ECO are briefed on the ECO BOUNDARIES, as a minimum. _____

7. Ensure all WORKERS are signed on the ECO Worker Tracking Form. IF the ACCEPTOR or designee is also a WORKER for the job item, THEN they **SHALL** also sign on ECO Worker Tracking Form. _____

Acceptor Release of ECO Checklist (Performed by Work Group Signing Off)

(Reference Procedure Section 6.14)

1) ACCEPTOR fully understands that RELEASING an activity on an ECO (signing off an ECO) is giving permission to Operations to release the ECO and the RELEASED equipment may be operated by the OPERATIONAL AUTHORITY at any time and without restrictions. _____

2) ENSURE the activity is complete OR in a state of condition that NO longer requires an ECO to provide personnel or equipment protection. _____

3) ENSURE ALL WORKERS signed off the ECO Worker Tracking Form. _____

4) EVALUATE the condition of the equipment that was worked **AND** ENSURE it is safe for unattended operation. _____

5) ENSURE operation of the equipment is safe to any remaining work under the WORK DOCUMENT. _____

6) ENSURE there are no checks, verifications, readings, observations, special tests, or other PMTs, required to be completed prior to releasing the equipment to the OPERATIONAL AUTHORITY. _____

7) ACCEPTORS **SHALL** ensure the following has been completed:

- All safety devices and guards are in place, IF all post maintenance or modification testing is complete. _____
- Any restraining devices, blocks or gags have been removed from the equipment. _____
- All personnel, tools, equipment, and other material are clear of the equipment _____
- Electrical connections are properly made (i.e., tight) and junction boxes are closed if all post maintenance or modification testing is complete. (Reference 2.2.4) _____

8) IF criteria 1-7 above are all satisfied, THEN the activity can be released; OTHERWISE **DO NOT RELEASE THE ECO** and perform the following:

8a) IF the equipment is **NOT** safe for unattended operation OR a PMT is required prior to release of the equipment to the OPERATIONAL AUTHORITY, THEN coordinate with the ISSUING AUTHORITY to develop an ECO Revision that will protect equipment and support testing. *The ECO revision SHALL have a DANGER or TEST tag on at least one component (e.g., breaker, handswitch, valve, etc.) to protect the equipment until it is proven that equipment is safe to operate. Some examples of when a DANGER or TEST tag SHALL remain to protect equipment include: 1) Phase rotational check required, 2) Electrical circuit replacement, 3) Major pump overhaul, and 4) Large pump packing replacement.* _____

9) The WSA (IWMC/OSS or Control Room) should be notified when the ECO is signed off. _____

Revision Acceptance Checklist (Performed by ACCEPTORS)

(Reference Procedure Section 6.17)

Each ACCEPTOR signed onto an ECO **SHALL** perform the following prior to approving a Revision to that ECO:

1. Review the revision to determine if BOUNDARIES for the job are affected. IF BOUNDARIES are NOT affected, THEN Approve the revision. _____

2. IF BOUNDARIES are affected, THEN perform the following:

   2.1. Ensure the ECO revision provides adequate protection for the work activity. _____

   2.2. IF Revision affects a WORK GROUP'S current BOUNDARIES (changes or removes one), THEN the WORK GROUP must cease work until the Revision is approved, implemented, and the new BOUNDARIES are walked down and verified by the ACCEPTORS. _____

   2.3. IF revision ADDS another BOUNDARY, THEN the revision must be approved, implemented and the new BOUNDARY walked down and verified by the acceptors PRIOR to commencing work that requires that BOUNDARY. _____

   2.4. WHEN the BOUNDARIES have been satisfactorily reviewed, THEN approve the revision. _____

   2.5. Brief **ALL** active WORKERS on the revision changes to the ECO. _____

3. IF the revision only adds or releases a TEST TAG, THEN only the WORK GROUP ACCEPTOR that owns the TEST TAG needs to review and approve the revision. _____

4. ACCEPTOR or designee approving a revision that will release a Danger Tag, must fully understand that this approval means, the devices listed on the ECO that are being released may be repositioned by the OPERATIONAL AUTHORITY. ALSO the ACCEPTOR agrees that the Operation of the listed components will have NO adverse effect on the safety of any remaining work currently being performed under the WORK DOCUMENT. (Reference 2.2.42) _____

5. WHEN performing a revision to partially release an ECO (e.g., an uncoupled motor run), THEN proper human performance techniques (e.g. peer checking) should be utilized to ensure that remaining BOUNDARIES provide adequate protection for ongoing or recommencing work prior to restarting the actual work. (Reference 2.2.43) _____

6. The WSA (IWMC/OSS or Control Room) should be notified when the revision is approved by the ACCEPTOR. _____

ECO Walkdown Checklist

(Reference Procedure Section 5.7)

ECO Number:_____

			Comment
Is the ECO for the correct Unit and train?	Y	N	_____
Does the ECO make sense from an operations fundamentals perspective (e.g., components are isolated prior to venting/draining, etc.)?	Y	N	_____
Do any of the ECO Notes require special actions?	Y	N	_____
Do TPNS numbers and functional description in the field match ECO?	Y	N	_____
Are the component locations correct?	Y	N	_____
Any special access requirements?	Y	N	_____
Ladders	Y	N	_____
Scaffolding	Y	N	_____
Floor Plug Removal	Y	N	_____
Other	Y	N	_____
Any hoses needed for venting or draining?	Y	N	_____
Clean	Y	N	_____
Radioactive	Y	N	_____
Acid, Oil, Other	Y	N	_____
Nearby drains verified?	Y	N	_____
Are there any special tools needed to hang ECO?	Y	N	_____
Is there any support needed to hang ECO? (MOST, Health Physics, Chemistry, Security, etc…)	Y	N	_____
Are there special system configurations needed? (purged, etc…)	Y	N	_____
Are there any special safety concerns? (climbing/safety harness)	Y	N	_____
HP review of ECO needed for ALARA or other radiological concerns?	Y	N	_____
Is there a Configuration Change Form (0PGP03-ZM-0021) with ECO if needed?	Y	N	_____
Error likely situations?	Y	N	_____
Required equipment/tools staged?	Y	N	_____ (location)

Additional Issues/Comments:

_____

_____

Walkdown Performed By: _____ DATE: _____

Resolutions Addressed By: _____ DATE: _____

This form shall be retained with the ECO until ECO performance is complete.

Reviewing ECO Revision Checklist (Performed by TECHNICAL REVIEWER)

(Reference Procedure Section 6.11)

1) IF a DANGER Tag is required to be removed by the ECO revision, THEN ensure the tag has been released by **ALL** ACCEPTORS. _____

2) IF a TEST TAG is required to be removed by the ECO revision, THEN ensure the TEST TAG owner has released the tag. _____

3) Ensure that each affected WORK DOCUMENT is listed on the ECO Revision. _____

4) IF the ECO revision reduces the ECO BOUNDARY, THEN ensure components between the original ECO BOUNDARY and the revised ECO BOUNDARY are restored by the revision to an approved procedural lineup position for the procedure in effect: (References 2.2.29 and 2.2.37)

   a. IF releasing an ECO from a system or portion of system that requires INDEPENDENT VERIFICATION per 0PGP03-ZA-0010, THEN ensure ALL applicable components within the boundaries of the ECO are listed as requiring restoration position verification **OR** that lineups be performed and verified to ensure these components are in the required positions. _____

   b. IF restoring a system that was drained or partially drained, THEN ensure the ECO release sequence minimizes the effect to the plant and will be in accordance with fill and vent procedures.

5) Components that are NOT restored per Step 4) **SHALL** be re-listed as untagged line items to ensure the component is returned to its REQUIRED POSITION upon RELEASE of the ECO. (Reference 2.2.38). _____

6) Ensure the revision will provide adequate protection for personnel and equipment for all activities listed on the ECO. _____

7) Perform CONFLICT QUERY. _____

8) Technically approve the Revision by filling in the Rev Reviewed Block. _____

ECO Performer/Dual Verifier RELEASE Checklist

(Reference Procedure Section 6.18 and PS-HND-002, ECO Guideline)

1. Verify that the "APPROVED BY" block has been completed and the ECO is the "Official" copy or a working copy. _____

2. Ensure DUAL VERIFICATION is utilized to install fuses. Also ensure the requirements of 0PGP03-ZM-0021 are met. _____

3. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. Are the requirements for releasing the ECO fully understood? _____

4 Review a-h for expectations on releasing ECO line items. WHEN a-h have been reviewed, THEN continue the ECO RELEASE. *These expectations do not need to be reviewed during the ECO RELEASE unless questions arise.* _____

   a) Ensure installed FME or Temporary Restraining devices are removed.

   b) Perform line items per indicated sequence order.

   c) IF installation of a fuse is required, THEN perform DUAL VERIFICATION prior to installing the fuse.

   d) Verify that the information recorded on the ECO line item agrees with the ECO tag and the component or equipment plant label (if component or equipment is labeled).

   e) Remove the tag from the component. Removed tags will be given to the Independent Verifier or Issuing Authority.

   f) Align the component or device to the Position specified.

   g) Review actions for correct response (STAR).

   h) Document each item positioned in the "PERFORMED BY" block on the ECO.

5. Update the ORACLE ECO database. _____

6. Arrange for any required Independent Verifications. _____

7. Return the ECO Official copy to the ISSUING AUTHORITY. _____

ECO Verifier RELEASE Checklist

(Reference Procedure Section 6.18 and PS-HND-002, ECO Guideline)

1. Verify the ECO is approved to be RELEASED and the Independent Verifier has the official copy or a working copy. _____

2. Review ECO line items and Notes for special requirements, HAZARDS, and notifications. _____

3. Review a-c for performing RELEASE verification of the ECO, then perform the RELEASE of the ECO. These expectations do not need to be reviewed during the RELEASE of the ECO unless questions arise. _____

   a) Verify the correct tag was removed from each component listed on the ECO.

   b) Verify each component listed on the ECO is in the proper position.

   c) Document in the "Verified BY" block that the verification has been performed.

4. Review pulled ECO tags to ensure all/only the correct tags were pulled. _____

5. Update the ORACLE ECO database. _____

6. Return the official copy of the ECO to the Issuing Authority (once ECO tags have been verified, they can be discarded). _____

7. Return the ECO Official copy to the ISSUING AUTHORITY. _____

UNIT 1 **(Circle Unit Performing Test)** **UNIT 2**

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating in device manipulation:

Name	Initials

Device lineup completed by: _____ (Operator) _____ (Date) _____ (Time)

Lineup 1 Reviewed: _____ (Unit Supervisor) _____ (Date)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
2-FC-0122 **(UNIT 2 ONLY)**	SPENT FUEL POOL COOLING WATER RETURN HEADER DRAIN VALVE	FHB 4' HVAC Rm 002 NW Overhead	LOCKED CLOSED	(1)		
1(2)-FC-0009B	SFP COOLING PUMP 1B(2B) PI-1408 ROOT VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0088	SFP COOLING PUMP 1B(2B) DISCHARGE TO PURIF LOOP 1B(2B) VENT VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0010B	SFP COOLING PUMP 1B(2B) DISCHARGE VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0125	1B(2B) SFPCP DISCH FI-1408 ROOT ISOL	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0126	1B(2B) SFPCP DISCH FI-1408 ROOT ISOL	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0014	SPENT FUEL POOL DEMIN WATER MAKEUP VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0048	SPENT FUEL POOL RX MAKE-UP WATER SUPPLY VALVE	FHB 22' SFPC Pump "B" Rm 106 N End	CLOSED			
1(2)-FC-0012D	SFP COOLING & PURIF LOOP 1B(2B) TO SPENT FUEL POOL ISOLATION VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0015B	SFP COOLING PUMP 1B(2B) DISCHARGE TO PURIFICATION LOOP ISOLATION VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0092	SFPCCS COMMON RETURN HEADER DRAIN VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0059	SFP COOLING PUMP 1B(2B) SUCTION LINE CAPPED CONNECTION VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0110	SFP COOLING PUMP 1B(2B) SUCTION CROSS-TIE DRAIN VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0006B	SFP COOLING PUMP 1B(2B) SUCTION FROM SPENT FUEL POOL ISOLATION VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0013B	SFP COOLING PUMP 1B(2B) TO 1A(2A) SUCTION CROSS-TIE VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			

(1) IF this procedure is being performed in Unit 1, THEN RECORD "N/A".

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0007B	SFP COOLING PUMP 1B(2B) SUCTION VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0008B	SFP COOLING PUMP 1B(2B) PI-1407 ROOT VALVE	FHB 22' SFPC Pump "B" Rm 106	OPEN			
1(2)-FC-0062	SFP COOLING PUMP 1B(2B) SUCTION TEST VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED (1)			
1(2)-FC-0106	SFP COOLING PUMP 1B(2B) CASING DRAIN TO FHB SUMP ISOLATION VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED WITH RESTRAINING PIN INSTALLED			
1(2)-FC-0067	SFP COOLING PUMP 1B(2B) CASING DRAIN TO FHB SUMP ISOLATION VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED WITH RESTRAINING PIN INSTALLED			
VALVE CAP	SFP COOLING PUMP 1B(2B) CASING DRAIN TO FHB SUMP ISOLATION CAP	DOWN STREAM 1(2)-FC-0106 and 1(2)-FC-0067	CAP INSTALLED			
1(2)-FC-0096	SFP COOLING PUMP 1B(2B) CASING VENT VALVE	FHB 22' SFPC Pump "B" Rm 106	CLOSED			
1(2)-FC-0009A	SFP COOLING PUMP 1A(2A) PI-1406 ROOT VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0010A	SFP COOLING PUMP 1A(2A) DISCHARGE VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0123	1A(2A) SFPCP DISCH FSL-1406 ROOT ISOL	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0124	1A(2A) SFPCP DISCH FSL-1406 ROOT ISOL	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0012C	SFP COOLING & PURIF LOOP 1A(2A) TO SPENT FUEL POOL ISOLATION VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0015A	SFP COOLING PUMP 1A(2A) DISCHARGE TO PURIFICATION LOOP ISOLATION VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0083	SFP PURIF LOOP 1A(2A)&B CROSS-TIE RETURN HEADER DRAIN VALVE"	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0058	SFP COOLING PUMP 1A(2A) SUCTION LINE CAPPED CONNECTION VALVE"	FHB 22' SFPC Pump "A" Rm 107	CLOSED			

(1) **(UNIT 2 ONLY)** CLOSED WITH RESTRAINING PIN INSTALLED.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0109	SFP COOLING PUMP 1A(2A) SUCTION CROSS-TIE DRAIN VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0013A	SFP COOLING PUMP 1A(2A) TO 1B(2B) SUCTION CROSS-TIE VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0006A	SFP COOLING PUMP 1A(2A) SUCTION FROM SPENT FUEL POOL ISOLATION VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0084	SFP COOLING PUMP 1A(2A) DISCHARGE TO PURIF LOOP 1A(2A) VENT VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0007A	SFP COOLING PUMP 1A(2A) SUCTION VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0008A	SFP COOLING PUMP 1A(2A) PI-1405 ROOT VALVE	FHB 22' SFPC Pump "A" Rm 107	OPEN			
1(2)-FC-0061	SFP COOLING PUMP 1A(2A) SUCTION TEST VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0095	SFP COOLING PUMP 1A(2A) CASING VENT VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED			
1(2)-FC-0066	SFP COOLING PUMP 1A(2A) CASING DRAIN TO FHB SUMP ISOLATION VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED WITH RESTRAINING PIN INSTALLED			
1(2)-FC-0105	SFP COOLING PUMP 1A(2A) CASING DRAIN TO FHB SUMP ISOLATION VALVE	FHB 22' SFPC Pump "A" Rm 107	CLOSED WITH RESTRAINING PIN INSTALLED			
VALVE CAP	SFP COOLING PUMP 1A(2A) CASING DRAIN TO FHB SUMP ISOLATION CAP	DOWN STREAM 1(2)-FC-0105 and 1(2)-FC-0066	CAP INSTALLED			
1(2)-FC-0086	SFP PURIFICATION LOOP 1A(2A) NORMAL RETURN HEADER DRAIN VALVE	FHB 22' SFPC Pump "A" Rm 107 NE	CLOSED			
1(2)-FC-0090	SFP PURIFICATION LOOP 1B(2B) NORMAL RETURN HEADER DRAIN VALVE	FHB 22' SFPC Pump "A" Rm 107 NE	CLOSED			
1(2)-FC-0001	SFP SKIMMER PUMP SUCTION VALVE	FHB 22' Skim Pmp Rm 109	OPEN			
1(2)-FC-0002	SFP SKIMMER PUMP PI-1402 ROOT VALVE	FHB 22' Skim Pmp Rm 109	OPEN			
1(2)-FC-0053	SFP SKIMMER PUMP DISCHARGE TEST VALVE	FHB 22' Skim Pmp Rm 109	CLOSED			

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0064	SFP SKIMMER PUMP CASING DRAIN VALVE	FHB 22' Skim Pmp Rm 109	CLOSED			
1(2)-FC-0065	CASK POOL PUMP DISCH TO SFP PURIF LOOP ISOLATION VALVE	FHB 22' Skim Pmp Rm 109	LOCKED CLOSED			
1(2)-FC-0060	SFP COOLING TO CASK POOL PUMP ISOLATION VALVE	FHB 22' Skim Pmp Rm 109	LOCKED CLOSED			
1(2)-FC-0068	SFP SKIMMER FILTER TO FUEL XFER CANAL RETURN HEADER ISOLATION VALVE	FHB 22' Pipe Chase Rm 110 On grating, Around Corner	CLOSED			
1(2)-FC-0069	SFP SKIMMER PUMP SUCTION FROM FUEL TRANSFER CANAL ISOLATION VALVE	FHB 22' Pipe Chase Rm 110 On grating, Around Corner	CLOSED			
1(2)-FC-0089	SFP COOLING PUMP 1B(2B) DISCHARGE TO PURIF LOOP 1B(2B) DRAIN VALVE	FHB 22' Pipe Chase Rm 110	CLOSED			
1(2)-FC-0081	SFP SKIMMER PUMP DISCHARGE HEADER DRAIN VALVE	FHB 22' Pipe Chase Rm 110	CLOSED			
1(2)-FC-0085	SFP COOLING PUMP 1A(2A) DISCHARGE TO PURIF LOOP 1A(2A) DRAIN VALVE	FHB 22' Pipe Chase Rm 110	CLOSED			
1(2)-FC-0056	SFP COOLING PUMPS 1A(2A) & B SUCTION FROM ICSA ORC DRAIN VALVE	FHB 22' Pipe Chase Rm 110 on Grating	LOCKED CLOSED			
1(2)-FC-0007C	SFP COOLING PUMPS 1A(2A) & B SUCTION FROM ICSA ORC ISOLATION VALVE	FHB 22' Pipe Chase Rm 110 on Grating	LOCKED CLOSED			
1(2)-FC-0057	SFP COOLING PUMPS 1A(2A) & B SUCT FROM ICSA TEST/VENT VALVE	FHB 22' Pipe Chase Rm 110 on Grating	CLOSED			
1(2)-FC-0082	SFP PURIFICATION LOOP 1A(2A) RETURN TO RX CAVITY OR ICSA VENT VALVE	FHB 22' Pipe Chase Rm 110 on Grating	CLOSED			
1(2)-FC-0052	SFP PURIFICATION LOOP RETURN HEADER TEST VALVE	FHB 22' Pipe Chase Rm 110 on Grating	CLOSED			
1(2)-FC-0013E	SFP COOLING & PURIFICATION DISCH TO RX CAVITY OR ICSA ORC ISOLATION VALVE	FHB 22' Pipe Chase Rm 110 on Grating	LOCKED CLOSED(1)			
1(2)-FC-0101	SFP HEAT EXCHANGER 1B(2B) VENT VALVE	FHB 36' SFPC HX "B" Rm 206	CLOSED			
1(2)-FC-0102	SFP HEAT EXCHANGER 1B(2B) DRAIN TO FHB SUMP ISOL VALVE	FHB 36' SFPC HX "B" Rm 206	CLOSED			

(1) 1(2)-FC-0013E "SFP COOLING & PURIFICATION DISCH TO RX CAVITY OR ICSA ORC ISOLATION VALVE".MAY be OPEN **OR** CONTROLLED per 0POP03-ZG-0010 Refueling Operations **Modes 5&6 ONLY** to prevent unnecessary entry into a Locked High Rad Area.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0013D	SFP COOLING WATER 1B(2B) TO 1A(2A) RETURN HEADER CROSS-TIE VALVE	FHB 36' SFPC HX "B" Rm 206	CLOSED			
1(2)-FC-0016B	SPENT FUEL POOL PURIFICATION LOOP 1B(2B) RETURN VALVE	FHB 36' SFPC HX "B" Rm 206	CLOSED			
1(2)-FC-0012B	SFP HEAT EXCHANGER 1B(2B) OUTLET VALVE	FHB 36' SFPC HX "B" Rm 206	OPEN			
1(2)-FC-0011B	SFP HEAT EXCHANGER 1B(2B) OUTLET THROTTLE VALVE	FHB 36' SFPC HX "B" Rm 206	(1) THROTTLED			
1(2)-FC-0103	SFP HEAT EXCHANGER 1B(2B) DRAIN TO FHB SUMP ISOL VALVE	FHB 36' SFPC HX "B" Rm 206	CLOSED			
1(2)-FC-0100	SFP HEAT EXCHANGER 1A(2A) DRAIN TO FHB SUMP ISOL VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0013C	SFP COOLING WATER 1A(2A) TO 1B(2B) RETURN HEADER CROSS-TIE VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0099	SFP HEAT EXCHANGER 1A(2A) DRAIN TO FHB SUMP ISOL VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0098	SFP HEAT EXCHANGER 1A(2A) VENT VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0087	SFP PURIFICATION LOOP 1A(2A) NORMAL RETURN HEADER VENT VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0091	SFP PURIFICATION LOOP 1B(2B) NORMAL RETURN HEADER VENT VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-FC-0012A	SFP HEAT EXCHANGER 1A(2A) OUTLET VALVE	FHB 36' SFPC HX "A" Rm 207	OPEN			
1(2)-FC-0011A	SFP HEAT EXCHANGER 1A(2A) OUTLET THROTTLE VALVE	FHB 36' SFPC HX "A" Rm 207	(1) THROTTLED			

(1) Verify valve position per ECO valve database. THROTTLED to maintain from 2500 to 3000 gpm for SFPC flow.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0016A	SPENT FUEL POOL PURIFICATION LOOP 1A(2A) RETURN VALVE	FHB 36' SFPC HX "A" Rm 207	CLOSED			
1(2)-IA-8384	IA ISOL FOR ZLP 182	FHB 68' SFP North Side	OPEN			
1(2)-IA-8386	IA ISOL FOR ZLP 183	FHB 68' SFP West Side	OPEN			
1(2)-IA-8387	IA ISOL FOR ZLP 184	FHB 68' SFP West Side	OPEN			
1(2)-IA-8383	IA ISOL FOR ZLP 181	FHB 68' SFP North Side	OPEN			
1(2)-IA-5035	IA to ZLP-187 (Rx Cavity Gate Seal)	RCB 68' SW side of Rx cavity on shield wall	OPEN			
1(2)-FC-0051	SFP COOLING & PURIFICATION TO RX CAVITY TEST VALVE	RCB 57' 90□ South	CLOSED			
1(2)-FC-0050	SFP COOLING & PURIFICATION TO RX CAVITY IRC ISOLATION VALVE	RCB 57' 90□ South	LOCKED CLOSED			
1(2)-FC-0013F	SFP COOLING & PURIFICATION DISCHARGE TO ICSA IRC ISOLATION VALVE	RCB 57' 90□ South	LOCKED CLOSED			
1(2)-FC-0054	SFP COOLING & PURIFICATION TO ICSA TEST VALVE	RCB 57' 90□ South	CLOSED			
1(2)-FC-0055	SFP COOLING PUMPS 1A(2A)&B SUCT FROM ICSA TEST VALVE	RCB 57' 90□ South	CLOSED			
1(2)-FC-0006C	SFP COOLING PUMPS 1A(2A)&B SUCTION FROM ICSA IRC ISOLATION VALVE	RCB 57' 90□ South	LOCKED CLOSED			
1(2)-FC-0079	SFP DEMIN 1A(2A) INLET VENT VALVE	MAB 51' Demin 1A(2A) Cubicle Overhead	CLOSED	Lineup Performed in 0POP02-XM-0001		

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0035B	SFP DEMIN 1B(2B) RESIN FILL VALVE	MAB 69' Demin Row Rm 329	LOCKED CLOSED			
1(2)-FC-0035A	SFP DEMIN 1A(2A) RESIN FILL VALVE	MAB 69' Demin Row Rm 329	LOCKED CLOSED			
1(2)-FC-0116	SFP DEMIN 1A(2A) OVERFLOW VENT VALVE	MAB 51' Demin 1A(2A) Cubicle Overhead	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0113	SFP DEMIN 1B(2B) PDI-4408 HIGH SIDE ROOT VALVE	MAB 51' INSIDE SFP DEMIN 1B(2B) DEMINERALIZER CUBICLE 244B (ACCESSED FROM 60' MAB)	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0114	SFP DEMIN 1B(2B) PDI-4408 LOW SIDE ROOT VALVE	MAB 51' INSIDE SFP DEMIN 1B(2B) DEMINERALIZER VALVE CUBICLE 238B	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0080	SFP DEMIN 1B(2B) INLET VENT VALVE	MAB 51' Demin 1B(2B) Cubicle Overhead	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0094	SFP DEMIN 1B(2B) OVERFLOW VENT VALVE	MAB 51' Demin 1B(2B) Cubicle Overhead	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0028A	SFP DEMIN FILTER 1A(2A) OUTLET ISOLATION VALVE	MAB 41' Filter Row Rm 237	OPEN			
1(2)-FC-0025A	SFP DEMIN FILTER 1A(2A) INLET ISOLATION VALVE	MAB 41' Filter Row Rm 237	OPEN			
1(2)-FC-0026A	SFP DEMIN FILTER 1A(2A) VENT VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0027A	SFP DEMIN FILTER 1A(2A) DRAIN TO EQUIPMENT DRAINS ISOLATION VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0046B	SFP PURIFICATION LOOP 1A(2A) RETURN TO RWST ISOLATION VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0046A	SFP PURIFICATION LOOP 1A(2A) RETURN TO RX CAVITY OR ICSA ISOLATION VALVE	MAB 41' Filter Row Rm 237	LOCKED CLOSED			
1(2)-FC-0033	SFP PURIFICATION LOOP 1A(2A) NORMAL RETURN TO SFPCCS ISOLATION VALVE	MAB 41' Filter Row Rm 237Q	CLOSED			

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0034	SFP PURIFICATION LOOPS 1(2)A & B TO RECYCLE HOLDUP TANKS 1(2)A&B ISOLATION VALVE	MAB 41' Filter Row Rm 237R	(2) CLOSED			
1(2)-FC-0045A	SFP PURIFICATION LOOP 1A(2A) TO/FROM BORON RECYCLE ISOLATION VALVE	MAB 41' Filter Row Rm 237R	LOCKED CLOSED			
1(2)-FC-0027B	SFP DEMIN FILTER 1B(2B) DRAIN TO EQUIPMENT DRAINS ISOLATION VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0025B	SFP DEMIN FILTER 1B(2B) INLET ISOLATION VALVE	MAB 41' Filter Row Rm 237	OPEN			
1(2)-FC-0026B	SFP DEMIN FILTER 1B(2B) VENT VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0045B	SFP PURIFICATION LOOP 1B(2B) TO/FROM BORON RECYCLE ISOLATION VALVE	MAB 41' Filter Row Rm 237R	LOCKED CLOSED			
1(2)-FC-0028B	SFP DEMIN FILTER 1B(2B) OUTLET ISOLATION VALVE	MAB 41' Filter Row Rm 237	OPEN			
1(2)-FC-0005	SFP SKIMMER FILTER RETURN HEADER ISOLATION VALVE	MAB 41' Filter Row Rm 237	(1) THROTTLED			
1(2)-FC-0104	SFP SKIMMER PUMP DISCHARGE VALVE	MAB 41' Filter Row Rm 237	OPEN			
1(2)-FC-0004A	SFP SKIMMER FILTER VENT TO WHT ISOLATION VALVE	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0004B	SFP SKIMMER FILTER DRAIN TO FLOOR DRAINS ISOL VLV	MAB 41' Filter Row Rm 237	CLOSED			
1(2)-FC-0003A	SFP SKIMMER FILTER PI-1403 ROOT VALVE	MAB 41' Skim Pmp Filter 1A(2A) Vlv Pit	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0003B	SFP SKIMMER FILTER PI-1404 ROOT VALVE	MAB 41' Skim Pmp Filter 1A(2A) Vlv Pit	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0024A	SFP DEMIN FILTER 1A(2A) PI-1412 ROOT VALVE	MAB 41' Filter 1A(2A) Vlv Pit	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0029A	SFP DEMIN FILTER 1A(2A) PI-1413 ROOT VALVE	MAB 41' Filter 1A(2A) Vlv Pit	OPEN	Lineup Performed in 0POP02-XM-0001		

(1) Throttled per ECO valve database.
(2) WHEN in Mode 5 with Reactor Coolant Loops NOT Filled or Mode 6, THEN this valve MAY be LOCKED CLOSED per 0PSP03-CV-0014. Reference Calculation NC-07090, Evaluation of Boron Dilution Flow Paths in Modes 5b and 6.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0031A	SFP DEMIN FILTER 1A(2A) FI-1414 HIGH SIDE ROOT VALVE	MAB 41' Filter 1A(2A) Vlv Pit Rm 237Q	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0032A	SFP DEMIN FILTER 1A(2A) FI-1414 LOW SIDE ROOT VALVE	MAB 41' Filter 1A(2A) Vlv Pit Rm 237Q	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0074	SFP DEMIN FILTER 1A(2A) OUTLET HEADER VENT VALVE	MAB 41' Filter 1A(2A) Vlv Pit Rm 237Q	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0073	SFP DEMIN FILTER 1A(2A) OUTLET HEADER DRAIN VALVE	MAB 41' Filter 1A(2A) Vlv Pit Rm 237Q	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0024B	SFP DEMIN FILTER 1B(2B) PI-1415 ROOT VALVE	MAB 41' Filter 1B(2B) Vlv Pit Rm 237R	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0029B	SFP DEMIN FILTER 1B(2B) PI-1416 ROOT VALVE	MAB 41' Filter 1B(2B) Vlv Pit Rm 237R	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0117	SFP PURIFICATION LOOP 1A(2A) TO LIQUID WASTE PROCESSING SYS ISOLATION VALVE	MAB 41' Filter Vlv Pit Rm 237Q	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0031B	SFP DEMIN FILTER 1B(2B) FI-1411 HIGH SIDE ROOT VALVE	MAB 41' Filter 1B(2B) Vlv Pit Rm 237R	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0032B	SFP DEMIN FILTER 1B(2B) FI-1411 LOW SIDE ROOT VALVE	MAB 41' Filter 1B(2B) Vlv Pit Rm 237R	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0078	SFP DEMIN FILTER 1B(2B) OUTLET HEADER VENT VALVE	MAB 41' Filter 1B(2B) Vlv Pit Rm 237R	CLOSED	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0038B	SFP DEMIN 1B(2B) OVERFLOW DRAIN VALVE	MAB 41' Demin Row Rm 238B	LOCKED CLOSED			
1(2)-FC-0021B	SFP DEMIN 1B(2B) INLET VALVE	MAB 41' Demin Row Rm 238B	OPEN			
1(2)-FC-0019	SFP DEMINS 1A(2A)&B INLET CROSS-TIE VALVE	MAB 41' Demin Row Rm 238B	CLOSED			
1(2)-FC-0030B	SFP DEMIN 1B(2B) BYPASS VALVE	MAB 41' Demin Row Rm 238B	CLOSED			
1(2)-FC-0036B	SFP DEMIN 1B(2B) RESIN TO SRST ISOLATION VALVE	MAB 41' Demin Row Rm 238B	LOCKED CLOSED			

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0037B	SFP DEMIN 1B(2B) OVERFLOW VALVE	MAB 41' Demin Row Rm 238B	LOCKED CLOSED			
1(2)-FC-0039B	SFP DEMIN 1B(2B) INLET FROM SLUICE PUMP DISCHARGE ISOLATION VALVE	MAB 41' Demin Row Rm 238B	LOCKED CLOSED			
1(2)-FC-0022B	SFP DEMIN 1B(2B) OUTLET TO EQUIPMENT DRAINS ISOLATION VALVE	MAB 41' Demin Row Rm 238B	CLOSED			
1(2)-FC-0023B	SFP DEMIN 1B(2B) OUTLET VALVE	MAB 41' Demin Row Rm 238B	OPEN			
1(2)-FC-0038A	SFP DEMIN 1A(2A) OVERFLOW DRAIN VALVE	MAB 41' Demin Row Rm 238C	LOCKED CLOSED			
1(2)-FC-0021A	SFP DEMIN 1A(2A) INLET VALVE	MAB 41' Demin Row Rm 238C	OPEN			
1(2)-FC-0020	SFP COOLING & CLEANUP TO SFP DEMIN 1A(2A) ISOLATION VALVE	MAB 41' Demin Row Rm 238C	CLOSED			
1(2)-FC-0037A	SFP DEMIN 1A(2A) OVERFLOW VALVE	MAB 41' Demin Row Rm 238C	LOCKED CLOSED			
1(2)-FC-0030A	SFP DEMIN 1A(2A) BYPASS VALVE	MAB 41' Demin Row Rm 238C	CLOSED			
1(2)-FC-0039A	SFP DEMIN 1A(2A) INLET FROM SLUICE PUMP DISCHARGE ISOLATION VALVE	MAB 41' Demin Row Rm 238C	LOCKED CLOSED			
1(2)-FC-0022A	SFP DEMIN 1A(2A) OUTLET TO EQUIPMENT DRAINS ISOLATION VALVE	MAB 41' Demin Row Rm 238C	CLOSED			
1(2)-FC-0023A	SFP DEMIN 1A(2A) OUTLET VALVE	MAB 41' Demin Row Rm 238C	OPEN			
1(2)-FC-0036A	SFP DEMIN 1A(2A) RESIN TO SRST ISOLATION VALVE	MAB 41' Demin Row Rm 238C	LOCKED CLOSED			
1(2)-FC-0018A	SFP DEMIN 1A(2A) INLET SAMPLE VALVE	MAB 41' Demin 1A(2A) Vlv Pit Rm 238C	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0111	SFP DEMIN 1A(2A) PDI-4405 HIGH SIDE ROOT VALVE	MAB 41' Demin 1A(2A) Vlv Pit Rm 238C	OPEN	Lineup Performed in 0POP02-XM-0001		

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0112	SFP DEMIN 1A(2A) PDI-4405 LOW SIDE ROOT VALVE	MAB 41' Demin 1A(2A) Vlv Pit Rm 238C	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0022C	SFP DEMIN 1A(2A) OUTLET SAMPLE VALVE	MAB 41' Demin 1A(2A) Vlv Pit Rm 238C	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0022D	SFP DEMIN 1B(2B) OUTLET SAMPLE VALVE	MAB 41' Demin 1B(2B) Vlv Pit Rm 238B	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0018B	SFP DEMIN 1B(2B) INLET SAMPLE VALVE	MAB 41' Demin 1B(2B) Vlv Pit Rm 238B	OPEN	Lineup Performed in 0POP02-XM-0001		
1(2)-FC-0070	SFP SKIMMER PUMP DISCHARGE HEADER DRAIN VALVE	MAB 29' Rm 110 Pipe Chase by Col F3-29	CLOSED			
1(2)-FC-0071	SFP SKIMMER PUMP DISCHARGE HEADER VENT VALVE	MAB 29' Rm 110 Pipe Chase by Col F3-29	CLOSED			
1(2)-FC-0118	SFP PURIFICATION LOOP 1A(2A) RETURN TO RX CAVITY OR ICSA DRAIN VALVE	MAB 29' Rm 110 Pipe Chase 8' W of Col G5-28	CLOSED			
1(2)-FC-0072	SFP DEMIN 1A(2A) OUTLET DRAIN VALVE	MAB 29' Rm 108 Pipe Chase Near Col F8-28	CLOSED			
1(2)-FC-0077	SFP DEMIN 1B(2B) OUTLET DRAIN VALVE	MAB 29' Rm 110 Pipe Chase Near Col F3-30	CLOSED			
1(2)-FC-0047A	RCDT PUMP DISCHARGE TO SFPCCS ISOLATION VALVE	MAB 29' Rm 216 Pen Space Under Grating on Reachrod	CLOSED			
1(2)-FC-0075	RCDT PUMP DISCHARGE TO SFPCCS VENT VALVE	MAB 29' Pen Space Rm 108 Center	CLOSED			
1(2)-BR-0035	BORON RECYCLE SYSTEM COMBINED DISCHARGE TO SFPCCS ISOLATION VALVE	MAB 19' RHT Mezz On Reachrod Outside Room	(1) CLOSED			
1(2)-FC-0047B	REFUELING WATER PURIF PUMP SUCTION VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	OPEN			
1(2)-FC-0063	REFUELING WATER PURIF PUMP PI-1418 ROOT VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	OPEN			

(1) WHEN in Mode 5 with Reactor Coolant Loops NOT Filled or Mode 6, THEN this valve MAY be LOCKED CLOSED per 0PSP03-CV-0014. Reference Calculation NC-07090, Evaluation of Boron Dilution Flow Paths in Modes 5b and 6.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-FC-0040A	REFUELING WATER PURIF PUMP SUCTION TEST VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	CLOSED			
1(2)-FC-0127	ISOLATION VALVE FOR BARS UNIT SUCTION HOSE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	(2) CLOSED			
1(2)-FC-0097	REFUELING WATER PURIF PUMP CASING DRAIN VALVE	MAB 10' Rm 64 Pen Space SW Corner	CLOSED			
1(2)-FC-0040B	REFUELING WATER PURIF PUMP PI-1419 ROOT VALVE	MAB 10' Rm 64 Pen Space SW Above Purif Pmp	OPEN			
1(2)-FC-0076	REFUELING WATER PURIF PUMP DISCHARGE TEST VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	CLOSED			
1(2)-FC-0042	REFUELING WATER PURIF PUMP DISCHARGE THROTTLE VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	(1) THROTTLED			
1(2)-FC-0043A	REFUELING WATER PURIF PUMP FIS-1417 HIGH SIDE ROOT VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pump	OPEN			
1(2)-FC-0043B	REFUELING WATER PURIF PUMP FIS-1417 LOW SIDE ROOT VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pump	OPEN			
1(2)-FC-0044	REFUELING WATER PURIF PUMP DISCHARGE VALVE	MAB 10' Rm 64 Pen Space SW S of Purif Pmp	OPEN			

(1) Verify valve position per ECO valve database. THROTTLED to maintain 190-200 gpm on FIS-1417 when RWPP in operation.
(2) 1(2)-FC-0127 is controlled by 0TOP02-FC-0003, Boric Acid Recovery System Operations, when BARS is in operation.

Unit 1 **(Circle Unit Performing Lineup)** **Unit 2**

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating in device manipulation:

Name	Initials

Device lineup completed by: _____ (Operator) _____ (Date) _____ (Time)

Lineup 2 Reviewed: _____ (Unit Supervisor) _____ (Date)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1K3(2K3)/D2	REFUELING WATER PURIFICATION PUMP 1A(2A)	MAB 10' Rm 065 MCC 1K3(2K3)	ON			
1S1(2S1)/C3	SPENT FUEL POOL SKIMMER PUMP 1A(2A)	MAB 60' MCC 1S1(2S1)	ON			
E1B1(E2B1)/4F	SPENT FUEL POOL COOLING PUMP 1A(2A)	EAB 35' LC E1B1(E2B1)	RACKED IN			
DPB435 BKR 13	SPENT FUEL POOL CLG PMP 1A(2A) SPC HTR [FC-PA-101A(201A)]	EAB 35' MCC E1B4(E2B4)/H1	ON			
E1C1(E2C1)/4D	SPENT FUEL POOL COOLING PUMP 1B(2B)	EAB 60' LC E1C1(E2C1)	RACKED IN			
DPC435 BKR 13	SPENT FUEL POOL CLG PMP 1B(2B) SPC HTR [FC-PA-101B(201B)]	EAB 60' MCC E1C4(E2C4)/J1	ON			
N1(2)FCHS1419	RWPP 1A(2A)	22 ft FHB at ZLP-749	(1) ON/OFF			
N1(2)FCHS1403	SKIMMER PUMP 1A(2A)	22 ft FHB at ZLP-749	(2) START/STOP			

(1) Required position is “ON” in operation, “OFF” when secured. Circle required position.
(2) Required position is “START” in operation, “STOP” when secured. Circle required position.

ECO Number: 2 - 13 - B0001 (Unit - Year - Number) **Unit:** 1 (2) **Page** 1 **of** 3

Hazardous System? ☒ Yes ☐ No **Notify Fire Protection?** ☐ Yes ☒ No

Notify Security? ☐ Yes ☒ No

What Is Being Tagged? Spent Fuel Pool Skimmer Pump 2A **TPNS#** 7R212NPA202A

Work Description: Replace Spent Fuel Pool Skimmer Pump 2A

Prepared By: _____ (Signature) _____ (Date) _____ (Time)

Tech Review By: _____ (Signature) _____ (Date) _____ (Time)

Approved By: _____ (Signature) _____ (Date) _____ (Time)

KEY

Notes:

System contains radioactive fluid.

Adequate Drain path does not exist within ECO boundaries.

ECO Number: 2 - 13 - B 0001
Unit Year Number

Page 2 of 3

Job Number	Work Document WAN / CR / Procedure	Work Group	Job Addition		Ready for Work Group Acceptance	Work Group Sign ON (Print, Sign, Date Time)	Work Group Sign OFF (Print, Sign, Date Time)
			Add	SRO			
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							
(Work Description)							

ECO Number: 2 - 13 - B 1092
Unit Year Number

Page 3 of 3

Line Number	Type	BOUNDARY	Component ID Or Instructions	Verification Required?	Action	Exe. Seq	Required Position	Performed By	Verified By
1	D		SFP Skimmer Pump Handswitch	Y	HANG	1	OFF		
2	D	B	SFP Skimmer Pump breaker MCC-2S1-C3	Y	HANG	2	OFF		
3	D	B	SFP Skimmer Pump discharge FC-0104	Y	HANG	3	CLOSED		
4	D	B	SFP Skimmer Pump suction FC-0001	Y	HANG	3	CLOSED		
5	D		SFP Skimmer Pump Test Vlv FC-0053	Y	HANG	4	OPEN		

Line number 2 required for JPM step 4(C)
Line numbers 3 and 4 required for JPM step 5(C)
Line number 5 required for JPM step 7(C)

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: COMPLETE AN OFFSITE AGENCY NOTIFICATION MESSAGE FORM

JPM NO.: A4

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: Complete an Offsite Agency Notification Message Form

JPM No.: A4

Rev. No.: 0

STP Objective: State the following concerning notification of State/County Agencies:
- The form used to make verbal notifications
- The form used to ensure proper agencies receive notification

Related K/A Reference: G2.4.39 [3.9/3.8] Knowledge of RO responsibilities in emergency plan implementation.

References: 0ERP01-ZV-IN02, Rev 29, Notifications to Offsite Agencies

Task Normally Completed By: PO

Method of Testing: Actual Performance

Location of Testing: Classroom

Time Critical Task: YES

Alternate Path JPM: NO

Validation Time: 15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

- The Unit 2 Shift Manager/Emergency Director has just declared an ALERT due to a fire in the Train B 4.16KV switchgear room.
- This was the initial declaration for the event.
- Plant conditions are given on the attached page.

INITIATING CUE:

As an extra Reactor Operator, the Shift Manager/Emergency Director directs you to MANUALLY complete Form 1, Offsite Notification Message, of 0ERP01-ZV-IN02, Notifications to Offsite Agencies. **NOTE: Use current date/time as the Emergency Classification declaration date/time.**

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Form 1, Offsite Notification Message is completed within 15 minutes of start time.

HANDOUTS:

Handout copy of 0ERP01-ZV-IN02

NOTES:

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

Performance Step: 1 (C*) **Start time:** _____

Complete Form 1, Offsite Notification Message

Standard:

Completes items 1-8 on Form 1 as follows within 15 minutes Refer to the KEY for a completed form):

1. *Enters name*
   **Marks "Unit 2"*
2. *Marks "This is a drill"*
3. *Enters message "1", marks "CR"*
4. **Marks "New", enters date/time, marks "Alert"*
5. **Marks "No"*
6. **Marks "New" and Item A*
7. *Marks "Not Contacted"*
8. **Marks "New", enters HA2 under "Initiating Condition", and an event description under "Explain".*

* Denotes critical portion of the step

Comment:

Begin 15 minute timer after the applicant indicates he/she is ready to begin.

Cue:

After the applicant has reviewed the Plant Conditions and indicates he/she is ready to begin, inform him/her they can begin.

Notes:

A KEY is provided for the evaluator which consists of a completed Form 1 for this event.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

Present completed Form 1 to the Shift Manager/Emergency Director for approval.

Standard:

Presents completed Form 1 to the Shift Manager/Emergency Director for approval.

Comment:

Cue:

As the Shift Manager/Emergency Director, accept the completed Form 1 from the applicant.

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A4, COMPLETE AN OFFSITE AGENCY NOTIFICATION MESSAGE FORM

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

INITIAL CONDITIONS:

- The Unit 2 Shift Manager/Emergency Director has just declared an ALERT due to a fire in the Train B 4.16KV switchgear room.
- This was the initial declaration for the event.
- Plant conditions are given on the attached page.

INITIATING CUE:

As an extra Reactor Operator, the Shift Manager/Emergency Director directs you to MANUALLY complete Form 1, Offsite Notification Message, of 0ERP01-ZV-IN02, Notifications to Offsite Agencies. **NOTE: Use current date/time as the Emergency Classification declaration date/time.**

JPM - HANDOUT

THIS IS A DRILL

Plant Conditions

- A fire in the Unit 2 Train B 4.16KV switchgear room caused the Shift Manager to declare an ALERT due to Initiating Condition HA2, Fire or Explosion in a Vital Area Potentially Affecting Safe Shutdown or Decay Heat Removal. (use current date/time as the declaration date/time)
- The Shift Manager/Emergency Director has determined there are no Recommended Protective Actions at this time.
- The Unit continues to operate at 100% power.
- The Department of State Health Services (DSHS) has not yet been contacted.
- No release is in progress.

THIS IS A DRILL

STI 33456260	**0ERP01-ZV-IN02**	**Rev. 29**	Page 1 of 36
Notifications To Offsite Agencies			
Quality	Non Safety-Related	Usage: **N/A**	Effective Date: 04/30/12

S. Korenek	Max Keyes	N/A	Emergency Response Division
PREPARER	TECHNICAL	USER	COGNIZANT ORGANIZATION

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1.0 Purpose and Scope

1.1 This procedure specifies the actions to be taken for notifying offsite agencies and the Nuclear Regulatory Commission of a declared emergency at the South Texas Project Electric Generating Station (STPEGS).

1.2 This procedure specifies the actions to be taken for notifying offsite agencies and the Nuclear Regulatory Commission of discovery of an undeclared (or misclassified) event.

2.0 Definitions

2.1 Electronic Offsite Notification System (EONS) – Computerized data base located in Oracle for the purpose of generating and transmitting the Offsite Notification Message to the State & County.

2.2 Emergency Notification System (ENS) - FTS, 2001 Telephone System, used for initial notification of an emergency to the NRC.

2.3 Health Physics Network (HPN) - FTS, 2001 Telephone System, used when requested by the NRC for radiological communications.

2.4 State and County Ringdown Line (Orange Phone) – Telephone system that automatically contacts Matagorda County Sheriff Dispatcher (Emergency Operations Center when activated) and Department of Public Safety (DPS) in Pierce, Texas simultaneously when activated.

3.0 Precautions and Limitations

NOTE

The15 minute State & County Notification is calculated from emergency declaration to initial telephone contact with one or both of the offsite contact points.

3.1 Notifications to offsite agencies shall meet the following time limit and criteria:

3.1.1 The State of Texas and Matagorda County shall be contacted within 15 minutes of the Emergency Director declaring:

Initial classification of the emergency;

Change in the classification; or

Change in Protective Action Recommendations (PAR)

3.1.2 Once contacted, the information contained in Items 1-8 and 12 of the Offsite Notification Message shall be transmitted. All information shall be provided after Message Number 1

NOTE

The hourly State & County Update Notification is calculated from the last time of telephone contact (Roll Call Time) with the offsite contact points.

3.1.3 Issue updates to the State and County approximately hourly unless a State/County consensus is obtained for a reduced frequency (static condition)

3.1.4 Notify the NRC Operations Center (Headquarters Operations Officer) immediately following the initial notifications to the State/County and no later than one hour after the emergency has been declared

3.2 If the Emergency Classification or PAR is changed during the 15 minute notification period but prior to contacting the State and County, and time permits the generation and notification with the revised Offsite Notification Message, then complete a new form and notify the State and County.

3.3 If the Emergency Classification or PAR is changed during the 15 minute notification period and time does not permit the generation of a revised form, then continue to complete notifications to the State/County prior to initiating the new notification, and inform the agencies that a change in classification or change in PAR will be forthcoming. (LCTS 9100453-936)

3.3.1 An exception to this situation is when termination is declared before the offsite agencies are notified of the emergency condition. For this situation, issue both notification forms concurrently.

3.4 If an Offsite Notification Message or Supplemental Offsite Notification Message is issued with incorrect information, then immediately contact the notified agencies; correct the information and follow-up with a corrected Form.

3.5 If during fax transmission an Offsite Notification Message or Supplemental Offsite Notification Message is found to be incorrect, then immediately stop transmission, gather the correct information, and re-transmit a corrected Offsite Notification Message.

3.6 To report an event or condition that met an EAL threshold and no longer exists at the time of discovery and the event or condition was due to a rapidly concluded event or an oversight in the emergency classification.

3.6.1 State and County notifications shall be made within one hour of discovery. Document notification using Form 5, Non-Emergency Offsite Notification Message

3.6.2 NRC notification shall be made within one hour of the discovery of the undeclared (or misclassified) event using the ENS Line

3.7 Any revisions to this procedure that change the format of Form 1, Offsite Notification Message or Form 2, Supplemental Offsite Notification Message shall be reviewed by the Department of State Health Services (DSHS) prior to becoming effective.

4.0 Responsibilities

NOTE

Refer to Addendum 6, Responsibilities for Notification.

4.1 The individual with Emergency Director Authority is responsible for approving all notifications to offsite agencies and ensuring notifications are made within the required time frames. Actual completion of forms may be delegated to other personnel.

4.2 The ENS Communicator is responsible for NRC Communications during all emergency classifications.

4.3 The Control Room State/County Communicator is responsible for notifications to the State/County while the Emergency Director is located in the Control Room.

4.4 The Chemical/Radiochemical Manager is responsible for preparing Form 1, Offsite Notification Message while the Emergency Director is located in the Technical Support Center.

4.4.1 Communicate with the NRC upon their request using the ENS Line

4.5 The TSC Communicator is responsible for completing notifications to the State and County when provided completed notification forms from the Chemical / Radiochemical Manager while the Emergency Director is located in the Technical Support Center.

4.5.1 The TSC Communicator shall contact the NRC using the ENS line as directed by the Chemical/Radiochemical Manager

4.6 The Engineering Assistant is responsible for preparing Form 1, Offsite Notification Message and Form 2, Supplemental Offsite Notification Message when the Emergency Director is located in the Emergency Operations Facility.

4.7 The Offsite Agency Communicator is responsible for completing notifications to the State and County when provided completed notification forms from the Engineering Assistant while the Emergency Director is located in the Emergency Operations Facility.

4.8 The Licensing Director or designee is responsible for assisting with notifications to the NRC over the ENS.

NOTE

Addendum 5, Emergency Communications provides information on the following special communications links:

- NRC Emergency Notification System (ENS)
- NRC Health Physics Network (HPN)
- State and County Ringdown Line
- STP Coordinator (QSE) Ringdown Line
- Satellite Telephone

5.0 Procedure

5.1 When the Emergency Director is in the Control Room perform the following:

5.1.1 State/County Communicator

- Complete the Offsite Notification Message using the Electronic Offsite Notification System (EONS). Instructions are in Addendum 1, Instructions for Completing Offsite Notification Message using EONS

OR

- Manually complete Form 1, Offsite Notification Message using the instructions in Addendum 2, Instructions for Manually Completing Offsite Notification Message.

- Makes notifications to the State and County and maintains Form 3, Offsite Message Log

5.1.2 ENS Communicator

- Completes Data Sheet 4, NRC Form 361 using the instructions in Addendum 4, Instructions for completing NRC Form 361
- At an Alert or higher emergency classification or a security based Unusual Event, continuous NRC communication is required, unless otherwise directed by the NRC. This responsibility shall not transfer to the Technical Support Center (TSC) or Emergency Operations Facility (EOF)
- At an Alert or higher emergency classification ensure NRC Headquarters is receiving ERDS information. If not contact the Information Systems Analyst and request assistance in connecting the data link

5.2 When the Emergency Director is in the Technical Support Center perform the following:

5.2.1 Chemical/Radiochemical Manager

- During facility activation receive a turnover from the State/County Communicator. Retrieve all Offsite Notification Messages and Offsite Message Log
- Complete the Offsite Notification Message using the Electronic Offsite Notification System (EONS). Instructions are in Addendum 1, Instructions for Completing Offsite Notification Message using EONS

OR

- Manually Complete Form 1, Offsite Notification Message using the instructions in Addendum 2, Instructions for Manually Completing Offsite Notification Message.
- The Chemical/Radiochemical Manager communicates with the NRC upon their request. NRC Communications is maintained in the Control Room and Emergency Operations Facility

5.2.2 TSC Communicator

- Makes notifications to the State and County when provided completed Offsite Notification Messages from the Chemical / Radiochemical Manager, and maintains Form 3, Offsite Message Log
- Contacts NRC using the ENS line as directed by the Chemical/ Radiochemical Manager

- Maintain a file containing copies of all Form 1, Offsite Notification Messages that originate from either the Control Room or Technical Support Center

5.3 When the Emergency Director is in the Emergency Operations Facility perform the following:

5.3.1 Engineering Assistant

- During facility activation receive a turnover from the Chemical / Radiochemical Manager. Retrieve a copy of all completed Offsite Notification Messages and Offsite Message Log

- Complete the Offsite Notification Message using the Electronic Offsite Notification System (EONS). Instructions are in Addendum 1, Instructions for Completing Offsite Notification Message using EONS

OR

- Manually complete Form 1, Offsite Notification Message using the instructions in Addendum 2, Instructions for Manually Completing Offsite Notification Message.

- Complete hourly updates, Form 2, Supplemental Offsite Notification Message using the instructions in Addendum 3, Instructions for Completing Supplemental Offsite Notification Message; unless a change in emergency classification or PAR, that will require a 15 minute notification only

5.3.2 Offsite Agency Communicator

- Makes notifications to the State and County when provided completed Offsite Notification Messages from the Engineering Assistant, and maintains Form 3, Offsite Message Log

- Maintains a file containing a copy of all Offsite Notification Messages from the start of the event to recovery

5.3.3 The Licensing Director is responsible for assisting in communications with the NRC over the ENS once the EOF is activated

5.4 Communications equipment problems should be promptly reported to TAC x7000 or if the EOF is activated contact the Communications System Supervisor.

6.0 References

6.1 STPEGS Emergency Plan

6.2 0PGP05-ZV-0004, Emergency Plan Implementing Procedure Users Guide

6.3 0ERP01-ZV-IN07, Offsite Protective Action Recommendations

6.4 0ERP01-ZV-IN01, Emergency Classification

6.5 10CFR50.72(a)ii.3

6.6 Inspection Report 91-03-01 (LCTS 9100453-936)

6.7 10CFR50 Appendix E, IV.D.3

6.8 IEN 89-89

6.9 Regulatory Guide 1.214, Response Strategies for Potential Aircraft Threats

6.10 0PGP05-ZV-0011, Emergency Communications

6.11 STAMPEDE, South Texas Assessment Model Projecting Estimated Dose Evaluation

7.0 Support Documents

7.1 Addendum 1, Instructions for Completing Offsite Notification Message using EONS

7.2 Addendum 2, Instructions for Manually Completing Offsite Notification Message

7.3 Addendum 3, Instructions for Completing Supplemental Offsite Notification Message

7.4 Addendum 4, Instructions for Completing NRC Form 361

7.5 Addendum 5, Emergency Communications (SPR 91-0447)

7.6 Addendum 6, Responsibilties for Notification

7.7 Addendum 7, Communications Equipment

7.8 Addendum 8, Meteorological Tower Data Instructions

7.9 Addendum 9, Atmospheric Stability Classification Calculation

7.10 Addendum 10, Approved Wording for Event Description

7.11 Form 1, Offsite Notification Message

7.12 Form 2, Supplemental Offsite Notification Message

7.13 Form 3, Offsite Message Log

7.14 Form 4, NRC Form 361

7.15 Form 5, Non-Emergency Offsite Notification Message

1.0 State & County Offsite Notification Message using the Electronic Offsite Notification System

NOTE

The Communicator records the time and contact names of DPS, Pierce and Matagorda County communicators on the Roll Call line

NOTE

New means the information from the previous Message has changed, Example: On Message 1 all new boxes will be selected, In subsequent Messages new will only be selected if the information is different from the previous Message. Unchanged will populate input fields with previous data

1.1 Log into Oracle and select Emergency Response Organization. Select PEFWRK - Offsite Notification Message, EONS log screen will appear.

1.2 Control Room State/County Communicator shall select "Insert Record" followed by the event name (e.g., Actual Event, Red Team Drill, Training, etc.)

- Upon activation of the TSC (Chemical/Radiochemical Manager) and EOF (Assistant Engineer) log into Oracle and select Emergency Response Organization. Select PEFWRK - Offsite Notification Message, the active EONS Offsite Notification Message log screen will appear; if not perform a query using the Event Name or Event ID (get this information during turnover)

1.3 Drill? - Ensure no check mark is present if this is an actual event (EONS default is Drill); click save when completed.

1.4 Click "Create New Notification" to proceed to input page.

ITEM	EXPLANATION
1	**Communicator** - Name of the person logged into Oracle will automatically populate the field. Edit if this message is originating from the TSC (TSC Communicator) or EOF (Offsite Agency Communicator)
2	**Drill ?** - Ensure no check mark is present if this is an actual event. To modify this box return to the previous screen
3	**Message #** - Sequential number is automatically inserted independent of facility originating the form (you may edit if necessary) • Originating From - Select your facility CR, TSC, or EOF • Unit – Select the affected Unit 1 or 2
4	**Emergency Classification** - select NEW or UNCHANGED. If unchanged is selected previous data will automatically populate the fields, go to Item 5 • NEW – Select the calendar icon to fill in the date and time the emergency was declared (you may edit if necessary) • Select the declared emergency
5	**Radiological Release in progress** - Select YES or NO. A radiological release is defined as exceeding the Emergency Action Level (EAL) for an Unusual Event (Initiating Condition RU1)
NOTE	Protective Action Recommendations are generated using STAMPEDE if a radiological release is in progress OR procedure 0ERP01-ZV-IN07, Offsite Protective Action Recommendations if no radiological release (PAR is based on plant status)
6	**Recommended Protective Actions** - Select NEW or UNCHANGED. If unchanged is selected previous data will automatically populate the fields, go to Item 7 If new is selected either 6.A or 6.B must be selected
6.A	**No Recommended Protective Actions at this time -** then go to Item 7
6.B	**Recommended Protective Actions are -** Select if a General Emergency Classification or as directed by the Emergency Director. Ensure the Emergency Director has approved the PAR prior to completing this section

NOTE EONS can automatically insert the PAR. Click the "Get ICS Data" to populate the wind direction & speed fields (this will also update Item 9 Meteorological Data)

Double click the Evacuate Zones input box to obtain the PAR list of values. Find the appropriate range of wind directions to match the met tower. Each wind direction range has three different PARs to choose from (2 Miles Downwind, 5 Miles Downwind, or 10 Miles Downwind) click on the PAR and the appropriate fields will be populated (you may edit if necessary)

6.B.1 **Evacuate Zones –** Individually lists the Evacuated Zones. Zones range from 1 to 11; if no data enter "None"

6.B.2 **Shelter in Place Zones -** Individually lists the Shelter in Place Zones. Zones range from 1 to 11; if no data enter "None"

6.B.3 **Affected Downwind Sectors -** Individually lists the Affected Downwind Sectors. Sectors range from A to R

7 **DSHS** - Indicate disposition on PAR' YES, NO or NOT CONTACTED

8 **Event Description** - Select if NEW or UNCHANGED. If unchanged is selected previous data will automatically populate the fields, go to Item 9

- If NEW place the courser into the input box and click the List of Values (LOV) Icon
- Select the alphanumeric designator; the appropriate event explanation will automatically populate the next field
  - Alphanumeric HU1, HU2, HU3, HA1, HA2, HA3, and HS4 require editing
  - Other changes SHALL be in a non-technical description of the event. DO NOT USE ACRONYMS in your explanation

ITEM	EXPLANATION

SELECT THE FOLLOW-UP TAB TO CONTINUE

9 **Meteorological Data** - Select NEW or UNCHANGED. If UNCHANGED is selected previous data will automatically populate the fields go to Item 10 or 11

- If NEW is selected click the "Get ICS Data" icon to automatically populate met fields with primary met tower 15 minute average lower wind speed, wind direction, delta T, and Stability Classification
- If unavailable insert manually using the backup tower on the Integrated Computer System (ICS) STAMPEDE DOSE ASSESSMENT DATA 6540 Screen see Addendum 8
- If both are unavailable contact the Impact Weather Service or National Weather Service (Emergency Communications Directory has the contact phone numbers); be sure to ask for 15 minute averages and not instantaneous value
- If completed manually the Stability Classification will have to be calculated using Addendum 9

10 **Release Involves** - Select NEW or UNCHANGED. If unchanged is selected previous data will automatically populate the fields go to Item 11

- If 10.A is selected use a default 4 hour value if the release duration is unknown, and release start date & time
- If 10.B is selected input the release duration and termination date & time

11 **Remarks** - SHALL be obtained from the Emergency Director

12 **Approvals** - Place the courser in the input box and click the List of Values (LOV) Icon to select the Emergency Director name then click save

- Select "Print Notification Form" and request the Emergency Director review and approve authorizing release of the message using the computer screen or a pdf printout of the form
- If changes are required close the PDF file to return to the input screens, make the changes click save. After the message is approved click the approved button to automatically date & time stamp the form

2.0 Contact the State and County using the Ringdown line (Orange Phone or Quintron) or alternate device. Communications Equipment is listed in Addendum 7.

- When one or both DPS, Pierce and Matagorda County Communicators are contacted record the names and time on the Roll Call Line
- Read completed ITEMS to the offsite agencies

3.0 Return to EONS, to complete the form. Insert the roll call names and click on Timestamp. Edit the time to reflect actual time of contact in step 0 if necessary.

4.0 Save the session and perform one of the following:

- Fax completed Offsite Notification Message by clicking the EONS send button
- Printout the completed form and manually fax using the BROADCAST Button

5.0 Complete notifications using Form 3, Offsite Message Log.

5.1 Contact and inform DSHS that a STP Emergency Offsite Notification Message has been sent via fax. If DSHS is located in the EOF this may be completed in person.

5.2 Contact and inform the unaffected Unit Control Room that an Emergency Offsite Notification Message has been sent via fax.

5.3 Contact and inform the STP Coordinator (QSE) that a STP Emergency Offsite Notification Message has been sent via fax. This step is not required by the Offsite Agency Communicator located in the EOF.

5.4 If manual fax is used, confirm successful fax delivery by reviewing the Fax Report for failures. Contact and read message to agencies / facilities that failed to receive the fax using the contact phone numbers located in the Emergency Communications Directory.

5.5 Issue notification updates to State and County hourly unless a State/County consensus is obtained for a reduced frequency (static condition).

- If the Emergency Director is located in the Control Room or Technical Support Center hourly update notifications are made using the Offsite Notification Message.
- If the Emergency Director is located in the Emergency Operations Facility, the Offsite Notification Message and Supplemental Offsite Notification Message are both used. (Guidance is found in Addendum 3, Instructions for Completing Supplemental Offsite Notification Message).

1.0 Manual State & County Offsite Notification Message

NOTE

Print the information on Form 1 (black ink should be used).

ONLY BLOCKS 1-8 AND 12 ARE REQUIRED TO BE COMPLETED UPON INITIAL NOTIFICATION UNLESS IT CONTAINS A RADIOLOGICAL RELEASE, THEN ALL BLOCKS ARE REQUIRED. ALL INFORMATION SHALL BE PROVIDED AFTER MESSAGE NUMBER 1

1.1 Complete Form 1, Offsite Notification Message

NOTE

The Communicator records the time and contact names of DPS, Pierce and Matagorda County communicators in the Roll Call section

NOTE

New means the information from the previous Message has changed, Example: On Message 1 all new boxes will be checked, In subsequent Messages new will only be checked if the information is different from the previous Message. Whether New or Unchanged, always complete the information

ITEM	EXPLANATION
1	**Communicator -** Name of the STP person communicating information to offsite agencies. Mark the applicable Unit. If the event is common to both Units, then mark Unit 1
2	**Drill -** Mark if notification is a drill or is NOT a drill
3	**Message Number -** Start with message number one (1). Number sequentially, independent of facility originating the form and indicate which facility is originating the message
4	**Emergency Classification -** Mark if the classification is NEW or UNCHANGED. Fill in the date and time the current classification was declared. Mark the event classification

ITEM	EXPLANATION

5 **Radiological release in progress -** Mark YES or NO. A radiological release is defined as exceeding the Emergency Action Level (EAL) for an Unusual Event (Initiating Condition RU1)

NOTE Protective Action Recommendations are generated using STAMPEDE if a radiological release is in progress or procedure 0ERP01-ZV-IN07, Offsite Protective Action Recommendations

6 **Recommended Protective actions -** Mark NEW or UNCHANGED

- General Emergency Classification shall contain a PAR
- Mark Box A or B. If Box A is marked then go to Item 7
- If Box B is checked, enter evacuated zones on line 1, sheltered in place zones on line 2, and affected downwind sectors on line 3. If Line 1 or 2 has no data enter "None"
- Ensure correct notations are used for zones and sectors. Zones range from 1 to 11. Sectors range from A to R

7 **DSHS PAR Concurrence -** Indicate if DSHS agrees with the Protective Action Recommendation YES or NO or NOT CONTACTED

8 **Event Description -** Mark if NEW or UNCHANGED. Enter the alphanumeric designator in the initiating condition line

- Addendum 10 contains approved wording for event description
- If wording other than that provide in Addendum 10 is used, include a brief explanation of the event in lay terms for clarification to offsite agencies. Legibly print a non-technical description of the event. DO NOT USE ACRONYMS

9 **Meteorological Data -** Mark NEW or UNCHANGED. Ensure 15 minute average lower wind speed, wind direction, and delta T are used, meteorological data is available on the Integrated Computer System (ICS) STAMPEDE DOSE ASSESSMENT DATA 6540 Screen (refer to Addendum 8). Delta Temperature conversion to Atmospheric Stability Classification Calculation in Addendum 9

10 **Release Involves -** Mark NEW or UNCHANGED. If Item 5 is checked yes (Radiological Release in Progress) then complete this section. Use a default 4 hour value if the release duration is unknown

11 **Remarks -** Request additional remarks from the Emergency Director

12 **Approved -** Signature of Emergency Director authorizing release of this message

2.0 Contact the State and County using the ringdown line (Orange Phone or Quintron) or alternate device. Communications Equipment is listed in Addendum 7.

- When one or both DPS, Pierce and Matagorda County Communicators are contacted record the names and time on the Roll Call Line
- Read completed ITEMS to the offsite agencies

3.0 Fax completed Form 1, Offsite Notification Message using the BROADCAST Button, log time fax initiated on Form 3.

4.0 Complete notifications using Form 3, Offsite Message Log.

4.1 Contact and inform DSHS that a STP Emergency Offsite Notification Message has been sent via fax. If DSHS is located in the EOF this may be completed in person.

5.6 Contact and inform the unaffected Unit Control Room that an Emergency Offsite Notification Message has been sent via fax.

5.7 Contact and inform the STP Coordinator (QSE) that a STP Emergency Offsite Notification Message has been sent via fax. This step is not required by the Offsite Agency Communicator located in the EOF.

5.8 Confirm successful Fax delivery by reviewing the Fax Report for failures. Contact and read message to agencies / facilities that failed using the contact phone numbers in the Emergency Communications Directory.

6.0 Issue notification updates to State and County hourly unless a State/County consensus is obtained for a reduced frequency (static condition).

6.1 If the Emergency Director is located in the Control Room or Technical Support Center hourly update notifications are made using the Offsite Notification Message.

6.2 If the Emergency Director is located in the Emergency Operations Facility, the Offsite Notification Message and Supplemental Offsite Notification Message are both used. (Guidance is found in Addendum 3, Instructions for Completing Supplemental Offsite Notification Message).

1.0 Supplemental Offsite Notification Message.

1.1 The Supplemental Offsite Notification Message shall be completed with the hourly update by the Engineering Assistant when the Emergency Director is located in the Emergency Operations Facility.

1.2 Complete Form 2, Supplemental Offsite Notification Message using black ink. No items are to be left blank even if information is unchanged.

ITEM	EXPLANATION
1	**DRILL:** Mark if notification is a drill or is NOT a drill
2	**Message #:** Insert the current hourly update message number
3	**Unit Status:** Insert the current power level of Unit 1 and Unit 2 (ask Technical Staff)
4	**Fission Product Barrier Status:** Insert status of Fuel Cladding, Reactor Coolant System, and Containment (ask System Status Evaluator)
5	**Prognosis of Situation:** Select one (ask Technical Director)
6	**Functional Safety Trains:** Select the number of Engineered Safety Features (ESF) trains in the affected unit which are functional (ask System Status Evaluator)
7	**Offsite Support Requested:** Select offsite support requested which will be responding to the site. This is completed to facilitate the support group requested through county established roadblocks (ask Deputy EOF Director)
8	**Onsite Protective Measures:** Mark each onsite protective measure taken (ask Radiological Director)
9	**Facilities Activated**: Select all that are activated (ask Deputy EOF Director)
10	**OFFSITE EXPOSURES:** Mark if YES or NO, if NO go to Item 11, if YES Complete using the information available (ask Dose Assessment Specialist)

ITEM	EXPLANATION

11 **Miscellaneous Information:** If information is not known enter unavailable or N/A

- Estimate of quantity of radioactive material released or being released (ask Offsite Field Team Supervisor)
- Chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodine's and particulates (ask Dose Assessment Specialist)
- Estimate of any surface radioactive contamination in plant, onsite or offsite (ask Radiological Director)
- Any additional licensee emergency response actions underway (ask Deputy EOF Director)

12 **Approved:** Emergency Director reviews and approves authorizing release of the message by signing including the date & time

2.0 Complete notifications using the Offsite Message Log.

2.1 Fax completed Supplemental Offsite Notification Message using the broadcast button, log time fax completed.

4.2 Contact and inform DSHS that a STP Emergency Offsite Notification Message has been sent via fax. If DSHS is located in the EOF this may be completed in person.

4.3 Contact and inform the unaffected Unit Control Room that an Emergency Offsite Notification Message has been sent via fax.

4.4 Contact and inform the STP Coordinator (QSE) that a STP Emergency Offsite Notification Message has been sent via fax. This step is not required by the Offsite Agency Communicator located in the EOF.

4.5 Confirm successful Fax delivery by reviewing the Fax Report for failures. Contact and read message to agencies / facilities that failed using the contact phone numbers in the Emergency Communications Directory.

1.0 NRC Notification

1.1 Notify the NRC Operations Center (Headquarters Operations Officer) immediately following initial notification of State/County agencies and no later than one hour after the emergency has been declared. Complete Form 4, NRC Form 361 and fax prior to initial contact and subsequent emergency declaration escalations. Additional records of conversation may be made on Emergency Action Log Sheets.

1.1.1 The initial and subsequent classifications, and significant plant condition changes, SHALL be reported to the NRC Operations Center Headquarters Operations Officer (HOO). During bridge telephone line communications with the NRC, if not in direct contact with the HOO, press *0 to reconnect with the HOO

1.1.2 Description, Provide a description of the event to include systems affected, actuation's and initiating signals, causes, effect of event on plant, actions taken or planned, etc. Additional space is provided on back of Form 4, NRC Form 361. Check block when Control Room Log Book entry is made

1.1.3 Radiological Releases, Complete this section if the event is radiologically based. Information from the Offsite Notification Message may be used if information described in Form 4, NRC Form 361 is not available and obtaining it would likely cause a late notification

1.1.4 At an Alert or higher emergency declaration (and a security based Unusual Event) the Control Room ENS Communicator must maintain an open telephone line with the NRC, unless otherwise directed by the NRC. During the course of the event, immediately report any further degradation in the level of safety of the plant or other worsening conditions, including those that require declaration of any of the emergency classes, or may change from one emergency class to another, or a termination of the emergency class. Immediately report the results of ensuing evaluations or assessments of plant conditions, the effectiveness of response or protective measures taken, and information relating to plant behavior that is not understood

1.2 IF NRC Communications is lost during an aircraft attack, THEN reestablish NRC contact as soon as practical after onsite aircraft impact, OR within 5 minutes of the previously anticipated impact time if no impact occurs. [Ref. 6.9]

1.0 Emergency Communications System

1.1 Emergency Notification System (ENS)

1.1.1 The ENS is a telephone circuit provided by the NRC

1.1.2 The ENS is activated to notify the NRC of a declared emergency or drills/exercises and to maintain communications with the NRC Operations Center as needed

1.1.3 If the ENS is activated, then a person SHALL remain on the line until the NRC agrees that the ENS may be terminated

1.1.4 There are seven (7) methods to notify the NRC. These are:

- ENS Telephone
- Outside phone lines
- Satellite Telephone
- Unit 1 Control Room direct phone line to Bay City
- Microwave Line
- Ringdown Line to STP Coordinator (QSE) and call forward to the NRC
- Security radio communications to Matagorda County Sheriff's Office and forwarded to the NRC

1.1.5 The principal method of communications with the NRC is the ENS. The circuit may also be activated by the NRC

1.1.6 If the ENS is out of order (see Addendum 7), then use outside phone lines to notify the NRC at one of the following telephone numbers (in order of priority) AND remain on the line if requested by the NRC

9-1-301-816-5100 9-1-301-951-0550

1.1.7 If the outside telephone lines are out of order, then use the Satellite Telephone to call the NRC at one of the following telephone numbers (in order of priority) AND remain on the line if requested by the NRC

00-1-301-816-5100 00-1-301-951-0550

1.1.8 If the Satellite Telephone is out of order, then use the Unit 1 Control Room direct phone line to Bay City and notify the NRC at one of the following telephone numbers (in order of priority) AND remain on the line if requested by the NRC

1-301-816-5100 1-301-951-0550

1.1.9 If the Unit 1 Control Room direct telephone line to Bay City is out of order, then use the Microwave Line. Using a site extension, notify the NRC Operations Center at one of the following telephone numbers (in order of priority) AND remain on the line if requested by the NRC

32-9-1-800-532-3469 32-9-1-800-449-3694

1.1.10 If the Microwave Line is out of order, then use the STP Coordinator (QSE) Ringdown Line and have the dispatcher forward the call or information to the NRC AND remain on the line if requested by the NRC

1.1.11 If the STP Coordinator (QSE) Ringdown Line is out of order, then use the Security radio console to contact the Matagorda County Sheriff's Office and request the information be forwarded to the NRC. Stay on the radio with the Matagorda County Sheriff's Office

1.2 State and County Ringdown Line

1.2.1 The State and County Ringdown Line is provided to notify State and County officials of a declared emergency

1.2.2 The State-County Ringdown Line is an automatic ringdown telephone circuit terminated on a Quintron or an ORANGE Telephone

1.2.3 There are seven (7) methods to notify the State/County. These are:

- State/County Ringdown Line
- Outside telephone lines
- Satellite Telephone
- Unit 1 Control Room direct telephone line to Bay City
- Microwave Line
- Ringdown Line to STP Coordinator and call forward to the State/County
- Security radio communications to Matagorda County Sheriff's Office and forwarded to DPS, Pierce

1.2.4 If the State/County Ringdown Line is out of order, then use outside telephone lines to notify the State and County at the following telephone numbers:

State/DPS-Pierce	Matagorda County Sheriff's Office
9-1-979-541-4595	9-1-979-241-3205

1.2.5 If the outside telephone lines are out of order, then use the Satellite Telephone to call the state and county at one of the following telephone numbers:

State/DPS-Pierce	Matagorda County Sheriff's Office
Satellite Phone to Land Line	
00-1-979-541-4595	00-1-979-241-3205
Satellite Phone to Satellite Phone	
00-881-621-437-721	00-881-621-437-541

1.2.6 If the Satellite Telephone is out of order, then use the Unit 1 Control Room direct telephone line to Bay City to notify the State/County at the following telephone numbers:

State/DPS-Pierce	Matagorda County Sheriff's Office
979-541-4595	979-241-3205

1.2.7 If the Unit 1 Control Room direct telephone line to Bay City is out of order, then use the Microwave Line. Using a site extension, notify the State and County at the following telephone numbers:

State/DPS-Pierce	Matagorda County Sheriff's Office
32-9-979-541-4595	32-9-979-241-3205

1.2.8 If the Microwave Line is out of order, then use the STP Coordinator (QSE) Ringdown Line and forward the telephone call or information to the State/County

1.2.9 If the STP Coordinator (QSE) Ringdown Line is out of order, then use the Security radio to notify the County and request they forward the information to DPS Pierce

1.3 Health Physics Network (HPN)

1.3.1 The HPN line is used at the request of the NRC. It is designed to provide communications with the NRC Health Physics Section and/or other nuclear power plants during a declared emergency

- STPEGS health physics personnel MAY request a conference call with other nuclear power plants on the HPN line by asking the NRC to connect the desired plant(s)

1.3.2 The principal method of communications with the HPN line is on an FTS, 2001 telephone

1.3.3 If the HPN is out of order then use outside phone lines to notify the NRC Operations Center at one of the following telephone numbers (IEN 89-19)

9-1-301-816-5100 9-1-301-951-0550

1.3.4 If the outside telephone lines are out of order, then use the Satellite Telephone to call the NRC Operations Center at one of the following telephone numbers (IEN 89-19)

00-1-301-816-5100 00-1-301-951-0550

1.3.5 If the Satellite Telephone is out of order, then use the Unit 1 Control Room direct phone line to Bay City and notify the NRC at one of the following telephone numbers

1-301-816-5100 1-301-951-0550

1.3.6 If the Unit 1 Control Room direct telephone line to Bay City is out of order, then use the microwave tower line. Using a site extension, notify the NRC Operations Center at one of the following telephone numbers

32-9-1-800-532-3469 32-9-1-800-449-3694

1.3.7 If the microwave tower line is out of order, then use the STP Coordinator (QSE) Ringdown Line and have the dispatcher forward the call or information to the NRC Operations Center

1.4 NOTIFY the NRC when the HPN Line has been returned to service. (IEN 89-19)

1.5 STP Coordinator (QSE) Ringdown Line.

1.5.1 The STP Coordinator (QSE) Ringdown Line is an automatic ringdown between the Owners and the plant

RESPONSIBILITY	RESPONSIBLE PERSON BASED ON LOCATION OF EMERGENCY DIRECTOR		
	Control Room	**Technical Support Center**	**Emergency Operations Facility**
Complete Form 1, Offsite Notification Message	State/County Communicator	Chemical/Radiochemical Manager	Engineering Assistant
Complete Form 4, NRC Form 361 and Maintain Open line as necessary	ENS Communicator	N/A	N/A
Update NRC on event status	ENS Communicator	Chemical/Radiochemical Manager	Licensing Director
Complete Form 2, Supplemental Offsite Notification Message	N/A	N/A	Engineering Assistant
Complete Form 3, Offsite Message Log	State/County Communicator	TSC Communicator	Offsite Agency Communicator

The below list is in order of preference based on available communications equipment.

State / County Notification	NRC Notification	Health Physics Network (HPN)
State / County Ring Down Telephone	Emergency Notification System (ENS) Telephone	FTS, 2001 Dedicated Telephone
Outside Telephone Lines	Outside Telephone Lines	Outside Telephone Lines
Satellite Telephone	Satellite Telephone	Satellite Telephone
Unit 1 Control Room direct telephone line to Bay City	Unit 1 Control Room direct telephone line to Bay City	Unit 1 Control Room direct telephone line to Bay City
Microwave Line	Microwave Line	Microwave Line
Ring Down line to STP Coordinator	Ring Down line to STP Coordinator	Ring Down line to STP Coordinator
Radio Communications via Matagorda County Sheriff's Office (Radio located in CAS and SAS)	Radio Communications via Matagorda County Sheriff's Office (Radio located in CAS and SAS)	Radio Communications via Matagorda County Sheriff's Office (Radio located in CAS and SAS)

Procedure 0PGP05-ZV-0011, Emergency Communications contains additional instructions for using communication devices

STAMPEDE DOSE ASSESSMENT DATA

6540.scr

Primary MET DATA
Lower Wind Speed Avg **7.29** MPH
Lower Wind Direction Avg **180.26** DEG
Delta T **-0.72** DEG
Lower Wind Direction Sigma **12.71** DEG

Back up MET DATA
Lower Wind Speed Avg **8.72** MPH
Lower Wind Direction Avg **184.45** DEG
Lower Wind Direction Sigma **12.25** DEG

NOTE

1.0 Always use Primary Met Data

2.0 Use Backup Met Data if the Primary Met Data is unavailable

3.0 Only use Lower Wind Direction Sigma if Delta T Data is unavailable

Rad MONITORS
Unit Vent RT 8010B Release Rate (µCi/sec) **0.0**
Unit Vent Flow Rate (scfm) **170030.5264**
Containment HI Range (R/hr) RT 8050 **1.3** RT 8050 **1.4**
STM Line (µCi/ml) RT 8046 **0.0** RT 8047 **0.0** RT 8048 **0.0** RT 8049 **0.0**
Failed Fuel Monitor (µCi/ml) RT 8039 **0.0**
RCB Airborne (µCi/cc) RT 8011 Noble Gas **0.0**
LETDN HX 1A LTDN OUTL FLOW **136.0000** GPM

Other MONITORS
Containment Pressure **0.1743** PSIG
MSL Flow Rate (MLB/HR) SG 1A FW-512 **4.602** FW-513 **4.612** SG 1B FW-522 **4.532** FW-523 **4.012** SG 1C FW-532 **4.502** FW-533 **4.303** SG 1D FW-542 **4.204** FW-543 **4.103**

Obtain DELTA TEMP AVG From ICS STAMPEDE DOSE ASSESSMENT DATA 6540 Screen

Stability Classification	Class	Delta T (60m-10m)°F	*Lower Wind Dir Sigma
Extremely Unstable	A	≤ -1.71	≥ 22.5
Moderately Unstable	B	-1.70 to -1.53	17.5 to 22.4
Slightly Unstable	C	-1.52 to -1.35	12.5 to 17.4
Neutral	D	-1.34 to -0.45	7.5 to 12.4
Slightly Stable	E	-0.44 to 1.35	3.8 to 7.4
Moderately Stable	F	1.36 to 3.60	2.1 to 3.7
Extremely Stable	G	≥ 3.61	≤ 2.0

	A Extremely Unstable	B Moderately Unstable	C Slightly Unstable	D Neutral	E Slightly Stable	F Moderately Stable	G Extremely Stable
Delta T°F	≤ -1.71	-1.70 to -1.53	-1.52 to -1.35	-1.34 to -0.45	-0.44 to 1.35	1.36 to 3.60	≥ 3.61
*Lower Wind Dir Sigma	≥ 22.5	17.5 to 22.4	12.5 to 17.4	7.5 to 12.4	3.8 to 7.4	2.1 to 3.7	≤ 2.0

*Do not use lower wind Dir Sigma if wind speed is less than 5 mph, use default Stability Class D

NOTE

Obtain Initiating Condition alphanumeric designation from the Emergency Director. Match designation with list below and enter into item 8 of Form 1

Fission Product Barrier Degradation

FU1	Loss or potential loss of Containment barrier
FA1	Loss or potential loss of Fuel Clad or Reactor Coolant System barrier
FS1	Loss or potential loss of two fission product barriers
FG1	Loss of two fission product barriers with potential loss or loss of the third barrier

System Malfunction

SU1	Loss of offsite power to safety systems. Multiple sources of emergency power are available.
SU2	Plant operation determined to be outside of plant safety specifications.
SU3	Unplanned loss of most Control Room safety system alarm indications.
SU4	Unplanned loss of all onsite or offsite communications capabilities.
SU5	Unplanned loss of safety related battery power causing difficulty monitoring plant conditions while shutdown.
SU6	Indication of degradation or potential loss of the Fuel Clad fission product barrier.
SU7	Indication of degradation of Reactor Coolant System fission product barrier.
SA1	Loss of all power to safety systems while the plant is shutdown and cooled down.
SA2	Reactor failed to automatically shutdown when required. Manual shutdown was successful.
SA3	Inability to maintain appropriate cooled down temperature while shutdown.
SA4	Difficulty monitoring changing plant conditions due to unplanned loss of most Control Room safety system alarm indications.
SA5	Electrical power to safety systems has degraded to a single source.
SA6	Indication of potential loss of the Fuel Clad fission product barrier.
SS1	Loss of all electrical power to safety systems.

SS2	Reactor failed to automatically shutdown when required. Initial attempts at manual shutdown were not successful.
SS3	Unplanned loss of safety related battery power compromising the ability to monitor and control plant safety functions.
SS4	Complete loss of systems required for plant cooldown.
SS5	Loss of water level in the Reactor Vessel that has or will uncover the fuel in the Reactor Vessel while the plant is shutdown and cooled down.
SS6	Inability to monitor changing plant conditions due to unplanned loss of most Control Room safety system alarm indications.
SG1	Prolonged loss of all electrical power to safety systems which will lead to a loss of all three fission product barriers unless restored.
SG2	All attempts to shutdown the reactor have been unsuccessful which may lead to loss of all three fission product barriers.

Abnormal Radiological Levels

RU1	Unplanned release to the environment of very low levels of radioactivity which exceed effluent limits and indicates a degradation in plant radiological controls.
RU2	Unexpected increase in plant radiation levels.
RA1	Unplanned release to the environment of low levels of radioactivity which significantly exceed effluent limits and indicates a substantial degradation in plant radiological controls.
RA2	Potential damage or damage to spent nuclear fuel outside of the Reactor Vessel.
RA3	Elevated plant radiation levels impede necessary access to plant operating stations.
RS1	Actual or projected radiological dose at the site boundary has reached a level which is equal to 10% of the dose which would prompt an offsite protective action recommendation.
RS2	An unexpected increase in containment radiation levels indicate a loss or potential loss of two fission product barriers.
RG1	Actual or projected radiological dose at the site boundary has reached a level which requires an offsite protective action recommendation.

Hazards and Other Conditions

HU1 (Describe destructive event) _____ is affecting normal plant operations.

HU2 (Fire or Explosion) in the (Protected Area or Switchyard) which affects normal plant operations.

HU3 (Toxic or Flammable) gasses are affecting normal plant operation.

HU4 Security event affecting normal plant operations.

HU5 Conditions exist, not specifically covered by the Station Emergency Plan, which are impacting normal plant operations and, in the judgment of the Emergency Director, warrants declaration of an Unusual Event.

HA1 (Describe destructive event) _____ may potentially affect safe plant operation.

HA2 (Fire or Explosion) in a plant vital area that may potentially affect safe operation of the plant.

HA3 (Toxic or Flammable) gasses may potentially affect safe operation of the plant.

HA4 Security Event in the Protected Area.

HA5 Evacuation of the Control Room. Plant controls established at Auxiliary Shutdown Panel.

HA6 Conditions exist, not specifically covered by the Station Emergency Plan, which may affect safe operation of the plant, and, in the judgment of the Emergency Director, warrants the declaration of an Alert.

HA7 Airborne Attack Threat.

HA8 Hostile Action within the Owner Controlled Area.

HS1 Security event in a vital area which could affect safe shutdown.

HS2 Evacuation of the Control Room and plant controls cannot be established.

HS3 Events affecting the ability to shutdown the plant or maintain it in a safe shutdown condition.

HS4 Site Attack (describe)_____.

HG1 Security Event Resulting in Loss of Physical Control of the Plant.

HG2 Conditions exist, not specifically covered by the Station Emergency Plan, which may potentially result in a hazard to the public, and in the judgment of the Emergency Director, warrants the declaration of a General Emergency.

STP 1690
Rev. 15

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
OFFSITE NOTIFICATION MESSAGE

Roll Call: _____ DPS Pierce _____ Matagorda County _____ Time

1. **Communicator Name:** _____
   ☐ Unit 1 ☐ Unit 2
2. ☐ This is a drill ☐ This is NOT a drill
3. **Message Number:** ___ **Originating From:** ☐ CR ☐ TSC ☐ EOF
4. **Emergency Classification:** ☐ New ☐ Unchanged
   Declared at Date/Time: _____
   ☐ Unusual Event ☐ Alert ☐ Site Area Emergency ☐ General Emergency ☐ Terminated
5. **Radiological release in progress:** ☐ Yes ☐ No
6. **Recommended Protective Actions:** ☐ New ☐ Unchanged
   A. ☐ No recommended protective actions at this time
   B. ☐ Recommended protective actions are:
      1. **Evacuate Zones:** _____
      2. **Shelter In Place Zones:** _____
      3. **Affected Downwind Sectors:** _____

   All Remaining Zones Go Indoors And Monitor EAS Radio
7. **Department of State Health Services (DSHS) concurs with recommendations in 6 above:**
   ☐ Yes ☐ Not Contacted ☐ No
8. **Event Description:** ☐ New ☐ Unchanged
   Initiating Condition: _____
   Explain: _____
   _____
9. **Meteorological data:** ☐ New ☐ Unchanged
   A. **Wind Speed** _____ **MPH** **Wind Direction From** _____ **Degrees** **Delta T** _____ **Degrees**
   B. **Stability Class (Check One):** ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G
   C. **Precipitation (Check One):** ☐ None ☐ Rain ☐ Sleet ☐ Snow ☐ Hail ☐ Fog
10. **Release Involves:** ☐ New ☐ Unchanged
    A. ☐ Radiological release in progress - Expected Duration (hrs) ___ **Started Date/Time:** _____
    B. ☐ Radiological release which has ended - Duration (hrs) ___ **Terminated Date/Time:** _____
11. **Remarks:** _____

12. **Approved:** _____ (Print/Sign) Emergency Director _____ Date/Time

STP 1686
REV. 13

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

SUPPLEMENTAL OFFSITE NOTIFICATION MESSAGE

1. ☐ THIS IS A DRILL ☐ THIS IS NOT A DRILL

2. MESSAGE #: S **3. UNIT STATUS:** **Unit 1 % Power** _____ **Unit 2 % Power** _____

3. FISSION PRODUCT BARRIER STATUS:

	FUEL CLADDING	REACTOR COOLANT SYSTEM	CONTAINMENT
Intact	☐	☐	☐
Potential Loss	☐	☐	☐
Loss	☐	☐	☐

5. PROGNOSIS OF SITUATION:
- ☐ Improving
- ☐ Stable
- ☐ Degrading Slowly
- ☐ Degrading Quickly
- ☐ Unknown, Under Assessment
- ☐ Other _____

6. FUNCTIONAL SAFETY TRAINS: ☐ **A** ☐ **B** ☐ **C**

7. OFFSITE SUPPORT REQUESTED:
- ☐ None
- ☐ Ambulance
- ☐ Fire
- ☐ Law Enforcement
- ☐ NRC
- ☐ Other

8. ONSITE PROTECTIVE MEASURES IMPLEMENTED:
- ☐ Assessable & Accountability
- ☐ Site Evacuation Of Non-Essentials
- ☐ Control Room Evacuation
- ☐ TSC / OSC Relocated Outside Protected Area
- ☐ Potassium Iodide Issued
- ☐ Radiological Exposures Above 10CFR20 Limits
- ☐ Medical Emergency Offsite Transport
- ☐ Other _____

9. FACILITIES ACTIVATED:
- ☐ TSC
- ☐ OSC
- ☐ EOF
- ☐ JIC
- ☐ Reception Center (for STP Only)
- ☐ Other _____

10. OFFSITE EXPOSURES: ☐ YES ☐ NO

☐ Projection (REM) ☐ Actual (REM)

MILES	1	2	3	4	5	6	7	8	9	10
TEDE										
CED										

Estimated Release Duration (Hrs) _____ Release Rate (μCi/sec) _____

11. MISCELLANEOUS INFORMATION:

12. APPROVED: _____ _____
(Print/Sign) Emergency Director DATE / TIME

STP 1691
Rev. 0

OFFSITE MESSAGE LOG

MESSAGE NUMBER	MATAGORDA COUNTY	DPS, PIERCE	FAX COMPLETED FORM	DEPARTMENT OF STATE HEALTH SERVICES (DSHS)	UNAFFECTED UNIT CONTROL ROOM	STP COORDINATOR (QSE)	CONFIRM SUCCESSFUL FAX TRANSMISSION	FAC	NOTIFICATION COMPLETED
EONS OR MANUAL	QUINTRON OR 979-241-3205 OR (When EOC Activated) 979-244-1178	QUINTRON OR 979-541-4595	USE EONS SEND OR BROADCAST FAX	512-458-7460	U1-8614/8610/ 8595/7732 U2-7953/8549/ 8683/8156	QUINTRON OR 713-537-3700	FAX REPORT N/A if EONS	LOC	NAME

15 MINUTE NOTIFICATION REQUIRED

LOG THE TIME OF CONTACT

WHEN COMPLETED, THIS RECORD SHALL BE RETAINED IN ACCORDANCE WITH THE DOCUMENT TYPE LIST (DTL).

NRC FORM 361 (12-2000)

REACTOR PLANT EVENT NOTIFICATION WORKSHEET

U.S. NUCLEAR REGULATORY COMMISSION OPERATIONS CENTER

EN #

NRC OPERATION TELEPHONE NUMBER: PRIMARY -- 301-816-5100 or 800-532-3469*, BACK UPS -- [1st] 301-951-0550 or 800-449-3694*, [2nd] 301-415-0550 and [3rd] 301-415-0553 *Licensees who maintain their own ETS are provided these telephone numbers.

NOTIFICATION TIME	FACILITY OR ORGANIZATION	UNIT	NAME OF CALLER	CALL BACK #
ET CT				

EVENT TIME & ZONE	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER
CT		/	/

EVENT CLASSIFICATIONS		1-Hr. Non-Emergency 10 CFR 50.72(b)(1)			(v)(A)	Safe S/D Capability	AINA
☐ GENERAL EMERGENCY	GEN/AAEC	☐	TS Deviation	ADEV	(v)(B)	RHR Capability	AINB
☐ SITE AREA EMERGENCY	SIT/AAEC	4-Hr. Non-Emergency 10 CFR 50.72(b)(2)			(v)(C)	Control of Rad Release	AINC
☐ ALERT	ALE/AAEC	☐ (i)	TS Required S/D	ASHU	(v)(D)	Accident Mitigation	AIND
☐ UNUSUAL EVENT	UNU/AAEC	☐ (iv)(A)	ECCS Discharge to RCS	ACCS	(xii)	Offsite Medical	AMED
☐ 50.72 NON-EMERGENCY	(see next columns)	☐ (iv)(B)	RPS Actuation (scram)	ARPS	(xiii)	Loss Comm/Asmt/Resp	ACOM
☐ PHYSICAL SECURITY (73.71)	DDDD	☐ (xi)	Offsite Notification	APRE	60-Day Optional 10 CFR 50.73(a)(1)		
☐ MATERIAL/EXPOSURE	B???	8-Hr. Non-Emergency 10 CFR 50.72(b)(3)			☐	Invalid Specified System Act	AINV
☐ FITNESS FOR DUTY	HFIT	☐ (ii)(A)	Degraded Condition	ADEG	Other Unspecified Requirement (Identify)		
☐ OTHER UNSPECIFIED REQMT	(see last column)	☐ (ii)(B)	Unanalyzed Condition	AUNA	☐		NONR
☐ INFORMATION ONLY	NNF	☐ (iv)(A)	Specified System Actuation	AESF	☐		NONR

DESCRIPTION

Include: Systems affected, actuations and their initiating signals, causes, effect on plant, actions taken or planned, etc. *(Continue on back)*

☐ Control Room Log Book entry made.

NOTIFICATIONS	YES	NO	WILL BE
NRC RESIDENT	☐	☐	☐
STATE(s)	☐	☐	☐
LOCAL	☐	☐	☐
OTHER GOV AGENCIES	☐	☐	☐
MEDIA/PRESS RELEASE	☐	☐	☐

ANYTHING UNUSUAL OR NOT UNDERSTOOD? ☐ YES (explain above) ☐ NO

DID ALL SYSTEMS FUNCTION AS REQUIRED? ☐ YES ☐ NO (explain above)

MODE OF OPERATION UNTIL CORRECTED:

ESTIMATE FOR RESTART DATE:

ADDITIONAL INFO ON BACK ☐ YES ☐ NO

ADDITIONAL INFORMATION PAGE 2 OF 2

RADIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

☐ LIQUID RELEASE	☐ GASEOUS RELEASE	☐ UNPLANNED RELEASE	☐ PLANNED RELEASE	☐ ONGOING	☐ TERMINATED
☐ MONITORED	☐ UNMONITORED	☐ OFFSITE RELEASE	☐ T.S. EXCEEDED	☐ RM ALARMS	☐ AREAS EVACUATED
☐ PERSONNEL EXPOSED OR CONTAMINATED		☐ OFFSITE PROTECTIVE ACTIONS RECOMMENDED		*State release path in description.	

	Release Rate (Ci/sec)	% T.S. Limit	HOO Guide	Total Activity (Ci)	% T.S. Limit	HOO Guide
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 µCi/sec			0.01 Ci
Particulate			1 µCi/sec			1 mCi
Liquid *(excluding tritium and Dissolved noble gases)*			10 µCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

	PLANT STACK	CONDENSER/AIR EJECTOR	MAIN STEAM LINE	SG BLOWDOWN	OTHER
RAD MONITOR READINGS					
ALARM SETPOINTS					
% T. S. LIMIT *(if applicable)*					

RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS ***(specific details/explanations should be covered in event description)***

LOCATION OF THE LEAK *(e.g., SG #, valve, pipe, etc)*

LEAK RATE	UNITS: gpm/gpd	T. S. LIMITS	SUDDEN OR LONG TERM DEVELOPMENT
LEAK START DATE:	TIME: MST	COOLANT ACTIVITY AND UNITS:	PRIMARY - SECONDARY -

LIST OF SAFETY EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION *(Continued from front)*

INITIALS AND DATE

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION NON-EMERGENCY OFFSITE NOTIFICATION MESSAGE

Roll call: _____	_____	_____
DPS Pierce	Matagorda County	Time

Communicator Name: _____

A condition existed that met the Emergency Plan criteria but no emergency was declared and the basis for the emergency class no longer exists at the time of the discovery.

Missed Emergency Classification:
- ☐ Unusual Event
- ☐ Alert
- ☐ Site Area Emergency
- ☐ General Emergency

Date/Time: _____

Event Description:

Initiating Condition: _____

Explain: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Approved: _____ **Date:** _____ **Time:** _____

STP 1690
Rev. 15

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION
OFFSITE NOTIFICATION MESSAGE

Roll Call: _____ DPS Pierce _____ Matagorda County _____ Time

1. **Communicator Name:** APPLICANTS NAME
   ☐ Unit 1 ☒ Unit 2
2. ☒ This is a drill ☐ This is NOT a drill
3. **Message Number:** 1 **Originating From:** ☒ CR ☐ TSC ☐ EOF
4. **Emergency Classification:** ☒ New ☐ Unchanged
   Declared at Date/Time: CURRENT DATE/TIME
   ☐ Unusual Event ☒ Alert ☐ Site Area Emergency ☐ General Emergency ☐ Terminated
5. **Radiological release in progress:** ☐ Yes ☒ No
6. **Recommended Protective Actions:** ☒ New ☐ Unchanged
   A. ☒ No recommended protective actions at this time
   B. ☐ Recommended protective actions are:
      1. Evacuate Zones: _____
      2. Shelter In Place Zones: _____
      3. Affected Downwind Sectors: _____

   This is the preferred wording from the procedure, however other wording that describes the event in lay terms WITHOUT acronyms is acceptable

   All Remaining Zones Go Indoors And Monitor EAS Radio
7. **Department of State Health Services (DSHS) concurs with recommendations in 6 above:**
   ☐ Yes ☒ Not Contacted ☐ No
8. **Event Description:** ☒ New ☐ Unchanged
   Initiating Condition: HA2
   Explain: Fire in a plant vital area that may potentially affect safe plant operation.
9. **Meteorological data:** ☐ New ☐ Unchanged
   A. **Wind Speed** _____ **MPH** **Wind Direction From** _____ **Degrees** **Delta T** _____ **Degrees**
   B. **Stability Class (Check One):** ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G
   C. **Precipitation (Check One):** ☐ None ☐ Rain ☐ Sleet ☐ Snow ☐ Hail ☐ Fog
10. **Release Involves:** ☐ New ☐ Unchanged
    A. ☐ Radiological release in progress - Expected Duration (hrs) ___ **Started Date/Time:** _____
    B. ☐ Radiological release which has ended - Duration (hrs) ___ **Terminated Date/Time:** _____
11. **Remarks:** _____
12. **Approved:** _____ (Print/Sign) Emergency Director _____ Date/Time

NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: REVIEW CONTROL ROOM LOGS

JPM NO.: NRC A5

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: REVIEW CONTROL ROOM LOGS

JPM No.: A5

Rev. No.: 0

STP Task: 30200, Review Operations Logs

STP Objective: 30200, Review Operations Logs IAW 0POP01-ZQ-0022, Plant Operations Shift Routines, to verify that all forms have been completed and any Corrective Action initiated.

Related K/A Reference: 2.1.3 [3.7/3.9], Knowledge of Shift Turnover Practices

References: 0POP01-ZQ-0022, Plant Operations Shift Routines
0POP02-CV-0003, Mixing of Boric Acid
Technical Specifications
SPR-940598, Low Boron Concentration, BAT 1A

Task Normally Completed By: SRO

Method of Testing: Simulated

Location of Testing: N/A

Time Critical Task: NO

Validation Time: 25 Minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The plant is in MODE 1, 100% steady state conditions. You are the on-shift Unit Supervisor. The Reactor Operator has completed pages 1-16 of 43 pages of the Operator Logs and has given them to you for your review.

INITIATING CUE:

Review the enclosed partial log package for Shift 1 (0000 – 0200) for completeness/accuracy.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Correctly locates the errors which have been inserted into the Control Room Log Package.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

NRC A5 handout.

NOTES:

1) The Control Room log package will consist of pages 1-of-43 through 16-of-43 of the Operator Logs for Modes 1, 2, 3, and 4. Two errors have been inserted into the Log Package. The applicant must locate the errors for successful completion of the task.

2) The Evaluator is provided with an ANSWER KEY which is appropriately marked ("KEY"). The location of inserted errors is also mentioned in the body of this JPM. The evaluator shall not hand out any page(s) marked as "KEY" to the student.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time: _____**

Review faulted Control Room Log Package.

Standard:

The applicant reviews the faulted Control Room Log Package for errors and/or omissions.

Comment:

While there is no time limit associated with this JPM, the applicant is expected to make reasonable progress during the review process.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Discuss errors and/or omissions located within the Control Room Logsheet Package.

Standard:

The applicant correctly locates the errors:

1) *Log page 12 of 43*
   The log taker has incorrectly taken credit for the level in BAT Tank 1A, which is being batched (filled) to a normal level. Because it is in a batching lineup, and it is boric acid concentration is unknown, the tank is inoperable. Therefore the total BAT Volume recorded on the logs should be the amount present in BAT tank 1B ONLY (this figure should be 26,500 gals and not 41,500 gal). Because the amount of boric acid present in BAT 1B is not greater than the minimum required in the TRM (27K), this would be a violation of the TRM.

2) *Log page 14 of 43*
   There is greater than a 12 step difference between DRPI and the STEP DEMAND POSITION INDICATION for CONTROL ROD BANK "D". This is a violation of TS 3.1.3.2, requiring DRPI and Step Demand to indicate within 12 steps of each other.

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A5, REVIEW CONTROL ROOM LOGS

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU'VE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The plant is in MODE 1, 100% steady state conditions. You are the on-shift Unit Supervisor. The Reactor Operator has completed pages 1-16 of 43 pages of the Operator Logs and has given them to you for your review.

INITIATING CUE:

Review the enclosed partial log package for Shift 1 (0000 – 0200) for completeness/accuracy.

CR

UNIT: 1 DATE: Today

0000-0200 SHIFT	1200-1400 SHIFT
Start Time: 0001 Mode: 1 Finish Time: 0120	Start Time: Mode: Finish Time:
Temporary Logs: YES___ NO_X **IF** Yes, Number of Temporary Logsheets:_____ START N/A hrs. STOP N/A hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.	**Temporary Logs:** YES___ NO___ **IF** Yes, Number of Temporary Logsheets:_____ START_____ hrs. STOP _____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.
OPERATOR: Robert Miller (1) SUPERVISOR:_____	OPERATOR:_____ (1) SUPERVISOR:_____
(1) Supervisor signature includes responsibility for second review requirements per 0PGP03-ZE-0004, Plant Surveillance Program.	

REMARKS
1) Currently batching acid to Boric Acid Tank 1A. Boric Acid Tank is isolated and not operable.

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
POWER RANGE NEUTRON FLUX	CP-011	NI-0041	100		2% CHANNEL CHECK (1) (2)	3.3.1 Table 3.3-1 Item 2, Action 2	1,2	(1) IF 1 CHANNEL IS INOP AND THERMAL POWER > 75%, THEN PERFORM OPSP10-II-0004 EVERY 12 HOURS. IF APPLICABLE, THEN RECORD THE FOLLOWING: * _____/_____ DATE / TIME OF NEXT CONDITIONAL SURVEILLANCE (2) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS.
		NI-0042	100					
		NI-0043	100					
		NI-0044	100					
A DG FOST	CP-003	LI-9109			N/A	N/A	1,2,3,4	
B DG FOST		LI-9111						
C DG FOST		LI-9113						
RCB DEWPOINT	CP-002	MI-9682	42		N/A °F	N/A	ALL	
RCB PRESSURE	ANNUN WINDOW 2M2-A2	N/A	SAT		NO ALARM OTHERWISE -0.1 TO +0.3 PSIG	3.6.1.4	1,2,3,4	

*"N/A" may **NOT** be written in the space for conditional surveillances until the normal Dayshift log reading is required to be performed. (Reference 6.14.22)

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
RCFC INLET TEMPS	CP-002 (1)	TI-9664	94		°F (2)	N/A	N/A	(1) RECORD ALL INSTRUMENTS. (2) IF RCFC INLET TEMP IS COLDER THAN RCFC OUTLET TEMP BY MORE THAN 5°F ON AN IDLE RCFC FAN OR AN RCFC INLET TEMP IS LESS THAN 50°F ON AN IDLE RCFC, THEN VERIFY OPERABILITY BY VISUAL INSPECTION OF THE BACKDRAFT DAMPER. (Ref. 6.14.7)
		TI-9673	84					
		TI-9661	81					
		TI-9667	91					
		TI-9670	63					
		TI-9676	86					
RCB AVG AIR TEMP	N/A	CALC (1)	SAT		≤ 110°F	3.6.1.5	1,2,3,4	(1) AVG THE FOUR HIGHEST OPERATING INLET TEMPS. ON RUNNING RCFCs. IF THE HIGHEST IS ≤ 110°F, THEN RECORD SAT.
RCFC OUTLET TEMPS	CP-002 (1)	TI-9665	55		≥ 50°F WITH ACCUMS PRESSURIZED (2) (Ref. 6.14.15 and 6.14.19)	N/A	N/A	(1) RECORD ALL INSTRUMENTS. (2) IF < 50°F, THEN VERIFY LOCAL ACCUM METAL TEMP WITH HAND HELD PYROMETER AND DOCUMENT THE TOP AND BOTTOM METAL TEMPS ON A TEMPORARY LOG. (Ref. 6.14.15 and 6.14.19)
		TI-9674	55					
		TI-9662	55					
		TI-9668	55					
		TI-9671	60					
		TI-9677	65					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
A CCW TEMP	CP-002	TI-4510 (1)	STBY		60-105°F	N/A	N/A	(1) CONTROL BOARD INDICATION IS EXPERIENCING A LACK OF ACCURACY DUE TO QDPS. ALTERNATE LOCAL CCW HEAT EXCHANGER INDICATION MAY BE USED, 1(2)-CC-TISH-4511, -TISH-4516, -TISH-4521 TO VERIFY CCW HEADER TEMP. IS IN THE BAND. (CR # 04-913)
B CCW TEMP		TI-4515 (1)	SEC					
C CCW TEMP		TI-4520 (1)	79					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
A ECW TEMP	CP-002	TI-6883 OR TW-6904A (1)	STBY		54-95°F (1) (2) (3)	3.7.5	1,2,3,4	(1) IF < 54°F, THEN OPERATE TRN A, B & C ESS CHILLERS PER COLD WEATHER GUIDELINES IN 0POP02-CH-0005, Essential Chiller Operation. AND IF < 44°F, THEN monitor temperature using qualified MT&E equipment at Thermowell location (Reference 0POP02-CH-0005, Essential Chiller Operation) IF ECW SUPPLY TEMP monitored at local Thermowell location < 37.2°F using Hart Scientific 1521 Handheld Thermometer (M&TE 100-00545) THEN DECLARE ESS CHILLER INOP. CREE 11-2630-1 (2) IF ECW SUPPLY TEMP < 75°F AND TEMPERATURE DECREASES BY GREATER THAN OR EQUAL TO 4°F BETWEEN CONSECUTIVE READINGS, THEN START ALL AVAILABLE IDLE ECW PUMPS. (CR 01-19410) (3) 93°F FOR ONE PUMP OPERATION AND 95°F FOR TWO OR THREE PUMP OPERATION. IF THESE ECW TEMP'S ARE EXCEEDED, THEN CONTACT SYSTEM ENGINEERING.
B ECW TEMP		TI-6888 OR TW-6905A (1)	76					
C ECW TEMP	CP-001	TI-6893 OR TW-6906A (1)	76					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
ACC A DISCH VLV	CP-001	MOV-0039A	SAT		OPEN/ PWR OFF	3.5.1	1,2,3 (1)	(1) MODE 3 WITH PZR PRESS > 1000 PSIG. (2) IF > 92 GAL DIFFERENCE BETWEEN CHANNELS, THEN SUBMIT CR FOR CALIBRATION. (3) INSTRUMENT ERROR REQUIRES OPERABILITY TO BE DETERMINED BY PLANT COMPUTER. (4) MODE 4 WITH RCS TCOLD < 350°F.
					CLOSED	3.4.9.3	4 (4)	
ACC A N2 PRESSURE		PI-0960	630		N/A	3.5.1 (3)	1,2,3 (1)	
		PI-0961	630					
ACC A WTR LEVEL		LI-0950	8975		CHNL CHECK ≤ 92 GAL (2)			
		LI-0951	8980					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
ACC B DISCH VLV	CP-001	MOV-0039B	SAT		OPEN/ PWR OFF	3.5.1	1,2,3 (1)	(1) MODE 3 WITH PZR PRESS > 1000 PSIG. (2) IF > 92 GAL DIFFERENCE BETWEEN CHANNELS, THEN SUBMIT CR FOR CALIBRATION. (3) INSTRUMENT ERROR REQUIRES OPERABILITY TO BE DETERMINED BY PLANT COMPUTER. (4) MODE 4 WITH RCS TCOLD < 350°F.
					CLOSED	3.4.9.3	4 (4)	
ACC B N2 PRESSURE		PI-0962	630		N/A	3.5.1 (3)	1,2,3 (1)	
		PI-0963	630					
ACC B WTR LEVEL		LI-0952	8900		CHNL CHECK ≤ 92 GAL (2)			
		LI-0953	8925					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
ACC C DISCH VLV	CP-001	MOV-0039C	SAT		OPEN/ PWR OFF	3.5.1	1,2,3 (1)	(1) MODE 3 WITH PZR PRESS > 1000 PSIG. (2) IF > 92 GAL DIFFERENCE BETWEEN CHANNELS, THEN SUBMIT CR FOR CALIBRATION. (3) INSTRUMENT ERROR REQUIRES OPERABILITY TO BE DETERMINED BY PLANT COMPUTER. (4) MODE 4 WITH RCS TCOLD < 350°F.
					CLOSED	3.4.9.3	4 (4)	
ACC C N2 PRESSURE		PI-0964	625		N/A	3.5.1 (3)	1,2,3 (1)	
		PI-0965	625					
ACC C WTR LEVEL		LI-0954	8910		CHNL CHECK ≤ 92 GAL (2)			
		LI-0955	8905					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
A RHR FLOW	CP-001	FI-0851	N/A		(1) (3) GPM 1 RHR & 1 RCP **OR** 2 RHR **OR** 2 RCPs	3.4.1.3	4 (2)	(1) IF NO OPERATIONS ARE PERMITTED CAUSING DILUTION AND CORE OUTLET TEMP IS ≥ 10 DEG SUBCOOLED, THEN ALL RCPs AND RHR PUMPS MAY BE DEENERGIZED FOR 1 HR. NO OPERATIONS ARE PERMITTED THAT WOULD CAUSE INTRODUCTION INTO THE RCS OF COOLANT WITH BORON CONCENTRATION LESS THAN THAT REQUIRED TO MEET SHUTDOWN MARGIN OF LCO 3.1.1, AND CORE OUTLET TEMPERATURE IS MAINTAINED AT LEAST 10°F BELOW SATURATION TEMPERATURE. (2) N/A IN MODES 1, 2, 3. (3) 1 RCP OR RHR PUMP OPERATING AND 1 MORE RCP OR RHR PUMP OPERABLE.
B RHR FLOW		FI-0852	N/A					
C RHR FLOW		FI-0853	N/A					
RHR PUMP IND LIGHTS		A H/S	N/A		POWER AVAIL (1) (3)			
		B H/S	N/A					
		C H/S	N/A					
ECCS VALVE STATUS	CP-001 MOV POSITION IND	0008A	SAT		VALVE SHUT AND POWER OFF	3.5.2	1, 2, 3	
		0019A						
		0008B	SAT					
		0019B						
		0008C	SAT					
		0019C						

UNIT: 1 DATE: Today

ANNUN WINDOW	ROOM	COMP POINT	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
22M1-D6	CCP A CCP B	HMTD9237 HMTD9238	SAT		≤ 130°F	TRM 3.7.13 (1)	ALL	(1) VERIFY ANNUNC WINDOW CLEAR. IF WINDOW IN ALARM STATE, THEN VERIFY TEMP SAT LOCALLY OR BY COMP POINT. RECORD SAT OR UNSAT IN THE SPACE PROVIDED AND DENOTE ANY ABNORMALITIES IN THE REMARKS SECTION. (2) ≤ 120°F WHEN TESTING PER TECHNICAL SPECIFICATION 4.8.1.1.2.e.7.
22M1-F1	AFWP A AFWP B AFWP C AFWP D	HCTD9744 HCTD9745 HCTD9746 HCTD9747	SAT		≤ 104°F			
22M2-A2	EW TRN A EW TRN B EW TRN C	HZTD9888 HZTD9889 HZTD9890	SAT		≤ 104°F			
22M2-A5	SI PP A SI PP B SI PP C	HFTD9517A HFTD9527A HFTD9537A	SAT		≤ 99°F			
22M2-B1	CCW PP A CCW PP B CCW PP C	HMTD9234 HMTD9235 HMTD9236	SAT		≤ 110°F			
22M2-E2	A DG 35' B DG 35' C DG 35'	HGTD9740 HGTD9741 HGTD9742	SAT		≤ 104°F (2)			
22M2-E3	BA PP A BA PP B	HMTD9333 HMTD9333A	SAT		≤ 99°F			
22M2-F1	RAD MON (H2 ANAL)	HMTD9338	SAT		≤99°F			
22M3-A1	A ELEC PEN B ELEC PEN C ELEC PEN	HETD9703 HETD9704 HETD9705	SAT		≤100°F			
22M3-B1	ESF SWGR A ESF SWGR B ESF SWGR C	HETD9713 HETD9718 HETD9720	SAT		≤ 82°F			
22M3-B7	RELAY ROOM	HETD9604	SAT		≤ 75°F			
	CONTROL ROOM	HETD9605A			≤ 76°F	T.S. 3.7.7 (1)		

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
PRT LEVEL	CP-004	LI-0670	66		65-75%	N/A	ALL	
PRT PRESS		PI-0669	1		< 6 PSIG			
RCDT LEVEL		LI-4901	50		8-92%			
RCDT PRESS		PI-4900	2		< 6 PSIG			
RCDT TEMP		TI-4902	69		< 187°F			
RCB SEC SUMP LEVEL		LI-7811	55		N/A %	N/A	1,2,3	
RCB NORM. SUMP LEVEL		LI-7812	6			3.4.6.1 3.4.6.2	1,2,3,4	
NORM SUMP DISCHARGE		FQI-7823	8104834		N/A GAL			

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
BAT A LVL	CP-004	LI-0103	15,000 (1)		N/A GAL	TRM 3.1.2.6	1,2,3,4	(1) ONLY APPLICABLE IF BAT(S) IS DESIGNATED BORON SOURCE. (2) SUM OF OPERABLE BAT TANKS.
BAT A TEMP.		TI-0104	110 (1)		≥ 65°F (1)			
BAT B TEMP.		TI-0107	95		≥ 65°F (1)			
BAT B LVL		LI-0105	26,500		N/A GAL			
BAT VOLUME	N/A	CALC (2)	41,500		≥30,400 GAL (1)			
EXCESS LETDN HX 1(2)A OUTL TEMP	CP-004	TI-0229	71		≤ 110 °F (1)			(1) IF >110 F, THEN CONTACT SYSTEM ENGINEERING FOR AN EVALUATION OF IMPACT ON U1118 AND RCS LEAKAGE.
PRZR VAPOR	CP-004	TI-0607	N/A		N/A	TRM 3.4.9.2	ALL (2)	(1) TI-0607 MINUS TI-0126. (2) ONLY IF AUX SPRAY IN USE.
REGEN HX TEMP		TI-0126	N/A		N/A			
AUX SPRAY DELTA-T		CALC.	N/A		≤ 621°F (1)			
PORV 655A BLOCK VLV		MOV-0001A			OPEN (1)	3.4.9.3 (2)	4 ONLY	(1) IF PORVs ARE USED FOR COLD OVERPRESSURE PROTECTION. (2) IF ALT VENT PATH ESTABLISHED, THEN LOG VENT VERIF SAT PER TECHNICAL SPECIFICATION 4.4.9.3.2.
PORV 656A BLOCK VLV		MOV-0001B						
CHARGING PUMP PRESSURE	CP-004	PI-0204	2700		CHNL CHECK ≤ 200 PSIG BETWEEN PI-0204 AND PI-0288B/287B/286B	3.3.2 Table 3.3-3, Item 3d-2, Action 16	1,2,3,4	(1) COORDINATE THE READING OF RUNNING PUMP(S) DISCHARGE PRESSURE IN THE CONTROL ROOM (PI-0204) WITH THE READING OF THE MEAB WATCH INDICATION PI-0288B/287B/286B) LOCALLY.
	(1)	PI-0288B PI-0287B PI-0286B	2700					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
RCS TAVG	CP-005	TI-0412A	590.0		≥ 571°F (1) CHNL CHECK 5°F (2)	3.3.2, Table 3.3-3, Item 5f, Action 20 3.1.1.4	1,2,3	(1) IF < 571°F WITH TAVG-TREF DEV ALARM **NOT** RESET IN MODE 1 OR IN MODE 2 WITH KEFF ≥ 1, THEN COMPLETE Logsheet 7, Tavg Surveillance Logsheet (2) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS.
		TI-0422A	590.0					
		TI-0432A	591.5					
		TI-0442A	591.0					
RCS TAVE DNB PARAMETER	CP-005	CALC (1)	590.625		≤ 595°F	3.2.5	1	(1) AVERAGE OF ALL OPERABLE RCS TAVE CHANNELS (3 MINIMUM).
LOOP DELTA-T	CP-005 OR PLANT COMPUTER (1)	TI-0411	100		≥ 5% BELOW SETPOINT (2)	N/A	1,2 (3)	(1) IF PLANT COMPUTER USED, THEN COMPARE TO PLANT COMPUTER SETPOINT. (2) LOG ACTUAL VALUE. IF LESS THAN 5% BELOW OTDT OR OPDT SETPOINTS, THEN RESTORE MARGIN TO GREATER THAN 5%. (3) N/A IN MODES 3 AND 4. (4) MAX DIFFERENCE BETWEEN OPERABLE CHANNELS DUE TO INSTRUMENT ERROR. LIMIT MAY BE EXCEEDED DUE TO DIFFERENT LOOP OPERATING TEMPERATURES.
		TI-0421	101					
		TI-0431	100					
		TI-0441	101					
OPDT SETPOINT		TI-0412B	107		CHNL CHECK 6% (4)	3.3.1, Table 3.3-1 Items 8,9 Action 6	1,2 (3)	
		TI-0422B	106					
		TI-0432B	108					
		TI-0442B	107					
OTDT SETPOINT		TI-0412C	120		CHNL CHECK 10% (4)			
		TI-0422C	122					
		TI-0432C	122					
		TI-0442C	120					
VESSEL FLANGE L/O TEMP	CP-005	TI-0600	57		N/A °F	3.4.6.2	1,2,3,4	

UNIT: 1 DATE: Today

PARAMETER	INSTRUMENT	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
FOP	N/A (1)	257		N/A	3.1.3.1 3.1.3.2 3.1.3.6	1,2 (4)	(1) FULL OUT POSITION (FOP) FROM PLANT CURVE BOOK TABLE 1.1. (2) RECORD BANK INSERTION LIMIT FOR PRESENT PWR LEVEL FROM CORE OPERATING LIMITS REPORT. (3) FULLY WITHDRAWN AS SPECIFIED IN CORE OPERATING LIMITS REPORT. (4) MODE 2 WITH KEFF ≥ 1. N/A IN MODES 3 AND 4.
CONTROL ROD BANK A POSITION INDICATION	GP. 1 DEMAND POS.	257		± 12 STEPS BETWEEN DRPI & DEMAND. ALL RODS IN BANK ABOVE INSERT LIMIT			
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	258					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2) (3)	257					
CONTROL ROD BANK B POSITION INDICATION	GP. 1 DEMAND POS.	257					
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	257					
CONTROL ROD BANK C POSITION INDICATION	GP. 1 DEMAND POS.	257					
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	257					
CONTROL ROD BANK D POSITION INDICATION	GP. 1 DEMAND POS.	253					
	GP. 2 DEMAND POS.	253					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	240					
	ROD INS LIMIT (2)	174					

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
SHUTDOWN ROD POS IND.	ALL BANKS	HIGHEST DEMAND POSITION	257		±12 STEPS BETWEEN DRPI POS. & DEMAND POS. VERIFY EACH ROD FULLY WITHDRAWN WHEN CRITICAL USING DRPI. (1)	3.1.3.1 3.1.3.2 3.1.3.5	1,2	(1) FULLY WITHDRAWN AS SPECIFIED IN CORE OPERATING LIMITS REPORT.
		LOWEST DEMAND POSITION	257					
		HIGHEST DRPI	258					
		LOWEST DRPI	258					
EXTENDED RANGE NEUTRON FLUX (S/D MONITOR)	CP-005	NY-0046	N/A		CHNL CHECK CPS (1)(3)(4)	Table 3.3.1, Item 7 (3)Action 5a (4)Action 5b Table 4.3-1, Item 7	3,4 ONLY	(1) IF HIGHEST READING ≥1000 CPS, THEN THE MAX DEV IS BY A FACTOR OF 10. IF NOT, MAX DEV. IS BY A FACTOR OF 15. (2) VERIFY NO ERROR MESSAGES WHEN PUSHBUTTON IS DEPRESSED. (Ref. 6.14.4) (3) WITH ONE CHANNEL INOPERABLE (4) WITH 2 CHANNELS INOPERABLE
		NY-0045	N/A					
		NY-0046 TEST P.B.	N/A		(2)			
		NY-0045 TEST P.B.	N/A					
QPTR ANNUNC WINDOW		5M3-A3	SAT		ALARM CLEAR (1)	4.2.4.1.b	1 > 50% PWR	(1) IF ALARM **NOT** CLEAR, THEN PERFORM OPSP10-NI-0002 EVERY 12 HRS. IF APPLICABLE, THEN RECORD THE FOLLOWING: * _____/_____ DATE / TIME OF NEXT CONDITIONAL SURVEILLANCE
		5M3-B3	SAT					

*"N/A" may **NOT** be written in the space for conditional surveillances until the normal Dayshift log reading is required to be performed. (Reference 6.14.22)

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
AXIAL FLUX DIFFERENCE	CP-005	NI-0041C	-1.5		+5,-10% OF TARGET AFD	3.2.1	MODE 1 > 15% POWER	(1) IF ALARM IS INOP, THEN PERFORM LOGSHEET 4. (2) IF ANY CONTROL BOARD AXIAL FLUX DIFFERENCE INDICATOR IS INOPERABLE, THEN THE "POWER RANGE NEUTRON FLUX" CHART RECORDER BLUE "DELTA V" DIGITAL DISPLAY FOR PEN 3 MAY BE USED TO CALCULATE THE VALUE FOR EACH CHANNEL USING THE EQUATION FOR DELTA-I% IN FIGURE 5.1 OF THE PLANT CURVE BOOK. (CP-018) (Channel I, NR-0041 for NI-0041C) (Channel II, NR-0042 for NI-0042C) (Channel III, NR-0043 for NI-0043C) (Channel IV, NR-0044 for NI-0044C)
		NI-0042C	-1.0					
		NI-0043C	-0.5					
		NI-0044C	-0.5					
	AFD HI ANNUNC WINDOW	5M3-D3	SAT		ALARM OPERABLE (1)			
SOURCE RANGE FLUX	CP-005	NI-0031B	N/A		CPS CHNL CHECK (1)	3.3.1 Table 3.3-1, Item 6 Actions 4,10 Item 5, Action 3	2,3,4 ONLY	(1) ≤ FACTOR OF 3 BETWEEN READINGS.
		NI-0032B	N/A					
INTERMED. RANGE FLUX		NI-0035B	5.0E-4		AMPS CHNL CHECK (1)		1,2 ONLY	
		NI-0036B	4.0E-4					
RCP A IND LIGHTS	CP-005	IND LIGHTS	N/A		POWER AVAIL (1) (2)	3.4.1.2	3,4 ONLY	(1) IF NO OPERATIONS ARE PERMITTED WHICH CAUSE DILUTION AND CORE OUTLET TEMP IS MAINTAINED AT LEAST 10°F SUBCOOLED, THEN ALL RCPs AND RHR PUMPS MAY BE DEENERGIZED FOR UP TO 1 HR. (2) IN MODE 3 AT LEAST 2 RCPs SHALL HAVE POWER. IN MODE 4 AT LEAST 2 OF ANY COMBINATION OF RCPs AND/OR RHR PUMPS SHALL HAVE POWER.
RCP B IND LIGHTS			N/A					
RCP C IND LIGHTS			N/A					
RCP D IND LIGHTS			N/A					

CR

UNIT: 1 DATE: Today

0000-0200 SHIFT	1200-1400 SHIFT
Start Time: 0001 Mode: 1 Finish Time: 0120	Start Time: Mode: Finish Time:
Temporary Logs: YES___ NO_X **IF** Yes, Number of Temporary Logsheets:_____ START N/A hrs. STOP N/A hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.	**Temporary Logs:** YES___ NO___ **IF** Yes, Number of Temporary Logsheets:_____ START_____ hrs. STOP _____ hrs. (Ref. 6.14.16) Note change to temporary log status in Remarks Section.
OPERATOR: Robert Miller (1) SUPERVISOR:_____	OPERATOR:_____ (1) SUPERVISOR:_____

(1) Supervisor signature includes responsibility for second review requirements per 0PGP03-ZE-0004, Plant Surveillance Program.

REMARKS

1) Currently batching acid to Boric Acid Tank 1A. Boric Acid Tank is isolated and not operable.

A note/remark should appear on the cover page which includes the out of specification reading/parameter, the associated limit exceeded, and corrective action(s) taken or in progress. Normally, the parameter would be circled in RED with a corresponding number to the note on the cover page.

(See JPM Step #2 for a technical explanation of the errors.

UNIT: 1 DATE: Today

PARAMETER	LOCATION	INSTR	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
BAT A LVL	CP-004	LI-0103	15,000 ①		N/A GAL			(1) ONLY APPLICABLE IF BAT(S) IS DESIGNATED BORON SOURCE.
BAT A TEMP.		TI-0104	110					TANKS.
BAT B TEMP.		TI-0107	95		≥ 65 °F (1)	TRM 3.1.2.6	1,2,3,4	
BAT B LVL		LI-0105	26,500		N/A GAL			
BAT VOLUME	N/A	CALC (2)	41,500		≥30,400 GAL (1)			
EXCESS LETDN HX 1(2)A OUTL TEMP	CP-004	TI-0229	71		≤ 110 °F (1)			(1) IF >110 F, THEN CONTACT SYSTEM ENGINEERING FOR AN EVALUATION OF IMPACT ON U1118 AND RCS LEAKAGE.
PRZR VAPOR	CP-004	TI-0607	N/A		N/A	TRM 3.4.9.2	ALL (2)	(1) TI-0607 MINUS TI-0126. (2) ONLY IF AUX SPRAY IN USE.
REGEN HX TEMP		TI-0126	N/A		N/A			
AUX SPRAY DELTA-T		CALC.	N/A		≤ 621°F (1)			
PORV 655A BLOCK VLV		MOV-0001A			OPEN (1)	3.4.9.3 (2)	4 ONLY	(1) IF PORVs ARE USED FOR COLD OVERPRESSURE PROTECTION. (2) IF ALT VENT PATH ESTABLISHED, THEN LOG VENT VERIF SAT PER TECHNICAL SPECIFICATION 4.4.9.3.2.
PORV 656A BLOCK VLV		MOV-0001B						
CHARGING PUMP PRESSURE	CP-004	PI-0204	2700		CHNL CHECK ≤ 200 PSIG BETWEEN PI-0204 AND PI-0288B/287B/286B	3.3.2 Table 3.3-3, Item 3d-2, Action 16	1,2,3,4	(1) COORDINATE THE READING OF RUNNING PUMP(S) DISCHARGE PRESSURE IN THE CONTROL ROOM (PI-0204) WITH THE READING OF THE MEAB WATCH INDICATION PI-0288B/287B/286B) LOCALLY.
	(1)	PI-0288B PI-0287B PI-0286B	2700					

BAT A should not be included in this total. The total should be 26,500 which is less than the limit and TRM requirements.

UNIT: 1 DATE: Today

PARAMETER	INSTRUMENT	00-02	12-14	LIMIT	TECHNICAL SPECIFICATION	MODE	NOTE
FOP	N/A (1)	257		N/A	3.1.3.1 3.1.3.2 3.1.3.6	1,2 (4)	(1) FULL OUT POSITION (FOP) FROM PLANT CURVE BOOK TABLE 1.1. (2) RECORD BANK INSERTION LIMIT FOR PRESENT PWR LEVEL FROM CORE OPERATING LIMITS REPORT. (3) FULLY WITHDRAWN AS SPECIFIED IN CORE OPERATING LIMITS REPORT. (4) MODE 2 WITH KEFF ≥ 1. N/A IN MODES 3 AND 4.
CONTROL ROD BANK A POSITION INDICATION	GP. 1 DEMAND POS.	257		± 12 STEPS BETWEEN DRPI & DEMAND. ALL RODS IN BANK ABOVE INSERT LIMIT			
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	258					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2) (3)	257					
CONTROL ROD BANK B POSITION INDICATION	GP. 1 DEMAND POS.	257					
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	257					
CONTROL ROD BANK C POSITION INDICATION	GP. 1 DEMAND POS.	257					
	GP. 2 DEMAND POS.	257					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	252					
	ROD INS LIMIT (2)	257					
CONTROL ROD BANK D POSITION INDICATION	GP. 1 DEMAND POS.	253					
	GP. 2 DEMAND POS.	253					
	DRPI HIGHEST ROD	252					
	DRPI LOWEST ROD	240					
	ROD INS LIMIT (2)	174					

Lowest rod DRPI is >12 steps from demand (exceeds limit)

NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: DETERMINE SHIFT STAFFING

JPM NO.: A6

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	Determine Shift Staffing
JPM No.:	A6
Rev. No.:	0
STP Task:	SRO 31100, Ensure the shift is manned properly
STP Objective:	SRO 50158, Knowledge of the Conduct of Operations
Related K/A Reference:	2.1.5 [2.9/3.9], Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.
References:	Conduct of Operations Chapter 2, Shift Operating Practices, Rev. 59 Technical Specifications
Task Normally Completed By:	SRO
Method of Testing:	Actual performance
Location of Testing:	Classroom
Time Critical Task:	NO
Validation Time:	15 Minutes

Required Materials (Tools/Equipment):

NONE

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 and Unit 2 are operating at full power. You are the Shift Manager for Unit 1 during a night shift. Initial shift manning is as follows:

Unit 1:

- Yourself
- one Unit Supervisor
- three Reactor Operators (includes 2 board operators and 1 STA qualified Reactor Operator)
- six Plant Operators (includes 2 Safe Shutdown Operators, 3 Qualified Fire Brigade Members, and 1 State/County Communicator)

Unit 2:

- one Shift Manager
- one Unit Supervisor
- one STA qualified SRO
- three Reactor Operators (includes 2 board operators and 1 ENS communicator)
- five Plant Operators (includes 2 Safe Shutdown Operators and 3 Qualified Fire Brigade Members)

INITIATING CUE
CONTINUED ON NEXT PAGE

JOB PERFORMANCE MEASURE INFORMATION SHEET

INITIATING CUE:

At 0100, the Unit 2 Shift Manager informs you that some of his crew members have become sick due to a bad meal and must be relieved. These individuals include the following Unit 2 watchstanders:

- Unit Supervisor
- STA
- Two Plant Operators (one serving as a Fire Brigade member and one serving as a Safe Shutdown Operator)

The Unit 2 Shift Manager makes the following suggestions:

1. He will take the Unit 2 Unit Supervisor watch. You will assume the Unit 1 and Unit 2 Shift Manager watches.
2. A Unit 1 Reactor Operator (STA Qualified) will assume the STA watch.
3. Transfer one Unit 1 Plant Operator to Unit 2 to serve as a Fire Brigade member.

Determine if these suggestions will satisfy the Conduct of Operations Manual requirements for Shift Staffing. If not, identify what must be done to satisfy the Conduct of Operations Manual requirements. Justify your answer.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

*Determines minimum shift staffing in accordance with Conduct of Operations procedure is **NOT** met as follows:*

- *Determines a SRO qualified individual should be called in as a Unit Supervisor or Shift Manager.*
- *Determines a Safe Shutdown qualified Plant Operator should be called in.*

HANDOUTS:

Student Handout of applicable pages for Shift Manning from Conduct of Operations, Chapter 2, Shift Operating Practices.

NOTES:

JOB PERFORMANCE MEASURE INFORMATION SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 (C*) Start time: _____

Determine if the suggested staffing changes will satisfy the Conduct of Operations Manual requirements for Shift Staffing. If not, identify what must be done AND **justify your answer**.

Standard:

Refers to Conduct of Operations, Shift Operating Practices for minimum shift complement. Determines the following:

- **Suggestion that he take the U2 US position and you will take the Shift Manager for both units will NOT satisfy requirements because 2 Shift Managers are required. Must either call in another US or SM.*
- *Suggestion that a U1 RO assume the STA function will work because only 1 STA qualified individual is required and that would be fulfilled by the U1 RO that's STA qualified.*
- **Suggestion that a U1 Plant Operator be transferred to U2 for Fire Brigade will NOT satisfy requirements for Safe Shutdown watches. Fire Brigade requirements would be met, even with the absence of the U2 Plant Operator qualified as Fire Brigade, however, upon losing the U2 Plant Operator qualified as Safe Shutdown, requirements for the # of Safe Shutdown watches (4) would not be met. Therefore, must call in a Plant Operator qualified as Safe Shutdown.*

* - denotes critical portion of step.

Comment:

Cue:

Notes:

- TERMINATE THE JPM - Stop time: _____

VERIFICATION OF COMPLETION

Job Performance Measure: A6, DETERMINE SHIFT STAFFING

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM – HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU'VE COMPLETED THE TASK

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Unit 1 and Unit 2 are operating at full power. You are the Shift Manager for Unit 1 during a night shift. Initial shift manning is as follows:

Unit 1:

- Yourself
- one Unit Supervisor
- three Reactor Operators (includes 2 board operators and 1 STA qualified Reactor Operator)
- six Plant Operators (includes 2 Safe Shutdown Operators, 3 Qualified Fire Brigade Members, and 1 State/County Communicator)

Unit 2:

- one Shift Manager
- one Unit Supervisor
- one STA qualified SRO
- three Reactor Operators (includes 2 board operators and 1 ENS communicator)
- five Plant Operators (includes 2 Safe Shutdown Operators and 3 Qualified Fire Brigade Members)

INITIATING CUE
CONTINUED ON NEXT PAGE

JPM – HANDOUT

INITIATING CUE:

At 0100, the Unit 2 Shift Manager informs you that some of his crew members have become sick due to a bad meal and must be relieved. These individuals include the following Unit 2 watchstanders:

- Unit Supervisor
- STA
- Two Plant Operators (one serving as a Fire Brigade member and one serving as a Safe Shutdown Operator)

The Unit 2 Shift Manager makes the following suggestions:

1. He will take the Unit 2 Unit Supervisor watch. You will assume the Unit 1 and Unit 2 Shift Manager watches.
2. A Unit 1 Reactor Operator (STA Qualified) will assume the STA watch.
3. Transfer one Unit 1 Plant Operator to Unit 2 to serve as a Fire Brigade member.

Determine if these suggestions will satisfy the Conduct of Operations Manual requirements for Shift Staffing. If not, identify what must be done to satisfy the Conduct of Operations Manual requirements. Justify your answer.

18.2.9 On-Shift Operations personnel expecting to be late or unable to report for shift are responsible for informing their assigned unit control room Unit Supervisor/Shift Manager at the earliest time possible but no later than the beginning of the scheduled shift. (Reference 25.8)

18.2.10 The Shift Manager or designee has the authority to call out required personnel, regardless of discipline, to maintain the minimum shift complement, support operation of the plant, or respond to emergencies.

18.3 Basis:

18.3.1 The notification to the Shift Manager when a licensed operator is unable to stand the watch is the individual's minimum responsibility. 0POP01-ZA-0014, Licensed Operator License Maintenance, provides additional guidance.

19.0 Shift Manning (References 25.2, 25.3, 25.8, 25.14, 25.16, 25.23, 25.48, 25.75, 25.102)

19.1 Definitions:

19.1.1 CREW COMPLEMENT - The operating crew for each unit will normally consist of 1 Shift Manager, 2 Unit Supervisors, 3 Reactor Operators, 6 Plant Operators and one of the Reactor Operators or Unit Supervisors STA qualified.

19.1.2 MINIMUM SHIFT COMPLEMENT – The minimum shift manning requirement, utilizing each of the unit's crew complement, is: 2 Shift Managers, 2 Unit Supervisors, 1 Shift Technical Advisor, 4 Reactor Operators, 1 ENS communicator, 4 Safe Shutdown Plant Operators, 5 Fire Brigade Members, and 1 State and County Communicator.

19.2 Expectations:

19.2.1 One Unit Supervisor of the crew complement will be designated as the Control Room Supervisor and the other Unit Supervisor to be designated Field Supervisor and/or Shift Technical Advisor.

19.2.2 The normal shift crew complement of 1 Shift Manager, 2 Unit Supervisors, 3 Reactor Operators and 6 Plant Operators should be maintained. Call out or holding over personnel to solely meet this requirement is not required unless plant conditions warrant the additional personnel or to maintain minimum shift complement.

19.2.3 In the event a Unit Supervisor is not available to fill the Field Supervisor position, the Shift Manager may designate a Reactor Operator to fill the Field Supervisor position.

19.2.4 In the event a Unit Supervisor or Reactor Operator is not available to fill the Field Supervisor position, the Shift Manager may designate a Plant Operator to act as a temporary Head Operator.

19.2.5 A site fire brigade of at least 5 members will be maintained on site at all times. One member of the fire brigade SHALL be fire brigade leader qualified.

19.2.6 Each unit will maintain safe shutdown watchstanders as required by tech specs and communicators as directed by the Emergency Plan. (Ref. 25.102)

19.2.7 The fire brigade will not include personnel necessary for safe shutdown of the unit. The fire brigade may include qualified personnel from other departments.

19.2.8 Safe shutdown watchstanders should not leave the protected area. IF it becomes necessary for any of these individuals to leave the protected area, THEN the Shift Manager will ensure adequate compensatory measures are in place. These measures ensure the required actions for the positions can be met.

19.2.9 The Unit Operations Managers will normally approve substitute Unit Supervisor or Shift Manager positions as part of the monthly schedule. The Unit Operations Managers will consider the experience and skills of the substitute members, and determine compatibility with the normally assigned shift crew complement. Any deviations from the approved schedule affecting an assigned Unit Supervisor/Shift Manager SHALL be approved by the Unit Operations Manager or designee prior to assuming the watch.

19.2.10 A Plant Operator in a minimum shift complement position SHALL carry a radio. Other Plant Operators should carry a radio. (Reference 25.100)

19.3 Basis:

19.3.1 The minimum shift crew manning requirements are specified in Technical Specification 6.2.2 and 10 CFR 50.54(m)(2)(i).

19.3.2 Shift coverage will be maintained without routine use of overtime. The objective is to have operating personnel work the twelve-hour shift schedule when the unit is operating. Guidance for use of overtime and applicable limits are governed by 0PGP03-ZA-0114, Fatigue Rule Program.

19.3.3 Restrictions placed on watchstanders leaving the protected area is necessary to ensure emergency personnel are available to respond within assumed response times. When watchstanders are outside the protected area it is difficult to validate individual response.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: REVIEW COMPLETED SURVEILLANCE (ECW)

JPM NO.: A7

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	Review Completed Surveillance (ECW)
JPM No.:	A7
Rev. No.:	0
Task No.:	SRO-12000 – Authorize the start of and review surveillance tests.
STP Objective:	SRO-12000 – Authorize the start of surveillance tests and review completion in accordance with PGP03-ZE-0004.
Related K/A Reference:	G2.2.12 [3.7/4.1] Knowledge of surveillance procedures.
References:	0PGP03-ZE-0004, Rev 26, Plant Surveillance Program 0PSP03-EW-0017, Rev 35, Essential Cooling Water System Train A Testing
Task Normally Completed By:	SRO
Method of Testing:	Actual Performance
Location of Testing:	Classroom
Time Critical Task:	NO
Alternate Path JPM:	NO
Validation Time:	25 minutes

Required Materials (Tools/Equipment):

Calculator

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Unit 1 is operating at 100% power. ECW Pump 1A surveillance has just been completed and 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, has been presented to you for the Plant Operations review. Section 5.3 of the procedure was not required to be performed.

INITIATING CUE:

You have been directed by the Shift Manger to perform the Plant Operations Second Review of the surveillance in accordance with 0PGP03-ZE-0004, Plant Surveillance Program, section 6.6.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Both errors have been identified as outlined in the body of the JPM.

HANDOUTS:

Handout copies of the completed surveillance and Surveillance Program Procedure.

NOTES:

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

Performance Step: 1(C*) **Start time: _____**

Review the completed surveillance per section 6.6 of 0PGP03-ZE-0004, Plant Surveillance Program.

Standard:

Reviews the completed surveillance and determines the following:

____ *Pump Test Results on page 2 are actually "Acceptable – All data within Acceptance Criteria". (Error carried forward)*

____ **On page 21, the Test Delta P is recorded under the incorrect ECW Total Flow Range (should be 19,000-19,049 instead of 18,000-18,049.*

____ *Step 5.4.16.4 is incorrectly completed (5.4.16.4.a should be initialed instead of 5.4.16.4.d). (Error carried forward)*

____ **On page 32, step 5.5.4, ECW Flow to ESF DG is outside the required range (Table 6).*

* Denotes critical portion of the step.

Comment:

A key is provided which highlights the above errors.

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A7, REVIEW COMPLETED SURVEILLANCE (ECW)

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Unit 1 is operating at 100% power. ECW Pump 1A surveillance has just been completed and 0PSP03-EW-0017, Essential Cooling Water System Train A Testing, has been presented to you for the Plant Operations review. Section 5.3 of the procedure was not required to be performed.

INITIATING CUE:

You have been directed by the Shift Manger to perform the Plant Operations Second Review of the surveillance in accordance with 0PGP03-ZE-0004, Plant Surveillance Program, section 6.6.

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Essential Cooling Water System Train A Testing			
Quality	Safety-Related	Usage: **IN HAND**	Effective Date: 07/11/2013

R. A. Smith	K. D. Regis	Crew 2B	Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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Procedure Performance Data Sheet

Unit Number: 1	Work Activity Number: 442954 442955 -ST: 86000713 86000714	
Technical Specification Reference: 3.7.4 4.0.5 4.3.2.1.1.c.7		
Test Interval: Per the Surveillance Database	Test Performance Allowed in Plant Modes: 1, 2, 3, 4, 5, 6 or Defueled	Train Reference: A

Reason for Test:

- ☒ Periodic Surveillance Test
- ☐ Maintenance Work Package # _____
- ☐ Other _____
- ☑ For Surveillance Credit
- ☐ Not for Surveillance Credit
- ☐ Increased Frequency Testing

Radiation Work Permit No.:	Fire Hazard Evaluation No.: N/A	Equipment Clearance No.: N/A

Administrative Approval to Perform Test:

M. Caine	today	2 hrs ago
Shift Manager	Date	Time

Test Results Review:

Pump Test Results:
- ☐ Acceptable - All data within Acceptance Criteria
- ☐ Acceptable - Data within Alert Range (explain in Remarks Section)
- ☒ Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks Section)

Valve Test Results:
- ☒ Acceptable - All data within Acceptance Criteria
- ☐ Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks Section)

Reviewed by: John Thomas	today	10 min. ago
Test Coordinator	Date	Time

Plant Operations Review:

All data within Acceptance Criteria?	☐ Yes	☐ No
Any pump data within Alert Range?	☐ Yes	☐ No
ECW Train A in Service?	☐ Yes	☐ No
Potential Reportable Occurrence?	☐ Yes	☐ No
LCO Action Statement Entered?	☐ Yes	☐ No

Reviewed by: _____	_____	_____
Shift Manager	Date	Time

Procedure Performance Data Sheet

Division Surveillance Coordinator Review:

Reviewed by: _____ _____ _____
Division Surveillance Coordinator | Date | Time

IST Coordinator Review:

Pump Test Results:
☐ Acceptable - All data within Acceptance Criteria
☐ Acceptable - Data within Alert Range (explain in Remarks Section)
☐ Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks Section)

Valve Test Results:
☐ Acceptable - (All data within Acceptance Criteria)
☐ Unacceptable - (Any data **NOT** within Acceptance Criteria) (explain in Remarks Section)

New Reference Value(s) Required? ☐ Yes (explain in Remarks) ☐ No ☐ Not Applicable

Corrective Action Taken: _____

_____

Reviewed by: _____ _____ _____
IST Coordinator | Date | Time

M&TE Used:

Description	STPEGS No.	Cal. Due Date
Discharge Pressure Test Instrument: ♦ Heise CMM-100 PSIG Pressure Gauge OR ♦ Fluke 700P06/100 PSIG Pressure Module ♦ Fluke Calibrator (718, 719, 743B, 744, 753, 754)	100-1931-22 100-1354-38	1/7/2014 12/20/2013
Vibration Instrument	100-1351-5	7/24/2014
DMM [Fluke Calibrator (718, 719, 743B, 744, 753, 754) or Equivalent]	100-1354-20	8/5/2014

Procedure Performance Data Sheet

Performers and Verifiers:

Name (Print)	Signature	Initials	Sections Performed
John Thomas	John Thomas	JT	various
Sam Simons	Sam Simons	SS	Various
Scott Wesley	Scott Wesley	SW	various
Drew Alley	Drew Alley	DA	Various
Adrian Purswell	Adrian Purswell	AP	various

Remarks: Section 5.3 not required by the surveillance test scheduling sheets. Pump delta-P was less than required action value. CR 13-98477 written

1.0 Purpose and Scope

1.1 This procedure provides instructions to demonstrate components in the Essential Cooling Water System, required to perform a specific function in shutting down the Reactor to a Cold Shutdown Condition or mitigating the consequences of an accident, are Operable per Technical Specification 4.0.5 and the Unit 1 and Unit 2 Pump and Valve Inservice Test Plan.

1.2 Satisfactory performance of Section 5.4 will partially satisfy the testing requirements of a Slave Relay Test for ECW Pump 1A(2A) per Technical Specification 4.3.2.1.1.c.7.

1.3 This procedure provides instructions to verify Essential Cooling Water Pump 1A(2A) is operating properly by observing that pump performance is within the allowable range of Acceptance Criteria.

1.4 This procedure provides instructions for verifying operability of 1(2)-EW-MOV-0121, ECW Pump 1A(2A) Discharge Valve, by exercising to the open and closed position.

1.5 This procedure provides instructions for verifying 1(2)-EW-0403, Emergency Backflush Check Valve, will pass full design accident flow.

1.6 This procedure provides instructions for verifying 1(2)-EW-0006, ECW Pump 1A(2A) Discharge Check Valve, opens during performance of Inservice Testing demonstrating functionality of the discharge check valve. The full open and closed testing requirement for discharge check valve 1(2)-EW-0006 is satisfied in accordance with 0PGP03-ZE-0016, Check Valve Condition Monitoring Program (CVCMP).

1.7 This procedure verifies that ECW Pump 1A(2A) Room Fans and dampers operate during ECW Pump 1A(2A) operation.

1.8 This procedure verifies the ECW Self Cleaning Strainer starts on ECW Pump Start.

1.9 The Surveillance Test Completion Notice (TCN) specifies the scope of testing to be accomplished. IF no scope is specified, THEN test all components.

2.0 Responsibilities

2.1 Test Coordinator SHALL ensure the procedure revision is correct and all applicable Field Changes are incorporated.

2.2 The Shift Manager SHALL grant permission for performance of this test.

2.3 This procedure SHALL be performed by Plant Operations.

2.4 WHEN "_____" (blank) follows a step, THEN the performer SHALL enter initials to verify step completion.

2.5 Plant Operations normally performs the vibration monitoring portion of this procedure, however, vibration monitoring MAY be performed by Performance Technicians.

2.6 I&C Maintenance SHALL perform venting of the ECW System flow instruments.

NOTE

After completion, procedure routing is per 0PGP03-ZE-0004, Plant Surveillance Program.

2.7 The following SHALL review the test results:

- Test Coordinator
- Shift Manager
- Division Surveillance Coordinator
- IST Coordinator

3.0 Precautions and Notes

3.1 IF one of the following occurs during performance of this test, THEN suspend the test AND restore Essential Cooling Water System to normal.

- Safety Injection Signal
- Loss of Offsite Power

3.2 IF either of the following conditions occur during testing of the ECW Pump, THEN suspend performance of the test until the condition is restored to the pre-test condition AND the Essential Cooling System is stabilized prior to continuing:

- Automatic start of the ECW Screen Wash Booster Pump
- Increasing temperatures from components supplied with ECW which may be an indication of inadequate ECW flow

3.3 IF during performance of this test, the ECW Self Cleaning Strainer differential pressure exceeds 8 psid as indicated by a Plant Computer alarm OR local indication on 1(2)-EW-PDI-6859, THEN the following SHALL be performed:

- Suspend testing
- Open 1(2)-EW-0188
- Start ECW Self Cleaning Strainer

3.3.1 WHEN strainer differential pressure is <8 psid, THEN perform the following:

- Stop the ECW Self Cleaning Strainer
- Close 1(2)-EW-0188
- Resume testing

3.4 This procedure should be reviewed in its entirety prior to performing the test.

3.5 Specific Reference Values incorporated in this procedure were obtained for the respective equipment on the following dates:

Component Description	Reference Value Date
Essential Cooling Water Pump 1A	01-15-2011
Essential Cooling Water Pump 2A	01-27-2012

This procedure, when complete, SHALL be retained for the life of the plant.

3.6 Essential Cooling Water System flows from QDPS are indicated on QDPS Detail Data Menu Page 9.

3.7 Communications between the Control Room, ECW Intake Structure, and CCW Heat Exchanger Room SHALL be maintained during testing in which valves or control switches are **NOT** in normal alignment.

3.8 Valves subject to testing SHALL be closed/opened by normal operation and without preliminary or subsequent exercising or adjustments. Tightening of a valve by manual means after operation of a valve operator, cycling a valve to improve leakage or stroke time performance, and mechanical agitation (tapping) of valves are examples of activities **NOT** allowed. (Reference 7.4.4)

3.9 IF Essential Cooling Water System Train A is shutdown, THEN testing of valves in Section 5.6 may be performed prior to starting the ECW Pump.

3.10 Acceptance Criteria steps are annotated with the letters **AC** in the left margin preceding the step.

3.11 IF this procedure can **NOT** be performed as written, THEN the procedure performer SHALL stop and immediately notify the Shift Manager.

3.12 IF any ECW Pump parameter falls in the Alert Range, THEN calibration of the affected instruments may be performed and the pump may be retested.

3.13 IF this procedure is terminated for any reason, THEN immediately notify the Shift Manager.

3.14 IF any Acceptance Criteria are **NOT** met, THEN immediately notify the Shift Manager AND document failure per 0PGP03-ZE-0004, Plant Surveillance Program.

Initials

4.0 Prerequisites

4.1 Ensure procedure revision is correct and all applicable Field Changes are incorporated. JT

4.2 This procedure may be performed in any Mode. Record the current plant Mode:

Mode 1 JT

4.3 Review Operability Assessment System (OAS) to ensure no equipment is out of service that could conflict with test completion or cause unexpected multiple trains to be inoperable while performing this test. JT

4.4 Essential Cooling Water System Train A is in operation or available for operation per 0POP02-EW-0001, Essential Cooling Water Operation. JT

4.5 Verify I&C Maintenance personnel are available (as applicable) to support the installation and removal of M&TE, and performance of instrument venting. JT

4.6 Verify qualified personnel are available for performance of ECW Pump vibration measurement. JT

4.7 For ECW pump testing, obtain the following test instrumentation:

- Test instrument with a range of 0 to 100 psig with an accuracy of ± 0.1% of full scale to measure ECW Pump 1A(2A) discharge pressure. [Heise CMM-100 PSIG Pressure Gauge or Fluke 700P06/100 PSIG with a Fluke Calibrator (718, 719, 743B, 744, 753, 754)] (Reference 7.4.2) JT
- Vibration instrument with an accuracy ± 5% of full scale to measure vibration velocity in in/sec. JT
- DMM [Fluke Calibrator (718, 719, 743B, 744, 753, 754) or Equivalent] JT

4.8 Ensure Essential Cooling Water Pump 1A(2A) is inspected and acceptable for operation per the criteria established in 0POP01-ZQ-0022, Plant Operations Shift Routines. JT

4.9 IF this procedure is being performed to demonstrate post-maintenance operability OR increased frequency testing of an Essential Cooling Water System component, THEN N/A the applicable subsection(s) for the component(s) **NOT** being tested. N/A

Initials

4.10 IF this procedure is being performed for scheduled surveillance testing AND **NOT** all components are being tested, THEN N/A applicable sub-section(s) for any component **NOT** being tested. JT

4.11 Evaluate current plant conditions and note in the Remarks Section of the PPDS any changes in Work Activity Risk Assessment due to special plant conditions. JT

Work Activity Risk Assessment by Plant Mode

Reactor Trip Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Defueled
NONE	NONE	NONE	NONE	NONE	NONE	NONE

Turbine Trip Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Defueled
NONE	NONE	NONE	NONE	NONE	NONE	NONE

ESF Actuation Potential:

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Defueled
LOW	LOW	LOW	LOW	LOW	LOW	LOW

4.12 Record the following or "N/A", as applicable, on the PPDS:

- Unit Number
- Work Activity Number
- Surveillance Test (ST) Number(s)
- Reason for Test
- M&TE Data for Vibration Instrument
- M&TE Data for 0-100 psig Test Instrument
- M&TE Data for DMM JT

4.13 Notify the Shift Manager to review Technical Specifications LCO 3.7.4 and LCOs for systems affected by ECW for action requirements prior to performing this surveillance. JT

4.14 Obtain the Shift Manager's signature on PPDS for administrative approval to perform test. JT

Initials

5.0 Procedure

5.1 Preparation

5.1.1 Ensure Prerequisites Section has been completed and Precautions and Notes Section has been read. JT

5.1.2 Conduct a prejob briefing, including any changes in Work Activity Risk Assessment as noted in the Remarks Section of the PPDS. JT

5.1.3 Ensure Control Room Logbook entry documents the commencement of this surveillance test. JT

5.1.4 IF performing any of the following sections, THEN ensure personnel performing these sections have locked valve keys. Keys are required for the following sections:

- Section 5.3 for testing 1(2)-EW-0403 requires a key for "1(2)-EW-0188 ECW PUMP 1A(2A) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". N/A
- Section 5.4 for testing 1A(2A) ECW Pump requires a key for "1(2)-EW-0188 ECW PUMP 1A(2A) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". JT

5.1.5 IF ECW Pump Inservice Testing is to be performed, THEN perform the following, OTHERWISE mark steps N/A:

5.1.5.1 Install Test Instrument for ECW Pump 1A(2A) discharge pressure as follows: [ECWIS, Room 104(101)] (Reference 7.4.1 and 7.4.2)

a. Install 0-100 psig Test Instrument at test connection for "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR". SS I&C

b. Verify Test Instrument is installed at the same elevation as "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR". SS I&C

5.1.5.2 Install DMM at TRANSMITTER 1(2)-EW-LT-6911 TEST terminal (+) and (–) to monitor mADC for ECW Pump 1A(2A) Bay Level. [ECWIS Screen Rm 1A(2A) Rm 109(Rm 112)] SS I&C

Initials

5.2 Essential Cooling Water Pump 1A(2A) Startup

5.2.1 IF ECW Pump 1A(2A) is shutdown, THEN perform the following, OTHERWISE GO TO Step 5.2.2:

> NOTE
>
> IF ECW Pump room temperature is high, THEN the ECW Pump room fan will restart after being shutdown with handswitch in "AUTO" AND Step 5.2.1.1 will be marked N/A.

5.2.1.1 IF ECW Pump 1A(2A) room fan(s) running, THEN stop running fan(s), AND ensure handswitches in "AUTO": (CP022)

- "RM 104 FAN 11A HZ-VFN001 (RM 101 FAN 21A HZ-VFN001)" N/A
- "RM 104 FAN 12A HZ-VFN002 (RM 101 FAN 22A HZ-VFN002)" N/A

> NOTE
>
> ECW Screen Wash Booster Pump and Traveling Screens may start on high differential pressure when the ECW Pump started.

5.2.1.2 Start ECW Pump 1A(2A) per 0POP02-EW-0001, Essential Cooling Water Operation. N/A

5.2.1.3 IF ECW Screen Wash Booster Pump and Traveling Screen 1A(2A) start, THEN perform the following: (CP002)

a. Approximately 4 minutes after ECW Pump start, ensure the "TRAV SCRN 1A(2A)" stops. N/A

b. Stop "SCRN WASH PUMP 1A(2A)". N/A

5.2.2 Verify "ECW SELF CLEANING STRAINER 1A(2A)" is running. [ECWIS, MCC E1A3(E2A3)/C1] JT

Initials

NOTE

IF ECWIS fans fail to operate OR ventilation dampers fail to open, THEN the Shift Manager SHALL be notified and an entry made in the Remarks Section of the PPDS.

5.2.3 Verify ECWIS ventilation operation as follows: (CP022)

5.2.3.1 ECWIS fans started on ECW Pump start OR are operating with ECW Pump running:

- "RM 104 FAN 11A HZ-VFN001 (RM 101 FAN 21A HZ-VFN001)" JT
- "RM 104 FAN 12A HZ-VFN002 (RM 101 FAN 22A HZ-VFN002)" JT

5.2.3.2 ECWIS intake and exhaust dampers are OPEN:

- "INTAKE FV-9894" JT
- "EXHAUST FV-9894A" JT

NOTE

Steps 5.2.4 and 5.2.5 may be performed concurrently.

5.2.4 Request I&C Maintenance perform the following:

5.2.4.1 IF a pressure instrument was installed in Step 5.1.5.1, THEN perform the following:

- Vent test instrument installed at "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR" [ECWIS Room 104(101)] SS I&C
- Ensure test instrument in service at "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR". SS I&C

Initials

5.2.4.2 Vent the following instruments:

- "1(2)-EW-FT-6853 CCW HEAT EXCHANGER 1A(2A) ECW RETURN FLOW TRANSMITTER" (26' MAB, Room 106) SS I&C
- "1(2)-EW-FT-6856 CCW PUMP SUPPLEMENTAL COOLER 11A(21A) ECW RETURN FLOW TRANSMITTER" (10' MAB Room 067) SS I&C
- "1(2)-EW-FT-6904 ESSENTIAL CHILLER 12A(22A) ECW RETURN FLOW TRANSMITTER" (10' MAB, Room 067) SS I&C
- "1(2)-EW-FT-6855 DIESEL GENERATOR #11(#21) ECW RETURN FLOW TRANSMITTER" (29' DGB, Room 001) SS I&C

5.2.5 IF ECW from Essential Chiller is in Cold Weather alignment, THEN request I&C Maintenance to vent bypass flow indicator "1-EW-FI-6904C ESSENTIAL CHILLER 12A ESSENTIAL COOLING WATER VALVE BYPASS FLOW (2-EW-FI-6904C ESSENTIAL CHILLER 22A ECW RETURN BYPASS FLOW INDICATOR)". (10' MAB, Room 067) N/A I&C

5.2.6 Station Operators and establish communications between the following locations:

- Control Room
- ECW Pump 1A(2A) Room 104(101) at the ECWIS
- CCW Heat Exchanger Room 26' MAB, Room 106 (if needed) JT

Initials

5.3 Testing Emergency Backflush Valve 1(2)-EW-0403 (Reference 7.4.5)

5.3.1 Verify flow through the discharge strainer emergency backflush line is less than or equal to ½ of pipe diameter. (On ECW Pond side of ECWIS) N/A

5.3.2 Record AS FOUND position of "1(2)-EW-0277 ECW PUMP 1A(2A) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE" in Step 5.5.3. [ECWIS, Room 104(101)] N/A

5.3.3 Open "1(2)-EW-0277 ECW PUMP 1A(2A) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE". [ECWIS Room 104(101)] N/A

5.3.4 Unlock and close "1(2)-EW-0188 ECW PUMP 1A(2A) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". N/A

AC 5.3.5 Verify flow through the discharge strainer emergency backflush line increases to full pipe diameter. (On ECW Pond side of ECWIS) N/A

NOTE

Placing ECW Self Cleaning Strainer handswitch in "STOP" will cause ESF Status Monitoring Lampbox 2M56 BYP/INOP "ECW STRN 1A(2A)" to alarm.

5.3.6 Remove ECW Self Cleaning Strainer 1A(2A) from service by placing "ECW SELF CLEANING STRAINER 1A(2A)" handswitch A1(2)EWHS6859 in "STOP". [ECWIS, MCC E1A3(E2A3)/C1] N/A

CAUTION

In order to preclude a potential water hammer when closing 90° butterfly valve 1(2)-EW-0277 in Step 5.3.7, the valve should be slowly closed.

5.3.7 Close "1(2)-EW-0277 ECW PUMP 1A(2A) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE". [ECWIS, Room 104(101)] N/A

5.3.8 Verify flow through the discharge strainer emergency backflush line returned to less than or equal to ½ of pipe diameter. (On ECW Pond side of ECWIS) N/A

Initials

5.4 Testing Essential Cooling Water Pump 1A(2A)

5.4.1 IF Section 5.3, Testing Emergency Backflush Valve 1(2)-EW-0403, was performed, THEN perform the following:

5.4.1.1 Record "N/A" for Steps 5.4.2 through 5.4.4. N/A

5.4.1.2 GO TO Step 5.4.5. N/A

NOTE

Placing ECW Self Cleaning Strainer handswitch in "STOP" will cause ESF Status Monitoring Lampbox 2M56 BYP/INOP "ECW STRN 1A(2A)" to alarm.

5.4.2 Remove ECW Self Cleaning Strainer 1A(2A) from service by placing "ECW SELF CLEANING STRAINER 1A(2A)" handswitch A1(2)EWHS6859 in "STOP". [ECWIS, MCC E1A3(E2A3)/C1] DA

5.4.3 Unlock and close "1(2)-EW-0188 ECW PUMP 1A(2A) DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE". [ECWIS, Room 104(101)] DA

5.4.4 Verify "1(2)-EW-0277 ECW PUMP 1A(2A) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE" is closed. [ECWIS, Room 104(101)] DA

5.4.5 Record the start time of the 2 minute system stabilization period.

90 min ago DA

5.4.6 WHEN at least 2 minutes have passed, THEN record the end time of the 2 minute system stabilization period.

87 min ago DA

Initials

NOTE

Normal ECW Pump Bay Level is 15.5 to 16.0 feet which equates to 12.666 to 13.333 mADC at the output of Bay Level Transmitter 1(2)-EW-LT-6911. Addendum 1 may be referred to for additional information regarding the conversion from mADC to ECW Bay Level.

5.4.7 Record 1(2)-EW-LT-6911 [ECW Pump 1A(2A) Bay Level] transmitter output in mADC as indicated on the installed DMM to three decimal places:

13.190 mADC (DMM at LT-6911) DA

5.4.8 Using ECW Pump Bay Level mADC recorded in Step 5.4.7 and Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor, record the Bay Level Correction Factor for ECW Pump 1A(2A):

Bay Level Correction Factor 4.37 psi JT

5.4.9 Record ECW Pump 1A(2A) discharge pressure from 0-100 psig Test Instrument at test connection for "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR" to at least one decimal place:

ECW Pump Discharge Pressure 46.1 psig JT

NOTE

The Bay Level Correction Factor value is ADDED to the ECW pump discharge pressure to compensate for the difference in the discharge pressure reading (as measured at centerline of the ECW pump horizontal discharge piping) and actual discharge pressure at the outlet of the ECW pump impeller (minus the suction pressure that is derived from bay level). (Reference: Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor)

5.4.10 Calculate ECW Pump 1A(2A) Delta P using the following formula:

46.1	psig +	4.37	psi =	50.47	psid	JT
Disch Press (Step 5.4.9)		Bay Level Corr Factor (Step 5.4.8)		Delta P		

Initials

5.4.11 Record ECW flow from the following components in Table 1: ECW System Flow:

- Flow to CCW Pump Supplementary Cooler "TRN A FT 6856" (QDPS) JT
- ECW Flow to "ESF DG 11(21) FT 6855" (QDPS) JT

5.4.12 Record ECW flow from Essential Chiller in Table 1: ECW System Flow, AND mark step **NOT** performed as N/A:

5.4.12.1 IF Train A Essential Chiller is in normal alignment, THEN record the following:

- "TRN A CHLR 12A(22A) FT 6904" (QDPS) JT

5.4.12.2 IF Train A Essential Chiller is in Cold Weather alignment, THEN record the following: (MAB 10', Room 067)

- "1-EW-FI-6904C ESSENTIAL CHILLER 12A ESSENTIAL COOLING WATER VALVE BYPASS FLOW (2-EW-FI-6904C ESSENTIAL CHILLER 22A ECW RETURN BYPASS FLOW INDICATOR)" N/A

5.4.13 Determine ECW flow from CCW Heat Exchanger 1A(2A) as follows:

5.4.13.1 Record ECW flow from CCW Heat Exchanger 1A(2A) QDPS "TRN A FT 6853" on Data Sheet 1 (Essential Cooling Water Flow from CCW Heat Exchanger) at approximately 30 second intervals until 21 flows have been recorded. (Detail Data Menu Page 9) JT

5.4.13.2 After 21 flows have been recorded, then add the individual flows and record total on Data Sheet 1. JT

5.4.13.3 Calculate and record the average ECW Train A Flow in AVERAGE block of Data Sheet 1. JT

5.4.13.4 Sign and Date performance of Data Sheet 1. JT

Initials

5.4.14 Record AVERAGE ECW Flow from CCW Heat Exchanger from Data Sheet 1 in Table 1, ECW System Flow. JT

5.4.15 Calculate and record Total ECW System Flow in Table 1: ECW System Flow. JT

Table 1: ECW System Flow

Component	ECW Flow	Units
ECW Flow to CCW Pump Cooler	48	gpm
ECW Flow to ESF DG 11(21)	1712	gpm
ECW Flow to Essen Chlr 12A(22A)	1181	gpm
ECW Flow to CCW HX	16090	gpm
TOTAL ECW SYSTEM FLOW =	19031	gpm

5.4.16 IF performing this test in **Unit 1**, THEN perform the following, OTHERWISE N/A Steps 5.4.16.1 through 5.4.16.8:

5.4.16.1 Determine ECW Total Flow Range of Table 2: ECW Pump 1A Reference Values, for the Total ECW System Flow recorded in Table 1: ECW System Flow.

ECW Total Flow Range 19000-19049 gpm JT

5.4.16.2 Record ECW Pump 1A Delta P from Step 5.4.10 in Table 2: ECW Pump 1A Reference Values, at the corresponding ECW Total Flow Range determined in Step 5.4.16.1. JT

AC 5.4.16.3 ECW Pump 1A obtained ANY "ECW Total Flow Range" identified in Table 2 (15,700 – 20,500 gpm) demonstrating open functionality of discharge check valve 1-EW-0006. JT

Acceptance Criteria: ANY "ECW Total Flow Range" identified within Table 2 is obtained.

Table 2: ECW Pump 1A Reference Values

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
15,700-15,749	62.5	N/A	dP< 58.1	58.1 ≤dP< 59.4	59.4 ≤dP≤ 66.3	dP> 66.3
15,750-15,799	62.4		dP< 58.0	58.0 ≤dP< 59.2	59.2 ≤dP≤ 66.1	dP> 66.1
15,800-15,849	62.2		dP< 57.8	57.8 ≤dP< 59.1	59.1 ≤dP≤ 65.9	dP> 65.9
15,850-15,899	62.0		dP< 57.7	57.7 ≤dP< 58.9	58.9 ≤dP≤ 65.8	dP> 65.8
15,900-15,949	61.9		dP< 57.6	57.6 ≤dP< 58.8	58.8 ≤dP≤ 65.6	dP> 65.6
15,950-15,999	61.7		dP< 57.4	57.4 ≤dP< 58.7	58.7 ≤dP≤ 65.4	dP> 65.4
16,000-16,049	61.6		dP< 57.3	57.3 ≤dP< 58.5	58.5 ≤dP≤ 65.3	dP> 65.3
16,050-16,099	61.4		dP< 57.1	57.1 ≤dP< 58.4	58.4 ≤dP≤ 65.1	dP> 65.1
16,100-16,149	61.3		dP< 57.0	57.0 ≤dP< 58.2	58.2 ≤dP≤ 65.0	dP> 65.0
16,150-16,199	61.1		dP< 56.8	56.8 ≤dP< 58.1	58.1 ≤dP≤ 64.8	dP> 64.8
16,200-16,249	61.0		dP< 56.7	56.7 ≤dP< 57.9	57.9 ≤dP≤ 64.6	dP> 64.6
16,250-16,299	60.8		dP< 56.6	56.6 ≤dP< 57.8	57.8 ≤dP≤ 64.5	dP> 64.5
16,300-16,349	60.7		dP< 56.4	56.4 ≤dP< 57.6	57.6 ≤dP≤ 64.3	dP> 64.3
16,350-16,399	60.5		dP< 56.3	56.3 ≤dP< 57.5	57.5 ≤dP≤ 64.1	dP> 64.1
16,400-16,449	60.3		dP< 56.1	56.1 ≤dP< 57.3	57.3 ≤dP≤ 64.0	dP> 64.0
16,450-16,499	60.2		dP< 56.0	56.0 ≤dP< 57.2	57.2 ≤dP≤ 63.8	dP> 63.8
16,500-16,549	60.0		dP< 55.8	55.8 ≤dP< 57.0	57.0 ≤dP≤ 63.6	dP> 63.6
16,550-16,599	59.9		dP< 55.7	55.7 ≤dP< 56.9	56.9 ≤dP≤ 63.5	dP> 63.5
16,600-16,649	59.7		dP< 55.5	55.5 ≤dP< 56.7	56.7 ≤dP≤ 63.3	dP> 63.3
16,650-16699	59.6		dP< 55.4	55.4 ≤dP< 56.6	56.6 ≤dP≤ 63.1	dP> 63.1
16,700-16,749	59.4		dP< 55.3	55.3 ≤dP< 56.4	56.4 ≤dP≤ 63.0	dP> 63.0
16,750-16,799	59.3		dP< 55.1	55.1 ≤dP< 56.3	56.3 ≤dP≤ 62.8	dP> 62.8
16,800-16,849	59.1		dP< 55.0	55.0 ≤dP< 56.2	56.2 ≤dP≤ 62.7	dP> 62.7
16,850-16,899	59.0		dP< 54.8	54.8 ≤dP< 56.0	56.0 ≤dP≤ 62.5	dP> 62.5
16,900-16,949	58.8		dP< 54.7	54.7 ≤dP< 55.9	55.9 ≤dP≤ 62.3	dP> 62.3
16,950-16,999	58.6		dP< 54.5	54.5 ≤dP< 55.7	55.7 ≤dP≤ 62.2	dP> 62.2
17,000-17,049	58.5		dP< 54.4	54.4 ≤dP< 55.6	55.6 ≤dP≤ 62.0	dP> 62.0
17,050-17,099	58.3		dP< 54.3	54.3 ≤dP< 55.4	55.4 ≤dP≤ 61.8	dP> 61.8
17,100-17,149	58.2		dP< 54.1	54.1 ≤dP< 55.3	55.3 ≤dP≤ 61.7	dP> 61.7
17,150-17,199	58.1		dP< 54.0	54.0 ≤dP< 55.2	55.2 ≤dP≤ 61.5	dP> 61.5

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
17,200-17,249	57.9	N/A	dP< 53.9	53.9 ≤dP< 55.0	55.0 ≤dP≤ 61.4	dP> 61.4
17,250-17,299	57.8		dP< 53.7	53.7 ≤dP< 54.9	54.9 ≤dP≤ 61.3	dP> 61.3
17,300-17,349	57.7		dP< 53.6	53.6 ≤dP< 54.8	54.8 ≤dP≤ 61.1	dP> 61.1
17,350-17,399	57.5		dP< 53.5	53.5 ≤dP< 54.6	54.6 ≤dP≤ 61.0	dP> 61.0
17,400-17,449	57.4		dP< 53.4	53.4 ≤dP< 54.5	54.5 ≤dP≤ 60.8	dP> 60.8
17,450-17,499	57.2		dP< 53.2	53.2 ≤dP< 54.4	54.4 ≤dP≤ 60.7	dP> 60.7
17,500-17,549	57.1		dP< 53.1	53.1 ≤dP< 54.3	54.3 ≤dP≤ 60.5	dP> 60.5
17,550-17,599	57.0		dP< 53.0	53.0 ≤dP< 54.1	54.1 ≤dP≤ 60.4	dP> 60.4
17,600-17,649	56.8		dP< 52.9	52.9 ≤dP< 54.0	54.0 ≤dP≤ 60.2	dP> 60.2
17,650-17,699	56.7		dP< 52.7	52.7 ≤dP< 53.9	53.9 ≤dP≤ 60.1	dP> 60.1
17,700-17,749	56.6		dP< 52.6	52.6 ≤dP< 53.7	53.7 ≤dP≤ 60.0	dP> 60.0
17,750-17,799	56.4		dP< 52.5	52.5 ≤dP< 53.6	53.6 ≤dP≤ 59.8	dP> 59.8
17,800-17,849	56.3		dP< 52.4	52.4 ≤dP< 53.5	53.5 ≤dP≤ 59.7	dP> 59.7
17,850-17,899	56.2		dP< 52.2	52.2 ≤dP< 53.3	53.3 ≤dP≤ 59.5	dP> 59.5
17,900-17,949	56.0		dP< 52.1	52.1 ≤dP< 53.2	53.2 ≤dP≤ 59.4	dP> 59.4
17,950-17,999	55.9		dP< 52.0	52.0 ≤dP< 53.1	53.1 ≤dP≤ 59.2	dP> 59.2
18,000-18,049	55.7	50.47	dP< 51.8	51.8 ≤dP< 53.0	53.0 ≤dP≤ 59.1	dP> 59.1
18,050-18,099	55.6	N/A	dP< 51.7	51.7 ≤dP< 52.8	52.8 ≤dP≤ 59.0	dP> 59.0
18,100-18,149	55.5		dP< 51.6	51.6 ≤dP< 52.7	52.7 ≤dP≤ 58.8	dP> 58.8
18,150-18,199	55.3		dP< 51.5	51.5 ≤dP< 52.6	52.6 ≤dP≤ 58.7	dP> 58.7
18,200-18,249	55.2		dP< 51.3	51.3 ≤dP< 52.4	52.4 ≤dP≤ 58.5	dP> 58.5
18,250-18,299	55.0		dP< 51.2	51.2 ≤dP< 52.3	52.3 ≤dP≤ 58.3	dP> 58.3
18,300-18,349	54.8		dP< 51.0	51.0 ≤dP< 52.1	52.1 ≤dP≤ 58.1	dP> 58.1
18,350-18,399	54.6		dP< 50.8	50.8 ≤dP< 51.9	51.9 ≤dP≤ 57.9	dP> 57.9
18,400-18,449	54.4		dP< 50.6	50.6 ≤dP< 51.7	51.7 ≤dP≤ 57.7	dP> 57.7
18,450-18,499	54.2		dP< 50.4	50.4 ≤dP< 51.5	51.5 ≤dP≤ 57.4	dP> 57.4
18,500-18,549	54.0		dP< 50.2	50.2 ≤dP< 51.3	51.3 ≤dP≤ 57.2	dP> 57.2
18,550-18,599	53.8		dP< 50.0	50.0 ≤dP< 51.1	51.1 ≤dP≤ 57.0	dP> 57.0
18,600-18,649	53.6		dP< 49.8	49.8 ≤dP< 50.9	50.9 ≤dP≤ 56.8	dP> 56.8
18,650-18,699	53.4		dP< 49.6	49.6 ≤dP< 50.7	50.7 ≤dP≤ 56.6	dP> 56.6

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
18,700-18,749	53.2	N/A	dP< 49.4	49.4 ≤dP< 50.5	50.5 ≤dP≤ 56.4	dP> 56.4
18,750-18,799	53.0		dP< 49.3	49.3 ≤dP< 50.3	50.3 ≤dP≤ 56.1	dP> 56.1
18,800-18,849	52.8		dP< 49.1	49.1 ≤dP< 50.1	50.1 ≤dP≤ 55.9	dP> 55.9
18,850-18,899	52.6		dP< 48.9	48.9 ≤dP< 49.9	49.9 ≤dP≤ 55.7	dP> 55.7
18,900-18,949	52.4		dP< 48.7	48.7 ≤dP< 49.7	49.7 ≤dP≤ 55.5	dP> 55.5
18,950-18,999	52.1		dP< 48.5	48.5 ≤dP< 49.5	49.5 ≤dP≤ 55.3	dP> 55.3
19,000-19,049	51.9		dP< 48.3	48.3 ≤dP< 49.3	49.3 ≤dP≤ 55.1	dP> 55.1
19,050-19,099	51.7		dP< 48.1	48.1 ≤dP< 49.2	49.2 ≤dP≤ 54.8	dP> 54.8
19,100-19,149	51.5		dP< 47.9	47.9 ≤dP< 49.0	49.0 ≤dP≤ 54.6	dP> 54.6
19,150-19,199	51.3		dP< 47.7	47.7 ≤dP< 48.8	48.8 ≤dP≤ 54.4	dP> 54.4
19,200-19,249	51.0		dP< 47.4	47.4 ≤dP< 48.5	48.5 ≤dP≤ 54.1	dP> 54.1
19,250-19,299	50.7		dP< 47.1	47.1 ≤dP< 48.1	48.1 ≤dP≤ 53.7	dP> 53.7
19,300-19,349	50.3		dP< 46.8	46.8 ≤dP< 47.8	47.8 ≤dP≤ 53.3	dP> 53.3
19,350-19,399	49.9		dP< 46.4	46.4 ≤dP< 47.4	47.4 ≤dP≤ 52.9	dP> 52.9
19,400-19,449	49.6		dP< 46.1	46.1 ≤dP< 47.1	47.1 ≤dP≤ 52.6	dP> 52.6
19,450-19,499	49.2		dP< 45.8	45.8 ≤dP< 46.8	46.8 ≤dP≤ 52.2	dP> 52.2
19,500-19,549	48.9		dP< 45.5	45.5 ≤dP< 46.4	46.4 ≤dP≤ 51.8	dP> 51.8
19,550-19,599	48.5		dP< 45.1	45.1 ≤dP< 46.1	46.1 ≤dP≤ 51.4	dP> 51.4
19,600-19,649	48.2		dP< 44.8	44.8 ≤dP< 45.8	45.8 ≤dP≤ 51.0	dP> 51.0
19,650-19,699	47.8		dP< 44.5	44.5 ≤dP< 45.4	45.4 ≤dP≤ 50.7	dP> 50.7
19,700-19,749	47.4		dP< 44.1	44.1 ≤dP< 45.1	45.1 ≤dP≤ 50.3	dP> 50.3
19,750-19,799	47.1		dP< 43.8	43.8 ≤dP< 44.7	44.7 ≤dP≤ 49.9	dP> 49.9
19,800-19,849	46.7		dP< 43.5	43.5 ≤dP< 44.4	44.4 ≤dP≤ 49.5	dP> 49.5
19,850-19,899	46.4		dP< 43.1	43.1 ≤dP< 44.1	44.1 ≤dP≤ 49.2	dP> 49.2
19,900-19,949	46.0		dP< 42.8	42.8 ≤dP< 43.7	43.7 ≤dP≤ 48.8	dP> 48.8
19,950-19,999	45.7		dP< 42.5	42.5 ≤dP< 43.4	43.4 ≤dP≤ 48.4	dP> 48.4
20,000-20,049	45.3		dP< 42.1	42.1 ≤dP< 43.0	43.0 ≤dP≤ 48.0	dP> 48.0
20,050-20,099	45.0		dP< 41.8	41.8 ≤dP< 42.7	42.7 ≤dP≤ 47.6	dP> 47.6
20,100-20,149	44.6		dP< 41.5	41.5 ≤dP< 42.4	42.4 ≤dP≤ 47.3	dP> 47.3
20,150-20,199	44.2		dP< 41.1	41.1 ≤dP< 42.0	42.0 ≤dP≤ 46.9	dP> 46.9

Initials

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
20,200-20,249	43.9	N/A	dP< 40.8	40.8 ≤dP< 41.7	41.7 ≤dP≤ 46.5	dP> 46.5
20,250-20,299	43.5		dP< 40.5	40.5 ≤dP< 41.4	41.4 ≤dP≤ 46.1	dP> 46.1
20,300-20,349	43.2		dP< 40.1	40.1 ≤dP< 41.0	41.0 ≤dP≤ 45.8	dP> 45.8
20,350-20,399	42.8		dP< 39.8	39.8 ≤dP< 40.7	40.7 ≤dP≤ 45.4	dP> 45.4
20,400-20,449	42.5		dP< 39.5	39.5 ≤dP< 40.3	40.3 ≤dP≤ 45.0	dP> 45.0
20,450-20,500	42.1		dP< 39.2	39.2 ≤dP< 40.0	40.0 ≤dP≤ 44.6	dP> 44.6

AC

5.4.16.4 Complete the following and mark steps that DO **NOT** apply N/A:

a. ECW Pump 1A Delta P is within Acceptable Range. N/A

b. ECW Pump 1A Delta P is within Required Action High. N/A

c. ECW Pump 1A Delta P is within Alert Range Low. N/A

d. ECW Pump 1A Delta P is within Required Action Low. JT

5.4.16.5 IF Total ECW System Delta P is within a Required Action Range, THEN immediately notify the Shift Manager. JT

Initials

5.4.16.6 Measure the unfiltered vibration velocity (V) at indicated test points (Addendum 2, ECW Pump Vibration Test Point Locations and Instructions) and record vibration in Table 3: Unit 1 ECW Pump 1A Vibration Data. DA

Table 3: Unit 1 ECW Pump 1A Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
1H1	0.040	.02	V ≤ 0.100	0.100 < V ≤ 0.240	> 0.240	in/sec
1H2	0.037	.02	V ≤ 0.092	0.092 < V ≤ 0.222	> 0.222	in/sec
1A	0.022	.03	V ≤ 0.055	0.055 < V ≤ 0.132	> 0.132	in/sec
2H1*	0.017	.03				in/sec
2H2*	0.012	.01				in/sec
3H1*	0.037	.04				in/sec
3H2*	0.027	.03				in/sec

* - Data point reference only for system health monitoring, **NOT** a code requirement and NO Acceptance Criteria applicable.

AC

5.4.16.7 Complete the following and mark steps that DO **NOT** apply N/A:

a. ECW Pump vibration is within Acceptable Range. JT

b. ECW Pump vibration is within the Alert Range. N/A

c. ECW Pump vibration is within the Required Action Range. N/A

5.4.16.8 IF ECW Pump 1A vibration is within Required Action Range, THEN immediately notify the Shift Manager. N/A

Initials

5.4.17 IF performing this test in **UNIT 2**, THEN perform the following, OTHERWISE N/A Steps 5.4.17.1 through 5.4.17.8:

5.4.17.1 Determine ECW Total Flow Range of Table 4: ECW Pump 2A Reference Values, for the Total ECW System Flow recorded in Table 1: ECW System Flow.

ECW Total Flow Range N/A gpm N/A

5.4.17.2 Record ECW Pump 2A Delta P from Step 5.4.10 in Table 4: ECW Pump 2A Reference Values, at the corresponding ECW Total Flow Range determined in Step 5.4.17.1. N/A

AC 5.4.17.3 ECW Pump 2A obtained ANY "ECW Total Flow Range" identified in Table 4 (15,700 – 20,500 gpm) demonstrating open functionality of discharge check valve 2-EW-0006. N/A

Acceptance Criteria: ANY "ECW Total Flow Range" identified within Table 4 is obtained.

Table 4: ECW Pump 2A Reference Values

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
15,700-15,749	61.5	N/A	dP< 57.2	57.2 ≤dP< 58.4	58.4 ≤dP≤ 65.2	dP> 65.2
15,750-15,799	61.3		dP< 57.0	57.0 ≤dP< 58.2	58.2 ≤dP≤ 65.0	dP> 65.0
15,800-15,849	61.2		dP< 56.9	56.9 ≤dP< 58.1	58.1 ≤dP≤ 64.8	dP> 64.8
15,850-15,899	61.0		dP< 56.7	56.7 ≤dP< 58.0	58.0 ≤dP≤ 64.7	dP> 64.7
15,900-15,949	60.8		dP< 56.6	56.6 ≤dP< 57.8	57.8 ≤dP≤ 64.5	dP> 64.5
15,950-15,999	60.7		dP< 56.4	56.4 ≤dP< 57.7	57.7 ≤dP≤ 64.3	dP> 64.3
16,000-16,049	60.5		dP< 56.3	56.3 ≤dP< 57.5	57.5 ≤dP≤ 64.2	dP> 64.2
16,050-16,099	60.4		dP< 56.1	56.1 ≤dP< 57.4	57.4 ≤dP≤ 64.0	dP> 64.0
16,100-16,149	60.2		dP< 56.0	56.0 ≤dP< 57.2	57.2 ≤dP≤ 63.8	dP> 63.8
16,150-16,199	60.1		dP< 55.9	55.9 ≤dP< 57.1	57.1 ≤dP≤ 63.7	dP> 63.7
16,200-16,249	59.9		dP< 55.7	55.7 ≤dP< 56.9	56.9 ≤dP≤ 63.5	dP> 63.5
16,250-16,299	59.8		dP< 55.6	55.6 ≤dP< 56.8	56.8 ≤dP≤ 63.3	dP> 63.3
16,300-16,349	59.6		dP< 55.4	55.4 ≤dP< 56.6	56.6 ≤dP≤ 63.2	dP> 63.2
16,350-16,399	59.4		dP< 55.3	55.3 ≤dP< 56.5	56.5 ≤dP≤ 63.0	dP> 63.0
16,400-16,449	59.3		dP< 55.1	55.1 ≤dP< 56.3	56.3 ≤dP≤ 62.8	dP> 62.8
16,450-16,499	59.1		dP< 55.0	55.0 ≤dP< 56.2	56.2 ≤dP≤ 62.7	dP> 62.7
16,500-16,549	59.0		dP< 54.8	54.8 ≤dP< 56.0	56.0 ≤dP≤ 62.5	dP> 62.5
16,550-16,599	58.8		dP< 54.7	54.7 ≤dP< 55.9	55.9 ≤dP≤ 62.3	dP> 62.3
16,600-16,649	58.7		dP< 54.5	54.5 ≤dP< 55.7	55.7 ≤dP≤ 62.2	dP> 62.2
16,650-16699	58.5		dP< 54.4	54.4 ≤dP< 55.6	55.6 ≤dP≤ 62.0	dP> 62.0
16,700-16,749	58.3		dP< 54.3	54.3 ≤dP< 55.4	55.4 ≤dP≤ 61.8	dP> 61.8
16,750-16,799	58.2		dP< 54.1	54.1 ≤dP< 55.3	55.3 ≤dP≤ 61.7	dP> 61.7
16,800-16,849	58.0		dP< 54.0	54.0 ≤dP< 55.1	55.1 ≤dP≤ 61.5	dP> 61.5
16,850-16,899	57.9		dP< 53.8	53.8 ≤dP< 55.0	55.0 ≤dP≤ 61.3	dP> 61.3
16,900-16,949	57.7		dP< 53.7	53.7 ≤dP< 54.8	54.8 ≤dP≤ 61.2	dP> 61.2
16,950-16,999	57.6		dP< 53.5	53.5 ≤dP< 54.7	54.7 ≤dP≤ 61.0	dP> 61.0
17,000-17,049	57.4		dP< 53.4	53.4 ≤dP< 54.5	54.5 ≤dP≤ 60.8	dP> 60.8
17,050-17,099	57.2		dP< 53.2	53.2 ≤dP< 54.4	54.4 ≤dP≤ 60.7	dP> 60.7
17,100-17,149	57.1		dP< 53.1	53.1 ≤dP< 54.2	54.2 ≤dP≤ 60.5	dP> 60.5
17,150-17,199	56.9		dP< 53.0	53.0 ≤dP< 54.1	54.1 ≤dP≤ 60.4	dP> 60.4

Table 4: ECW Pump 2A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
17,200-17,249	56.8	N/A	dP< 52.8	52.8 ≤ dP< 53.9	53.9 ≤ dP≤ 60.2	dP> 60.2
17,250-17,299	56.6		dP< 52.7	52.7 ≤ dP< 53.8	53.8 ≤ dP≤ 60.0	dP> 60.0
17,300-17,349	56.5		dP< 52.5	52.5 ≤ dP< 53.7	53.7 ≤ dP≤ 59.9	dP> 59.9
17,350-17,399	56.3		dP< 52.4	52.4 ≤ dP< 53.5	53.5 ≤ dP≤ 59.7	dP> 59.7
17,400-17,449	56.2		dP< 52.2	52.2 ≤ dP< 53.4	53.4 ≤ dP≤ 59.6	dP> 59.6
17,450-17,499	56.0		dP< 52.1	52.1 ≤ dP< 53.2	53.2 ≤ dP≤ 59.4	dP> 59.4
17,500-17,549	55.9		dP< 52.0	52.0 ≤ dP< 53.1	53.1 ≤ dP≤ 59.2	dP> 59.2
17,550-17,599	55.7		dP< 51.8	51.8 ≤ dP< 52.9	52.9 ≤ dP≤ 59.1	dP> 59.1
17,600-17,649	55.6		dP< 51.7	51.7 ≤ dP< 52.8	52.8 ≤ dP≤ 58.9	dP> 58.9
17,650-17,699	55.4		dP< 51.5	51.5 ≤ dP< 52.7	52.7 ≤ dP≤ 58.7	dP> 58.7
17,700-17,749	55.3		dP< 51.4	51.4 ≤ dP< 52.5	52.5 ≤ dP≤ 58.6	dP> 58.6
17,750-17,799	55.1		dP< 51.3	51.3 ≤ dP< 52.4	52.4 ≤ dP≤ 58.4	dP> 58.4
17,800-17,849	55.0		dP< 51.1	51.1 ≤ dP< 52.2	52.2 ≤ dP≤ 58.3	dP> 58.3
17,850-17,899	54.8		dP< 51.0	51.0 ≤ dP< 52.1	52.1 ≤ dP≤ 58.1	dP> 58.1
17,900-17,949	54.7		dP< 50.8	50.8 ≤ dP< 51.9	51.9 ≤ dP≤ 57.9	dP> 57.9
17,950-17,999	54.5		dP< 50.7	50.7 ≤ dP< 51.8	51.8 ≤ dP≤ 57.8	dP> 57.8
18,000-18,049	54.4		dP< 50.6	50.6 ≤ dP< 51.6	51.6 ≤ dP≤ 57.6	dP> 57.6
18,050-18,099	54.2		dP< 50.4	50.4 ≤ dP< 51.5	51.5 ≤ dP≤ 57.5	dP> 57.5
18,100-18,149	53.9		dP< 50.1	50.1 ≤ dP< 51.2	51.2 ≤ dP≤ 57.2	dP> 57.2
18,150-18,199	53.6		dP< 49.9	49.9 ≤ dP< 51.0	51.0 ≤ dP≤ 56.9	dP> 56.9
18,200-18,249	53.3		dP< 49.6	49.6 ≤ dP< 50.7	50.7 ≤ dP≤ 56.5	dP> 56.5
18,250-18,299	53.1		dP< 49.3	49.3 ≤ dP< 50.4	50.4 ≤ dP≤ 56.2	dP> 56.2
18,300-18,349	52.8		dP< 49.1	49.1 ≤ dP< 50.1	50.1 ≤ dP≤ 55.9	dP> 55.9
18,350-18,399	52.5		dP< 48.8	48.8 ≤ dP< 49.9	49.9 ≤ dP≤ 55.6	dP> 55.6
18,400-18,449	52.2		dP< 48.6	48.6 ≤ dP< 49.6	49.6 ≤ dP≤ 55.3	dP> 55.3
18,450-18,499	51.9		dP< 48.3	48.3 ≤ dP< 49.3	49.3 ≤ dP≤ 55.0	dP> 55.0
18,500-18,549	51.6		dP< 48.0	48.0 ≤ dP< 49.1	49.1 ≤ dP≤ 54.7	dP> 54.7
18,550-18,599	51.4		dP< 47.8	47.8 ≤ dP< 48.8	48.8 ≤ dP≤ 54.4	dP> 54.4
18,600-18,649	51.1		dP< 47.5	47.5 ≤ dP< 48.5	48.5 ≤ dP≤ 54.1	dP> 54.1
18,650-18,699	50.8		dP< 47.2	47.2 ≤ dP< 48.2	48.2 ≤ dP≤ 53.8	dP> 53.8

Table 4: ECW Pump 2A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
18,700-18,749	50.5	N/A	dP< 47.0	47.0 ≤ dP< 48.0	48.0 ≤ dP≤ 53.5	dP> 53.5
18,750-18,799	50.2		dP< 46.7	46.7 ≤ dP< 47.7	47.7 ≤ dP≤ 53.2	dP> 53.2
18,800-18,849	49.9		dP< 46.4	46.4 ≤ dP< 47.4	47.4 ≤ dP≤ 52.9	dP> 52.9
18,850-18,899	49.6		dP< 46.2	46.2 ≤ dP< 47.2	47.2 ≤ dP≤ 52.6	dP> 52.6
18,900-18,949	49.4		dP< 45.9	45.9 ≤ dP< 46.9	46.9 ≤ dP≤ 52.3	dP> 52.3
18,950-18,999	49.1		dP< 45.6	45.6 ≤ dP< 46.6	46.6 ≤ dP≤ 52.0	dP> 52.0
19,000-19,049	48.8		dP< 45.4	45.4 ≤ dP< 46.3	46.3 ≤ dP≤ 51.7	dP> 51.7
19,050-19,099	48.5		dP< 45.1	45.1 ≤ dP< 46.1	46.1 ≤ dP≤ 51.4	dP> 51.4
19,100-19,149	48.2		dP< 44.8	44.8 ≤ dP< 45.8	45.8 ≤ dP≤ 51.1	dP> 51.1
19,150-19,199	47.9		dP< 44.6	44.6 ≤ dP< 45.5	45.5 ≤ dP≤ 50.8	dP> 50.8
19,200-19,249	47.6		dP< 44.3	44.3 ≤ dP< 45.3	45.3 ≤ dP≤ 50.5	dP> 50.5
19,250-19,299	47.5		dP< 44.1	44.1 ≤ dP< 45.1	45.1 ≤ dP≤ 50.3	dP> 50.3
19,300-19,349	47.3		dP< 44.0	44.0 ≤ dP< 44.9	44.9 ≤ dP≤ 50.1	dP> 50.1
19,350-19,399	47.1		dP< 43.8	43.8 ≤ dP< 44.8	44.8 ≤ dP≤ 50.0	dP> 50.0
19,400-19,449	47.0		dP< 43.7	43.7 ≤ dP< 44.6	44.6 ≤ dP≤ 49.8	dP> 49.8
19,450-19,499	46.8		dP< 43.5	43.5 ≤ dP< 44.5	44.5 ≤ dP≤ 49.6	dP> 49.6
19,500-19,549	46.7		dP< 43.4	43.4 ≤ dP< 44.3	44.3 ≤ dP≤ 49.5	dP> 49.5
19,550-19,599	46.5		dP< 43.2	43.2 ≤ dP< 44.2	44.2 ≤ dP≤ 49.3	dP> 49.3
19,600-19,649	46.3		dP< 43.1	43.1 ≤ dP< 44.0	44.0 ≤ dP≤ 49.1	dP> 49.1
19,650-19,699	46.2		dP< 42.9	42.9 ≤ dP< 43.9	43.9 ≤ dP≤ 48.9	dP> 48.9
19,700-19,749	46.0		dP< 42.8	42.8 ≤ dP< 43.7	43.7 ≤ dP≤ 48.8	dP> 48.8
19,750-19,799	45.9		dP< 42.7	42.7 ≤ dP< 43.6	43.6 ≤ dP≤ 48.6	dP> 48.6
19,800-19,849	45.7		dP< 42.5	42.5 ≤ dP< 43.4	43.4 ≤ dP≤ 48.4	dP> 48.4
19,850-19,899	45.5		dP< 42.4	42.4 ≤ dP< 43.3	43.3 ≤ dP≤ 48.3	dP> 48.3
19,900-19,949	45.4		dP< 42.2	42.2 ≤ dP< 43.1	43.1 ≤ dP≤ 48.1	dP> 48.1
19,950-19,999	45.2		dP< 42.1	42.1 ≤ dP< 43.0	43.0 ≤ dP≤ 47.9	dP> 47.9
20,000-20,049	45.1		dP< 41.9	41.9 ≤ dP< 42.8	42.8 ≤ dP≤ 47.8	dP> 47.8
20,050-20,099	44.9		dP< 41.8	41.8 ≤ dP< 42.7	42.7 ≤ dP≤ 47.6	dP> 47.6
20,100-20,149	44.7		dP< 41.6	41.6 ≤ dP< 42.5	42.5 ≤ dP≤ 47.4	dP> 47.4
20,150-20,199	44.6		dP< 41.5	41.5 ≤ dP< 42.4	42.4 ≤ dP≤ 47.3	dP> 47.3

Initials

Table 4: ECW Pump 2A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
20,200-20,249	44.4	N/A	dP< 41.3	41.3 ≤ dP< 42.2	42.2 ≤ dP≤ 47.1	dP> 47.1
20,250-20,299	44.3		dP< 41.2	41.2 ≤ dP< 42.1	42.1 ≤ dP≤ 46.9	dP> 46.9
20,300-20,349	44.1		dP< 41.0	41.0 ≤ dP< 41.9	41.9 ≤ dP≤ 46.8	dP> 46.8
20,350-20,399	44.0		dP< 40.9	40.9 ≤ dP< 41.8	41.8 ≤ dP≤ 46.6	dP> 46.6
20,400-20,449	43.8		dP< 40.7	40.7 ≤ dP< 41.6	41.6 ≤ dP≤ 46.4	dP> 46.4
20,450-20,500	43.6		dP< 40.6	40.6 ≤ dP< 41.5	41.5 ≤ dP≤ 46.3	dP> 46.3

AC 5.4.17.4 Complete the following and mark steps that DO **NOT** apply N/A:

a. ECW Pump 2A Delta P is within Acceptable Range. N/A

b. ECW Pump 2A Delta P is within Required Action High. N/A

c. ECW Pump 2A Delta P is within Alert Range Low. N/A

d. ECW Pump 2A Delta P is within Required Action Low. N/A

5.4.17.5 IF Total ECW System Delta P is within the Required Action Range, THEN immediately notify the Shift Manager. N/A

Initials

5.4.17.6 Measure the unfiltered vibration velocity (V) at indicated test points (Addendum 2, Vibration Test Point Locations and Instructions) and record vibration in Table 5: Unit 2 ECW Pump 2A Vibration Data. N/A

Table 5: Unit 2 ECW Pump 2A Vibration Data

Vibration Data Points	Ref Value	Test Data	Accept Range	Alert Range High	Req'd Action High	Units
1H1	0.084	N/A	V ≤ 0.210	0.210 < V ≤ 0.504	> 0.504	in/sec
1H2	0.050		V ≤ 0.125	0.125 < V ≤ 0.300	> 0.300	in/sec
1A	0.026		V ≤ 0.065	0.065 < V ≤ 0.156	> 0.156	in/sec
2H1*	0.025					in/sec
2H2*	0.024					in/sec
3H1*	0.039					in/sec
3H2*	0.025					in/sec

* - Data point reference only for system health monitoring, **NOT** a code requirement and NO Acceptance Criteria applicable.

AC

5.4.17.7 Complete the following and mark steps that DO **NOT** apply N/A:

a. ECW Pump vibration is within Acceptable Range. N/A

b. ECW Pump vibration is within the Alert Range. N/A

c. ECW Pump vibration is within the Required Action Range. N/A

5.4.17.8 IF ECW Pump 2A vibration is within Required Action Range, THEN immediately notify the Shift Manager. N/A

Initials

5.5 Restoration of Essential Cooling Water System Flow

5.5.1 **(UNIT 1 ONLY)** Perform the following to restore 1-EW-0188 to the required Master Equipment Database (MED) valve configuration:

5.5.1.1 **DV** Open 1-EW-0188 to **6 ¼ Turns Open** AND record the AS LEFT position:

1-EW-0188 AS LEFT Position 6 1/4 turns open

DA
Perform

AP
Dual Verif

5.5.1.2 Lock "1-EW-0188 ECW PUMP 1A DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE" in the AS LEFT position.

DA
Perform

AP
Ind. Verif

5.5.2 **(UNIT 2 ONLY)** Perform the following to restore 2-EW-0188 to the required Master Equipment Database (MED) valve configuration:

5.5.2.1 **DV** Open 2-EW-0188 to **7 ¾ Turns Open** AND record the AS LEFT position:

2-EW-0188 AS LEFT Position N/A

N/A
Perform

N/A
Dual Verif

5.5.2.2 Lock "2-EW-0188 ECW PUMP 2A DISCHARGE STRAINER BACKFLUSH THROTTLE VALVE" in the AS LEFT position.

N/A
Perform

N/A
Ind. Verif

5.5.3 IF Section 5.3, Testing Emergency Backflush Valve 1(2)-EW-0403, was performed, THEN restore "1(2)-EW-0277 ECW PUMP 1A(2A) DISCHARGE STRAINER EMERGENCY BACKFLUSH VALVE" to the AS FOUND position AND record AS LEFT position:

- 1(2)-EW-0277 AS FOUND Position N/A
- 1(2)-EW-0277 AS LEFT Position N/A

N/A
Perform

N/A
Ind. Verif

Initials

5.5.4 Return ECW Self Cleaning Strainer 1A(2A) to service by placing "ECW SELF CLEANING STRAINER 1A(2A)" handswitch A1(2)EWHS6859 in "AUTO". [ECWIS, MCC E1A3(E2A3)/C1] DA

Perform

AP

Ind. Verif

NOTE

- IF Essential Chiller is in Cold Weather alignment, THEN ECW flow to Essential Chiller is in accordance with 0POP02-CH-0005, Essential Chiller Operation.
- IF Standby Diesel Generator 11(21) flow is **NOT** within the required range, THEN SED Performance Technicians should be notified to perform individual heat exchanger flow measurements prior to any valve adjustments. (Reference 7.4.6)
- IF Emergency Diesel Generator ECW flow is adjusted, THEN System Engineering should be notified that the individual cooler flows on the diesel engine may have been affected.

5.5.5 Ensure ECW System flows are restored to normal flow range and record ECW flow in Table 6: As Left ECW System Flow: JT

Table 6: As Left ECW System Flow

Component	Indicator	ECW Flow	Normal Flow Range
ECW Flow to CCW HX	QDPS TRN A FT 6853	15996 gpm	14,040 to 17,400 gpm
ECW Flow to Essen Chlr 12A(22A)	(QDPS) FT 6904	1161 gpm	1100 to 1272 gpm
	(Cold Weather Alignment) 1(2)-EW-FI-6904C (10' MAB Chiller Room)		230 to 250 gpm Throttled per 0POP02-CH-0005
ECW Flow to CCW Pump Supplementary Cooler	QDPS TRN A FT 6856	48 gpm	40 to 50 gpm
ECW Flow to ESF DG	QDPS DG 11(21) FT 6855	1757 gpm	1486 to 1743 gpm

Initials

5.5.6 IF a Pressure instrument was installed in Step 5.1.5.1, THEN remove the 0-100 psig Test Instrument installed at ECW Pump discharge test connection for "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR" and install cap.

SW
I&C

SS
Ind. Verif

5.5.7 Ensure "1(2)-EW-PI-6880 ECW PUMP 1A(2A) DISCHARGE PRESSURE INDICATOR" is in service.

SW
I&C

SS
Ind. Verif

5.5.8 IF installed in Step 5.1.5.2, THEN ensure the DMM installed at 1(2)-EW-LT-6911 [ECW Pump 1A(2A) Bay Level] is removed. [ECWIS Screen Rm 1A(2A) Rm 109(Rm 112)]

SW
I&C

SS
Ind. Verif

Initials

5.6 Testing ECW Pump 1A(2A) Discharge Valve 1(2)-EW-MOV-0121

5.6.1 Ensure ECW Pump 1A(2A) is shutdown per 0POP02-EW-0001, Essential Cooling Water Operation. JT

5.6.2 Ensure "DISCH ISOL MOV-0121" is CLOSED. (CP002) JT

5.6.3 Perform the following "DISCH ISOL MOV-0121" Open Exercise Test:

5.6.3.1 Open ECW Pump Discharge Valve by momentarily placing handswitch "DISCH ISOL MOV-0121" to "OPEN". JT

AC 5.6.3.2 Verify "DISCH ISOL MOV-0121" goes fully open (red lamp ON, green lamp OFF): JT

Acceptance Criteria: "valve fully open"

5.6.3.3 Verify "DISCH ISOL MOV-0121" is fully open in Step 5.6.3.2 to satisfy the Acceptance Criteria. JT

5.6.4 Perform the following "DISCH ISOL MOV-0121" Close Exercise Test:

5.6.4.1 Close ECW Pump Discharge Valve by momentarily placing handswitch "DISCH ISOL MOV-0121" to "CLOSE". JT

AC 5.6.4.2 Verify "DISCH ISOL MOV-0121" goes fully closed (red light OFF, green light ON). JT

Acceptance Criteria: "valve fully closed"

5.6.4.3 Verify "DISCH ISOL MOV-0121" is fully closed in Step 5.6.4.2 to satisfy the Acceptance Criteria. JT

Initials

5.7 Restoration & Documentation

5.7.1	Notify the Shift Manager that testing is complete.	JT
5.7.2	Restore ECW System as directed by the Shift Manager per 0POP02-EW-0001, Essential Cooling Water Operation.	JT
5.7.3	Ensure Performers and Verifiers Section of PPDS is complete.	JT
5.7.4	Ensure M&TE Used Section of PPDS is complete.	JT
5.7.5	Ensure required information has been recorded on the M&TE Usage form (WOFWOME) in STP IMPACT for each piece of M&TE used. (Reference 7.4.3)	JT
5.7.6	IF any problems occurred, THEN initiate Condition Report(s) AND log Condition Report number in Remarks Section of PPDS.	JT
5.7.7	Complete Test Results Section of the PPDS.	JT
5.7.8	Forward test package to Shift Manager for review.	JT

6.0 Acceptance Criteria

6.1 Essential Cooling Water Emergency Backflush Check Valve 1(2)-EW-0403 full opened by indication of flow from emergency backflush piping. (Step 5.3.5.)

6.2 ECW Pump 1A(2A) Delta P SHALL be within the Acceptable Range or the Alert Range. (Step 5.4.16.4 or 5.4.17.4)

6.3 ECW Pump 1A(2A) Vibration Test Data SHALL be within the Acceptable Range or the Alert Range. (Step 5.4.16.7 or 5.4.17.7)

6.4 ECW Pump 1A(2A) Discharge Check Valve 1(2)-EW-0006 exercised to the open position as demonstrated by the ability to perform ECW Pump 1A(2A) Inservice Testing. (Step 5.4.16.3 or 5.4.17.3)

6.5 1(2)-EW-MOV-0121, ECW Pump Discharge Valve SHALL operate through one complete cycle open and closed. (Steps 5.6.3.2 and 5.6.4.2)

7.0 References

7.1 Technical Specifications

7.1.1 Technical Specification 3.7.4

7.1.2 Technical Specification 4.0.5

7.1.3 Technical Specification 4.3.2.1.1.c.7

7.2 Regulatory Guides and Standards

7.2.1 None

7.3 UFSAR

7.3.1 Section 3.9.6, Inservice Testing of Pumps and Valves

7.3.2 Section 9.2.1.2, Essential Cooling Water System

7.4 Commitments

7.4.1 SPR 870394, ECW Pump Test Failure Due To Instrumentation Problems

7.4.2 SPR 940802, Installed Plant Pump Gages Exceed ASME Section XI Range Requirements

7.4.3 SPR 941413, M&TE Issue Sheets not Completed for each use of Instrument

7.4.4 Generic Letter 91-15, Operating Feedback Report, Solenoid-Operated Valve Problems at U.S. Reactors

7.4.5 ST-HL-AE-4393, Reply to Notice of Violation 9236-05 Regarding Failure to Include Valves in the Inservice Testing (IST) Program

7.4.6 MATS Item 9201148-936 (NRC IR 92-201), July 1992 ECW Inspection

7.4.7 CR 97-12395, Containment Spray Pump Slave Relay Testing

7.4.8 CREE 01-11507-10, Implementation of Stroke Time Testing Requirement for Power Operated Valves

7.5 Technical Standards and Manuals

7.5.1 VTD-H127-0002 in VTB-H127-0002, Instruction Manual for ECW Screen Wash Pump, Reactor Makeup Water Pump, and EAB Chilled Water Pump

7.5.2 4Z479Z44810 Sh 23, Instrument Data Sheet, Head-Type Primary Flow Elements

7.5.3 5R289MB1006, Essential Cooling Water System Design Basis Document

7.5.4 Unit 1/Unit 2 Pump and Valve Inservice Test Plan

7.5.5 ASME OM Code Case OMN-1, Revision 1 – Alternate Rules for Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants

7.5.6 MPR-2524-A, Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary

7.6 Drawings

7.6.1 Piping and Instrument Drawings

7.6.1.1 5R289F05038 #1 and #2 Sheet 1, Essential Cooling Water System Train 1A(2A)

7.6.1.2 5R289F05039 #1 and #2, Essential Cooling Water System

7.6.2 Elementary Wiring Diagrams

7.6.2.1 9-E-EW01-01 #1 and #2, Essential Cooling Water Pumps 1A, 1B & 1C (2A, 2B & 2C)

7.6.2.2 9-E-EW02-02 #1 and #2, Essential Cooling Water Screen Wash Booster Pump 1A, 1B & 1C

7.6.2.3 9-E-EW05-02 #1, Essential Cooling Water Traveling Screens 1A, 1B & 1C

7.6.2.4 9-E-EW05-02 #2, Essential Cooling Water Traveling Screens Train "A", "B" & "C"

7.7 STPEGS Procedures and Policies

7.7.1 0POP02-EW-0001, Essential Cooling Water Operation

7.7.2 0POP02-CH-0005, Essential Chiller Operation

7.7.3 0PSP03-EW-0008, Essential Cooling Water Pump 1A(2A) Reference Values Measurement

7.7.4 0POP01-ZQ-0022, Plant Operations Shift Routines

7.7.5 0PGP03-ZE-0004, Plant Surveillance Program

7.7.6 0PGP03-ZC-0004, Measuring and Test Equipment Control Program

7.7.7 0PGP03-ZM-0016, Installed Plant Instrumentation Calibration Verification Program

7.7.8 0PGP03-ZE-0015, Inservice Testing Program

7.7.9 0PGP03-ZE-0016, Check Valve Condition Monitoring Program (CVCMP)

7.7.10 0PGP03-ZE-0021, Inservice Testing Program for Valves

7.7.11 0PGP03-ZE-0022, Inservice Testing Program for Pumps

7.8 Calculations

7.8.1 MC-6118, Calculation for Screen Wash Pump Minimum Flow

7.8.2 Calculation No. 88-EW-002, ECW Pump Discharge and Suction Pressures

7.8.3 5R289F22537, Process Flow Diagram Essential Cooling Water System

8.0 Support Documents

8.1 Addendum 1, Essential Cooling Water Pump Bay Level Correction Factor

8.2 Addendum 2, ECW Pump Vibration Test Point Locations and Instructions

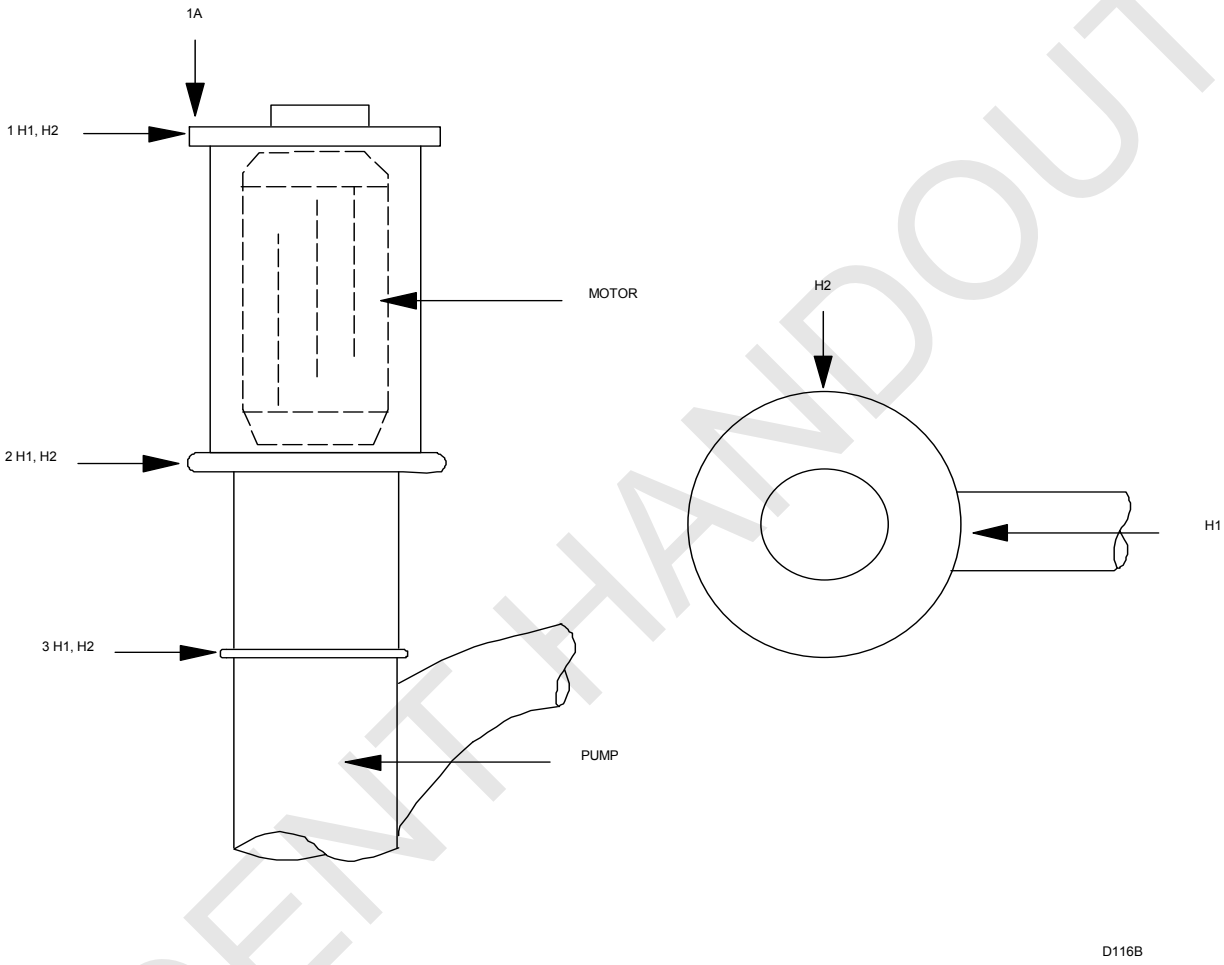
8.3 Data Sheet 1, Essential Cooling Water Flow from CCW Heat Exchanger

NOTE

The ECW Pump Bay Level Correction Factor was calculated using the following:

- *ECW Bay Level Correction Factor = 0.43 psi/ft x (26 ft - ECW Bay Level)*
- *ECW Bay Level = [{ (LT-6911 mADC – 4 mADC) / 16 mADC } x 12 ft] + 9 ft*

Bay Level Transmitter LT-6911 mADC Output as Indicated on DMM	Bay Level LI-6911 Feet (For Information Only)	Bay Level Correction Factor (psi)
11.967 - 12.033	15.0	4.76
12.034 - 12.099	15.05	4.74
12.100 - 12.166	15.1	4.72
12.167 - 12.233	15.15	4.70
12.234 - 12.299	15.2	4.68
12.300 - 12.366	15.25	4.65
12.367 - 12.433	15.3	4.63
12.434 - 12.499	15.35	4.61
12.500 - 12.566	15.4	4.59
12.567 - 12.633	15.45	4.57
12.634 - 12.699	15.5	4.55
12.700 - 12.766	15.55	4.52
12.767 - 12.833	15.6	4.50
12.834 - 12.899	15.65	4.48
12.900 - 12.966	15.7	4.46
12.967 - 13.033	15.75	4.44
13.034 - 13.099	15.8	4.42
13.100 - 13.166	15.85	4.40
13.167 - 13.233	15.9	4.37
13.234 - 13.299	15.95	4.35
13.300 - 13.366	16.0	4.33
13.367 - 13.433	16.05	4.31
13.434 - 13.499	16.1	4.29
13.500 - 13.566	16.15	4.27
13.567 - 13.633	16.2	4.24
13.634 - 13.699	16.25	4.22
13.700 - 13.766	16.3	4.20
13.767 - 13.833	16.35	4.18
13.834 - 13.899	16.4	4.16
13.900 – 13.966	16.45	4.14
13.967 - 14.033	16.5	4.11



D116B.WPG

H1- Denotes a horizontal vibration point. Probe SHALL be held perpendicular to the machine axis and parallel to both the floor and the pump discharge piping.

H2- Denotes a horizontal vibration point. Probe SHALL be held parallel to the floor and perpendicular to both the machine axis and the pump discharge piping.

A- Denotes an axial vibration point. Probe SHALL be held perpendicular to the floor and parallel to the Machine axis.

"TRN A FT 6853" Flow (gpm)	
1	15745
2	16078
3	15999
4	16174
5	16164
6	15989
7	16012
8	16190
9	15972
10	16457
11	15979
12	15946
13	15896
14	16006
15	16233
16	16226
17	16366
18	15929
19	16431
20	15962
21	16144
TOTAL =	337898
AVERAGE	16090

Step 5.4.13 Performed By: John Thomas Date: today

6.6 Surveillance Test Results and Review

NOTE

The surveillance test data package and any other approvals, step performance acknowledgments, data, etc. contained in the surveillance procedure comprise the documentation which is required to comply with the controls of 0PGP07-ZA-0001, "Records Management."

6.6.1 WHEN the surveillance test is complete in accordance with Step 6.3.14, the controls of 0PGP07-ZA-0001, "Records Management" for the protection and storage of in-process and completed records SHALL apply.

NOTE

- The designated second review is required by the surveillance program to assure that all acceptance criteria are satisfied and that the surveillance test package meets documentation requirements prior to transmittal to RMS. The designated second review SHALL be performed by a knowledgeable individual (such as a Shift Manager, DSC, program owner, supervisor, or designee from the performing section responsible for the test performance). Step 6.6.2 provides detailed requirements for the second review in addition to the review requirements stated in Addendum 1. The surveillance procedure SHALL include a signature block for this second review requirement.
- IF any subsequent reviews determine that the surveillance test was not satisfactorily completed, THEN the performing division SHALL inform the Surveillance Scheduler in addition to the requirements specified in this procedure.

6.6.2 A second review of the surveillance test SHALL be performed by a knowledgeable individual. The second review SHALL be performed as follows:

6.6.2.1 Reviewer SHALL sign for performing a review of the Data Package making a determination of whether or not the Acceptance Criteria were satisfied.

6.6.2.2 IF this second review, or any additional review, reveals that test results previously judged to have satisfied the Acceptance Criteria have in fact NOT satisfied the Acceptance Criteria, THEN:

a. The Shift Manager SHALL be immediately notified.

b. The notification of the Shift Manager SHALL be documented in the test package per step 6.5.1.

c. The second reviewer SHALL ensure a Condition Report is initiated in accordance with 0PGP03-ZX-0002, if appropriate.

6.6.2.3 The designated second reviewer or other knowledgeable individual in the performing section's organization SHALL:

a. Review the Data Package for legibility, accuracy, traceability, and completeness.

b. Verify that a Condition Report has been initiated for any component that failed to satisfy the acceptance criteria.

c. Ensure that any Condition Report initiated during the surveillance test is documented on the Procedure Performance Data Sheet.

6.6.2.4 When reviewing Surveillance Calibration procedures (PSP05s), IF the "As Found" data is out of tolerance, THEN the following steps SHALL be performed. (AE-HL-93735) (SPR 940212)

a. Initiate a CNAQ action per 0PGP03-ZX-0002, to have the Cognizant System Engineer perform an Out of Tolerance Evaluation on the affected instrument(s). The action should have a due date 45 days from the date of Out of Tolerance was discovered.

b. Forward a copy of the Out of Tolerance data sheet(s) AND completed Form 1 from procedure 0PGP03-ZM-0016 as a cover sheet to the Cognizant System Engineer.

c. Record the CR# and Action # on the Procedure Performance Data Sheet of the surveillance package.

6.6.2.5 IF during the performance of the surveillance any out of tolerance condition was adjusted back in tolerance in accordance with the instructions of the surveillance procedure (PSP02s, PSP06s and PSP14s), THEN the following steps SHALL be performed.

a. Initiate a CNAQ action per 0PGP03-ZX-0002, to have System Engineering perform a Maintenance Rule Evaluation on the affected instrument(s). The action should have a due date 45 days from the date of surveillance performance.

b. Forward a copy of the Out of Tolerance data sheet(s) AND completed Form 4 "Surveillance Out of Tolerance Data Sheet" as a cover sheet to System Engineering.

c. Record the CR# and Action # on the Procedure Performance Data Sheet of the surveillance package.

6.6.2.6 The Plant Surveillance Coordinator SHALL evaluate out of tolerance data for impacts to extended surveillance test intervals in the Surveillance Frequency Control Program.

CAUTION

Reference values test data SHALL be reviewed by the System Engineer within 96 hours of completing the test. (SPR 910187)

6.6.3 The completed test packages SHALL be forwarded to the Surveillance Scheduler after performance of the Second Review as indicated in the following steps.

6.6.3.1 If the package performs a surveillance test for which a TCN is included in the test package. (i.e. requires status updating by Surveillance Scheduler)

6.6.3.2 If the package has additional review signature requirements that have not been completed. (i.e. requires backend review by DSC, Section XI Coordinator, or System Engineer)

6.6.4 Completed test packages may be transmitted to RMS by the performing division after the DSC review whenever requirements of step 6.6.3 are not applicable.

Procedure Performance Data Sheet

Unit Number: 1	Work Activity Number: 442954 442955	-ST: 86000713 86000714

Technical Specification Reference:
3.7.4
4.0.5
4.3.2.1.1.c.7

Test Interval:	Test Performance Allowed in Plant Modes:	Train Reference:
Per the Surveillance Database	1, 2, 3, 4, 5, 6 or Defueled	A

Reason for Test:

- ☒ Periodic Surveillance Test
- ☐ Maintenance Work Package # _____
- ☐ Other _____
- ☒ For Surveillance Credit
- ☐ Not for Surveillance Credit
- ☐ Increased Frequency Testing

Radiation Work Permit No.:	Fire Hazard Evaluation No.:	Equipment Clearance No.:
	N/A	N/A

Administrative Approval to Perform Test:

M. Caine (Shift Manager) | Today (Date) | 2 hrs ago (Time)

Test Results Review:

Pump Test Results:
- ☒ Acceptable - All data within Acceptance Criteria
- ☐ Acceptable - Data
- ☒ Unacceptable - Any Section)

Pump test results are now Acceptable - All data within Acceptance Criteria

Valve Test Results:
- ☒ Acceptable - All data within Acceptance Criteria
- ☐ Unacceptable - Any data **NOT** within Acceptance Criteria (explain in Remarks Section)

Reviewed by: John Thomas (Test Coordinator) | Today (Date) | 10 min ago (Time)

Plant Operations Review:

All data within Acceptance Criteria?	☐ Yes	☐ No
Any pump data within Alert Range?	☐ Yes	☐ No
ECW Train A in Service?	☐ Yes	☐ No
Potential Reportable Occurrence?	☐ Yes	☐ No
LCO Action Statement Entered?	☐ Yes	☐ No

Reviewed by: _____ (Shift Manager) | _____ (Date) | _____ (Time)

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
17,200-17,249	57.9	N/A	dP< 53.9	53.9 ≤dP< 55.0	55.0 ≤dP≤ 61.4	dP> 61.4
17,250-17,299	57.8		dP< 53.7	53.7 ≤dP< 54.9	54.9 ≤dP≤ 61.3	dP> 61.3
17,300-17,349	57.7		dP< 53.6	53.6 ≤dP< 54.8	54.8 ≤dP≤ 61.1	dP> 61.1
17,350-17,399	57.5		dP< 53.5	53.5 ≤dP< 54.6	54.6 ≤dP≤ 61.0	dP> 61.0
17,400-17,449	57.4		dP< 53.4	53.4 ≤dP< 54.5	54.5 ≤dP≤ 60.8	dP> 60.8
17,450-17,499	57.2		dP< 53.2	53.2 ≤dP< 54.4	54.4 ≤dP≤ 60.7	dP> 60.7
17,500-17,549	57.1		dP< 53.1	53.1 ≤dP< 54.3	54.3 ≤dP≤ 60.5	dP> 60.5
17,550-17,599	57.0		dP< 53.0	53.0 ≤dP< 54.1	54.1 ≤dP≤ 60.4	dP> 60.4
17,600-17,649	56.8		dP< 52.9	52.9 ≤dP< 54.0	54.0 ≤dP≤ 60.2	dP> 60.2
17,650-17,699	56.7		dP< 52.7	52.7 ≤dP< 53.9	53.9 ≤dP≤ 60.1	dP> 60.1
17,700-17,749	56.6		dP< 52.6	52.6 ≤dP< 53.7	53.7 ≤dP≤ 60.0	dP> 60.0
17,750-17,799	56.4		dP< 52.5	52.5 ≤dP< 53.6	53.6 ≤dP≤ 59.8	dP> 59.8
17,800-17,849	56.3		dP< 52.4	52.4 ≤dP< 53.5	53.5 ≤dP≤ 59.7	dP> 59.7
17,850-17,899	56.2		dP< 52.2	52.2 ≤dP< 53.3	53.3 ≤dP≤ 59.5	dP> 59.5
17,900-17,949	56.0					dP> 59.4
17,950-17,999	55.9					dP> 59.2
18,000-18,049	55.7	50.47	dP< 51.8	51.8 ≤dP< 53.0	53.0 ≤dP≤ 59.1	dP> 59.1
18,050-18,099	55.6	N/A	dP< 51.7	51.7 ≤dP< 52.8	52.8 ≤dP≤ 59.0	dP> 59.0
18,100-18,149	55.5		dP< 51.6	51.6 ≤dP< 52.7	52.7 ≤dP≤ 58.8	dP> 58.8
18,150-18,199	55.3		dP< 51.5	51.5 ≤dP< 52.6	52.6 ≤dP≤ 58.7	dP> 58.7
18,200-18,249	55.2		dP< 51.3	51.3 ≤dP< 52.4	52.4 ≤dP≤ 58.5	dP> 58.5
18,250-18,299	55.0		dP< 51.2	51.2 ≤dP< 52.3	52.3 ≤dP≤ 58.3	dP> 58.3
18,300-18,349	54.8		dP< 51.0	51.0 ≤dP< 52.1	52.1 ≤dP≤ 58.1	dP> 58.1
18,350-18,399	54.6		dP< 50.8	50.8 ≤dP< 51.9	51.9 ≤dP≤ 57.9	dP> 57.9
18,400-18,449	54.4		dP< 50.6	50.6 ≤dP< 51.7	51.7 ≤dP≤ 57.7	dP> 57.7
18,450-18,499	54.2		dP< 50.4	50.4 ≤dP< 51.5	51.5 ≤dP≤ 57.4	dP> 57.4
18,500-18,549	54.0		dP< 50.2	50.2 ≤dP< 51.3	51.3 ≤dP≤ 57.2	dP> 57.2
18,550-18,599	53.8		dP< 50.0	50.0 ≤dP< 51.1	51.1 ≤dP≤ 57.0	dP> 57.0
18,600-18,649	53.6		dP< 49.8	49.8 ≤dP< 50.9	50.9 ≤dP≤ 56.8	dP> 56.8
18,650-18,699	53.4		dP< 49.6	49.6 ≤dP< 50.7	50.7 ≤dP≤ 56.6	dP> 56.6

Incorrect range. Should be 19,000-19,049

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
18,700-18,749	53.2	N/A	dP< 49.4	49.4 ≤dP< 50.5	50.5 ≤dP≤ 56.4	dP> 56.4
18,750-18,799	53.0		dP< 49.3	49.3 ≤dP< 50.3	50.3 ≤dP≤ 56.1	dP> 56.1
18,800-18,849	52.8		dP< 49.1	49.1 ≤dP< 50.1	50.1 ≤dP≤ 55.9	dP> 55.9
18,850-18,899	52.6		dP< 48.9	48.9 ≤dP< 49.9	49.9 ≤dP≤ 55.7	dP> 55.7
18,900-18,949	52.4					
18,950-18,999	52.1		dP< 48.5	48.5 ≤dP< 49.5	49.5 ≤dP≤ 55.3	dP> 55.3
19,000-19,049	51.9		dP< 48.3	48.3 ≤dP< 49.3	49.3 ≤dP≤ 55.1	dP> 55.1
19,050-19,099	51.7		dP< 48.1	48.1 ≤dP< 49.2	49.2 ≤dP≤ 54.8	dP> 54.8
19,100-19,149	51.5		dP< 47.9	47.9 ≤dP< 49.0	49.0 ≤dP≤ 54.6	dP> 54.6
19,150-19,199	51.3		dP< 47.7	47.7 ≤dP< 48.8	48.8 ≤dP≤ 54.4	dP> 54.4
19,200-19,249	51.0		dP< 47.4	47.4 ≤dP< 48.5	48.5 ≤dP≤ 54.1	dP> 54.1
19,250-19,299	50.7		dP< 47.1	47.1 ≤dP< 48.1	48.1 ≤dP≤ 53.7	dP> 53.7
19,300-19,349	50.3		dP< 46.8	46.8 ≤dP< 47.8	47.8 ≤dP≤ 53.3	dP> 53.3
19,350-19,399	49.9		dP< 46.4	46.4 ≤dP< 47.4	47.4 ≤dP≤ 52.9	dP> 52.9
19,400-19,449	49.6		dP< 46.1	46.1 ≤dP< 47.1	47.1 ≤dP≤ 52.6	dP> 52.6
19,450-19,499	49.2		dP< 45.8	45.8 ≤dP< 46.8	46.8 ≤dP≤ 52.2	dP> 52.2
19,500-19,549	48.9		dP< 45.5	45.5 ≤dP< 46.4	46.4 ≤dP≤ 51.8	dP> 51.8
19,550-19,599	48.5		dP< 45.1	45.1 ≤dP< 46.1	46.1 ≤dP≤ 51.4	dP> 51.4
19,600-19,649	48.2		dP< 44.8	44.8 ≤dP< 45.8	45.8 ≤dP≤ 51.0	dP> 51.0
19,650-19,699	47.8		dP< 44.5	44.5 ≤dP< 45.4	45.4 ≤dP≤ 50.7	dP> 50.7
19,700-19,749	47.4		dP< 44.1	44.1 ≤dP< 45.1	45.1 ≤dP≤ 50.3	dP> 50.3
19,750-19,799	47.1		dP< 43.8	43.8 ≤dP< 44.7	44.7 ≤dP≤ 49.9	dP> 49.9
19,800-19,849	46.7		dP< 43.5	43.5 ≤dP< 44.4	44.4 ≤dP≤ 49.5	dP> 49.5
19,850-19,899	46.4		dP< 43.1	43.1 ≤dP< 44.1	44.1 ≤dP≤ 49.2	dP> 49.2
19,900-19,949	46.0		dP< 42.8	42.8 ≤dP< 43.7	43.7 ≤dP≤ 48.8	dP> 48.8
19,950-19,999	45.7		dP< 42.5	42.5 ≤dP< 43.4	43.4 ≤dP≤ 48.4	dP> 48.4
20,000-20,049	45.3		dP< 42.1	42.1 ≤dP< 43.0	43.0 ≤dP≤ 48.0	dP> 48.0
20,050-20,099	45.0		dP< 41.8	41.8 ≤dP< 42.7	42.7 ≤dP≤ 47.6	dP> 47.6
20,100-20,149	44.6		dP< 41.5	41.5 ≤dP< 42.4	42.4 ≤dP≤ 47.3	dP> 47.3
20,150-20,199	44.2		dP< 41.1	41.1 ≤dP< 42.0	42.0 ≤dP≤ 46.9	dP> 46.9

Correct range for which 50.47 is within the Acceptable Range.

Initials

Table 2: ECW Pump 1A Reference Values
(continued from previous page)

ECW Total Flow Range	Ref. Delta P	Test Delta P	Required Action Low	Alert Range Low	Acceptable Range	Required Action High
20,200-20,249	43.9	N/A	dP< 40.8	40.8 ≤dP< 41.7	41.7 ≤dP≤ 46.5	dP> 46.5
20,250-20,299	43.5		dP< 40.5	40.5 ≤dP< 41.4	41.4 ≤dP≤ 46.1	dP> 46.1
20,300-20,349	43.2		dP< 40.1	40.1 ≤dP< 41.0	41.0 ≤dP≤ 45.8	dP> 45.8
20,350-20,399	42.8		dP< 39.8	39.8 ≤dP< 40.7	40.7 ≤dP≤ 45.4	dP> 45.4
20,400-20,449	42.5		dP< 39.5	39.5 ≤dP< 40.3	40.3 ≤dP≤ 45.0	dP> 45.0
20,450-20,500	42.1		dP< 39.2	39.2 ≤dP< 40.0	40.0 ≤dP≤ 44.6	dP> 44.6

AC

5.4.14.4 Complete the following and mark steps that DO **NOT** apply N/A:

a. ECW Pump 1A Delta P is within Acceptable Range. N/A

b. ECW Pump 1A Delta P is within Required Action High. N/A

5.4.14.4.a should be initialed

c. ECW Pump 1A Delta P is within Alert Range Low. N/A

d. ECW Pump 1A Delta P is within Required Action Low. JT

5.4.14.5 IF Total ECW System Delta P is within a Required Action Range, THEN immediately notify the Shift Manager. JT

Initials

NOTE

- IF Essential Chiller is in Cold Weather alignment, THEN ECW flow to Essential Chiller is in accordance with 0POP02-CH-0005, Essential Chiller Operation.
- IF Standby Diesel Generator 11(21) flow is **NOT** within the required range, THEN SED Performance Technicians should be notified to perform individual heat exchanger flow measurements prior to any valve adjustments. (Reference 7.4.6)
- IF Emergency Diesel Generator ECW flow is adjusted, THEN System Engineering should be notified that the individual cooler flows on the diesel engine may have been affected.

5.5.4 Ensure ECW System flows are restored to normal flow range and record ECW flow in Table 6: As Left ECW System Flow: JT

Table 6: As Left ECW System Flow

Component	Indicator	ECW Flow	Normal Flow Range
ECW Flow to CCW HX	QDPS TRN A FT 6853	15996 gpm	14,040 to 17,400 gpm
ECW Flow to Essen Chlr 12A(22A)	(QDPS) FT 6904	1161 gpm	1100 to 1272 gpm
	(Cold Weather Alignment) 1(2)-EW-FI-6904C (10' MAB Chiller Room)		230 to 250 gpm Throttled per 0POP02-CH-0005
ECW Flow to CCW Pump Supplementary Cooler	QDPS TRN A FT 6856	48 gpm	40 to 50 gpm
ECW Flow to ESF DG	QDPS DG 11(21) FT 6855	1757 gpm	1486 to 1743 gpm

Outside the normal flow range

NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: INITIATE A DOSE EXTENSION

JPM NO.: A8

REVISION: 0

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	Initiate a Dose Extension
JPM No.:	A8
Rev. No.:	0
STP Task:	SRO-20100, Supervise Control Room personnel during startup and shutdown
STP Objective:	92185, Given the title of an administrative procedure, IDENTIFY the location of any listed forms, logs, or indexes, and describe how to process these items.
Related K/A Reference:	2.3.13 [3.4/3.8] Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (3.4/3.8)
References:	0PGP03-ZR-0050, Rev 12
Task Normally Completed By:	SRO
Method of Testing	Actual Performance
Location of Testing:	Classroom
Time Critical Task:	No
Validation Time:	15 minutes

Required Materials (Tools/Equipment):

Calculator
Student handouts

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK

INITIAL CONDITIONS:

John King is a recently hired Non Licensed Operator (NLO) from another utility. John received 300 mrem at his previous employer this year prior to coming to STP, and has received 1500 mrem since starting work at STP.

INITIATING CUE:

Due to manpower shortages, John was asked to perform an outage job in which he would receive an additional 200 mrem. John has agreed to perform the job and has presented you (his supervisor) with Form 2, Personnel Dose Extension Authorization, for your signature.

Additional information for John King:

- Age – 27 years
- Lifetime dose – 2200 mrem
- Year-to-date eye dose – 1800 mrem

1) Determine if Form 2 has been completed properly and sign if appropriate.
2) Identify who must approve this dose extension.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Determines the correct extension number to be 2000 mrem and identifies the Responsible Department Manager (Operations Manager) and Radiation Protection Manager as the individuals that must approve the extension.

HANDOUTS:

- Handout copy of partially completed Form 2
- Handout copy of 0PGP03-ZR-0050

NOTES:

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1**(C)** **Start time: _____**

Determine if Form 2 is completed correctly

Standard:

Determines an extension to 2000 mrem must be requested.

Comment:

Extension request must include exposure received at previous employer.

Cue:

Provide the student with the following if not already done:

- Handout copy of partially completed Form 2
- Handout copy of 0PGP03-ZR-0050

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2**(C)**

Identify individuals who must approve the extension.

Standard:

Identifies the Responsible Department Manager (Operations Manager) and Radiation Protection Manager as the individuals who must approve the extension.

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A8, INITIATE A DOSE EXTENSION

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM – HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU'VE COMPLETED THE TASK

INITIAL CONDITIONS:

John King is a recently hired Non Licensed Operator (NLO) from another utility. John received 300 mrem at his previous employer this year prior to coming to STP, and has received 1500 mrem since starting work at STP.

INITIATING CUE:

Due to manpower shortages, John was asked to perform an outage job in which he would receive an additional 200 mrem. John has agreed to perform the job and has presented you (his supervisor) with Form 2, Personnel Dose Extension Authorization, for your signature.

Additional information for John King:

- Age – 27 years
- Lifetime dose – 2200 mrem
- Year-to-date eye dose – 1800 mrem

1) Determine if Form 2 has been completed properly and sign if appropriate.
2) Identify who must approve this dose extension.

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	Radiation Protection Program		
Form 2 (Rev 1)	Personnel Dose Extension Authorization		Page 1 of 1

SECTION 1 (Completed by requesting individual and supervisor)

Name: John King SSN: 123-45-6789 Age: 27 Co./Dept. STPNOC/Ops

I request an annual exposure extension to _____ mrem total (STP plus other licensees) for year 2013.

Reason To be able to perform outage job

John King	today		
Applicant Signature	Date	Supervisor or Employer	Date

****

SECTION 2 (Completed by Dosimetry Personnel)

Dose History: [x] Form 4/5 [ ] PADS [ ] Statement Lifetime TEDE: 2200 mrem

STP YTD TEDE: 1500 mrem EYE DOSE (all sources YTD): 1800 mrem

Offsite YTD TEDE: 300 mrem

Current YTD TEDE: 1800 mrem = 1800 mrem + 0 mrem + 0 mrem

Total Record Estimate CEDE

AVAILABLE LIFETIME MARGIN: 5000 mrem [Age - Lifetime TEDE (rem)] x 1000

AVAILABLE ANNUAL MARGIN: 0 mrem [Smaller of 1500 - Current YTD TEDE at STP or 5000 - Current YTD TEDE total]

Completed By: Fred Sanford Date: today

****

SECTION 3: APPROVALS Signatures/Date

Extension Due to Annual Dose Control
1500 to 3000 mrem/yr: (1)(2)
>3000 to 4000 mrem/yr: (1)(2)(3)
>4000 to 5000 mrem/yr: (1)(2)(3)(4)

(1) _____ / _____
Responsible Department Manager

(2) _____ / _____
Radiation Protection Manager

Extension Due to Lifetime Dose Control
>0 to 1000 mrem/yr with lifetime TEDE > Age in Rem: (1)(2)(3)
>1000 mrem/yr with lifetime TEDE > Age in Rem: (1)(2)(3)(4)

(3) _____ / _____
Plant General Manager

This extension permits an additional _____ mrem to be received.

(4) _____ / _____
STPNOC Vice President

Extension granted to _____ mrem for calendar year _____.

****

Computer updated by: _____ _____
Initials Date

When completed, this form SHALL be retained in accordance with the Document Type List (DTL).

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Radiation Protection Program			
Quality	Non Safety-Related	Usage: **Available**	Effective Date: 07/30/2012

C. Wire	L. Archer	N/A	Health Physics
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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1.0 Purpose and Scope

1.1 This procedure defines the Radiation Protection Program for the South Texas Project (STP). (10CFR20.1101)

1.2 This procedure is applicable to personnel and activities performed at or for STP under the operating license which may involve the potential or actual exposure to radiation or radioactive material.

1.3 Nothing in this procedure SHALL be construed as limiting actions which may be necessary to protect the public health and safety. Provisions of this procedure may be waived in declared emergencies at or above the ALERT classification. (10CFR20.1001(b))

2.0 References

2.1 Title 10 Code of Federal Regulations, Part 19, "Notices, Instructions, and Reports to Workers; Inspections"

2.2 Title 10 Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation"

2.3 American Nuclear Insurers (ANI) Bulletin 80-1A, "Nuclear Liability Insurance Records Retention"

2.4 ANI Engineering Criteria, "Radiation Protection Criteria," Sections 8.1 through 8.10

2.5 Operations Quality Assurance Plan (OQAP)

2.6 Technical Specifications for STPEGS

2.7 Updated Final Safety Analysis Report (UFSAR)

2.8 Offsite Dose Calculation Manual (ODCM)

2.9 STP Administrative Policy, STP 711 "Radiation Protection Program"

2.10 0PGP03-ZR-0039, Radiological Environmental Monitoring

2.11 0PGP03-ZR-0044, Contamination Control Program

2.12 0PGP03-ZR-0048, Personnel Dosimetry Program

2.13 0PGP03-ZR-0049, Planned Special Exposures

2.14 0PGP03-ZR-0051, Radiological Access Controls/Standards

2.15 0PGP03-ZR-0052, ALARA Program

2.16 0PGP03-ZR-0053, Radioactive Material Control Program

2.17 0PGP03-ZR-0054, Respiratory Protection Program

2.18 0PGP03-ZX-0003, Station Self-Assessment Program

2.19 0PGP03-ZX-0007, Preparation of the Annual Radioactive Effluent Release Report

2.20 0PRP04-ZR-0013, Radiological Survey Program

2.21 0PRP04-ZR-0015, Radiological Posting and Warning Devices

2.22 Regulatory Guide 1.8, Qualification and Training of Personnel for Nuclear Power Plants

2.23 INPO 05-008, Guidelines for Radiological Protection at Nuclear Power Stations

2.24 Condition Report 97-14108, Snubber Trailer found to contain Low Levels of Contamination

2.25 Condition Report 01-11960, Dosimetry Records for Incoming Incomplete

2.26 Condition Report 08-16621, Dose Extension for Personnel Prior to Reaching AAL

3.0 Definitions

NOTE

- Definitions given in this section are in addition to those listed in 10 CFR 20.1003 and the Technical Specifications for STP.
- Timeframe definitions are as follows unless specified in the program/implementing procedure.

3.1 ADMINISTRATIVE ACTION LEVELS (AAL): An AAL is a predetermined value of a monitored radiological parameter above which additional actions occur. For control purposes, AALs are established below regulatory limits.

3.2 ALARA: (As Low As is Reasonably Achievable) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10 CFR Part 20 as is practical, consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest. (10CFR20.1003)

3.3 ANNUAL (ANNUALLY): Occurring within a calendar year.

3.4 CONTROLLED AREA: The area lying outside of the restricted area up to the site boundary.

3.5 DAILY: Occurring within 36 hours from last performance.

3.6 MONTHLY: Occurring within a calendar month.

3.7 OWNER CONTROLLED AREA (OCA): The area surrounding the Protected Area where STP Nuclear Operating Company (STPNOC) reserves the right to restrict access, search personnel, and vehicles.

3.8 PRACTICABLE: Possible and workable. The determination of workable may include an assessment of the costs and expected benefits to be derived.

3.9 QUARTERLY: The 3 month period, Jan.-Mar., April-June, July-Sept., or Oct.-Dec.

3.10 RADIATION PROTECTION PROGRAM: The composite of all aspects of compliance with applicable federal regulation and licensing requirements dealing with radiation and radioactive material. Included are applicable policies in the STPNOC Administrative Policies Manual and procedures detailing the various aspects of the program in the 0PGP03-ZR series of the STP Plant Procedures Manual and other procedures specified in this document.

3.11 RADIOLOGICALLY CONTROLLED AREA (RCA): Area designated by Radiation Protection to control personnel access and material movement for Radiation Protection purposes.

3.12 RESTRICTED AREA: The area enclosed by the security fence surrounding both units. Other areas may be included in the restricted area if designated by the Radiation Protection Manager and with appropriate access controls for the area in place.

3.13 SEMI-ANNUAL (ANNUALLY): Occurring within either the first or second six month period of a calendar year.

3.14 SUITABLE: Appropriate considering only the information available at the time an action was taken.

3.15 TIMELY: Performed in an expeditious manner. As a minimum, timely means rapidly enough to meet specified time requirements for reporting as specified in 10 CFR 20.2201 or to protect the health and safety of workers and members of the public.

3.16 WEEKLY: Occurring within the calendar week.

4.0 Responsibilities

4.1 The Senior Management Team

4.1.1 Promulgate Radiation Protection and ALARA Program policy.

4.1.2 Provide resources and organization sufficient to maintain the Radiation Protection and ALARA Programs in compliance with the Code of Federal Regulation and licensing commitments.

4.1.3 Ensure the active support of all departments for the Radiation Protection and ALARA Programs.

4.1.4 Provide direct access by the Radiation Protection Manager for resolution of concerns regarding the Radiation Protection and ALARA Programs.

4.2 Plant General Manager

4.2.1 Ensure support for the Radiation Protection and ALARA Programs, including environmental monitoring, chemistry control, and radioactive waste minimization.

4.2.2 Operate and maintain STP safely and efficiently consistent with good ALARA practices and in full compliance with regulatory requirements.

4.2.3 Participate in setting and approving of goals and objectives for the STP ALARA and Radiation Protection Programs.

4.2.4 ALARA Review Committee Chairperson.

4.3 Radiation Protection Manager

4.3.1 Manage the Radiation Protection and ALARA Programs in accordance with current regulations, license requirements, and policy.

4.3.2 Administer the site Respiratory Protection Program.

4.3.3 Provide technical support in the areas of ALARA and Radiation Protection.

4.3.4 Track and trend radiation work performance, recommending actions as necessary to correct adverse trends.

4.3.5 Review incidents involving radiation protection controls, identifying root causes, concerns, and corrective actions.

4.3.6 Monitor the receipt and shipment of radioactive materials.

4.3.7 Assure calibration services for instrumentation used to implement the Radiation Protection Program.

4.3.8 Participate in the development and approval of training programs related to work in restricted areas.

4.3.9 Recommend radiation exposure goals to management.

4.3.10 Develop reports required by regulatory agencies and industry groups to present station performance with respect to Radiation Protection and ALARA.

4.3.11 Provide for dosimetry services including personnel dose record retention and personnel dose information management as required to support the Radiation Protection and ALARA programs.

4.3.12 Provide for radiological environmental monitoring.

4.4 Department and Division Managers

4.4.1 Provide information to Radiation Protection Division personnel necessary to support radiological control of work.

4.4.2 Assist in resolving radiological deficiencies associated with operations, procedures, systems, equipment, and work practices associated with their organization.

4.4.3 Develop division/department goals and monitor performance with respect to ALARA.

4.4.4 Ensure that their organization's contracts for vendor services contain adequate information regarding the provisions of the Radiation Protection Program.

4.4.5 Solicit exposure estimates and evaluate contractor proposals for radiological implications of their work and include ALARA considerations in the selection process.

4.5 Supervisors

4.5.1 Ensure that subordinates comply with the Radiation Protection and ALARA Program requirements applicable to them.

4.5.2 Maintain awareness of the radiation exposures of subordinates.

4.5.3 Inform Radiation Protection when a female subordinate declares pregnancy or intent to become pregnant.

4.6 Employees and Contractors

4.6.1 Provide notification to the on duty Radiation Protection Supervisor of materials and equipment under their control received from other nuclear facilities which will be used in an RCA. This notification should occur prior to or upon arrival of the material at STP. (CR 97-14108)

4.6.2 Use safe radiological work practices in accordance with approved procedures and radiation work control instructions.

4.6.3 Comply with applicable requirements described in Radiation Protection procedures.

4.6.4 Inform the dosimetry staff whenever occupational exposure is received or anticipated from other licensees while working at STP.

4.6.5 May voluntarily declare pregnancy or intent to become pregnant by notifying supervision and Radiation Protection in writing of pregnancy or intent and the estimated date of conception if pregnant.
(See Form 1, Declaration of Pregnancy or Intent to Become Pregnant.)

4.6.6 IF an individual has had OR will have a radiopharmaceutical administration, informing the dosimetry staff prior to the administration OR as soon as possible after the administration COULD help prevent the following:

- Affecting the individuals Thermoluminescent Dosimeter (TLD)
- Causing alarms at the contamination portal monitors at the RCA exits and in the security gate houses
- Affecting installed plant monitors. In extreme cases emergency safeguards features equipment actuation could result from a worker recently receiving a radiopharmaceutical administration and standing near certain radiation monitors.

5.0 Procedure

5.1 ALARA Program (ANI EC8.2)

5.1.1 Activities at STP involving actual or potential radiation exposure to workers or members of the public SHALL be planned, conducted, and evaluated in accordance with the ALARA philosophy. (10CFR20.1101(b))

5.1.2 A structured approach to ALARA SHALL be implemented such that higher projected individual or collective doses receive increased management attention. Specifications of the ALARA program are contained in 0PGP03-ZR-0052, ALARA Program.

5.1.3 Procedures SHALL incorporate sound ALARA and Radiation Protection principles and practices, e.g., hold points, cautions, and protective actions. (10CFR20.1101(b))

5.1.3.1 New procedures governing activities with potential for radiation exposure SHALL be reviewed to ensure appropriate inclusion of these items.

5.1.3.2 Changes to existing procedures SHALL be reviewed for ALARA considerations if the change alters the radiation exposure potential.

5.1.4 A documented review of modifications and design changes inside of the RCA SHALL be performed prior to implementation for consideration of the radiation exposure implications of the alterations. (10CFR20.1101(b))

5.1.5 Work activities within a RCA SHALL be conducted in accordance with the radiological instructions contained in the work control document and/or radiation work permit.

5.1.6 An ALARA Review Committee SHALL provide management overview of activities involving personnel exposure. (ANI EC8.3)

5.2 Radiation Protection Division Organization, Training, and Qualifications

5.2.1 The Radiation Protection Division SHALL consist of sufficient managerial, technical, supervisory, and technician personnel to affect the Radiation Protection Program.

5.2.2 The Radiation Protection Manager is the Health Physics Division Manager. Training and qualification of the Radiation Protection Manager SHALL include:

5.2.2.1 Education and experience in accordance with Regulatory Guide 1.8.

5.2.2.2 Orientation in the specific design and systems of STP and management organization and functions of STPNOC.

5.2.2.3 Periodic professional training, e.g., refresher courses, retraining or continuing education as necessary to keep abreast of current developments in the radiation protection field.

5.2.3 Radiological training and qualification of Radiation Protection Technicians and Supervisors SHALL be conducted as a joint effort of the Nuclear Training Department and the Radiation Protection Division in accordance with plant procedures.

5.2.4 The technical staff should be provided opportunities to attend training to enhance their knowledge, skills, and abilities in radiation protection and remain current in the field.

5.3 Radiation Dose Monitoring

5.3.1 Personnel SHALL be monitored for internal and external exposure as required by 10CFR20. (10CFR20.1502)

5.3.1.1 External radiation dose for individuals requiring monitoring SHALL be monitored by using an individual monitoring device. At STP, Thermoluminescent Dosimeters shall be accredited under the National Voluntary Laboratory Accreditation Program. (10CFR20.1501(c))

5.3.1.2 Internal radiation dose, i.e., committed dose equivalent and/or committed effective dose equivalent based on intake, is monitored primarily by bioassay utilizing whole body counting. Other bioassay methods SHALL be used as necessary for radionuclides and/or intake pathways for which whole body counting does not provide adequate information. (10CFR20.1204, 10CFR20.1703(a))

5.3.1.3 Other methods of evaluating radiation dose to individuals, such as Effective Dose Equivalent (EDE), may be used as necessary to supplement those described in 5.3.1.1 and 5.3.1.2. Such methods include, but are not limited to, calculation of skin dose from exposure to noble gas or contamination, radiation field measurements and stay times, results from other radiation monitors, and calculation of intake from air concentration and stay times.

5.3.2 0PGP03-ZR-0048, Personnel Dosimetry Program, describes the requirements and responsibilities for monitoring personnel dose in detail.

5.3.3 Dose to members of the public SHALL be monitored through surveys, measurement of effluents, and calculations sufficient to demonstrate compliance with 10CFR20 and any other licensing requirements. (10CFR20.1302)

5.4 Radiation Exposure Controls

5.4.1 The degree of control exercised during work activities SHALL be commensurate with the potential hazard presented by the work activity consistent with ALARA.

5.4.1.1 Engineering controls, e.g., shielding and source term reduction, should be employed whenever practicable to control exposure.

5.4.1.2 IF engineering controls are not practicable or are insufficient, THEN administrative controls, e.g., instructions and stay time limitations, SHALL be used to control or limit exposure.

5.4.1.3 Controls to maintain exposure to radiation and radioactive material ALARA are established in 0PGP03-ZR-0052, ALARA Program and 0PGP03-ZR-0051, Radiological Access Controls/Standards.

5.4.2 The potential for internal exposure should be controlled primarily by application of engineering and process controls such that the concentration of licensed radioactivity in the work environment is consistent with ALARA. (10CFR20.1701)

5.4.2.1 IF engineering and process controls are not practicable, THEN other means SHALL be utilized, consistent with maintaining the total effective dose equivalent (TEDE) ALARA, to limit intakes of licensed radioactive material. (10CFR20.1702)

5.4.2.2 The respiratory protection program SHALL meet regulatory and license requirements. It is described in detail in 0PGP03-ZR-0054, Respiratory Protection Program, and the supporting bioassay program is described in 0PGP03-ZR-0048, Personnel Dosimetry Program. (10CFR20.1703(a)(3)(iv))

5.4.3 Activities SHALL be conducted at STP within the occupational dose limits of 10 CFR 20.1201, 1207, and 1208 except as provided 5.4.3.1 and 5.4.3.2 below. (10CFR20.1201, 1207, and 1208)

5.4.3.1 Planned special exposures as provided in 10 CFR 20.1206 may be used only in exceptional situations when alternatives which might avoid the exposure are unavailable or impractical and SHALL be consistent with the ALARA philosophy. Controls for planned special exposures are described in 0PGP03-ZR-0049, Planned Special Exposures. (10CFR20.1206, 20.2105, 20.2204)

5.4.3.2 Personnel exposures during a declared emergency at or above the ALERT Classification at STP SHALL be controlled in accordance with the Emergency Plan.

5.4.4 Activities at STP SHALL be conducted such that the dose to a member of the public is less than 0.1 rem TEDE per year. (10CFR20.1301)

5.5 Administrative Action Levels (AAL) for Individual Radiation Dose (ANI EC8.4, INPO 05-008)

NOTE

Because minors are not employed by STP, the AALs discussed herein assume an adult worker and do not apply to minors.

5.5.1 The AAL on lifetime TEDE is N rem where N equals the individual's age in whole years.

5.5.2 The AAL on annual TEDE is 1.5 rem for Occupational Exposure received at STP. Actions should be taken to ensure awareness of individuals approaching this AAL. (10CFR20.2104, INPO 05-008, CR 01-11960)

5.5.3 The AAL for Shallow Dose Equivalent (whole body skin dose) and extremity dose is 40 rem per year. Approval from the Radiation Protection Manager SHALL be required to exceed 40 rem per year, limited by the 50 rem per year limit of 10CFR20. (10CFR20.1201(a))

5.5.4 There is no AAL for lens of eye dose as the controls for TEDE limit dose to lens of the eye. Dose to lens of eye is limited to 15 rem per year by regulation. (10CFR20.1201(a))

5.5.5 There is no AAL for CEDE or CDE since engineering controls limit planned exposures to small fractions of the applicable regulatory limits.

5.5.6 IF the individual's lifetime dose (in rem) is greater than their age OR the current year (year-to-date) dose is greater than 1.5 rem, THEN a Personnel Dose Extension Authorization form (Form 2) should be completed prior to setting an AAL in the computer. (CR 08-16621)

5.5.7 Year-to-date dose history, including eye dose, SHALL be determined prior to granting a larger AAL. (10CFR20.2104, CR 01-11960)

5.5.8 The following signatures are required as a minimum on Form 2.

5.5.8.1 The individual to whom the extension applies.

5.5.8.2 The responsible department manager.

5.5.8.3 The Radiation Protection Manager.

5.5.8.4 The employer, if not an STPNOC employee.

5.5.9 Additional management approvals MAY be required for dose extensions as indicated on Form 2.

5.5.10 In order to limit the dose to the embryo/fetus of a declared pregnant woman as defined in 10CFR20.1003 or intent to become pregnant, the following actions SHALL be taken:

5.5.10.1 The declared or intent to become pregnant woman SHALL complete section 1 of Form 1 and deliver Form 1 to Dosimetry.

5.5.10.2 Dosimetry SHALL collect the declared or intent to become pregnant woman's current TLD AND restrict the declared or intent to become pregnant woman's RCA access. Collected TLD SHOULD be processed IAW site procedures.

5.5.10.3 Dosimetry SHALL use TLD results and electronic dosimeter (EPD) results to estimate the dose received since conception or intent to become pregnant and enter estimate on Form 1.

5.5.10.4 Form 1 SHALL be forwarded to RPM and RPM will schedule a briefing with the declared pregnant or intent to become pregnant woman and a Human Resources representative to agree upon an occupational dose limit to be applicable for the remainder of the pregnancy. Such dose limit SHALL not exceed the limits of Steps 5.5.10.6 or 5.5.10.8.

5.5.10.5 After the briefing, Form 1 SHALL be forwarded to Dosimetry. Dosimetry SHALL issue a new TLD, enter dose limits established on Form 1 and status the worker as "P".

5.5.10.6 Occupational exposure of the declared pregnant woman SHALL be limited such that the dose to the embryo/fetus does not exceed 500 mrem for the entirety of the gestation period unless 450 mrem has been exceeded at the time of declaration. (10CFR20.1208(a))

5.5.10.7 Occupational exposure for the intent to become pregnant woman SHOULD be limited to 500 mrem per year for the duration of the intent to become pregnant.

5.5.10.8 IF the dose to the embryo/fetus at time of declaration is at or above 450 mrem, THEN the permissible occupational dose for the remainder of the pregnancy SHALL be limited to 50 mrem additional. (10CFR20.1208(d))

5.5.10.9 Dosimetry SHALL account for transition from conception year to birth year, IF 500 mrem limit spans more than 1 dosimetry year.

5.5.10.10 Efforts SHALL be made to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant or intent to become pregnant woman. (10CFR20.1208(b))

5.5.10.11 Form 1 SHALL be completed and forwarded to personnel dosimetry file and retained in accordance with the Document Type List (DTL).

5.6 Radiation and Radioactive Material Surveys

5.6.1 Instrumentation

5.6.1.1 Radiation detection instrumentation used at STP for determination of personnel exposures and proper posting SHALL be calibrated for the radiation measured using sources traceable to the National Institute of Standards and Technology or other nationally recognized standards. (10CFR20.1501(b))

5.6.1.2 Calibration frequencies and instrument control systems SHALL ensure that radiation detection instruments are properly calibrated, are likely to remain within calibration tolerance for the duration of use, and are recalibrated at periodic intervals. (10CFR20.1501(b))

5.6.1.3 Unless reliability data indicate otherwise, calibration frequency for instruments in routine use should not exceed manufacturer's recommended interval or annually, whichever is less. (ANI EC8.8)

5.6.1.4 Calibration criteria for accuracy and precision SHALL be prescribed in documents governing the calibration of the instrument.

NOTE

Routine surveys are not required in areas where continuous air monitors and/or area radiation monitors give sufficient information to monitor radiological conditions. Routine surveys are not required in locked areas if these areas are not entered.

5.6.2 Routine survey measurements SHALL be scheduled in accordance with the following general guidelines: (ANI EC8.8)

5.6.2.1 Routine surveys should characterize all radiological conditions necessary to provide radiological controls based on plant area.

5.6.2.2 Routine survey frequency should be established based upon the probability of radiological conditions changing, the likely magnitude of any change, and the potential hazard that could result from a change.

5.6.3 Job coverage, or specific surveys, SHALL be of a type and frequency and sufficiently detailed to assess the extent of radiation levels and/or concentrations of radioactive materials and the potential radiological hazards to which workers may be exposed. (10CFR20.1501(a))

5.6.3.1 Protective measures for workers SHALL be based upon historical data, anticipated and/or observed conditions, and documented survey data.

5.6.3.2 Continuous job coverage SHOULD be utilized if there is the potential for rapidly deteriorating radiological conditions in a work area not adequately monitored by an alarming monitor.

5.6.4 Radiological surveys SHALL be clearly and legibly documented. Each record of radiation measurements SHALL identify:

5.6.4.1 The radiological hazards in type and quantity using the units rad, rem, or curie, as appropriate, and multiples and subdivisions thereof. (10CFR20.2101(a))

5.6.4.2 Any other information needed to ensure the completeness of the record as defined by procedure.

5.6.5 Records of results of surveys and calibrations SHALL be retained in accordance with regulations and insurers stipulations. (10CFR20.2103, ANI Bulletin 80-1A)

5.6.6 0PRP04-ZR-0013, Radiological Survey Program, provides the detailed description of the survey program.

5.7 Control of the Workplace

5.7.1 Radioactive Material Control

5.7.1.1 Procedural guidance SHALL exist which includes responsibilities of departments and individuals, administrative controls on materials, and instructions for handling radioactive materials.

5.7.1.2 Security aspects of special nuclear materials, e.g., inventory, custody, and accountability are outside the scope of the Radiation Protection program. However, the Radiation Protection Manager SHALL approve storage locations considering ALARA and radiation protection implications. (10CFR20.1101(b))

5.7.1.3 The contamination control program SHALL be based upon the following general considerations.

a. Contamination of the workplace should be prevented whenever practicable by elimination of the source.

b. Should elimination of the source be impractical, control or containment techniques SHALL be used to minimize the affected area.

c. Decontamination methods SHALL be used to minimize the area and level of radioactive contamination consistent with ALARA.

5.7.1.4 0PGP03-ZR-0053, Radioactive Material Control Program, and 0PGP03-ZR-0044, Contamination Control Program, provide detailed description of the controls on radioactive material.

5.7.2 Appropriate radiological instruction SHALL be provided to all individuals with access to the restricted area commensurate with potential radiological protection hazards in the area to be entered. For escorted visitors, this instruction may be provided by the qualified escort. Specific qualifications for access to an RCA is contained in 0PGP03-ZR-0051, Radiological Access Controls/Standards. (10CFR19.12, ANI EC8.2)

5.7.3 0PGP03-ZR-0051, Radiological Access Controls/Standards, provides the detail for radiological control of access at STP.

5.7.4 Work within a RCA SHALL be performed under the provisions of the ALARA program as defined in 0PGP03-ZR-0052, ALARA Program.

5.7.5 Radiation Protection personnel have the authority to issue immediate "Stop Work" orders on any job that is NOT considered radiologically safe. (ANI EC8.2)

5.7.5.1 IF sufficient controls are instituted to make the job acceptably safe, e.g., through additional protective requirements in the work control document, THEN the technician or Radiation Protection (RP) Supervisor may permit a job to restart.

5.7.5.2 IF sufficient controls cannot be instituted to make the job acceptably safe in the judgment of RP supervision, THEN "Stop Work" orders may be lifted ONLY by individuals filling the roles of Radiation Protection Manager or Plant Manager.

5.7.6 The level of compliance with radiological procedures SHALL be assessed through a program which provides for investigation and documentation of incidents and escalation to higher levels of management. (10CFR20.2102)

5.7.7 Posting Requirements

5.7.7.1 All postings SHALL be conspicuously displayed.

5.7.7.2 Posting of areas SHALL be performed in accordance with 10 CFR 20.1902 and Technical Specifications.

5.7.7.3 Additional information may be provided as part of the postings to make individuals aware of potential radiation exposures, to minimize those exposures, and provide instructions as to the proper course of action. (10CFR20.1901(c))

5.7.7.4 0PRP04-ZR-0015, Radiological Posting and Warning Devices, provides a detailed description of postings used.

5.8 Radioactivity Release Assessment

5.8.1 Effluents released SHALL be monitored and in compliance with license requirements and applicable federal regulations. The reporting program for effluent monitoring is contained in 0PGP03-ZX-0007, Preparation of the Annual Radioactive Effluent Release Report. (10CFR20.1301, 1302)

5.8.2 The radiological environmental impact of operation of STPEGS SHALL be assessed as required by license conditions and federal regulations. The program description is contained in 0PGP03-ZR-0039, Radiological Environmental Monitoring, and the Offsite Dose Calculation Manual (ODCM). (10CFR20.1301, 1302)

5.8.3 Records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment SHALL be retained in accordance with regulations and insurers stipulations. (10CFR20.2103, ANI Bulletin 80-1A)

5.9 Radiological Program Assessment

5.9.1 Information from the compliance assessment program of Step 5.7.6 should be tracked and trended with reports to management identifying any positive or negative trends.

5.9.2 The Radiation Protection Program SHALL be reviewed at least annually with reports provided to the Radiation Protection Manager. These assessments may be performed by the Radiation Protection Division technical staff, independent contractors, or other knowledgeable personnel. An INPO evaluation or a review, assessment, or audit of a program area by Quality Assurance fulfills the requirement for the area evaluated. (10CFR20.1101(c), ANI EC8.2)

5.9.2.1 The content of the annual Radiation Protection Program Review Report shall include the following as a minimum:

- ALARA Program (planning, controls, outage performance, dose reduction, items completed from the 5 year ALARA plan, high radiation area control)
- Dosimetry Program (internal and external)
- Health Physics Operations (surveys, contamination control, radioactive material control, instrumentation)
- Organizational Effectiveness (performance indicators, corrective action program, human performance, observation program, training, and event trending)

- Quality Department monitoring
- Radioactive Waste, material processing, and transportation
- Radiological Environmental Monitoring Program (REMP)
- Respiratory Protection Program

5.9.3 Records generated in performing assessments of Step 5.9.2 SHALL be retained for at least 3 years from the assessment. (10CFR20.2102(b))

6.0 Support Documents

6.1 Addendum 1, Instructions for Personnel Dose Extension Authorization

6.2 Addendum 2, Restricted Areas and Applied Controls

6.3 Form 1, Declaration of Pregnancy or Intent to Become Pregnant

6.4 Form 2, Personnel Dose Extension Authorization

SECTION 1: Individual and Supervisor

1. Print or type the individual's name who needs and is requesting the extension.
2. Enter the individuals social security number or the identification number (passport, etc.) if social security number is not used for identification at STP.
3. Enter the individual's age in years as of his last birthday.
4. Enter the company that is the individual's employer and the STP department responsible for the individual's employment at STP.
5. For the line reading "I request an annual dose extension to _____ mrem total (STP plus other licenses) for year _____.", enter the **total** annual dose limit desired in the first blank and the exposure year for which the limit is desired. Example 1: An individual not limited by lifetime TEDE has accrued 1500 mrem to date at STP and has 2500 mrem total for year XXXX. Anticipated additional dose required to perform is job is 700 mrem. The total annual dose limit requested is 3200 (2500 + 700) mrem. The year would be XXXX. Example 2: An individual who is limited by lifetime TEDE has accrued 500 mrem YTD at STP and 500 mrem total for year YYYY. The anticipated additional dose required to perform his job is 700 mrem. The total annual dose limit requested is 1200 (500 + 700) mrem.
6. In the reason blank, indicate (1) the estimated additional dose which caused this extension to be necessary and the assignment for which the dose will be used and (2) why this individual SHOULD receive the additional dose. Special skills, limited work force and similar reasons are prudent reasons to process the dose extension.
7. The individual for whom the dose extension is being processed signs the applicant's signature space and dates his signature.
8. IF an STP employee, THEN the individual's supervisor or manager signs and dates the supervisor or employer blank. IF not an STP employee, THEN a representative of the individual's employer signs and dates the blank.

SECTION 2: Dosimetry

1. Check the dose history for the individual and mark the appropriate box. IF known, THEN enter the individual's lifetime TEDE.
2. Enter the STP Year to Date (YTD) TEDE and the YTD TEDE from other licensees.
3. Enter the current year eye dose from all sources/locations.
4. Compute and enter the individuals current YTD TEDE using the formula given.
5. Compute the lifetime TEDE margin available and enter. IF lifetime TEDE is greater than age in years, THEN enter zero.
6. Compute the available annual margin based on the formula given. The available annual margin is the smaller of 1.5 rem minus YTD TEDE at STP or 5 rem minus **total** YTD TEDE.
7. The individual completing Section 2 signs and dates the form.

SECTION 3: Approvals

NOTE: The RPM will normally complete the blanks in Section 3 describing the additional dose permitted by this extension and the total amount of dose this extension will permit the individual to receive. The dose is authorized only after approval signatures are secured.

The individual requesting the dose extension is responsible for securing the approval signatures required. The individual's supervisor or, for contractors, site representative is expected to assist as necessary. Dosimetry personnel can assist the individual in determining which approval signatures are required.

Extensions are processed for two primary reasons but both result in an extension to the annual dose permitted as that is the way doses are controlled. The extension is either based on a control of the annual dose for the dose year, i.e., dose MAY exceed 1.5 rem TEDE at STP or 80 percent of a federal limit, or a control of the lifetime dose, lifetime dose in rem MAY exceed age in years.

The Responsible Department Manager and the Radiation Protection Manager must sign the form in all cases. The Responsible Department Manager is the STP manager responsible for the activities of the individual requesting the dose extension.

IF **annual dose is limiting** and lifetime dose is **not** limiting,

1. IF the total annual dose requested is less than or equal to 3 rem, THEN only the Responsible Department Manager and the Radiation Protection manager must sign the form.
2. IF the total annual dose requested is greater than 3 rem but less than or equal to 4 rem, THEN the Plant Manager must also sign the form.
3. IF the total annual dose requested is greater than 4 rem, THEN both the Plant Manager and a member of the Executive Team must also sign the form.

IF **lifetime dose is limiting** and annual dose is **not** limiting,

1. IF the total annual dose requested is less than or equal to 1 rem, THEN the Responsible Department Manager, the Radiation Protection Manager, and the Plant Manager must sign the form.
2. IF the total annual dose requested is greater than 1 rem, THEN a member of the Executive Team must also sign the form.

Pursuant to the regulatory definition of restricted area and the provisions of 0PGP03-ZR-0050, the following site areas are designated as restricted areas with the controls stipulated for each area.

1. Radiation Instrumentation Repair and Calibration Facility (Metrology Laboratory) Controls:
   - The facility is to be locked or guarded at all times with access permitted only to those authorized by the Metrology and Radiological Laboratories Supervisor.
   - The facility is posted as a Radiologically Controlled Area.
   - Items exhibiting radioactivity SHALL be stored separately from non-radioactive material.
2. TLD irradiator room at the Nuclear Support Center. The area shall be considered a restricted area when the irradiator is unlocked. Controls: Whenever the TLD irradiator is unlocked, the door to the room shall be locked or guarded to prevent unauthorized access. Uncontrolled entry to the mechanical equipment room, in which the TLD irradiator room is located, shall be limited to the portion of the room not barricaded. Access to the barricaded area requires individuals to log onto the appropriate Radiation Work Permit.
3. Radiological Environmental Monitoring Standards Laboratory. Controls: The laboratory is posted as a Radiologically Controlled Area. The door to the laboratory shall be locked any time cognizant laboratory personnel are not in the area.
4. Old Steam Generator Storage Facility. Controls: The facility shall be locked except when entry is required. All entries shall be in accordance with radiation protection procedures.
5. Onsite Staging Facility (Warehouse D). Controls: The facility shall be locked except when entry is required. All entries shall be in accordance with radiation protection procedures.
6. Onsite Staging Facility for High Integrity Containers. Controls: The facility shall be locked except when entry is required. All entries shall be in accordance with radiation protection procedures.
7. Main warehouse (radioactive material storage cage). Controls: The cage shall be locked except when entry is required. All entries shall be in accordance with radiation protection procedures

SECTION I: Completed by the Individual Declaring Pregnancy or Intent to Become Pregnant

Name: _____

Employer: _____

SSN: _____

Check one:

☐ Declared Pregnant ☐ Intent to Become Pregnant

Estimated Date of Conception for Declared Pregnant Woman:_____

0PGP03-ZR-0050, 5.5.10.4, requires you to meet with the Radiation Protection Manager and a Human Resources Representative to determine an acceptable occupational dose limit applicable for the duration of your pregnancy.

SECTION II: Completed by Dosimetry Personnel

Annual Dose: Current year_____mrem Previous year _____ mrem

Dose received since conception to date of declaration: _____mrem

Completed By: _____ Date: _____

SECTION III: Completed at the Briefing

Briefing **Briefing Date/Time: ___/___/___ ___:___ am pm**

During the meeting the following items were discussed:

* Contents of Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure."
* Risks of radiation exposure to the unborn child and recommended dose levels for the unborn child.
* Previous dose history in current job.
* Methods to minimize exposure during pregnancy and available job accommodation.
* Worker to inform Dosimetry when to restore normal limits, i.e., when you are no longer pregnant.
* Intent to become pregnant will be effective for 1 year at which time a review of status will occur.
* RWP / WAN to be used by worker.
* IF brief is for intent to become pregnant, a separate Form 1 is required once pregnant AND the individual wishes to be a declared pregnant woman.
* Other: _____

Based on the briefing, I request to continue work in my current capacity or equivalent with a limit for the duration of the pregnancy or one year for intent to become pregnant of _____mrem.

I understand that the dose margin will be set at _____ mrem (the limit requested) plus _____ mrem (required margin of the RWP) plus 100 mrem, = _____ dose margin required.

____mrem requested + ____ mrem (RWP) + 100 mrem = _____ dose margin required.

_____ Signature of Worker ___/___/___ Date

_____ Human Resources Representative ___/___/___ Date

_____ Radiation Protection Manager ___/___/___ Date

SECTION IV: Completed by Dosimetry Personnel Following Briefing

Ensure status = P

Computer Updated by:_____/___/___
Initials Date

SECTION 1 (Completed by requesting individual and supervisor)

Name:_____ SSN:_____ Age:_____ Co./Dept.____/_____

I request an annual exposure extension to_____mrem total (STP plus other licensees) for year _____.

Reason _____

_____

_____ _____ _____ _____

Applicant Signature Date Supervisor or Employer Date

****

SECTION 2 (Completed by Dosimetry Personnel)

Dose History: [ ] Form 4/5 [ ] PADS [ ] Statement Lifetime TEDE: _____mrem

STP YTD TEDE: _____mrem EYE DOSE (all sources YTD): _____mrem

Offsite YTD TEDE:_____mrem

Current YTD TEDE: ____mrem = _____mrem + _____mrem + _____mrem

Total Record Estimate CEDE

AVAILABLE LIFETIME MARGIN: _____mrem [Age - Lifetime TEDE (rem)] x 1000

AVAILABLE ANNUAL MARGIN: _____mrem [Smaller of 1500 - Current YTD TEDE at STP or 5000 - Current YTD TEDE total]

Completed By:_____Date:_____

****

SECTION 3: APPROVALS Signatures/Date

Extension Due to Annual Dose Control
1500 to 3000 mrem/yr: (1)(2)
>3000 to 4000 mrem/yr: (1)(2)(3)
>4000 to 5000 mrem/yr: (1)(2)(3)(4)

(1) _____ / _____
Responsible Department Manager

(2) _____ / _____
Radiation Protection Manager

Extension Due to Lifetime Dose Control
>0 to 1000 mrem/yr with lifetime TEDE > Age in Rem: (1)(2)(3)
>1000 mrem/yr with lifetime TEDE > Age in Rem: (1)(2)(3)(4)

(3) _____ / _____
Plant General Manager

This extension permits an additional _____mrem to be received.

(4) _____ / _____
STPNOC Vice President

Extension granted to _____mrem for calendar year _____.

****

Computer updated by: _____ _____
Initials Date

NUCLEAR TRAINING DEPARTMENT

ADMINISTRATIVE JOB PERFORMANCE MEASURE

TITLE: DECLARE EMERGENCY ACTION LEVEL

JPM NO.: NRC A9

REVISION: 1

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	DECLARE EMERGENCY ACTION LEVEL
JPM No.:	A9
Rev. No.:	1
Task No.:	74026 (SRO), Classify emergency conditions.
STP Objective:	Given an emergency condition and a copy of the emergency classification tables from 0ERP01-ZV-IN01, Emergency Classification, classify the emergency condition.
Related K/A Reference:	2.4.41 [2.9/4.6], Knowledge of the emergency action level thresholds and classifications.
References:	0ERP01-ZV-IN01, Rev. 9, Emergency Classification
Task Normally Completed By:	SRO
Method of Testing:	Actual Performance
Location of Testing:	Classroom
Time Critical Task:	YES (15 minutes based on E-Plan Evaluation criteria)
Alternate Path JPM:	NO
Validation Time:	15 minutes

Required Materials (Tools/Equipment):

Steam Tables

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

INITIAL CONDITIONS:

The plant was initially at 100% power, steady-state. An RCS leak developed inside Containment. The crew determined the leak could not be isolated and had increased to greater than 200 gpm. The crew initiated a manual Reactor trip and Safety Injection. During EOP performance, the leak propagated into a Loss of Coolant Accident resulting in a rapid depressurization of the RCS to saturation conditions at 1500 psig. Reactor Vessel Water Level has been continuously lowering. Core Exit Thermocouples have been rising and exceeded 708 °F (orange path) 20 minutes ago. Containment pressure has risen to 18 psig.

Current plant conditions are:

- RCS pressure is 1445 psig
- RCS Thot temperatures are 600 °F, rising.
- RCS Tcold temperatures are 560 °F
- Pressurizer level is 0%
- Reactor Vessel Water Level (Plenum) is 5%
- Containment pressure has unexpectedly lowered rapidly to 3 psig.
- Containment Radiation levels are at 70 R/hr on RT-8050 and 8051.
- CET's 720 °F slowly rising.

INITIATING CUE:

This JPM is time-critical. The time limit starts when you (the applicant) understand the Initial Conditions and Initiating Cue.

You are the Unit 1 Shift Manager. Based on the CURRENT Plant conditions as described above:

1. Classify the event at its **MINIMUM** Emergency Classification (i.e. over-classification will be incorrect).
2. Circle or indicate in some manner in the Student Handout copy of 0ERP01-ZV-IN01, Emergency Classification, the underlying plant condition/s or criteria you used to make your determination of the classification.
3. Notify your Evaluator when you have completed the JPM.

JOB PERFORMANCE MEASURE INFORMATION SHEET

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

A GENERAL EMERGENCY is declared under Emergency Action Level FG1, Loss of any two barriers AND potential loss of third barrier.

AND

The underlying plant conditions or criteria are circled or annotated in some way in the student handout to indicate the bases for the General Emergency. Refer to JPM Step 2 for details.

HANDOUTS:

Student Handout copy of 0ERP01-ZV-IN01, Emergency Classification

NOTES:

The student is to be provided the following:

- Student Handout copy of 0ERP01-ZV-IN01, Emergency Classification

JOB PERFORMANCE MEASURE CHECK SHEET

A copy of Steam Tables

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of 0ERP01-ZV-IN01, Emergency Classification, and a set of Steam Tables.

Standard:

Student is provided a copy of 0ERP01-ZV-IN01, Emergency Classification, and a set of Steam Tables.

Comment:

A procedural handout IS provided to give to the student. Additionally, he/she is to receive a copy of the Steam Tables.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C)

Classifies the event in accordance with Addendum 1 in 0ERP01-ZV-IN01, AND indicates the underlying plant conditions/criteria the classification is based on by circling or annotating them in the student handout.

Standard:

Classifies the event as a GENERAL EMERGENCY (FG1) per Addendum 1 page 2.
AND
Circles or annotates in some way the underlying plant conditions or criteria the classification is based on in the student handout.

Fuel Clad: Orange Path , Core Exit Thermocouple ≥ 708 °F or Plenum level less than 20% (3)

RCS: Core Cooling Yellow w/subcooling < 0 °F OR Leak rate > CVCS ability to maintain RCS inventory as indicated by loss of RCS subcooling. (4)

Containment: Containment Pressure (2)
Initial increase followed by rapid unexplained decrease

Comment:

Cue:

When the student completes the JPM and turns in his/her results, BEFORE ALLOWING THE STUDENT TO LEAVE, ensure the student has circled or annotated in some way in their student handout, what the underlying plant conditions/criteria are for the declaration made.

Notes:

This declaration must be completed within 15 minutes of the time when the applicant understands the initial conditions and initiating cue.

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: A9, DECLARE EMERGENCY ACTION LEVEL

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM - HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EXAMINER WHEN YOU HAVE COMPLETED THE TASK

INITIAL CONDITIONS:

The plant was initially at 100% power, steady-state. An RCS leak developed inside Containment. The crew determined the leak could not be isolated and had increased to greater than 200 gpm. The crew initiated a manual Reactor trip and Safety Injection. During EOP performance, the leak propagated into a Loss of Coolant Accident resulting in a rapid depressurization of the RCS to saturation conditions at 1500 psig. Reactor Vessel Water Level has been continuously lowering. Core Exit Thermocouples have been rising and exceeded 708 °F (orange path) 20 minutes ago. Containment pressure has risen to 18 psig.

Current plant conditions are:

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- RCS Tcold temperatures are 560 °F
- Pressurizer level is 0%
- Reactor Vessel Water Level (Plenum) is 5%
- Containment pressure has unexpectedly lowered rapidly to 3 psig.
- Containment Radiation levels are at 70 R/hr on RT-8050 and 8051.
- CET's 720 °F and slowly rising.

JPM - HANDOUT

INITIATING CUE:

This JPM is time-critical. The time limit starts when you (the applicant) understand the Initial Conditions and Initiating Cue.

You are the Unit 1 Shift Manager. Based on the CURRENT Plant conditions as described above:

1. Classify the event at its **MINIMUM** Emergency Classification (i.e. over-classification will be incorrect).
2. Circle or indicate in some manner in the Student Handout copy of 0ERP01-ZV-IN01, Emergency Classification, the underlying plant condition/s or criteria you used to make your determination of the classification.
3. Notify your Evaluator when you have completed the JPM.

STI 33565389	**0ERP01-ZV-IN01**	**Rev. 9**	Page 1 of 114
Emergency Classification			
Quality	Non Safety-Related	Usage: **IN HAND**	Effective Date: 06/20/12

S. Korenek	Max Keyes	N/A	Emergency Response Division
PREPARER	TECHNICAL	USER	COGNIZANT ORGANIZATION

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1.0 Purpose and Scope

1.1 This procedure provides guidance to the Emergency Director for determination of the appropriate Emergency Classification.

1.2 This procedure implements the requirements of the South Texas Project Electric Generating Station (STPEGS) Emergency Plan specific to Emergency Classification.

2.0 Definitions

2.1 AFFECTING SAFE SHUTDOWN: An event in progress has adversely affected functions that are necessary to bring the station to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Station condition applicability is determined by Technical Specification LCOs in effect.

2.2 ALERT: Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the station or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels.

2.3 EMERGENCY ACTION LEVEL (EAL): A pre-determined, site specific, observable threshold for a plant Initiating Condition that is used to place the plant in a given emergency class. [EALs can be in the form of: instrument readings, measurable parameters (on or off site), a discrete observable event, equipment status, certain natural phenomena or via Emergency Operating Procedure guidance.]

2.4 EMERGENCY CLASSIFICATION: One of a set of four titles established by the Nuclear Regulatory Commission (NRC) for grouping off-normal nuclear power plant conditions according to: (1) their relative radiological consequences; and (2) the time sensitive onsite and offsite radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classifications in ascending order of seriousness are Unusual Event, Alert, Site Area Emergency, and General Emergency.

2.5 EXCLUSION AREA BOUNDARY: The boundary of the Exclusion Area, as shown in Addendum 3. The Exclusion Area is oval shaped such that any point on the Exclusion Area Boundary is at least 1430 meters from the center of either containment building. The licensee has control over all activities within the Exclusion Area.

2.6 FACILITY: The area and buildings within the Protected Area and the switchyard.

2.7 FISSION PRODUCT BARRIER (FPB): The three boundaries for preventing the release of fission products to the environment. They are:

- Fuel Cladding
- Reactor Coolant System
- Reactor Containment Building

2.8 FUNCTIONAL: A component is fully capable of meeting its design function. It would be declared inoperable if unable to meet Technical Specifications.

2.9 GENERAL EMERGENCY (GE): Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels offsite for more than the immediate site area.

2.10 HATCH MONITOR: Temporary monitor installed when Containment Monitors RT-8050 and RT-8051 are out of service. A correction factor has been calculated to relate Hatch Monitor dose rate to the dose rate inside Containment. (CR 01-3566)

2.11 HOSTILE ACTION: An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, takes hostages, and /or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area.)

2.12 HOSTILE FORCE: One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

2.13 IMMINENT: Mitigation actions have been ineffective and trended information indicates that the event or condition will occur within 1 or 2 hours.

2.14 INITIATING CONDITION: One of a predetermined subset of nuclear power plant conditions where either the potential exists for a radiological emergency, or such an emergency has occurred.

2.15 INOPERABLE: A component does not meet Technical Specifications. The component may be functional, capable of meeting its design function.

2.16 LOSS: A component is inoperable and not functional.

2.17 NOTIFICATION OF UNUSUAL EVENT: Events are in process or have occurred which indicate a potential degradation of the level of safety of the station or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

2.18 POTENTIAL LOSS: Mitigation actions are not effective and trended information indicates that the parameters are outside desirable bands and not stable or improving.

2.19 PROTECTED AREA: That area inside the physical security boundary of the site that includes the nuclear reactor plant.

2.20 PROTECTIVE ACTION GUIDES (PAG): Environmental Protection Agency (EPA) guide for exposure to a release of radioactive material.

2.21 RADIOLOGICAL RELEASE: Any radiological release from the plant that exceeds the EAL limits established for an Unusual Event.

2.22 RECOVERY: That phase of an emergency when the emergency condition no longer exists and the plant is in a stable, shutdown, and safe condition; major repairs, if required, have been identified in order to return the plant to operation; and the potential for uncontrolled releases of radioactive material to the environment no longer exists.

2.23 SECURITY ALERT: A security related situation that requires an increased level of readiness on the part of the Security Force.

2.24 SECURITY EMERGENCY: A security related emergency situation for which prompt response by the Security Force, immediate action by plant personnel, and/or assistance from offsite agencies may be required to apprehend intruders and mitigate the effects of or prevent radiological sabotage.

2.25 SITE BOUNDARY: The edge of the plant property whose access may be controlled by the licensee. This boundary is congruent with the Exclusion Area Boundary for the purpose of dose assessment.

2.26 SITE AREA EMERGENCY (SAE): Events are in process or have occurred which involve an actual or likely major failures of station functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels beyond the site boundary.

2.27 STEAM GENERATOR TUBE RUPTURE (SGTR): A Steam Generator tube leak greater than the capacity of the Chemical and Volume Control System (CVCS) to maintain pressurizer level.

2.28 TERMINATION: Exiting the emergency condition.

2.29 THYROID COMMITTED DOSE EQUIVALENT (CDE): Total committed dose from internally deposited radionuclide over subsequent 50 year period to the Thyroid.

2.30 TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE): The sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

2.31 TRANSIENT: A planned reactor trip in which the expected post-trip response did not occur.

2.32 VALID: An Indication, report or condition is considered to be VALID when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

2.33 VITAL AREA: Locations within the Protected Area as defined by security procedures which contain equipment that directly affect the safety of the plant.

3.0 Precautions and Limitations

3.1 The Emergency Director is the only individual who can declare an emergency or change an Emergency Classification. The normal progression for Emergency Director is:

3.1.1 Shift Manager to

3.1.2 TSC Manager to

3.1.3 EOF Director

3.2 The Shift Manager/Emergency Director shall declare an emergency within a 15 minute time frame. The time frame starts when information, which exceeds an EAL, is available to any staff member trained in EAL assessment. This information may be from:

- A plant indicator or indicators.
- A report of an off-normal condition.
- Computer displays.
- Completion of dose assessments.
- Completion of chemistry analysis.
- Completion of inspections.

3.2.1 The 15 minute time frame is to assess initiating conditions and associated EALs, and validate or confirm the information. If this assessment/validation or conformation is completed before the 15 minute time frame elapses, the emergency class shall be declared as soon as possible.

- The 15 minute time frame shall not be construed as a grace period to attempt to restore plant conditions to avoid declaring an emergency class.

3.2.2 Exception: A delay in declaring the emergency class within the 15 minute time frame shall be acceptable if both of the following conditions are met:

3.2.2.1 Actions are immediately needed to protect the public health and safety and results in less risk to the general public,

AND

3.2.2.2 The Offsite Response Organizations are not denied the opportunity to implement actions to protect the public health and safety.

4.0 Responsibilities

4.1 The Emergency Director is responsible for declaring or changing an Emergency Classification based on the EALs contained in Addendum 1, Emergency Classification Tables.

4.2 Emergency Response personnel are responsible for alerting the Emergency Director of conditions which may change the emergency classification.

5.0 Procedure

NOTE

Addendum 1, Emergency Classification Tables, may be removed from the basic procedure for use in classifying emergencies.

5.1 Upon recognition of the potential for an event or plant condition to represent an emergency OR as directed from other procedures, refer to Addendum 1, Emergency Classification Tables.

5.2 Anytime Emergency Operating Procedures (EOPs) or Off-Normal Procedures are initiated, this procedure should be reviewed to determine if an emergency action level has been reached.

5.3 IF the event or condition meets EALs applicable to more than one Emergency Classification, THEN declare the highest Emergency Classification and implement the appropriate procedure.

5.4 Based on the judgment of the Emergency Director, an emergency can be declared at any level even if it is not specifically covered in Addendum 1.

5.5 Any person recognizing an emergency or potential emergency condition should notify the Emergency Director and/or Shift Manager.

5.6 Declaration of an emergency class is not required if:

5.6.1 The event or condition which met an EAL threshold no longer exists at the time of discovery.

AND

5.6.2 The event or condition was due to a rapidly concluded event or an oversight in the emergency classification.

5.6.3 Reporting requirements of 10CFR50.72 are applicable and the guidance of NUREG-1022 should be applied.

5.7 The classification of an emergency may be downgraded by the Emergency Director if appropriate for the conditions.

5.8 Use the following criteria/guidance to determine entry into Recovery or Termination:

5.8.1 Recovery

- A Site Area or General Emergency has been declared;
- The emergency condition no longer exists and the plant is in a stable, shutdown, and safe condition;
- Major repairs, if required, have been identified in order to return the plant to operation;
- The potential for uncontrolled release of radioactive material to the environment no longer exists; and
- Concurrence from the NRC, State, and County has been obtained.

5.8.2 Termination: One of the following applicable conditions exists

5.8.2.1 From Recovery

- Repairs identified during the recovery phase are complete and the plant is ready to return to normal operations.

5.8.2.2 From Alert or Unusual Event

- The emergency condition no longer exists and the plant is ready to return to normal operations; or
- The emergency condition no longer exists, repair activities are minor, and the plant is in a stable shutdown mode.

5.9 Addendum 2, Basis for Emergency Action Levels may be used in explanation of why a particular EAL was selected in classifying an emergency.

6.0 References

6.1 STPEGS Emergency Plan

6.2 Updated Final Safety Analysis Report (UFSAR)

6.3 0POP05-EO-EC00, Loss of All AC Power

6.4 0POP05-EO-FO02, Core Cooling Critical Safety Function Status Tree

6.5 0POP05-EO-FO04, Integrity Critical Safety Function Status Tree

6.6 0POP05-EO-FO05, Containment Critical Safety Function Status Tree

6.7 0POP05-EO-FRC1, Response to Inadequate Core Cooling

6.8 0POP05-EO-FRH1, Response to Loss of Secondary Heat Sink

6.9 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS

6.10 0POP04-ZO-0002, Natural and Destructive Phenomena Guidelines

6.11 0POP04-SY-0001, Seismic Event

6.12 0POP04-ZO-0001, Control Room Evacuation.

6.13 Regulatory Guide 1.101, Emergency Planning and Preparedness for Nuclear Power Reactors.

6.14 NUMARC/NESP-007. Methodology for Development of Emergency Action Levels, January, 1992

6.15 0POP01-ZA-0018, Emergency Operating Procedure User's Guide

6.16 Safeguards Contingency Plan

6.17 0SDP01-ZS-0011, Implementing Procedures for Safeguards Contingency Events

6.18 Calculation No. 91-RA-001

6.19 Calculation No. 01-RA-001, Radiation Monitor Calculations for Emergency Action Levels

6.20 03-ZE-003, RT8050/RT8051 Contingency Conversion Constant for Post-Accident Failed Fuel Monitoring

6.21 NRC Bulletin 2005-02: Emergency Preparedness and Response Actions for Security-Based Events

6.22 10 CFR Part 50, Appendix E, Section IV.C, Activation of Emergency Organization

6.23 NSIR/DRP-ISG-01, Interim Staff Guidance, Emergency Planning for Nuclear Power Plants

7.0 Support Documents

7.1 Addendum 1, Emergency Classification Tables

7.2 Addendum 2, Basis for Emergency Action Levels

7.3 Addendum 3, Exclusion Area Boundary

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RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

Determine which combination of the three barriers are lost or have a potential loss and use the following matrix to classify the event. Also, an event (or multiple events) could occur which result in the conclusion that the loss or potential loss is IMMINENT (within 1 to 2 hours). In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT (1-2)	ALERT (3-4)	SITE AREA EMERGENCY (5-8)	GENERAL EMERGENCY (9-10)
FU1 ANY Loss or ANY Potential Loss of Containment **FU2** Fuel Clad Degradation See SU6 **FU3** RCS Leakage - See SU7	**FA1** ANY Loss or ANY Potential Loss of Fuel Clad or RCS	**FS1** Loss of BOTH Fuel Clad and RCS OR Potential Loss of BOTH Fuel Clad and RCS **OR** Potential Loss of EITHER Fuel Clad or RCS **AND** Loss of ANY Additional Barrier	**FG1** Loss of ANY Two Barriers AND Potential Loss or Loss of Third Barrier

Operating Modes 1 through 4

Note: 1. At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from General Emergency.

2. The ability to escalate to higher emergency classes as an event degrades must be maintained. RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Determination of Emergency Classification Level

Select values from the top of the columns on the next page, which describe specific Fission Product Barrier degradation. Select the higher value that applies from each barrier. Add the values to arrive at the total challenge to the Fission Product Barriers. The emergency classification is determined from the range of values shown in parentheses in the table above.

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

EAL	FUEL CLAD		RCS		CONTAINMENT	
	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (1)	LOSS (2)
1	CSF Core Cooling - Orange **OR** Heat Sink - Red[2]	CSF Core Cooling - Red	CSF RCS Integrity – Red **OR** Heat Sink - Red[2]	CSF Core Cooling - Yellow with subcooling < 0 °F	CSF Containment - Red **OR** Core Cooling - Orange > 15 min.	–
2	RCS Activity Failed Fuel Monitor, RT-8039, equal to or greater than 870 µCi/ml	RCS Activity Dose Equivalent Iodine greater than 300 µCi/gm	RCS Leak Rate Unisolable leak exceeding the capacity of one centrifugal charging pump in the normal charging mode.	RCS Leak Rate Leak rate greater than CVCS System's ability to maintain RCS inventory as indicated by loss of RCS subcooling.	Containment Pressure Greater than 6% hydrogen concentration in containment **OR** Containment pressure greater than 9.5 psig with neither containment spray nor RCFC running.	Containment Pressure Initial increase followed by rapid unexplained decrease **OR** Containment pressure or sump level not increasing as expected with LOCA conditions.
3	Core Exit Thermocouple ≥ 708°F	Core Exit Thermocouple 1200°F	SG Tube Rupture SG Tube has ruptured and the primary to secondary leak rate is greater than the capacity of one centrifugal charging pump.	SG Tube Rupture SG Tube is ruptured and has a non-isolable secondary steam release	–	SG Tube Leak Primary to secondary leakage greater than 150 gpd through any one steam generator with direct secondary side leakage to atmosphere
4	Reactor Vessel Water Level Plenum level less then 20%	–	–	–	Containment Bypass VALID increase in reading on area or ventilation monitors in areas adjacent to the containment boundary with a known LOCA inside containment.	Containment Isolation Containment isolation signal **AND** Valves not closed **AND** A pathway to the environment exists.
5	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	RCB Rad Monitor RT-8050 or RT-8051 greater than 1,000 R/hr **OR** Hatch Monitor greater than 2,222 mR/hr	–

Note: 1. The Fuel Clad barrier and the RCS barrier are weighted more heavily than the Containment Barrier. Unusual Event Initiating Conditions (ICs) associated with RCS and Fuel Clad barriers are addressed under SU6 and SU7.

2. CSF indicators must be valid; outside the immediate control of the operator.

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Emergency Classification			
Quality	Non Safety-Related	Usage: **IN HAND**	Effective Date: 06/20/12

S. Korenek	Max Keyes	N/A	Emergency Response Division
PREPARER	TECHNICAL	USER	COGNIZANT ORGANIZATION

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1.0 Purpose and Scope

1.1 This procedure provides guidance to the Emergency Director for determination of the appropriate Emergency Classification.

1.2 This procedure implements the requirements of the South Texas Project Electric Generating Station (STPEGS) Emergency Plan specific to Emergency Classification.

2.0 Definitions

2.1 AFFECTING SAFE SHUTDOWN: An event in progress has adversely affected functions that are necessary to bring the station to and maintain it in the applicable HOT or COLD SHUTDOWN condition. Station condition applicability is determined by Technical Specification LCOs in effect.

2.2 ALERT: Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the station or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels.

2.3 EMERGENCY ACTION LEVEL (EAL): A pre-determined, site specific, observable threshold for a plant Initiating Condition that is used to place the plant in a given emergency class. [EALs can be in the form of: instrument readings, measurable parameters (on or off site), a discrete observable event, equipment status, certain natural phenomena or via Emergency Operating Procedure guidance.]

2.4 EMERGENCY CLASSIFICATION: One of a set of four titles established by the Nuclear Regulatory Commission (NRC) for grouping off-normal nuclear power plant conditions according to: (1) their relative radiological consequences; and (2) the time sensitive onsite and offsite radiological emergency preparedness actions necessary to respond to such conditions. The existing radiological emergency classifications in ascending order of seriousness are Unusual Event, Alert, Site Area Emergency, and General Emergency.

2.5 EXCLUSION AREA BOUNDARY: The boundary of the Exclusion Area, as shown in Addendum 3. The Exclusion Area is oval shaped such that any point on the Exclusion Area Boundary is at least 1430 meters from the center of either containment building. The licensee has control over all activities within the Exclusion Area.

2.6 FACILITY: The area and buildings within the Protected Area and the switchyard.

2.7 FISSION PRODUCT BARRIER (FPB): The three boundaries for preventing the release of fission products to the environment. They are:

- Fuel Cladding
- Reactor Coolant System
- Reactor Containment Building

2.8 FUNCTIONAL: A component is fully capable of meeting its design function. It would be declared inoperable if unable to meet Technical Specifications.

2.9 GENERAL EMERGENCY (GE): Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels offsite for more than the immediate site area.

2.10 HATCH MONITOR: Temporary monitor installed when Containment Monitors RT-8050 and RT-8051 are out of service. A correction factor has been calculated to relate Hatch Monitor dose rate to the dose rate inside Containment. (CR 01-3566)

2.11 HOSTILE ACTION: An act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, takes hostages, and /or intimidates the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included. HOSTILE ACTION should not be construed to include acts of civil disobedience or felonious acts that are not part of a concerted attack on the nuclear power plant. Non-terrorism based EALs should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area.)

2.12 HOSTILE FORCE: One or more individuals who are engaged in a determined assault, overtly or by stealth and deception, equipped with suitable weapons capable of killing, maiming, or causing destruction.

2.13 IMMINENT: Mitigation actions have been ineffective and trended information indicates that the event or condition will occur within 1 or 2 hours.

2.14 INITIATING CONDITION: One of a predetermined subset of nuclear power plant conditions where either the potential exists for a radiological emergency, or such an emergency has occurred.

2.15 INOPERABLE: A component does not meet Technical Specifications. The component may be functional, capable of meeting its design function.

2.16 LOSS: A component is inoperable and not functional.

2.17 NOTIFICATION OF UNUSUAL EVENT: Events are in process or have occurred which indicate a potential degradation of the level of safety of the station or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

2.18 POTENTIAL LOSS: Mitigation actions are not effective and trended information indicates that the parameters are outside desirable bands and not stable or improving.

2.19 PROTECTED AREA: That area inside the physical security boundary of the site that includes the nuclear reactor plant.

2.20 PROTECTIVE ACTION GUIDES (PAG): Environmental Protection Agency (EPA) guide for exposure to a release of radioactive material.

2.21 RADIOLOGICAL RELEASE: Any radiological release from the plant that exceeds the EAL limits established for an Unusual Event.

2.22 RECOVERY: That phase of an emergency when the emergency condition no longer exists and the plant is in a stable, shutdown, and safe condition; major repairs, if required, have been identified in order to return the plant to operation; and the potential for uncontrolled releases of radioactive material to the environment no longer exists.

2.23 SECURITY ALERT: A security related situation that requires an increased level of readiness on the part of the Security Force.

2.24 SECURITY EMERGENCY: A security related emergency situation for which prompt response by the Security Force, immediate action by plant personnel, and/or assistance from offsite agencies may be required to apprehend intruders and mitigate the effects of or prevent radiological sabotage.

2.25 SITE BOUNDARY: The edge of the plant property whose access may be controlled by the licensee. This boundary is congruent with the Exclusion Area Boundary for the purpose of dose assessment.

2.26 SITE AREA EMERGENCY (SAE): Events are in process or have occurred which involve an actual or likely major failures of station functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed Environmental Protection Agency (EPA) Protective Action Guideline (PAG) exposure levels beyond the site boundary.

2.27 STEAM GENERATOR TUBE RUPTURE (SGTR): A Steam Generator tube leak greater than the capacity of the Chemical and Volume Control System (CVCS) to maintain pressurizer level.

2.28 TERMINATION: Exiting the emergency condition.

2.29 THYROID COMMITTED DOSE EQUIVALENT (CDE): Total committed dose from internally deposited radionuclide over subsequent 50 year period to the Thyroid.

2.30 TOTAL EFFECTIVE DOSE EQUIVALENT (TEDE): The sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

2.31 TRANSIENT: A planned reactor trip in which the expected post-trip response did not occur.

2.32 VALID: An Indication, report or condition is considered to be VALID when it is verified by (1) an instrument channel check, or (2) indications on related or redundant indicators, or (3) by direct observation by plant personnel, such that doubt related to the indicator's operability, the condition's existence, or the report's accuracy is removed. Implicit in this definition is the need for timely assessment.

2.33 VITAL AREA: Locations within the Protected Area as defined by security procedures which contain equipment that directly affect the safety of the plant.

3.0 Precautions and Limitations

3.1 The Emergency Director is the only individual who can declare an emergency or change an Emergency Classification. The normal progression for Emergency Director is:

3.1.1 Shift Manager to

3.1.2 TSC Manager to

3.1.3 EOF Director

3.2 The Shift Manager/Emergency Director shall declare an emergency within a 15 minute time frame. The time frame starts when information, which exceeds an EAL, is available to any staff member trained in EAL assessment. This information may be from:

- A plant indicator or indicators.
- A report of an off-normal condition.
- Computer displays.
- Completion of dose assessments.
- Completion of chemistry analysis.
- Completion of inspections.

3.2.1 The 15 minute time frame is to assess initiating conditions and associated EALs, and validate or confirm the information. If this assessment/validation or conformation is completed before the 15 minute time frame elapses, the emergency class shall be declared as soon as possible.

- The 15 minute time frame shall not be construed as a grace period to attempt to restore plant conditions to avoid declaring an emergency class.

3.2.2 Exception: A delay in declaring the emergency class within the 15 minute time frame shall be acceptable if both of the following conditions are met:

3.2.2.1 Actions are immediately needed to protect the public health and safety and results in less risk to the general public,

AND

3.2.2.2 The Offsite Response Organizations are not denied the opportunity to implement actions to protect the public health and safety.

4.0 Responsibilities

4.1 The Emergency Director is responsible for declaring or changing an Emergency Classification based on the EALs contained in Addendum 1, Emergency Classification Tables.

4.2 Emergency Response personnel are responsible for alerting the Emergency Director of conditions which may change the emergency classification.

5.0 Procedure

NOTE

Addendum 1, Emergency Classification Tables, may be removed from the basic procedure for use in classifying emergencies.

5.1 Upon recognition of the potential for an event or plant condition to represent an emergency OR as directed from other procedures, refer to Addendum 1, Emergency Classification Tables.

5.2 Anytime Emergency Operating Procedures (EOPs) or Off-Normal Procedures are initiated, this procedure should be reviewed to determine if an emergency action level has been reached.

5.3 IF the event or condition meets EALs applicable to more than one Emergency Classification, THEN declare the highest Emergency Classification and implement the appropriate procedure.

5.4 Based on the judgment of the Emergency Director, an emergency can be declared at any level even if it is not specifically covered in Addendum 1.

5.5 Any person recognizing an emergency or potential emergency condition should notify the Emergency Director and/or Shift Manager.

5.6 Declaration of an emergency class is not required if:

5.6.1 The event or condition which met an EAL threshold no longer exists at the time of discovery.

AND

5.6.2 The event or condition was due to a rapidly concluded event or an oversight in the emergency classification.

5.6.3 Reporting requirements of 10CFR50.72 are applicable and the guidance of NUREG-1022 should be applied.

5.7 The classification of an emergency may be downgraded by the Emergency Director if appropriate for the conditions.

5.8 Use the following criteria/guidance to determine entry into Recovery or Termination:

5.8.1 Recovery

- A Site Area or General Emergency has been declared;
- The emergency condition no longer exists and the plant is in a stable, shutdown, and safe condition;
- Major repairs, if required, have been identified in order to return the plant to operation;
- The potential for uncontrolled release of radioactive material to the environment no longer exists; and
- Concurrence from the NRC, State, and County has been obtained.

5.8.2 Termination: One of the following applicable conditions exists

5.8.2.1 From Recovery

- Repairs identified during the recovery phase are complete and the plant is ready to return to normal operations.

5.8.2.2 From Alert or Unusual Event

- The emergency condition no longer exists and the plant is ready to return to normal operations; or
- The emergency condition no longer exists, repair activities are minor, and the plant is in a stable shutdown mode.

5.9 Addendum 2, Basis for Emergency Action Levels may be used in explanation of why a particular EAL was selected in classifying an emergency.

6.0 References

6.1 STPEGS Emergency Plan

6.2 Updated Final Safety Analysis Report (UFSAR)

6.3 0POP05-EO-EC00, Loss of All AC Power

6.4 0POP05-EO-FO02, Core Cooling Critical Safety Function Status Tree

6.5 0POP05-EO-FO04, Integrity Critical Safety Function Status Tree

6.6 0POP05-EO-FO05, Containment Critical Safety Function Status Tree

6.7 0POP05-EO-FRC1, Response to Inadequate Core Cooling

6.8 0POP05-EO-FRH1, Response to Loss of Secondary Heat Sink

6.9 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS

6.10 0POP04-ZO-0002, Natural and Destructive Phenomena Guidelines

6.11 0POP04-SY-0001, Seismic Event

6.12 0POP04-ZO-0001, Control Room Evacuation.

6.13 Regulatory Guide 1.101, Emergency Planning and Preparedness for Nuclear Power Reactors.

6.14 NUMARC/NESP-007. Methodology for Development of Emergency Action Levels, January, 1992

6.15 0POP01-ZA-0018, Emergency Operating Procedure User's Guide

6.16 Safeguards Contingency Plan

6.17 0SDP01-ZS-0011, Implementing Procedures for Safeguards Contingency Events

6.18 Calculation No. 91-RA-001

6.19 Calculation No. 01-RA-001, Radiation Monitor Calculations for Emergency Action Levels

6.20 03-ZE-003, RT8050/RT8051 Contingency Conversion Constant for Post-Accident Failed Fuel Monitoring

6.21 NRC Bulletin 2005-02: Emergency Preparedness and Response Actions for Security-Based Events

6.22 10 CFR Part 50, Appendix E, Section IV.C, Activation of Emergency Organization

6.23 NSIR/DRP-ISG-01, Interim Staff Guidance, Emergency Planning for Nuclear Power Plants

7.0 Support Documents

7.1 Addendum 1, Emergency Classification Tables

7.2 Addendum 2, Basis for Emergency Action Levels

7.3 Addendum 3, Exclusion Area Boundary

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RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

Determine which combination of the three barriers are lost or have a potential loss and use the following matrix to classify the event. Also, an event (or multiple events) could occur which result in the conclusion that the loss or potential loss is IMMINENT (within 1 to 2 hours). In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT (1-2)	ALERT (3-4)	SITE AREA EMERGENCY (5-8)	GENERAL EMERGENCY (9-10)
FU1 ANY Loss or ANY Potential Loss of Containment **FU2** Fuel Clad Degradation See SU6 **FU3** RCS Leakage - See SU7	**FA1** ANY Loss or ANY Potential Loss of Fuel Clad or RCS	**FS1** Loss of BOTH Fuel Clad and RCS OR Potential Loss of BOTH Fuel Clad and RCS **OR** Potential Loss of EITHER Fuel Clad or RCS **AND** Loss of ANY Additional Barrier	**FG1** Loss of ANY Two Barriers AND Potential Loss or Loss of Third Barrier

Operating Modes 1 through 4

Note: 1. At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from General Emergency.

2. The ability to escalate to higher emergency classes as an event degrades must be maintained. RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Determination of Emergency Classification Level

Select values from the top of the columns on the next page, which describe specific Fission Product Barrier degradation. Select the higher value that applies from each barrier. Add the values to arrive at the total challenge to the Fission Product Barriers. The emergency classification is determined from the range of values shown in parentheses in the table above.

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

EAL	FUEL CLAD		RCS		CONTAINMENT	
	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (1)	LOSS (2)
1	CSF Core Cooling - Orange **OR** Heat Sink - Red[2]	CSF Core Cooling - Red	CSF RCS Integrity – Red **OR** Heat Sink - Red[2]	CSF Core Cooling - Yellow with subcooling < 0 °F	CSF Containment - Red **OR** Core Cooling - Orange > 15 min.	–
2	RCS Activity Failed Fuel Monitor, RT-8039, equal to or greater than 870 µCi/ml	RCS Activity Dose Equivalent Iodine greater than 300 µCi/gm	RCS Leak Rate Unisolable leak exceeding the capacity of one centrifugal charging pump in the normal charging mode.	RCS Leak Rate Leak rate greater than CVCS System's ability to maintain RCS inventory as indicated by loss of RCS subcooling.	Containment Pressure Greater than 6% hydrogen concentration in containment **OR** Containment pressure greater than 9.5 psig with neither containment spray nor RCFC running.	Containment Pressure Initial increase followed by rapid unexplained decrease **OR** Containment pressure or sump level not increasing as expected with LOCA conditions.
3	Core Exit Thermocouple ≥ 708°F	Core Exit Thermocouple 1200°F	SG Tube Rupture SG Tube has ruptured and the primary to secondary leak rate is greater than the capacity of one centrifugal charging pump.	SG Tube Rupture SG Tube is ruptured and has a non-isolable secondary steam release	–	SG Tube Leak Primary to secondary leakage greater than 150 gpd through any one steam generator with direct secondary side leakage to atmosphere
4	Reactor Vessel Water Level Plenum level less then 20%	–	–	–	Containment Bypass VALID increase in reading on area or ventilation monitors in areas adjacent to the containment boundary with a known LOCA inside containment.	Containment Isolation Containment isolation signal **AND** Valves not closed **AND** A pathway to the environment exists.
5	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	RCB Rad Monitor RT-8050 or RT-8051 greater than 1,000 R/hr **OR** Hatch Monitor greater than 2,222 mR/hr	–

Note: 1. The Fuel Clad barrier and the RCS barrier are weighted more heavily than the Containment Barrier. Unusual Event Initiating Conditions (ICs) associated with RCS and Fuel Clad barriers are addressed under SU6 and SU7.

2. CSF indicators must be valid; outside the immediate control of the operator.

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX

ELECTRICAL

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SG1 Prolonged Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses. **Modes: 1-4**	**EAL-1** Entry into 0POP05-EO-EC00, Loss of ALL AC Power, for greater than 15 minutes. **AND** Either of the following conditions exists: a. Restoration of at least one 4160V AC ESF Bus within 4 hours is not likely. **OR** b. Degradation of core cooling is indicated by a valid Red or Orange path on the Core Cooling Critical Safety Function Status Tree.	**GE**
SS1 Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses. **Modes: 1-4**	**EAL-1** No voltage on all 4160 VAC ESF busses for greater than 15 minutes.	**SAE**
SS3 Loss of All Class 1E DC Power. **Modes: 1-4**	**EAL-1** Less than 107 volts DC on ALL four (4) ESF DC battery busses for greater than 15 minutes.	**SAE**
SA1 Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses During Cold Shutdown or Refueling. **Modes: 5, 6, and Defueled**	**EAL-1** No voltage on all 4160 VAC ESF busses for greater than 15 minutes.	**ALERT**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX

ELECTRICAL

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SA5 AC Power Capability to the Three 4160V AC ESF Busses is Reduced to a Single Power Source for Greater than 15 Minutes Such that Any Additional Single Failure Would Result in loss of ALL AC power. **Modes: 1-4**	**EAL-1** The following conditions exist: a. Loss of power to the STBY 1 XFMR, STBY 2 XFMR, UAT, and 13.8 KV Emergency bus 1(2)L for greater than 15 minutes. **AND** b. Onsite power capability has been degraded to a single ESF diesel generator capable of supplying power to at least one ESF bus. **EAL-2** The following conditions exist: a. One of the following offsite power supplies is providing power to ALL of the energized 4160 ESF busses: - STBY 1 XFMR - STBY 2 XFMR - UAT - 13.8 KV Emergency bus 1(2)L **AND** b. ESF DGs 11(21), 12(22), AND 13(23) are not capable of providing power to their respective bus.	**ALERT**
SU1 Loss of Offsite Power to ESF Busses for Greater than 15 Minutes. **Modes: 1-6, Defueled**	**EAL-1** The following conditions exist: a. Loss of power to the STBY 1 XFMR, STBY 2 XFMR, UAT, and 13.8 KV Emergency bus 1(2)L for greater than 15 minutes. **AND** b. At least 2 ESF DGs are supplying power to their respective busses.	**UE**
SU5 Unplanned Loss of Class 1E DC Power During Cold Shutdown or Refueling for Greater than 15 Minutes. **Modes: 5 and 6**	**EAL-1** Loss of ESF DC Power to Channel 1 and Channel 4 based on Battery Bus Voltage less than 107 volts DC for greater than 15 minutes.	**UE**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX
REACTOR PROTECTION/TECHNICAL SPECIFICATION SHUTDOWNS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SG2 Failure of the Reactor Protection System to Complete an Automatic Reactor Trip. **AND** Manual Reactor Trip Was NOT Successful. **AND** There is Indication of an Extreme Challenge to the Ability to Cool the Core. **Modes: 1 and 2**	**EAL-1** Entry into 0POP05-EO-FRS1, Response to Nuclear Power Generation – ATWS. **AND** Either of the following: a. Degradation of core cooling is indicated by a valid Red path on the Core Cooling Critical Safety Function Status Tree. **OR** b. Degradation of heat sink is indicated by a valid Red path on the Heat Sink Critical Safety Function Status Tree.	**GE**
SS2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Set point Has Been Exceeded. **AND** Manual Reactor Trip Was NOT Successful. **Modes: 1 and 2**	**EAL-1** Entry into 0POP05-EO-FRS1, Response to Nuclear Power Generation – ATWS.	**SAE**
SA2 Failure of Reactor Protection System Instrumentation To Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Set point Has Been Exceeded and Manual Reactor Trip Was Successful from the Control Room. **Modes: 1-3**	**EAL-1** Reactor Protection System set point exceeded with NO automatic trip. **AND** A manual reactor trip was required for plant shutdown.	**ALERT**
SU2 Operation Outside the Plant Safety Envelope As Defined By Technical Specifications. **Modes: 1-4**	**EAL-1** The plant cannot be brought to the required operating mode within Technical Specifications LCO Action Statement Time.	**UE**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX
COMMUNICATIONS/ALARMS/ASSESSMENT

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SS6 Inability to Monitor a Significant Transient in Progress. **Modes: 1-4**	**EAL-1** The following conditions exist: a. Loss of Control Room Indicators and Annunciators associated with Safety Systems. **AND** b. Compensatory Non-Alarming Indications are Unavailable (e.g. QDPS, ICS, ERFDADS, Control Board, or Local Alarms). **AND** c. Significant transient in progress.	**SAE**
SA4 Unplanned Loss of Most Control Room Safety System Annunciation or Indication with Either (1) a Significant Transient In Progress, or (2) Compensatory Indicators are Unavailable. **Modes: 1-4**	**EAL-1** The following conditions exist: a. Loss of most (>50%) of Control Room Safety System annunciators or indicators for greater than 15 minutes. **AND** b. The Shift Manager determines that the loss of the annunciators or indicators requires increased surveillance of compensatory indicators (e.g. Control Board Indicators, Local Indicators, QDPS, ICS, ERFDADS) to safely operate the unit. **AND** c. Annunciator or Indicator Loss does not result from planned action. **AND** d. Either of the following conditions exist: 1. A significant plant transient is in progress. **OR** 2. Compensatory indications are unavailable or cannot be adequately monitored with on-shift personnel.	**ALERT**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX

COMMUNICATIONS/ALARMS/ASSESSMENT

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SU3 Unplanned Loss of Most Control Room Safety System Annunciation or Indication for Greater than 15 Minutes. **Modes: 1-4**	**EAL-1** The following conditions exist: a. Loss of most (>50%) of Control Room Safety System annunciators or indicators for greater than 15 minutes. **AND** b. Compensatory indications are available and can be adequately monitored with on-shift personnel. **AND** c. The Shift Manager determines that the loss of the annunciators or indicators requires increased surveillance of compensatory indications (e.g. Control Board Indicators, Local Indicators, QDPS, ICS, ERFDADS) to safely operate the unit. **AND** d. Annunciator or indicator loss is not the result of planned action.	**UE**
SU4 Unplanned Loss of All Onsite or Offsite Communications Capabilities. **Modes: At all times**	**EAL-1** Unplanned loss of ALL onsite telephone, radio and headset communications capability affecting the ability to perform routine operations. **EAL 2** Unplanned loss of ALL onsite to offsite telephone and FAX communications capability: Plant telephone system, DPS/MCSO Ringdown Line, STP Coordinator (QSE) Ringdown Line, NRC ENS Line.	**UE**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX

SHUTDOWN MAINTENANCE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SS4 Complete Loss of Any Function Needed to Achieve or Maintain Hot Shutdown. **Modes: 1-4**	**EAL-1** Modes 1-3 - Loss of all feedwater function (main, startup, and auxiliary) indicated by SG narrow range level less than 14% [34%] in ALL SGs AND total feedwater flow less than 576 gpm. **EAL-2** Mode 4 - Loss of RHR function indicated by entry into 0POP04-RH-0001, Loss of Residual Heat Removal, AND loss of all feedwater function (main, startup, and auxiliary) indicated by SG narrow range level less than 14% [34%] in ALL SGs AND total feedwater flow less than 576 gpm.	**SAE**
SS5 Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel. **Modes: 5 and 6**	**EAL-1** Loss of Reactor Vessel Water Level as indicated by: a. Loss of all Decay Heat Removal Cooling as determined by entry into, 0POP04-RH-0001, Loss of Residual Heat Removal. **AND** b. The Core is or will be uncovered as indicated by: RCS Narrow Range Hot Leg Level less than -2 inches (Elev. 32'-1").	**SAE**

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX

SHUTDOWN MAINTENANCE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SA3 Inability to Maintain Plant in Cold Shutdown. **Modes: 5 and 6**	**EAL-1** The following conditions exist: a. Less than 2 RHR loops are functional. **AND** b. Temperature increase that either: 1. Results in Tavg exceeding 200°F. **OR** 2. Results in uncontrolled* temperature rise, causing Tavg to approach 200°F.	**ALERT**

*Outside the immediate control of the operator. This EAL is intended to preserve the anticipatory philosophy of the Emergency Classification Scheme.

RECOGNITION CATEGORY S
SYSTEMS
INITIATING CONDITION MATRIX
FISSION PRODUCT BARRIER - THRESHOLD LEVELS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
SA6 Fuel Clad Degradation. **Modes: 1-6**	**EAL-1** Failed Fuel Monitor, RT-8039, indicates greater than or equal to 870 μCi/ml and this reading is not the result of a crud burst as confirmed by a grab sample. **EAL-2** Dose Equivalent Iodine (DEI) sample greater than 300 μCi/gm.	**ALERT**
SU6 Fuel Clad Degradation. **Modes: 1-6**	**EAL-1** Failed Fuel Monitor, RT-8039, indicates greater than or equal to 300 μCi/ml and this reading is not the result of a crud burst as confirmed by a grab sample. **EAL-2** Dose Equivalent Iodine (DEI) sample greater than Technical Specification limitations.	**UE**
SU7 RCS Leakage. **Modes: 1-4**	**EAL-1** Unidentified or pressure boundary leakage greater than 10 gpm. **EAL-2** Identified leakage greater than 25 gpm.	**UE**

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIOLOGICAL RELEASE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RG1 Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1,000 mrem TEDE or 5,000 mrem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology. **Modes: At all times**	**EAL 1** A valid reading on one or more of the following monitors that exceeds the value shown. **UNIT VENT** RT-8010B > 2.00 E+8 µCi/sec ***MAIN STEAM LINE** RT-8046 > 50 µCi/ml RT-8047 > 50 µCi/ml RT-8048 > 50 µCi/ml RT-8049 > 50 µCi/ml **AND** An offsite dose assessment using 0ERP01-ZV-TP01, Offsite Dose Calculations, using actual meteorology cannot be completed within 15 minutes. **IF** an offsite dose assessment is completed, refer to EAL-2. **EAL-2** Dose assessment indicates dose consequences greater than 1,000 mrem TEDE and/or 5,000 mrem thyroid CDE. **EAL-3** Field survey results indicate site boundary dose rates exceeding 1,000 mrem/hr expected to continue for more than one hour; **OR** Analysis of field survey samples indicate thyroid dose commitment of 5,000 mrem for one hour of inhalation.	**GE**

*Main Steam Line Monitors RT-8046 thru RT-8049 assumes a Gap Inventory and a steam release into the environment of 1.05 E+6 lbs./hr

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIOLOGICAL RELEASE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RS1 Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mrem TEDE or 500 mrem Thyroid CDE for the Actual or Projected Duration of the Release. **Modes: At all times**	**EAL-1** A valid reading on one or more of the following monitors that exceeds or is expected to exceed the value shown. **UNIT VENT** RT-8010B > 2.00 E+7 µCi/sec ***MAIN STEAM LINE** RT-8046 > 5 µCi/ml RT-8047 > 5 µCi/ml RT-8048 > 5 µCi/ml RT-8049 > 5 µCi/ml **AND** An offsite dose assessment using 0ERP01-ZV-TP01, Offsite Dose Calculations, using actual meteorology cannot be completed within 15 minutes. **IF** an offsite dose assessment is completed, refer to EAL-2. **EAL-2** Dose assessment indicates dose consequences greater than 100 mrem TEDE and/or 500 mrem thyroid CDE. **EAL-3** Field survey results indicate site boundary dose rates exceeding 100 mrem/hr expected to continue for more than one hour; **OR** Analysis of field survey samples indicate thyroid dose commitment of 500 mrem for one hour of inhalation.	**SAE**

*Main Steam Line Monitors RT-8046 thru RT-8049 assumes a Gap Inventory and a steam release into the environment of 1.05 E+6 lbs./hr

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIOLOGICAL RELEASE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RA1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 25 Times the Unusual Event EALs at the site boundary for 15 Minutes or Longer. **Modes: At all times**	**EAL-1** A valid reading on the following monitor that exceeds the value shown indicating that the release may have exceeded the emergency criterion. **UNIT VENT** RT-8010B > 2.50 E+6 μCi/sec for 15 minutes **EAL-2** Confirmed sample analysis for gaseous releases indicates concentrations or release rates with a release duration of 15 minutes or longer in excess of 2.50 E-5 μCi/ml at the site boundary. **EAL-3** Confirmed sample analysis of liquid releases indicates concentration or release rates in excess of 25 times the Effluent Concentration Limit at the site boundary. **EAL-4** Site boundary radiation dose rate ≥ 3 mrem/hr for greater than 15 minutes based on dose projections or field team measurements.	**ALERT**

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIOLOGICAL RELEASE

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RU1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two (2) Times the ODCM Limit at the site boundary for expected duration of 60 Minutes or Longer. **Modes: At all times**	**EAL-1** A valid reading on the following monitor that exceeds the value shown indicating that the release may have exceeded the emergency criterion. **UNIT VENT** RT-8010B > 1.00 E+5 μCi/sec for 60 minutes **EAL-2** Confirmed sample analyses for gaseous releases indicates concentrations or release rates with a release duration of 60 minutes or longer in excess of 1.00 E-6 μCi/ml (two times the Effluent Concentration Limit*) at the site boundary. **EAL-3** Confirmed sample analysis for liquid releases indicates concentration or release rates with a release duration of 60 minutes or longer in excess of two (2) times the Effluent Concentration Limit at the site boundary. **EAL-4** Valid dose rate projection ≥ 0.1 mrem/hr at the site boundary for 60 minutes or longer.	**UE**

* The Effluent Concentration Limit for Xe-133 is 5.00 E-7 μCi/ml.

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIATION LEVELS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RG2 Unexpected Increase in Containment Radiation Levels. **Modes: 1-4**	**EAL-1** Valid reading on RCB High Range Monitors, RT-8050 or RT-8051 greater than 1,000 R/hr. **OR** Valid reading on Hatch Monitor greater than 2,222 mR/hr.	**GE**
RS2 Unexpected Increase in Containment Radiation Levels. **Modes: 1-4**	**EAL-1** Valid reading on RCB High Range Monitors, RT-8050 or RT-8051 greater than 100 R/hr. **OR** Valid reading on Hatch Monitor greater than 222 mR/hr.	**SAE**
RA2 Major Damage to Irradiated Fuel or Loss of Water Level that has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel. **Modes: At all times**	**EAL-1** Valid readings on one or more of the following monitors: FHB Exhaust, RT-8035 > 5.00 E-2 μCi/ml FHB Exhaust, RT-8036 > 5.00 E-2 μCi/ml Area Detector (68' FHB), RE-8090 > 5,000 mR/hr **EAL-2** Valid readings on the following radiation monitor with spent nuclear fuel in the Refueling Cavity or Inside Containment Storage Area (ICSA). (Mode 6 Only). Area Detector (68' RCB), RE-8099 > 5,000 mR/hr **EAL-3** Irradiated fuel uncovered (actual or potential) based on observation OR water level below top of fuel storage racks.	**ALERT**

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIATION LEVELS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RA3 Release of Radioactive Material or Increases in Radiation Levels that Impedes Operation of Systems Required to Maintain Safe Operation or to Establish or Maintain Cold Shutdown. **Modes: At all times**	Valid Readings on any of the following Area Detectors: **EAL-1** RE-8066 > 15 mR/hr (35' EAB) **EAL-2** RE-8058 > 5.00 E+3 mR/hr (10' MAB) RE-8060 > 5.00 E+3 mR/hr (10' MAB) RE-8061 > 5.00 E+3 mR/hr (10' MAB) RE-8062 > 5.00 E+3 mR/hr (10' MAB) RE-8063 > 5.00 E+3 mR/hr (29' MAB) RE-8077 > 5.00 E+3 mR/hr (60' MAB) RE-8084 > 5.00 E+3 mR/hr (-29' FHB) RE-8085 > 5.00 E+3 mR/hr (-29' FHB) RE-8086 > 5.00 E+3 mR/hr (-29' FHB) RE-8087 > 5.00 E+3 mR/hr (-29' FHB) RE-8090 > 5.00 E+3 mR/hr (68' FHB)	**ALERT**

RECOGNITION CATEGORY R
RADIOLOGICAL
INITIATING CONDITION MATRIX

RADIATION LEVELS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
RU2 Unexpected Increase in Plant Radiation Levels or Airborne Concentrations. **Modes: At all times**	**EAL-1** Valid Readings on any of the following Area Detectors greater than 1,000 Times 24 hr. average. RE-8052, (-11' RCB) RE-8053, (-11' RCB) RE-8054, (19' RCB) RE-8055, (68' RCB) RE-8056, (52' RCB) RE-8057, (10' EAB) RE-8058, (10' MAB) RE-8059, (10' MAB) RE-8060, (10' MAB) RE-8061, (10' MAB) RE-8062, (10' MAB) RE-8063, (29' MAB) RE-8064, (29' MAB) RE-8065, (29' MAB) RE-8066, (35' EAB) RE-8067, (35' EAB) RE-8068, (41' MAB) RE-8069, (OSC) RE-8070, (41' MAB) RE-8071, (41' MAB) RE-8072, (41' MAB) RE-8073, (41' MAB) RE-8074, (41' MAB) RE-8075, (41' MAB) RE-8076, (60' EAB) RE-8077, (60' MAB) RE-8078, (60' MAB) RE-8079, (60' MAB) RE-8080, (41' MAB) RE-8081, (68' FHB) RE-8082, (60' MAB) RE-8083, (41' MAB) RE-8084, (-29' FHB) RE-8085, (-29' FHB) RE-8086, (-29' FHB) RE-8087, (-29' FHB) RE-8088, (30' FHB) RE-8089, (68' FHB) RE-8090, (68' FHB) RE-8091, (68' FHB) RE-8092, (29' TGB) RE-8093, (29' TGB) RE-8094, (TSC) RE-8097, (68' FHB) RE-8098, (60' MAB) RE-8099, (60' RCB) RE-8100, (35' EAB) RE-8101, (35' EAB) **EAL-2** Uncontrolled* loss of water level in the Spent Fuel Pool and Fuel Transfer Canal with all irradiated fuel assemblies remaining covered by water. **EAL-3** Uncontrolled* decrease of water level in the Refueling Cavity/ICSA with all irradiated fuel assemblies remaining covered with water. (Mode 6 Only).	**UE**

*Outside the immediate control of the operator

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

SECURITY

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HG1 Security Event Resulting in Loss of Physical Control of the Facility. **Modes: At all times**	**EAL-1** A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions.	**GE**
HS1 Security Event in the Vital Area. **Modes: At all times**	**EAL-1** Intrusion into a Vital Area by a hostile force. **EAL-2** Security Emergency that in the judgment of the Emergency Director could prevent safe shutdown or interfere with maintaining safe shutdown conditions. **EAL-3** Confirmed presence of an explosive device in a Vital Area.	**SAE**
HS4 Site Attack. **Modes: At all times**	**EAL-1** A notification from Security that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the protected area.	**SAE**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

SECURITY

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HA4 Security Event in the Protected Area. **Modes: At all times**	**EAL-1** Security Emergency as determined from the Safeguards Contingency Plan.	**ALERT**
HA7 Notification of an Airborne Attack Threat. **Modes: At all times**	**EAL-1** A validated notification from NRC of an airliner attack threat less than 30 minutes away.	**ALERT**
HA8 Notification of HOSTILE ACTION within the Owner Controlled Area. **Modes: At all times**	**EAL-1** A notification from the Security Force that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the Owner Controlled Area.	**ALERT**
HU4 Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant. **Modes: At all times**	**EAL-1** Security Alert as defined by the Safeguards Contingency Plan. **EAL-2** A credible South Texas Project security threat notification. **EAL-3** A validated notification from NRC providing information of an aircraft threat.	**UE**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

FIRE/EXPLOSION

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HA2 Fire or Explosion in a Vital Area Potentially Affecting Safe Shutdown or Decay Heat Removal. **Modes: See specific EAL**	**EAL-1** Fire or Explosion potentially affecting Safe Shutdown Equipment or systems required for decay heat removal. **(Modes: 1-6)** The following conditions exist: a. Fire or explosion in any of the following areas: • Mechanical/Electrical Auxiliary Building • Reactor Containment Building • Isolation Valve Cubicle • Diesel Generator Building • Essential Cooling Water Intake Structure **AND** b. Affected system parameter indications show degraded performance or plant personnel report visible damage to systems structures or components within the specified area required for safe shutdown. **EAL-2** Fire or explosion in one or more of the areas listed below which impacts ability to maintain cooling for spent fuel. • Fuel Handling Building • Mechanical/Electrical Auxiliary Building **(Modes: At all times)**	**ALERT**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

FIRE/EXPLOSION

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HU2 Fire or Explosion in the Protected Area or Switchyard which Affects Normal Operation. **Modes: At all times**	**EAL-1** Fire within the areas below which is not under control within 15 minutes of initial notification. **EAL-2** Explosion in or adjacent to any of the following areas which damages equipment necessary for normal plant operation. Areas considered for EAL-1 and EAL-2: • Switchyard • Turbine Generator Building • Mechanical/Electrical Auxiliary Building • Fuel Handling Building • Reactor Containment Building • Essential Cooling Water Intake Structure • Isolation Valve Cubicle • Diesel Generator Building • Circulating Water Intake Structure	**UE**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

TOXIC/FLAMMABLE GAS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HA3 Toxic/Flammable Gases Potentially Affecting Safe Operation. **Modes: At all times**	**EAL-1** Confirmed entry of toxic gas into Control Room envelope. **EAL-2** Uncontrolled entry of flammable gas into a Vital Area. **EAL-3** Uncontrolled entry of toxic gas into the facility in life threatening concentration or into a Vital Area where lack of access constitutes a safety problem.	**ALERT**
HU3 Toxic/Flammable Gases Affecting Plant Operation. **Modes: At all times**	**EAL-1** Onsite toxic or flammable gas release which requires evacuation of areas within the Protected Area. **EAL-2** Report by Local, County or State Officials for potential evacuation of site personnel based on offsite event.	**UE**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX
NATURAL OR DESTRUCTIVE PHENOMENA

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HA1 Natural or Destructive Phenomena Potentially Affecting Safe Operation. **Modes: At all times**	**EAL-1** Seismic motion exceeding Operating Basis Earthquake (OBE) as indicated by Seismic monitor alarm and confirmed by 0POP04-SY-0001. **EAL-2** Tornado or high wind causing visible structural damage to any of the following plant structures: • Reactor Containment Building • ECW Intake Structure • Mechanical/Electrical Auxiliary Building • Isolation Valve Cubicle • Fuel Handling Building • Diesel Generator Building **EAL-3** Entry of floodwater into safety related structures such that the function of safety related equipment is jeopardized. **EAL-4** Predicted or actual breach of Main Cooling Reservoir retaining dike along North Wall. **EAL-5** Vehicle crash affecting a plant Vital Area. **EAL-6** Turbine failure generated missiles result in any visible structural damage to or penetration of any of the following plant areas: • Reactor Containment Building • ECW Intake Structure • Mechanical/Electrical Auxiliary Building • Isolation Valve Cubicle • Fuel Handling Building • Diesel Generator Building	**ALERT**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX
NATURAL OR DESTRUCTIVE PHENOMENA

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HU1 Natural or Destructive Phenomena Affecting Plant Operations. **Modes: At all times**	**EAL-1** Earthquake detected by seismic monitoring system and confirmed by 0POP04-SY-0001, Seismic Event. **EAL-2** Tornado striking facilities within the Protected Area. **EAL-3** Shutdown of the facility required due to actual or predicted natural phenomenon in accordance with 0POP04-ZO-0002, Natural or Destructive Phenomena Guidelines. **EAL-4** Vehicle crash into plant structures or systems within the Protected Area. **EAL-5** Report of main turbine failure resulting in casing penetration. **OR** Damage to turbine or generator seals.	**UE**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX
CONTROL ROOM EVACUATION

INITIATING CONDITIONS	EMERGENCY ACTION LEVEL	CLASS
HS2 Control Room Evacuation and Plant Control Cannot be Established. **Modes: 1-6**	**EAL-1** 1. The following conditions exist: a. Control Room evacuation has been initiated per 0POP04-ZO-0001, Control Room Evacuation. **AND** b. Control of the plant cannot be established by completion of step 14 of 0POP04-ZO-0001 within 15 minutes.	**SAE**
HA5 Control Room Evacuation. **Modes: 1-6**	**EAL-1** The Control Room is evacuated and the plant is being controlled per 0POP04-ZO-0001, Control Room Evacuation.	**ALERT**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

MISCELLANEOUS EVENTS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HG2 Miscellaneous Events which May Potentially Result in a Hazard to the Public. **Modes: At all times**	**EAL-1** Other conditions exist which in the judgment of the Emergency Director indicate: a. Actual or imminent substantial core degradation with potential for loss of containment. **OR** b. Potential for uncontrolled radionuclide releases. These releases can reasonably be expected to exceed EPA PAG plume exposure levels outside the site boundary.	**GE**
HS3 Miscellaneous Events Affect the Ability to Shutdown the Plant or Maintain it in a Safe Shutdown Condition. **Modes: At all times**	**EAL-1** Other conditions exist which in the judgment of the Emergency Director indicate actual or likely major failures of plant functions needed for protection of the public.	**SAE**
HA6 Miscellaneous Events Potentially Affecting Safe Plant Operation. **Modes: At all times**	**EAL-1** Essential Cooling Pond (ECP) level less than 23.0 ft. mean sea level with no make-up available. **EAL-2** Other conditions exist which in the judgment of the Emergency Director indicate that plant safety systems may be degraded and that increased monitoring of plant functions is warranted.	**ALERT**

RECOGNITION CATEGORY H
HAZARDS
INITIATING CONDITION MATRIX

MISCELLANEOUS EVENTS

INITIATING CONDITION	EMERGENCY ACTION LEVEL	CLASS
HU5 Miscellaneous Events Affecting Plant Operations. **Modes: At all times**	**EAL-1** Essential Cooling Pond (ECP) level less than 25.0 ft. mean sea level. **EAL-2** Uncontrolled RCS Cooldown due to Secondary Depressurization. **EAL-3** Other conditions exist which in the judgment of the Emergency Director indicate a potential degradation of the level of safety of the plant.	**UE**

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FUEL CLAD BARRIER

EAL-1, Critical Safety Function (CSF) Status

Potential Loss

Core Cooling - ORANGE indicates subcooling has been lost and that some clad damage may occur. Heat Sink-RED indicates the heat sink function is under extreme challenge and thus a potential loss of the fuel clad barrier. A declaration should not be made if Heat Sink -RED is the result of operator control of auxiliary feedwater flow.

Loss

Core Cooling - RED indicates significant superheating and core uncovery and is considered to indicate loss of the fuel-clad barrier.

EAL-2, Reactor Coolant System (RCS) Activity

Potential Loss

A Failed Fuel Monitor reading of 870 microcuries/ml or greater indicates possible clad failure of about 1%.

Loss

A coolant activity level of 300 microcuries/gm Dose Equivalent I-131 is well above that for iodine spikes and indicates significant clad heating and a loss of the fuel clad barrier.

FUEL CLAD BARRIER, CONTINUED

EAL-3, Core Exit Thermocouple

Potential Loss

Core Exit Thermocouple readings of between ≥ 708°F and 1200°F would indicate a loss of subcooling with the potential for fuel clad damage. This reading is redundant with the value needed to achieve Critical Safety Function Core Cooling - Orange.

Loss

Core Exit Thermocouple readings of 1200°F or higher corresponds to significant superheating of the coolant. This is redundant with the value needed to achieve Critical Safety Function Core Cooling - Red and should be considered an indicator of loss of fuel clad barrier.

EAL-4, Reactor Vessel Water Level

Potential Loss

A Reactor Vessel Water Level plenum reading of less than 20% corresponds to the Critical Safety Function Core Cooling - Orange and is indicative that without corrective actions the top of the active core could become uncovered leading to a core melt sequence.

Loss

None

EAL-5, Reactor Containment Building (RCB) Radiation Monitors

Potential Loss

None

Loss

A reading of greater than 100 R/hr on the RCB Accident Monitors or 222 mR/hr on the Hatch Monitor indicates release of reactor coolant, with elevated activity indicative of fuel damage. This value assumes the instantaneous release and dispersal into the containment of the reactor coolant noble gas and iodine inventory associated with 2% gap activity. This value is the same as that in RCS Barrier Loss EAL-5, and this EAL indicates a loss of both the fuel clad and RCS barriers.

REACTOR COOLANT SYSTEM (RCS) BARRIER

EAL-1, Critical Safety Function (CSF) Status

Potential Loss

A RED path on these Critical Safety Functions indicates an extreme challenge and a potential loss of the RCS barrier. A declaration should not be made if Heat Sink - RED is the result of operator control of auxiliary feedwater flow.

Loss

A YELLOW path with subcooling less than 0°F in Core Cooling indicates that subcooling has been lost because of inadequate makeup capability.

EAL-2, Reactor Coolant System (RCS) Leak Rate

Potential Loss

Normal RCS make up capacity of one centrifugal charging pump (CCP) is unable to maintain RCS liquid inventory. The capacity of one CCP is 240 gpm which is the approximate design flow of a CCP with the RCS at 2235 psig and is the maximum charging flow identified in 0POP01-ZA-0018, Emergency Operating Procedure User's Guide. Any event that results in significant RCS inventory shrinkage will result in no lower than an ALERT emergency classification.

Loss

Conditions are such that leakage from the RCS is greater than the available inventory control capacity such that a loss of subcooling has occurred. The loss of subcooling is the fundamental indication that the inventory control systems are inadequate.

REACTOR COOLANT SYSTEM (RCS) BARRIER, CONTINUED

EAL-3, Steam Generator (SG) Tube Rupture

Potential Loss

Normal operation of CVCS is unable to maintain RCS liquid inventory. The capacity of one CCP is 240 gpm which is the approximate design flow of a CCP with the RCS at 2235 psig and is the maximum charging flow identified in 0POP01-ZA-0018. Any event that results in significant RCS inventory shrinkage will result in no lower than an ALERT emergency classification.

Loss

This EAL indicates that there is a direct release of radioactive fission and activation products to the environment. This EAL also means Containment Loss EAL-3 is exceeded.

EAL-5, Reactor Containment Building (RCB) Radiation Monitors

Potential Loss

None

Loss

A reading of greater than 100 R/hr on the RCB Accident Monitors or 222 mR/hr on the Hatch Monitor indicates release of reactor coolant, with elevated activity indicative of fuel damage. This value assumes the instantaneous release and dispersal into the containment of the reactor coolant noble gas and iodine inventory associated with 2% gap activity. This value is the same as that in Fuel Clad Barrier Loss EAL-5, and this EAL indicates a loss of both the fuel clad and RCS barriers.

CONTAINMENT BARRIER

EAL-1, Critical Safety Function (CSF) Status

Potential Loss

A RED path on the Containment Critical Safety Function indicates an extreme challenge to the containment barrier and its potential loss due to pressure greater than design.

A Core Cooling ORANGE path represents an imminent melt situation which could lead to vessel failure and an increased potential for containment failure. In conjunction with the Fuel Clad and RCS Barrier EALs, this EAL results in the declaration of a General Emergency. Fifteen (15) minutes is chosen to provide a reasonable period to allow function restoration procedures to arrest the core melt sequence. This EAL should be entered as soon as it is recognized that the function restoration procedures have not been, or will not be, effective.

Loss

None

EAL-2, Containment Pressure

Potential Loss

Six percent (6%) hydrogen is the minimum explosive mixture in the Westinghouse Owners Group Emergency Response Guidelines and represents a potential loss of containment barrier. The second EAL means that containment heat removal systems are not functioning properly when they are needed.

Loss

A rapid unexplained loss of pressure, not attributable to containment spray or condensation effects, following an initial pressure increase indicates a loss of containment integrity. If containment pressure and sump levels do not increase as expected following a LOCA, then a loss of containment integrity is also indicated.

CONTAINMENT BARRIER, CONTINUED

EAL-3, Steam Generator (SG) Tube Leak

Potential Loss

None

Loss

Greater than Technical Specification primary to secondary leakage with a pathway to the environment outside normal plant design or operations.

The release to the environment must be due to the failure to isolate an abnormal pathway (e.g., nonisolable stuck open Safety, PORV, or steam line break outside containment).

Examples of pathways to atmosphere that are NOT considered a direct secondary side release path to atmosphere when evaluating plant conditions for the applicability of this EAL:

- Normal operation of the PORV to decrease Steam Generator pressure or control plant temperature.
- Pathways that result from the plant operational design such as the Condenser Air Removal System discharge.
- Pathways that are incidental to normal operation of the plant such as minor leakage from degraded secondary system components.

EAL-4, Containment Bypass

Potential Loss

An increase in area or ventilation radiation monitor readings located in areas adjacent to containment with a LOCA in progress could be due to penetration leakage. Other causes for increases could be interfacing system LOCAs involving systems (e.g. HHSI, LHSI) located in these areas, and leakage from systems recirculating containment sump water. All of these conditions are associated with a known LOCA and are indicative of a potential loss of the containment barrier. Unexplained increases in monitor readings without a LOCA should be classified in accordance with the Radiological section. Adjacent areas are those spaces immediately outside the containment boundary that are monitored by area or ventilation radiation monitors.

CONTAINMENT BARRIER, CONTINUED

EAL-4, Containment Isolation

Loss

This EAL indicates incomplete containment isolation that allows direct release to the environment and loss of the containment barrier.

EAL-5, Reactor Containment Building (RCB) Radiation Monitors

Potential Loss

This EAL indicates significant fuel damage, equivalent to 20% gap activity, in excess of Fuel Clad and RCS Barrier EALs. Regardless of whether containment is challenged, the amount of activity associated with fuel damage of this magnitude, if released, could have such severe consequences that it is treated as a potential loss of containment, which would lead to a classification of General Emergency.

Loss

None

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU1 Loss of Offsite Power to ESF Busses for Greater than 15 Minutes

OPERATING MODE APPLICABILITY: 1-6, Defueled

EMERGENCY ACTION LEVELS:

EAL-1 The following conditions exist:

a. Loss of power to the STBY 1 XFMR, STBY 2 XFMR, UAT, and 13.8 KV Emergency bus 1(2)L for greater than 15 minutes.

AND

b. At least 2 ESF DGs are supplying power to their respective busses.

BASIS:

Prolonged loss of offsite AC power reduces required redundancy and potentially degrades the level of safety of the plant by rendering the plant more vulnerable to a complete Loss of AC Power (Station Blackout). Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU2 Operation Outside the Plant Safety Envelope as defined by Technical Specifications

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 The plant cannot be brought to the required operating mode within Technical Specifications LCO Action Statement Time.

BASIS:

Limiting Conditions of Operation (LCOs) often require the plant to be brought to a required shutdown mode when the Technical Specification required configuration cannot be restored. Depending on the circumstances, this may or may not be an emergency or precursor to a more severe condition. In any case, the initiation of plant shutdown required by the site Technical Specifications requires a four-hour report under 10CFR50.72(b) non-emergency events. The plant is within its safety envelope when being shutdown within the allowable action statement time in the Technical Specifications. An immediate declaration of an Unusual Event is required when the plant cannot be brought to the required operating mode within the allowable action statement time in the Technical Specifications, as the plant is outside its safety envelope. Declaration of an Unusual Event is based on the time at which the LCO-specified action statement time period elapses under Technical Specifications and is not related to how long a condition may have existed. Other required Technical Specification shutdowns that involve precursors to more serious events are addressed by other System Malfunction, Hazards, or Fission Product Barrier Degradation ICs.

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU3 Unplanned Loss of Most Control Room Safety System Annunciation or Indication for Greater Than 15 Minutes

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 The following conditions exist:

a. Loss of most (>50%) of Control Room Safety System annunciators or indicators for greater than 15 minutes.

AND

b. Compensatory indications are available and can be adequately monitored with on-shift personnel.

AND

c. The Shift Manager determines that the loss of the annunciators or indicators requires increased surveillance of compensatory indications (e.g. Control Board Indicators, Local Indicators, QDPS, ICS, ERFDADS) to safely operate the unit.

AND

d. Annunciator or indicator loss is not the result of planned action.

BASIS:

This IC and its associated EAL is intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment.

Unplanned loss of annunciators or indicator excludes scheduled maintenance and testing activities.

SYSTEM MALFUNCTIONS

Compensatory Indications: Includes any alternate source of information such as computers, Control Board indication or Local indication, which can be monitored to compensate for the loss of alarm functions or other indications.

Quantification of Most is arbitrary, however, it is estimated that if approximately 50% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of the plant conditions. This judgment is supported by the specific opinion of the Shift Manager that additional operating personnel will be required to provide increased monitoring of system operation to safely operate the unit.

The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10CFR50.72. If the shutdown is not in compliance with the Technical Specification action, the Unusual Event is based on SU2, Operation outside the plant safety envelope as defined by Technical Specifications.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Due to the limited number of safety systems in operation during cold shutdown, refueling, and defueled modes, no IC is indicated during these modes of operation.

This Unusual Event will be escalated to an Alert if a transient is in progress during the loss of annunciation or indication.

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU4 Unplanned Loss of All Onsite or Offsite Communications Capabilities

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Unplanned loss of ALL onsite telephone, radio and headset communications capability affecting the ability to perform routine operations.

EAL-2 Unplanned loss of ALL onsite to offsite telephone and FAX communications capability: Plant telephone system, DPS/MCSO Ringdown Line, STP Coordinator (QSE) Ringdown Line, NRC ENS Line.

BASIS:

The purpose of this IC and its associated EALs is to recognize a loss of communications capability that either defeats the plant operations staff's ability to perform routine tasks necessary for plant operations or the ability to communicate problems with offsite authorities. The loss of offsite communications ability is expected to be significantly more comprehensive than that addressed by 10CFR50.72.

Onsite communications loss encompasses the loss of all means of routine two-way communications.

Offsite communications loss encompasses the loss of all means of communications with offsite authorities. This EAL is intended to be used only when extraordinary means are being utilized to make communications possible (relaying of information from radio transmissions, individuals being sent to offsite locations, etc.).

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU5 Unplanned Loss of Class 1E DC Power During Cold Shutdown or Refueling for Greater than 15 Minutes

OPERATING MODE APPLICABILITY: 5 and 6

EMERGENCY ACTION LEVELS:

EAL-1 Loss of ESF DC Power to Channel 1 and Channel 4 based on Battery Bus Voltage less than 107 volts DC for greater than 15 minutes.

BASIS:

The purpose of this IC and its associated EAL is to recognize a loss of DC power compromising the ability to monitor and control the removal of decay heat during Cold Shutdown or Refueling operations. This EAL is intended to be anticipatory in as much as the operating crew may not have necessary indication and control of equipment needed to respond to the loss.

Unplanned is included in this IC and EAL to preclude the declaration of an emergency as a result of planned maintenance activities. Routinely STP performs maintenance on a Train related basis during shutdown periods. It is intended that the loss of the operating (operable) train is to be considered. If this loss results in the inability to maintain cold shutdown, the escalation to an Alert will be per SA3 Inability to Maintain Plant in Cold Shutdown.

Class 1E bus voltage should be used as the minimum bus voltage necessary for the operation of safety related equipment. This voltage value of 107 volts DC incorporates a margin of at least 15 minutes of operation before the onset of inability to operate those loads.

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU6 Fuel Clad Degradation

OPERATING MODE APPLICABILITY: 1-6

EMERGENCY ACTION LEVELS:

EAL-1 Failed Fuel Monitor, RT-8039, indicates greater than or equal to 300 μCi/ml and this reading is not the result of a crud burst as confirmed by a grab sample.

EAL-2 Dose Equivalent Iodine (DEI) sample greater than Technical Specification limitations.

BASIS:

This IC is included as an Unusual Event because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. 300 μCi/ml reading on RT-8039 is based on 0.1% of the gap inventory. Grab sample verification is required in case of radiation monitor failures or high background radiation errors. Escalation of this IC to the Alert level is via the Fission Product Barrier Degradation Monitoring ICs.

SYSTEM MALFUNCTIONS

UNUSUAL EVENT

SU7 RCS Leakage

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 Unidentified or pressure boundary leakage greater than 10 gpm.

EAL-2 Identified leakage greater than 25 gpm.

BASIS:

This IC is included as an Unusual Event because it may be a precursor of more serious conditions and, as result, is considered to be a potential degradation of the level of safety of the plant. The 10-gpm value for the unidentified and pressure boundary leakage was selected as it is observable with normal control room indications. Lesser values must generally be determined through the time-consuming RCS Inventory surveillance test. The EAL for identified leakage is set at a higher value due to the lesser significance of identified leakage in comparison to unidentified or pressure boundary leakage. In either case, escalation of this IC to the Alert level is via Fission Product Barrier Degradation ICs or IC SA3, Inability to Maintain Plant in Cold Shutdown.

SYSTEM MALFUNCTIONS

ALERT

SA1 Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses During Cold Shutdown or Refueling

OPERATING MODE APPLICABILITY: 5 and 6, and Defueled

EMERGENCY ACTION LEVELS:

EAL-1 No voltage on all 4160 VAC ESF busses for greater than 15 minutes.

BASIS:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal, Spent Fuel Pool Cooling and the Ultimate Heat Sink. When in cold shutdown, refueling, or defueled mode the event can be classified as an Alert because of the significantly reduced decay heat and lower temperature and pressure, which allows increased time to restore one of the emergency busses relative to that specified for the Site Area Emergency EAL. Escalating to Site Area Emergency, if appropriate, is by Abnormal Rad Levels/Radiological Effluent, or Emergency Director Judgment ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

SYSTEM MALFUNCTIONS

ALERT

SA2 Failure of Reactor Protection System Instrumentation to Complete or Initiate an Automatic Reactor Trip Once a Reactor Protection System Set point Has Been Exceeded and Manual Reactor Trip Was Successful from the Control Room

OPERATING MODE APPLICABILITY: 1-3

EMERGENCY ACTION LEVELS:

EAL-1 Reactor Protection System set point exceeded with NO automatic trip.

AND

A manual reactor trip was required for plant shutdown.

BASIS:

This condition indicates failure of the automatic protection system to trip the reactor. This condition is more than a potential degradation of a safety system in that a front line automatic protection system did not function in response to a plant transient and thus the plant safety has been compromised, and design limits of the fuel may have been exceeded. An Alert is indicated because conditions exist that lead to potential loss of fuel clad or RCS. Reactor protection system set point being exceeded (rather than limiting safety system set point being exceeded) is specified here because failure of the automatic protection system is the issue. A manual reactor trip is any set of actions by the reactor operator(s) in the Control Room which causes control rods to be rapidly inserted into the core and brings the reactor subcritical. Failure of manual reactor trip would escalate the event to a Site Area Emergency.

SYSTEM MALFUNCTIONS

ALERT

SA3 Inability to Maintain Plant in Cold Shutdown

OPERATING MODE APPLICABILITY: 5 and 6

EMERGENCY ACTION LEVELS:

EAL-1 The following conditions exist:

a. Less than 2 RHR loops are functional.

AND

b. Temperature increase that either:

1. Results in Tavg exceeding 200^{o} F.

OR

2. Results in uncontrolled* temperature rise causing Tavg to approach 200^{o} F.

*Outside the immediate control of the operator. This EAL is intended to preserve the anticipatory philosophy of the Emergency Classification Scheme.

BASIS:

This EAL addresses complete loss of functions required for core cooling during refueling and cold shutdown modes. Escalation to Site Area Emergency or General Emergency would be via Abnormal Rad Levels/Radiological Effluent or Emergency Director Judgment ICs.

This IC and its associated EAL are based on concerns raised by Generic Letter 88-17, Loss of Decay Heat Removal. A number of phenomena such as pressurization, vortexing, steam generator U-tube draining, RCS level differences when operating at a mid-loop condition, decay heat removal system design, and level instrumentation problems can lead to conditions where decay heat removal is lost and core uncovery can occur. NRC analyses show sequences that can cause core uncovery in 15 to 20 minutes and severe core damage within an hour after decay heat removal is lost. Under these conditions, RCS integrity is lost and fuel clad integrity is lost or potentially lost, which is consistent with a Site Area Emergency.

SYSTEM MALFUNCTIONS

Indicators for this EAL are those methods used by the plant in response to Generic Letter 88-17 which include core exit temperature monitoring and RCS water level monitoring. In addition, radiation monitor readings may also be appropriate as an indicator of this condition.

Uncontrolled means that system temperature increase is not the result of planned actions by the plant staff. The EAL guidance related to uncontrolled temperature rise is necessary to preserve the anticipatory philosophy of NUREG-0654 for events starting from temperatures much lower than the cold shutdown temperature limit.

Escalation to the Site Area Emergency is by IC SS5, Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel, or by Radiological ICs.

SYSTEM MALFUNCTIONS

ALERT

SA4 Unplanned Loss of Most Control Room Safety System Annunciation or Indication With Either (1) A Significant Transient In Progress, or (2) Compensatory Indicators Are Unavailable

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 The following conditions exist:

a. Loss of most (>50%) of Control Room Safety System annunciators or indicators for greater than 15 minutes.

AND

b. The Shift Manager determines that the loss of the annunciators or indicators requires increased surveillance of compensatory indicators (e.g. Control Board Indicators, Local Indicators, QDPS, ICS, ERFDADS) to safely operate the unit.

AND

c. Annunciator or Indicator Loss does not result from planned action.

AND

d. Either of the following conditions exist:

1. A significant plant transient is in progress.

OR

2. Compensatory indications are unavailable or cannot be adequately monitored with on-shift personnel.

SYSTEM MALFUNCTIONS

BASIS:

This IC and its associated EAL are intended to recognize the difficulty associated with monitoring changing plant conditions without the use of a major portion of the annunciation or indication equipment during a transient.

Planned loss of annunciators or indicators includes scheduled maintenance and testing activities.

Quantification of Most is arbitrary; however, it is estimated that if approximately 50% of the safety system annunciators or indicators are lost, there is an increased risk that a degraded plant condition could go undetected. It is not intended that plant personnel perform a detailed count of the instrumentation lost but use the value as a judgment threshold for determining the severity of plant conditions. This judgment is supported by the specific opinion of the Shift Manager that additional operating personnel will be required to provide increased monitoring of system operation to safely operate the unit(s).

The loss of specific, or several, safety system indicators should remain a function of that specific system or component operability status. This will be addressed by the specific Technical Specification. The initiation of a Technical Specification imposed plant shutdown related to the instrument loss will be reported via 10CFR50.72. If the shutdown is not in compliance with the Technical Specification action, the Unusual Event is based on SU2, Operation outside the plant safety envelope as defined by Technical Specifications.

Significant Transient includes response to automatic or manually initiated functions such as Reactor Trips, runbacks involving greater than 25% thermal power change, ECCS injections, or thermal power oscillations of 10% or greater.

Compensatory Indications includes any alternate source of information such as computers, Control Room indication or Local indication, which can be monitored to compensate for the loss of alarm functions or other indications. If both a major portion of the annunciation system and all computer monitoring are unavailable to the extent that additional operating personnel are required to monitor indications, the Alert is required.

Due to the limited number of safety systems in operation during cold shutdown, refueling and defueled modes, no IC is indicated during these modes of operation.

This Alert will be escalated to a Site Area Emergency if the operating crew cannot monitor a transient in progress.

SYSTEM MALFUNCTIONS

ALERT

SA5 AC Power Capability To The Three 4160V AC ESF Busses Is Reduced To A Single Power Source For Greater Than 15 Minutes Such That Any Additional Single Failure Would Result In Loss of ALL AC Power

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1

The following conditions exist:

a. Loss of power to the STBY 1 XFMR, STBY 2 XFMR, UAT, and 13.8 KV Emergency bus 1(2)L for greater than 15 minutes,

AND

b. Onsite power capability has been degraded to a single ESF diesel generator capable of supplying power to at least one ESF bus.

EAL-2

The following conditions exist:

a. One of the following offsite power supplies is providing power to ALL of the energized 4160 ESF busses:

STBY 1 XFMR
STBY 2 XFMR
UAT
13.8 KV Emergency bus 1(2)L

AND

b. ESF DGs 11(21), 12(22), AND 13(23) are not capable of providing power to their respective bus.

SYSTEM MALFUNCTIONS, CONTINUED

BASIS:

This IC and the associated EALs provide an escalation from IC SU1, Loss of All Offsite Power to Essential Busses for Greater Than 15 Minutes. The condition indicated by this IC is the degradation of the offsite and onsite power systems such that any additional single failure would result in a station blackout. This condition could occur due to a loss of offsite power with a concurrent failure of two ESF diesel generators to supply power to their emergency busses. Another related condition could be the loss of all but one offsite power source, or the loss of two 4160V AC ESF busses. The subsequent loss of this single power source would escalate the event to a Site Area Emergency in accordance with IC SS1, Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses.

SYSTEM MALFUNCTIONS

ALERT

SA6 Fuel Clad Degradation

OPERATING MODE APPLICABILITY: 1-6

EMERGENCY ACTION LEVELS:

EAL-1 Failed Fuel Monitor, RT-8039, indicates greater than or equal to 870 μCi/ml and this reading is not the result of a crud burst as confirmed by a grab sample.

EAL-2 Dose Equivalent Iodine (DEI) sample greater than 300 μCi/gm.

BASIS:

This IC is included as an Alert because it is considered to be a potential degradation in the level of safety of the plant and a potential precursor of more serious problems. 870 μCi/ml reading on RT-8039 is based on 1% of the gap inventory. Grab sample verification is required in case of radiation monitor failures or high background radiation errors.

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS1 Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 No voltage on all 4160 VAC ESF busses for greater than 15 minutes.

BASIS:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will cause core uncovery and loss of containment integrity, thus this event can escalate to a General Emergency. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Escalation to General Emergency is via Fission Product Barrier Degradation or IC SG1, Prolonged Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS2 Failure of Reactor Protection System Instrumentation To Complete or Initiate An Automatic Reactor Trip Once A Reactor Protection System Set point Has Been Exceeded

AND

Manual Reactor Trip was NOT successful

OPERATING MODE APPLICABILITY: 1 and 2

EMERGENCY ACTION LEVELS:

EAL-1 Entry into 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

BASIS:

Automatic and manual reactor trip are not considered successful if action away from the main Control Room was required to trip the reactor.

Under these conditions, the reactor is producing more heat than the maximum decay heat load for which the safety systems are designed. A Site Area Emergency is indicated because conditions exist that lead to imminent loss or potential loss of both fuel clad and RCS. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response. Escalation of this event to a General Emergency would be via Fission Product Barrier Degradation ICs.

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS3 Loss of All Class 1E DC Power

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 Less than 107 volts DC on ALL four (4) ESF DC battery busses for greater than 15 minutes.

BASIS:

Loss of all DC power compromises ability to monitor and control plant safety functions. Prolonged loss of all DC power will cause core uncovering and loss of containment integrity when there is significant decay heat and sensible heat in the reactor system. Escalation to a General Emergency would occur by Radiological or Fission Product Barrier Degradation ICs. Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS4 Complete Loss of any Function Needed to Achieve or Maintain Hot Shutdown

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 **Mode 1-3** - Loss of all feedwater function (main, startup, and auxiliary) indicated by SG narrow range level less than 14% [34%] in ALL SGs AND total feedwater flow less than 576 gpm.

EAL-2 **Mode 4** - Loss of RHR function indicated by entry into 0POP04-RH-0001, Loss of Residual Heat Removal, AND loss of all feedwater function (main, startup, and auxiliary) indicated by SG narrow range level less than 14% [34%] in ALL SGs AND total feedwater flow less than 576 gpm.

BASIS:

These EALs address complete loss of functions required for hot shutdown with the reactor at pressure and temperature. Under these conditions, there is an actual major failure of a system intended for protection of the public. Thus, declaration of a Site Area Emergency is warranted. These EALs are only applicable in Modes 1-4. The conditions described above could be initiated in Modes 1 or 2 leading to a transition to Mode 3. Escalation to General Emergency would be via Radiological or Fission Product Barrier Degradation ICs. The SG narrow range level of 34%, as indicated by the brackets, is to be used as indication during adverse containment conditions.

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS5 Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel

OPERATING MODE APPLICABILITY: 5 and 6

EMERGENCY ACTION LEVELS:

EAL-1 Loss of Reactor Vessel Water Level as indicated by:

a. Loss of all Decay Heat Removal Cooling as determined by entry into, 0POP04-RH-0001, Loss of Residual Heat Removal.

AND

b. The Core is or will be uncovered as indicated by:

RCS Narrow Range Hot Leg Level less than -2 inches (Elev. 32'-1").

BASIS:

Under the conditions specified by this IC, severe core damage can occur and reactor coolant system pressure boundary integrity may not be assured.

This IC covers sequences such as prolonged boiling following loss of decay heat removal. Thus, declaration of a Site Area Emergency is warranted under the conditions specified by the IC. Escalation to a General Emergency is via Radiological Effluent IC RG1, Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1,000 mrem TEDE or 5,000 mrem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology.

SYSTEM MALFUNCTIONS

SITE AREA EMERGENCY

SS6 Inability to Monitor a Significant Transient in Progress

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 The following conditions exist:

a. Loss of Control Room Indicators and Annunciators associated with Safety Systems.

AND

b. Compensatory Non-Alarming Indications are Unavailable (e.g. QDPS, Integrated Computer System (ICS), ERFDADS, Control Board, and Local Alarms).

AND

c. Significant transient in progress.

BASIS:

This IC and its associated EAL are intended to recognize the inability of the Control Room staff to monitor the plant response to a transient. A Site Area Emergency is considered to exist if the Control Room staff cannot monitor safety functions needed for protection of the public.

STP plant annunciators for this EAL should be limited to include those identified in the Off Normal Operating Procedures, in the Emergency Operating Procedures, and in other EALs. (e.g., radiation monitors, etc.)

Compensatory non-alarming indications in this context includes computer-based information such as QDPS, ICS, ERFDADS, etc. This should include all computer systems available for this use depending on specific plant design and subsequent retrofits.

Significant Transient includes response to automatic or manually initiated functions such as reactor trips, runbacks involving greater than 25% thermal power change, ECCS injections, or thermal power oscillations of 10% or greater.

SYSTEM MALFUNCTIONS

STP plant indications needed to monitor safety functions necessary for protection of the public must include Control Room indications, computer generated indications and dedicated annunciation capability. The specific indications should be those used to determine such functions as the ability to shut down the reactor, maintain the core cooled and in a coolable geometry, to remove heat from the core, to maintain the reactor coolant system intact, and to maintain containment intact.

Planned actions are excluded from this EAL since the loss of instrumentation of this magnitude is of such significance during a transient that the cause of the loss is not a more tolerable factor.

SYSTEM MALFUNCTIONS

GENERAL EMERGENCY

SG1 Prolonged Loss of Offsite and Onsite Power to All Three 4160V AC ESF Busses

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 Entry into 0POP05-EO-EC00, Loss of All AC Power, for greater than 15 minutes.

AND

Either of the following conditions exist:

a. Restoration of at least one 4160V AC ESF Bus within 4 hours is not likely.

OR

b. Degradation of core cooling is indicated by a valid Red or Orange path on the Core Cooling Critical Safety Function Status Tree.

BASIS:

Loss of all AC power compromises all plant safety systems requiring electric power including RHR, ECCS, Containment Heat Removal and the Ultimate Heat Sink. Prolonged loss of all AC power will lead to loss of fuel clad, RCS, and containment. The four hours to restore AC power is based on a site blackout coping analysis performed in conformance with 10CFR50.63 and Regulatory Guide 1.155, Station Blackout, with appropriate allowance for offsite emergency response. Although this IC may be viewed as redundant to the Fission Product Barrier Degradation IC, its inclusion is necessary to better assure timely recognition and emergency response.

This IC is specified to assure that in the unlikely event of a prolonged station blackout, timely recognition of the seriousness of the event occurs and that declaration of a General Emergency occurs as early as is appropriate, based on a reasonable assessment of the event trajectory.

The likelihood of restoring at least one emergency bus should be based on a realistic appraisal of the situation since a delay in an upgrade decision based on only a chance of mitigating the event could result in a loss of valuable time in preparing and implementing public protective actions.

SYSTEM MALFUNCTIONS

In addition, under these conditions, fission product barrier monitoring capability may be degraded. Although it may be difficult to predict when power can be restored, it is necessary to give the Emergency Director a reasonable idea of how quickly (s)he may need to declare a General Emergency based on two major considerations.

1. Are there any present indications that core cooling is already degraded to the point that Loss or Potential Loss of Fission Product Barriers is IMMINENT?

2. If there are no present indications of such core cooling degradation, how likely is it that power can be restored in time to assure that a loss of two barriers with a potential loss of the third barrier can be prevented?

Thus, indication of continuing core cooling degradation must be based on Fission Product Barrier monitoring with particular emphasis on Emergency Director judgment as it relates to IMMINENT Loss or Potential Loss of fission product barriers and degraded ability to monitor fission product barriers.

SYSTEM MALFUNCTIONS

GENERAL EMERGENCY

SG2 Failure of the Reactor Protection System to Complete an Automatic Reactor Trip AND Manual Reactor Trip was NOT Successful AND There is Indication of an Extreme Challenge to the Ability to Cool the Core

OPERATING MODE APPLICABILITY: 1 and 2

EMERGENCY ACTION LEVELS:

EAL-1 Entry into 0POP05-EO-FRS1, Response to Nuclear Power Generation - ATWS.

AND

Either of the following:

a. Degradation of core cooling is indicated by a valid Red path on the Core Cooling Critical Safety Function Status Tree.

OR

b. Degradation of heat sink is indicated by a valid Red path on the Heat Sink Critical Safety Function Status Tree.

BASIS:

Automatic and manual reactor trip are not considered successful if action away from main control room is required to trip the reactor.

Under the conditions of this IC and its associated EALs, the efforts to bring the reactor subcritical have been unsuccessful and, as a result, the reactor is producing more heat than the maximum decay heat load for which the safety systems were designed. Although there are capabilities away from the reactor control console, such as emergency boration, the continuing temperature rise indicates that these capabilities are not effective. This situation could be a precursor for a core melt sequence.

The extreme challenge to the ability to cool the core is intended to mean that the core exit temperatures are at or approaching 1200^{o} F or that the reactor vessel water level is below the top of active fuel. This EAL equates to a core cooling RED condition.

SYSTEM MALFUNCTIONS

Another consideration is the inability to initially remove heat during the early stages of this sequence. If feedwater flow is insufficient to remove the amount of heat required by design from at least one steam generator, an extreme challenge should be considered to exist. This EAL equates to a Heat Sink RED condition.

In the event either of these challenges exist at a time that the reactor has not been brought below the power associated with the safety system design (5% power) a core melt sequence exists. In this situation, core degradation can occur rapidly. For this reason, the General Emergency declaration is intended to be anticipatory of the fission product barrier matrix declaration to permit maximum offsite intervention time.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

UNUSUAL EVENT

RU1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds Two (2) Times the ODCM Limit at the site boundary for expected duration of 60 Minutes or Longer.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A valid reading on the following monitor that exceeds the value shown indicating that the release may have exceeded the emergency criterion.

RT-8010B Unit Vent (Release Rate) >1.00 E+5 μCi/sec for 60 Minutes

Note: If the monitor reading is sustained for longer than 60 minutes and the required assessments cannot be completed within this period, then the declaration must be made based on the valid reading.

EAL-2 Confirmed sample analyses for gaseous releases indicates concentrations or release rates with a release duration of 60 minutes or longer in excess of 1.00 E-6 μCi/ml (two times the Effluent Concentrations*) at the site boundary.

EAL-3 Confirmed sample analyses for liquid releases indicates concentrations or release rates with a release duration of 60 minutes or longer in excess of two (2) times the Effluent Concentration Limit at the site boundary.

EAL-4 Valid dose rate measurement at the site boundary ≥ 0.1 mrem/hr for 60 minutes or longer.

BASIS:

The term "Unplanned," as used in this context, includes any release for which a radioactive discharge permit was not prepared, or a release that exceeds the conditions (e.g., minimum dilution flow, maximum discharge flow, alarm set points, etc.) on the applicable permit.

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be correct.

* The Effluent Concentration Limit for Xe-133 is 5.00 E-7 μCi/ml.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

The Unusual Event Limit is an unplanned release in excess of twice the Offsite Dose Calculation Manual (ODCM) limits that continues for 60 minutes or longer. Such an event is outside the permissible operating limits for South Texas Project and presumably represents an uncontrolled situation involving degradation in the level of plant safety. For a release to the offsite atmosphere, the limits of Control 3.11.2.1 apply (500 mrem/yr noble gas whole body and 1,500 mrem/yr organ dose rates). The final integrated dose (which is very low in the Unusual Event emergency class) is not the primary concern; it is the degradation in plant control implied by the fact that the release was not isolated within 60 minutes. For example, a release of eight times the ODCM limits for 15 minutes does not exceed this initiating condition. Further, the Emergency Director should not wait until 60 minutes has elapsed, but should declare the event as soon as it is evident the release will not be stopped within 60 minutes.

There is generally more than one applicable Site Radiological Effluent Limit (e.g., air dose rate, other Technical Specifications may be more limiting). For this reason, the EALs should trigger an assessment of all applicable ODCM and NRC limits.

The methods for calculating offsite dose for routine releases as described in the ODCM do not correspond to the methods used to assess doses during an accident. Specifically, the ODCM uses sector average X/Q dispersion that is smaller than the centerline X/Q used in emergency release calculations. Moreover, the ODCM uses a 500 hour average X/Q (averaged over all 16 sectors, 5.30 E-06 sec/m^3) whereas emergency calculations typically use the X/Q for the sector into which the wind is blowing at the time of the release. In addition, the ODCM uses dose conversion factors calculated as described in Regulatory Guide 1.109 while emergency doses are calculated using Environmental Protection Agency (EPA) dose factors. The methodology of the ODCM produces a Unit Vent high alarm set point for noble gases of about 5.00 E+04 μCi/sec. When this alarm set point is evaluated using STAMPEDE*, the emergency offsite dose calculation method, and the assumptions below the resulting dose rates are about 540 mrem/yr (0.1 mrem/hr) TEDE , 150 mrem/yr (0.02 mrem/hr) gamma, and 550 mrem/yr thyroid CDE rate. These dose rates are in general agreement with the limits of ODCM Control 3.11.2.1. Consequently, adopting twice the Unit Vent high alarm set point is consistent with the criteria of twice the ODCM Control 3.11.2.1.

EAL 1 is set at 2 times the ODCM Limit which approximately corresponds to two (2) Effluent Concentration Limit for Xe-133 (5.00 E-7 μCi/ml specified in 10CFR20, Appendix B) which is the nuclide likely to dominate the release for this type of accident. The Unit Vent release rate of 1.00 E+5 μCi/sec produces concentrations at the site boundary of 1.00 E-6 μCi/ml when evaluated with the default meteorological conditions (X/Q = 1.00 E-5 sec/m^3).

EAL-4, the measured dose rate criteria is based on two times the ODCM Limits or 1,000 mrem/yr. Typical exposure rate instruments may detect radiation at 1,000 mrem/yr or 0.1 mrem/hr. Therefore, if radiation is detected, twice the Effluent Concentrations of 10CFR20, Appendix B are exceeded and the criterion of EAL-1 is also met.

* Assumed default meteorological conditions (X/Q = 1.00 E-5 sec/m^3), coolant inventory radionuclide release at 5.00 E+4 μCi/sec, and one (1) hour of decay before release.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

UNUSUAL EVENT

RU2 Unexpected Increase in Plant Radiation Levels or Airborne Concentrations

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Valid readings on any of the following Area Detectors RE-8052 through RE-8101 greater than 1,000 times 24 hr. average.

EAL-2 Uncontrolled loss of water level in the Spent Fuel Pool and Fuel Transfer Canal with all irradiated fuel assemblies remaining covered by water.

EAL-3 Uncontrolled decrease of water level in the Refueling Cavity/ICSA with all irradiated fuel assemblies remaining covered with water (Mode 6 only).

BASIS:

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be correct.

All of the above events tend to have long lead times relative to potential for radiological release outside the site boundary, thus impact to public health and safety is very low.

EAL-1 addresses unplanned increases in in-plant radiation levels that represent a degradation in the control of radioactive material, and represent a potential degradation in the level of safety of the plant. This EAL escalates to an Alert per IC RA3, if the increases impair safe operation.

Explicit coverage of EALs-2 and-3 is appropriate given their potential for increased doses to plant staff. Classification as an Unusual Event is warranted as a precursor to a more serious event.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

RA1 Any Unplanned Release of Gaseous or Liquid Radioactivity to the Environment that Exceeds 25 Times the Unusual Event EALs at the site boundary for 15 Minutes or Longer

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A valid reading on the following monitor that exceeds the value shown indicating that the release may have exceeded the emergency criterion.

RT-8010B Unit Vent (Release Rate) >2.50 E+6 μCi/sec for 15 Minutes

NOTE: If the monitor reading(s) is sustained for longer than 15 minutes and the required assessments cannot be completed within this period, then the declaration must be made based on the valid reading. IF multiple release paths are indicated by elevated radiological monitor readings, THEN sum readings.

EAL-2 Confirmed sample analysis for gaseous releases indicates concentrations or release rates with a release duration of 15 minutes or longer in excess of 2.50 E-5 μCi/cc at the site boundary.

EAL-3 Confirmed sample analysis of liquid releases indicates concentration or release rates in excess of 25 times the Effluent Concentration Limit at the site boundary.

EAL-4 Site boundary radiation dose rate ≥ 3 mrem/hr for greater than 15 minutes based on dose projections or field team measurements.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

BASIS:

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be valid.

The Alert limit has historically been set at 100 times the ODCM Control 3.11.2.1 limits. Although the Alert action level should be well above the Unusual Event action level to indicate significantly worsening radiological conditions, it should remain well below the Site Area action level. The accident is not sufficiently severe to assume fuel damage so the coolant inventory of radioactive material is appropriate for evaluating this accident level. If 100 times the ODCM Control were used, the Alert limit would be very close to the Site Area limit. For this reason, the Bases for this limit was reduced to 25 times the Unusual Event action level.

EAL 1 is set at 25 times the Unusual Event action level. The release rate 2.00 E+6 μCi/sec would produce dose rates at the site boundary of about 30 rem/yr (TEDE) for the design basis coolant inventory of radionuclides. The design basis coolant inventory of radionuclides includes iodines and some corrosion products in addition to noble gases (as specified in the emergency offsite dose calculation code STAMPEDE). It is anticipated that a release of this magnitude would involve at least the activity available in the reactor coolant and therefore this mixture of radioactive materials is appropriate.

EAL-4, the measured dose rate criteria is based on the external dose rate component of EAL 1 above. The external dose component of 30 rem/yr (TEDE) is about 3 mrem/hr.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

RA2 Major Damage to Irradiated Fuel or Loss of Water Level that has or Will Result in the Uncovering of Irradiated Fuel Outside the Reactor Vessel.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Valid readings on one or more of the following radiation monitors:

FHB Exhaust, RT-8035	> 5.00 E-2 μCi/ml
FHB Exhaust, RT-8036	> 5.00 E-2 μCi/ml
Area Detector (68' FHB), RE-8090	> 5,000 mR/hr

EAL-2 Valid readings on the following radiation monitor with spent nuclear fuel in the Refueling Cavity or Inside Containment Storage Area (ICSA). (Mode 6 Only).

Area Detector (68' RCB), RE-8099 > 5,000 mR/hr

EAL-3 Irradiated fuel uncovered (actual or potential) based on observation OR water level below top of fuel storage racks.

BASIS:

NUREG-0818, Emergency Action Levels for Light Water Reactors, forms the basis for these EALs.

There is time available to take corrective actions, and there is little potential for substantial fuel damage. In addition, NUREG/CR-4982, Severe Accident in Spent Fuel Pools in Support of Generic Safety Issue 82, July 1987, indicates that even if corrective actions are not taken, no prompt fatalities are predicted, and that risk of injury is low. In addition, NRC Information Notice No. 90-08, KR-85 Hazards from Decayed Fuel presents the following in its discussion:

> In the event of a serious accident involving decayed spent fuel, protective actions would be needed for personnel on site, while offsite doses (assuming an exclusion area radius of one mile from the plant site) would be well below the Environmental Protection Agency's Protective Action Guides.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

Accordingly, it is important to be able to properly survey and monitor for Kr-85 in the event of an accident with decayed spent fuel.

Licensees may wish to reevaluate whether EALs specified in the Emergency Plan and procedures governing decayed fuel handling activities appropriately focus on concern for onsite workers and Kr-85 releases in areas where decayed spent fuel accidents could occur, for example, the spent fuel pool working floor. Furthermore, licensees may wish to determine if emergency plans and corresponding implementing procedures address the means for limiting radiological exposures of onsite personnel who are in other areas of the plant. Among other things, moving onsite personnel away from the plume and shutting off building air intakes downwind from the source may be appropriate.

Thus, an Alert Classification for this event is appropriate. Escalation, if appropriate, would occur via Radiological ICs.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

ALERT

RA3 Release of Radioactive Material or Increases in Radiation Levels that Impedes Operation of Systems Required to Maintain Safe Operation or to Establish or Maintain Cold Shutdown.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Valid radiation detector readings GREATER THAN 15 mrem/hr in areas requiring continuous occupancy to maintain plant safety functions:

RE-8066 - Control Room

EAL-2 Valid radiation detector readings GREATER THAN 5 R/hr in areas requiring infrequent access to maintain plant safety functions.

RE-8058, 8060, 8061, 8062, 8063, 8077, indicate accessibility to plant support equipment. RE-8084, 8085, 8086, 8087, 8090 indicate accessibility to safety injection equipment in the Fuel Handling Building.

NOTE: The Emergency Director should determine the cause of the increase in radiation levels and review other ICs for applicability.

BASIS:

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be correct.

This IC addresses increased radiation levels that impede necessary access to operating stations, or other areas containing equipment that must be operated manually, in order to maintain safe operation or perform a safe shutdown. It is this impaired ability to operate the plant that results in the actual or potential substantial degradation of the level of safety of the plant. The cause and/or magnitude of the increase in radiation levels is not a concern of this IC. The Emergency Director must consider the source or cause of the increase radiation levels and determine if any other IC may be involved. For example, a dose rate of 15 mrem/hr in the Control Room or TSC may be a problem in itself.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

However, the increase may also be indicative of high dose rates in the containment due to LOCA. In this latter case, an SAE or GE may be indicated by the fission product barrier matrix ICs.

This IC is not meant to apply to increases in the containment dome radiation monitors as these events are addressed in the fission product barrier matrix ICs. Nor is it intended to apply to anticipated temporary increases due to planned events. (e.g., incore detector movement, radwaste container movement, depleted resin transfers, etc.)

The only area requiring continuous occupancy is the Control Room; however, other control stations that are manned continuously, such as a radwaste control room, a central security alarm station, or an operator station in the plant should be alerted if Control Room radiation levels reach the action level. The value of 15 mrem/hr is derived from the GDC 19 value of 5 rem in 30 days with adjustment of expected occupancy times. Although Section III.D.3 of NUREG-0737, Clarification of TMI Action Plan Requirements, provides that the 15 mrem/hr value can be averaged over the 30 days, the value is used here without averaging, as a 30 day duration implies in event potentially more significant than an Alert.

For areas requiring infrequent access, the values are based on radiation levels which result in exposure control measures intended to maintain doses within normal occupational exposure guidelines and limits (i.e., 10CFR20), and in doing so, will impede necessary access.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

SITE AREA EMERGENCY

RS1 Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mrem TEDE or 500 mrem Thyroid CDE for the Actual or Projected Duration of the Release.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A valid reading on one or more of the following monitors that exceeds the value shown.

RT-8010B	Unit Vent (Release Rate)	>2.00 E+7 μCi/sec
RT-8046 thru RT-8049	Main Steam Line Monitors	>5 μCi/ml

AND

An offsite dose assessment using 0ERP01-ZV-TP01, Offsite Dose Calculations, using actual meteorology cannot be completed within 15 minutes.

If an offsite dose assessment is completed, refer to EAL-2.

Note: IF multiple release paths are indicated by elevated radiological monitor readings, THEN sum readings.

Note: RT-8046 thru 8049 Main Steam Line Monitors assumes Gap Inventory and a steam release into the environment of 1.05 E+6 lbs./hr.

EAL-2 Dose assessment indicates dose consequences greater than 100 mrem TEDE or 500 mrem thyroid CDE.

EAL-3 Field survey results indicate site boundary dose rates exceeding 100 mrem/hr expected to continue for more than one hour; OR Analysis of field survey samples indicate thyroid dose commitment of 500 mrem for one hour of inhalation.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

BASIS:

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be correct.

The Site Area Emergency limit is 0.1 times the Protective Action Guides (PAGs) (0.100 rem TEDE or 0.500 rem Thyroid CDE at the site boundary). The 100 mrem TEDE and 500 mrem Thyroid CDE dose were adopted at one-tenth the EPA Protective Action Guideline doses. Doses at these levels would generally require action within the site boundary to protect personnel.

EAL 1 uses a source term that is representative of a postulated accident mixture of noble gases and iodine. The mixture assumes a gap inventory (as defined in the STAMPEDE emergency offsite dose calculation code) about one hour after the reactor ceases to be critical. This mixture is consistent with fuel damage that would be necessary for generating the dose rates associated with a site area emergency. The average centerline X/Q is assumed to be 1.00 E-5 sec/m^3 to be consistent with the value used for emergency offsite dose calculations.

The 100 mrem TEDE and 500 mrem integrated thyroid dose were adopted at one-tenth the EPA Protective Action Guideline doses. Doses at these levels would generally require action within the site boundary to protect personnel. Note that the gap inventory radionuclide mixture contains sufficient iodine to exceed the 500 mrem/hr thyroid CDE criteria before the 100 mrem/hr TEDE is exceeded.

Integrated doses are generally not monitored in real-time. In establishing the emergency action levels, a duration of one hour is assumed, and the EALs are based on a site boundary dose rate of 100 mrem/hr TEDE or 500 mrem/hr thyroid, whichever is more limiting (depends on source term assumptions). If the Radiological Director/Emergency Director indicates a longer or shorter duration for the period in which the substantial portion of the activity is released, these dose rates should be adjusted.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

SITE AREA EMERGENCY

RS2 Unexpected Increase in Containment Radiation Levels.

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 Valid reading on RCB High Range Monitors, RT-8050 or RT-8051 greater than 100 R/hr.

OR

Valid reading on Hatch Monitor greater than 222 mR/hr.

BASIS:

A reading of greater than 100 R/hr on the RCB Accident Monitors or 222 mR/hr on the Hatch Monitor indicates release of reactor coolant, with elevated activity indicative of fuel damage. This value assumes the instantaneous release and dispersal into the containment of the reactor coolant noble gas and iodine inventory associated with 2% gap activity. This EAL indicates a loss of both the fuel clad and RCS barriers.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY

RG1 Site Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity that Exceeds 1,000 mrem TEDE or 5,000 mrem Thyroid CDE for the Actual or Projected Duration of the Release Using Actual Meteorology

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A valid reading on one or more of the following monitors that exceeds the value shown.

RT-8010B	Unit Vent (Release Rate)	>2.00 E+8 μCi/sec
RT-8046 thru RT-8049	Main Steam Line Monitors	>50 μCi/ml

AND

An offsite dose assessment using 0ERP01-ZV-TP01, Offsite Dose Calculations, using actual meteorology cannot be completed within 15 minutes.

If an offsite dose assessment is completed, refer to EAL-2.

Note: IF multiple release paths are indicated by elevated radiological monitor readings, THEN sum readings.

Note: RT-8046 thru RT-8049 Main Steam Line Monitors assumes a Gap Inventory and a steam release into the environment of 1.05 E+6 lbs./hr.

EAL-2 Dose assessment indicates dose consequences greater than 1,000 mrem TEDE and/or 5,000 mrem thyroid CDE.

EAL-3 Field survey results indicate site boundary dose rates exceeding 1,000 mrem/hr expected to continue for more than one hour; or analysis of field survey samples indicate thyroid dose commitment of 5,000 mrem for one hour of inhalation.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

BASIS:

Valid means that an unexpected radiation monitor reading has been confirmed by the operators to be correct.

Doses in excess of 1 rem TEDE or 5 rem Thyroid CDE at the site boundary warrant declaration of a General Emergency. The Emergency Action Level (EAL) is based on a dose rate consistent with the release rate that would have to be sustained for one hour to produce the 1 rem TEDE or 5 rem Thyroid CDE at the site boundary. Integrated doses are generally not monitored in real-time. In establishing the EALs, a duration of one hour is assumed, and the EALs are based on site boundary doses for either TEDE or Thyroid CDE, whichever is more limiting (source term dependent). The severity of the General Emergency requires fuel damage to have sufficient activity for significant offsite dose consequences. If the Radiological Director or Emergency Director indicates a longer or shorter duration for the period in which the substantial portion of the activity is released, these dose rates should be adjusted.

The release rate was derived using the centerline X/Q, 1.00 E-5 sec/m^3 , associated with average annual meteorology for emergency offsite dose calculations. Actual meteorology is used when calculating dose projections using 0ERP01-ZV-TP01, Offsite Dose Calculations.

Actual meteorology is specifically identified in the initiating condition since it gives the most accurate dose assessment. Actual meteorology (including forecasts) should be used whenever possible.

ABNORMAL RAD LEVELS/RADIOLOGICAL EFFLUENT

GENERAL EMERGENCY

RG2 Unexpected Increase in Containment Radiation Levels

OPERATING MODE APPLICABILITY: 1-4

EMERGENCY ACTION LEVELS:

EAL-1 Valid reading on RCB High Range Monitors, RT-8050 or RT-8051 greater than 1,000 R/hr.

OR

Valid reading on Hatch Monitor greater than 2,222 mR/hr.

BASIS:

This EAL indicates significant fuel damage, equivalent to 20% gap activity. Regardless of whether containment is challenged, the amount of activity associated with fuel damage of this magnitude, if released, could have such severe consequences that it is treated as a loss of containment, which would lead to a classification of General Emergency.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

UNUSUAL EVENT

HU1 Natural or Destructive Phenomena Affecting Plant Operations

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Earthquake detected by seismic monitoring system and confirmed by 0POP04-SY-0001 Seismic Event.

EAL-2 Tornado striking facilities within the Protected Area.

EAL-3 Shutdown of the facility required due to actual or predicted natural phenomenon, in accordance with 0POP04-ZO-0002, Natural or Destructive Phenomena Guidelines.

EAL-4 Vehicle crash into plant structures or systems within the Protected Area.

EAL-5 Report of main turbine failure resulting in casing penetration **OR** damage to turbine or generator seals.

BASIS:

EAL-1: Damage may be caused to some portions of the site, but should not affect ability of safety functions to operate. Method of detection can be based on instrumentation, validated by seismic event procedure 0POP04-SY-0001.

EAL-2: Based on the assumption that a tornado striking (touching down) within the Protected Area boundary may have potentially damaged plant structures containing functions or systems required for safe shutdown of the plant. If such damage is confirmed visually or by other in-plant indications, the event may be escalated to Alert.

EAL-3: This EAL raises awareness that the potential exists for loss of electrical power or station blackout. It also represents a threshold beyond which special provisions for additional support are likely.

EAL 4: Addresses events such as aircraft crash that may damage plant structures containing systems and functions required for safe shutdown. If the crash is confirmed to affect a Vital Area, the event may be escalated to an Alert.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

EAL-5: Intended to address main turbine rotating component failures of sufficient magnitude to cause observable damage to the turbine casing or to the seals of the turbine generator. Of major concern is the potential for leakage of combustible fluids (lubricating oils) and gases (hydrogen cooling) to the plant environs. Actual fires and flammable gas build up are appropriately classified via HU2 and HU3. This EAL is consistent with the definition of an Unusual Event while maintaining the anticipatory nature desired and recognizing the risk to non-safety related equipment. Escalation of the emergency classification is based on potential damage done by missiles generated by the failure or by radiological releases in conjunction with a steam generator tube rupture. These latter events would be classified by the radiological ICs or Fission Product Barrier ICs.

NOTE

If generator seal damage is observed after the generator has been purged for disassembly, declaration of an Unusual Event is not required. In this case, there is no report of a leak, no detection of hydrogen, and no explosion or fire. In effect, the amount of gas that leaked did not affect normal operations of the plant. (Ref. NUMARC Questions and Answers, June 1993)

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

UNUSUAL EVENT

HU2 Fire or Explosion in the Protected Area or Switchyard which Affects Normal Operation

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Fire within the areas below which is not under control within 15 minutes of initial notification.

EAL-2 Explosion in or adjacent to any of the following areas which damages equipment necessary for normal plant operation.

Areas considered for EAL-1 and EAL-2:

- Switchyard
- Turbine Generator Building
- Mechanical/Electrical Auxiliary Building
- Fuel Handling Building
- Reactor Containment Building
- Essential Cooling Water Intake Structure
- Isolation Valve Cubicle
- Diesel Generator Building
- Circulating Water Intake Structure

BASIS:

The purpose of this IC is to address the magnitude and extent of explosions or fires that may be potentially significant precursors to damage to safety systems or for initiation of plant transients. This excludes such items as fires within administration buildings, wastebasket fires, and other small fires of no safety consequence. This IC applies to buildings and areas contiguous to plant Vital Areas or other significant buildings or areas. The intent of this IC is not to include buildings (e.g., warehouses) or areas that are not contiguous or immediately adjacent to plant Vital Areas. Initial Notification is a credible notification a fire is occurring or verification of a fire detection system alarm. Verification of the alarm includes actions that can be taken within the Control Room or other plant specific locations to ensure the alarm is not spurious, but does not include dispatch of personnel to the scene to confirm a fire exists (NUMARC Q&A, June 1993). Fifteen minutes is allowed to verify that the fire alarm is valid and that initial fire fighting efforts have not been effective.

Escalation to a higher emergency class is by IC HA2, Fire or Explosion in a Vital Area Potentially Affecting Safe Shutdown or Decay Heat Removal.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

UNUSUAL EVENT

HU3 Toxic/Flammable Gases Affecting Plant Operation

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Onsite toxic or flammable gas release which requires evacuation of areas within the Protected Area.

EAL-2 Report by Local, County or State Officials for potential evacuation of site personnel based on offsite event.

BASIS:

This IC is based on releases in concentrations within the site boundary that will affect the health of plant personnel or affect the safe operation of the plant with the plant being within the evacuation area of an offsite event (e.g., tanker truck accident releasing toxic gases, etc.) The evacuation area is as determined from the DOT Evacuation Tables for Selected Hazardous Materials, in the DOT Emergency Response Guide for Hazardous Materials.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

UNUSUAL EVENT

HU4 Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Security Alert as defined by the Safeguards Contingency Plan.

EAL-2 A credible South Texas Project security threat notification (2002 ICM Order).

EAL-3 A validated notification from NRC providing information of an aircraft threat (2005 Security Advisory).

BASIS**:**

EAL 1 is based on the Safeguards Contingency Plan. Security events which do not represent at least a potential degradation in the level of safety of the plant are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72.

The intent of EAL 2 is to ensure that appropriate notifications for the security threat are made in a timely manner. Only the plant to which the specific threat is made need declare the Notification of an Unusual Event. The determination of "credible" is made through use of information found in the Safeguards Contingency Plan or site procedures.

The intent of EAL 3 is to ensure that notifications for the security threat are made in a timely manner and that Offsite Response Organizations and plant personnel are at a state of heightened awareness regarding the credible threat. Only the plant to which the specific threat is made need declare the Notification of Unusual Event. This EAL is met when a plant receives information regarding an aircraft threat from the NRC. Should the threat involve an airliner (airliner is meant to be a large aircraft with the potential for causing significant damage to the plant) then escalation to Alert via HA7 would be appropriate if the airliner is less than 30 minutes away from the plant .The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner. The status of the plane is provided by NORAD through the NRC. It is not the intent of this EAL to replace existing non-hostile related EALs involving aircraft.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

UNUSUAL EVENT

HU5 Miscellaneous Events Affecting Plant Operations

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Essential Cooling Pond (ECP) level less than 25.0 ft. mean sea level.

EAL-2 Uncontrolled RCS Cooldown due to Secondary Depressurization.

EAL-3 Other conditions exist which in the judgment of the Emergency Director indicate a potential degradation of the level of safety of the plant.

BASIS:

EAL-1 Based on the requirement to shutdown the plant for ECP level less than 25.5 ft. mean sea level. (STP UFSAR 9.2.5.1.1.5).

EAL-2 Based on the potential increase of energy removal from the RCS causing a reduction in coolant temperature and pressure. The cooldown may result in an insertion of positive reactivity or Steam Generator Tube Rupture. Escalation is via Fission Product Barrier Degradation.

EAL-3 This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Unusual Event emergency class.

From a broad perspective, one area that may warrant Emergency Director judgment is related to likely or actual breakdown of site specific event mitigating actions. Examples to consider include inadequate emergency response procedures, transient response either unexpected or not understood, failure or unavailability of emergency systems during an accident in excess of that assumed in accident analysis, or insufficient availability of equipment and/or support personnel.

Specific example of actual events that may require Emergency Director judgment for Unusual Event declaration are listed here for consideration. However, this list is by no means all inclusive and is not intended to limit the discretion of the site to provide further examples.

- Missile(s) impacting safety related structures.
- Near-site explosion which may adversely affect normal site activities.
- Near-site release of toxic or flammable gas which may adversely affect normal site activities.

It is also intended that the Emergency Director's judgment not be limited by any list of events as defined here or as augmented by the site. This list is provided solely as examples for consideration and it is recognized that actual events may not always follow a preconceived description.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA1 Natural or Destructive Phenomena Potentially Affecting Safe Operation

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Seismic motion exceeding Operating Basis Earthquake (OBE) as indicated by a Seismic monitor alarm and confirmed by 0POP04-SY-0001.

EAL-2 Tornado or high wind causing visible structural damage to any of the following plant structures:

- Reactor Containment Building
- ECW Intake Structure
- Mechanical/Electrical Auxiliary Building
- Isolation Valve Cubicle
- Fuel Handling Building
- Diesel Generator Building

EAL-3 Entry of flood water into safety related structures such that the function of safety related equipment is jeopardized.

EAL-4 Predicted or actual breach of Main Cooling Reservoir retaining dike along North Wall.

EAL-5 Vehicle crash affecting a plant Vital Area.

EAL-6 Turbine failure generated missiles result in any visible structural damage to or penetration of any of the following plant areas:

- Reactor Containment Building
- ECW Intake Structure
- Mechanical/Electrical Auxiliary Building
- Isolation Valve Cubicle
- Fuel Handling Building
- Diesel Generator Building

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

BASIS:

EAL-1: Based on STPEGS UFSAR design basis. Seismic events of this magnitude can cause damage to safety functions.

EAL-2: Based on actual evidence of wind damage regardless of wind speed.

EAL-3: Based on potential for uncontrolled or ineffectually controlled flooding of vital structures which potentially affects systems required for safe shutdown of the plant.

EAL-4: Based on potential for a design basis flood event resulting from breach of the dike. (Ref. UFSAR 3.4.1)

EAL-5: Addresses items such as airplane, helicopter, or machinery crash into plant vital areas.

EAL-6: Is intended to address the threat to safety related equipment imposed by missiles generated by main turbine rotating component failures. This EAL is, therefore, consistent with the definition of an ALERT in that if missiles have damaged or penetrated areas containing safety-related equipment the potential exists for substantial degradation of the level of safety of the plant.

Each of these EALs is intended to address events that may have resulted in a plant Vital Area being subjected to forces beyond design limits, and thus damage may be assumed to have occurred to plant safety systems. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation or Radiological ICs.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SAFETY

ALERT

HA2 Fire or Explosion in a Vital Area Potentially Affecting Safe Shutdown or Decay Heat Removal

OPERATING MODE APPLICABILITY: See Specific EAL

EMERGENCY ACTION LEVELS:

EAL-1 Fire or Explosion potentially affecting Safe Shutdown Equipment or systems required for decay heat removal (Modes 1-6).

The following conditions exist:

a. Fire or explosion in any of the following areas:

- Mechanical/Electrical Auxiliary Building
- Reactor Containment Building
- Isolation Valve Cubicle
- Diesel Generator Building
- Essential Cooling Water Intake Structure

AND

b. Affected system parameter indications show degraded performance or plant personnel report visible damage to systems, structures or components within the specified area required for safe shutdown.

EAL-2 Fire or explosion in one or more of the areas listed below which impacts ability to maintain cooling for spent fuel. (Mode: At all times)

- Fuel Handling Building
- Mechanical/Electrical Auxiliary Building

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SAFETY

BASIS:

EAL-1 & 2: The areas above contain functions and systems required for the safe shutdown of the plant. This EAL addresses a fire and not the degradation in performance of affected systems. System degradation is addressed in the System Malfunction EALs. The reference to damage of systems is used to identify the magnitude of the fire and to discriminate against minor fires. The reference to safety systems is included to discriminate against fires in areas having a low probability of affecting safe operation. The significance here is not that a safety system was degraded but the fact that the fire was large enough to cause damage to these systems. The designation of a single train is appropriate when the fire is large enough to affect more than one component and an Alert is justified.

Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels/Radiological Effluent, or Emergency Director Judgment ICs. With regard to explosions, only those explosions of sufficient force to damage permanent structures or equipment required for safe operation within the identified plant area should be considered. As used here, an explosion is a rapid, violent, unconfined combustion, or a catastrophic failure of pressurized equipment, that potentially imparts significant energy to near-by structures and materials. The inclusion of a report of visible damage should not be interpreted as mandating a lengthy damage assessment prior to classification. No attempt is made in this EAL to assess the actual magnitude of the damage. The occurrence of the explosion with reports of evidence of damage (e.g., deformation, scorching) is sufficient for declaration. The declaration of an Alert and the activation of the TSC will provide the Emergency Director with the resources needed to perform these damage assessments. The Emergency Director also needs to consider any security aspects of the explosions, if applicable.

Potential loss of decay heat removal during shutdown conditions or loss of spent fuel cooling capability can result in challenges to operators and plant response mechanisms. Vulnerabilities for the consequences of fire or explosion may be increased in Mode 4, 5 and 6 because of the likelihood of support systems being out of service for maintenance and reduced requirements for electrical power.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA3 Toxic/Flammable Gases Potentially Affecting Safe Operation

OPERATING MODE APPLICABILITY: At all times

EMERGENCY ACTION LEVELS:

EAL-1 Confirmed entry of toxic gas into Control Room envelope.

EAL-2 Uncontrolled entry of flammable gas into a Vital Area.

EAL-3 Uncontrolled entry of toxic gas into the facility in life threatening concentration or into a Vital Area where lack of access constitutes a safety problem.

BASIS:

This IC is based on gases that have entered a plant structure affecting the safe operation of the plant. This IC applies to buildings and areas contiguous to plant Vital Areas or other significant buildings or areas. The intent of this IC is not to include buildings (e.g., warehouses) or other areas that are not contiguous or immediately adjacent to plant Vital Areas. It is appropriate that increased monitoring be done to ascertain whether consequential damage has occurred. Escalation to the higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation or Abnormal Radiation Level / Radiological Release ICs.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA4 Security Event in the Protected Area.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Security Emergency as determined from the Safeguards Contingency Plan.

BASIS**:**

This class of security events represents an escalated threat to plant safety above that contained in the Unusual Event. Escalation will be IC HS1, Security Event in the Vital Area

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA5 Control Room Evacuation

OPERATING MODE APPLICABILITY: 1-6

EMERGENCY ACTION LEVELS:

EAL-1 The Control Room is evacuated and the plant is being controlled within 15 minutes per 0POP04-ZO-0001, Control Room Evacuation.

BASIS:

With the evacuation of the Control Room, additional support, monitoring and direction through the TSC and for other Emergency Operations Centers is necessary. Inability to establish control from outside the Control Room within 15 minutes will escalate this event to a Site Area Emergency (HS2). Step 14 of 0POP04-ZO-0001 places the control transfer switches in the Auxiliary Shutdown Panel (ASP) position. At this point the operators can determine that actual control is achieved at the ASP. If the Emergency Director is not confident that the appropriate plant controls are functioning at the ASP, escalation to a Site Area Emergency is indicated.

As stated in NUREG-0654, the rationale for the Alert class is to provide prompt notification of minor events which could lead to more serious consequences given operator error or equipment failure or which might be indicative of more serious conditions which are not yet fully realized. When an Alert is declared, based upon control room evacuation or any other EAL, the Technical Support Center is staffed. Declaration of an Alert is appropriate to notify onsite and offsite emergency organizations that a control room evacuation is taking place and that the possibility exists, however small, that control cannot be established outside of the control room.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA6 Miscellaneous Events Potentially Affecting Safe Plant Operation

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Essential Cooling Pond (ECP) level less than 23.0 ft. mean sea level. with no make-up available.

EAL-2 Other conditions exist which in the judgment of the Emergency Director indicate that plant safety systems may be degraded and that increased monitoring of plant functions is warranted.

BASIS:

EAL-1 Based on continued depletion of ECP with no make-up. EAL allows 1.5 ft. margin to minimum ECP level described in UFSAR Table 9.2.5.3.

EAL-2 Intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the Alert emergency class.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA7 Notification of an Airborne Attack Threat

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A validated notification from NRC of an airliner attack threat less than 30 minutes away.

BASIS**:**

The intent of this EAL is to ensure that notifications for the security threat are made in a timely manner and that Offsite Response Organizations and plant personnel are at a state of heightened awareness regarding the credible threat. Only the plant to which the specific threat is made need declare the Alert. This EAL is met when a plant receives information regarding an airliner attack threat from NRC and the airliner is less than 30 minutes away from the plant.

This EAL is intended to address the contingency of a very rapid progression of events due to an airborne hostile attack such as that experienced on September 11, 2001. This EAL is not premised solely on the potential for a radiological release. Rather the issue includes the need for assistance due to the possibility for significant and indeterminate damage from such an attack. Although vulnerability analyses show Nuclear Power Plants to be robust, it is appropriate for Offsite Response Organizations to be notified and encouraged to activate (if they do not normally) to be better prepared should it be necessary to consider further actions. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner. The status of the plane is provided by NORAD through the NRC.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

ALERT

HA8 Notification of HOSTILE ACTION within the Owner Controlled Area.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A notification from the Security Force that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the Owner Controlled Area.

BASIS**:**

This EAL is intended to address the potential for a very rapid progression of events due to a terrorist attack including:

- Air attack (airliner impacting the OCA)
- Land-based attack (HOSTILE FORCE progressing across licensee property or directing projectiles at the site)
- Waterborne attack (HOSTILE FORCE on water attempting forced entry or directing projectiles at the site)
- Bombs breeching the Owner Controlled Area

This EAL is not premised solely on adverse health effects caused by a radiological release. Rather the issue is the immediate need for assistance due to the nature of the event and the potential for significant and indeterminate damage. Although nuclear power plant security officers are well trained and prepared to protect against HOSTILE ACTION, it is appropriate for Offsite Response Organizations to be notified and encouraged to begin activation (if they do not normally) to be better prepared should it be necessary to consider further actions.

This EAL is intended to address the contingency for a very rapid progression of events due to an airborne hostile attack such as that experienced on September 11, 2001 and the possibility for additional attacking aircraft. It is not intended to address accidental aircraft impact as that initiating condition is adequately addressed by other EALs. This EAL is not premised solely on the potential for a radiological release. Rather the issue includes the need for assistance due to the possibility for significant and indeterminate damage from additional attack elements.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

Although vulnerability analyses show nuclear power plants to be robust, it is appropriate for Offsite Response Organizations to be notified and to activate in order to be better prepared to respond should protective actions become necessary. If not previously notified by NRC that the aircraft impact was intentional, then it would be expected, although not certain, that notification by an appropriate Federal agency would follow. In this case, appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. However, the declaration should not be unduly delayed awaiting Federal notification. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner. The status of the plane is provided by NORAD through the NRC.

This IC/EAL addresses the immediacy of an expected threat arrival or impact on the site within a relatively short time. The fact that the site is an identified attack candidate with minimal time available for further preparation requires a heightened state of readiness and implementation of protective measures that can be effective (onsite evacuation, dispersal or sheltering) before arrival or impact.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

SITE AREA EMERGENCY

HS1 Security Event in the Vital Area

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Intrusion into a Vital Area by a hostile force.

EAL-2 Security Emergency which in the judgment of the Emergency Director could prevent safe shutdown or interfere with maintaining safe shutdown conditions.

EAL-3 Confirmed presence of an explosive device in a Vital Area.

BASIS:

This class of security events represents an escalated threat to plant safety above that contained in the Alert IC in that a hostile force has progressed from the Protected Area to a Vital Area, or that other events (e.g. sabotage) have been found which could affect safe shutdown.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

SITE AREA EMERGENCY

HS2 Control Room Evacuation and Plant Control Cannot be Established.

OPERATING MODE APPLICABILITY: 1-6

EMERGENCY ACTION LEVELS:

EAL-1 1. The following conditions exist:

a. Control room evacuation has been initiated per 0POP04-ZO-0001, Control Room Evacuation.

AND

b. Control of the plant cannot be established by completion of step 14 of 0POP04-ZO-0001 within 15 minutes.

BASIS:

Step 14 of 0POP04-ZO-0001 places the control transfer switches in the Auxiliary Shutdown Panel (ASP) position. At this point, the Operators can determine they have control at the ASP. Expeditious transfer of safety systems has not occurred but fission product barrier damage may not yet be indicated. Time for transfer based on analysis or assessments as to how quickly control must be reestablished without core uncovering and/or core damage. In cold shutdown and refueling modes, operator concern is directed toward maintaining core cooling such as is discussed in Generic Letter 88-17, Loss of Decay Heat Removal. In power operation, hot standby and hot shutdown modes, operator concern is primarily directed toward maintaining critical safety functions and thereby assuring fission product barrier integrity. Escalation of this event, if appropriate, would be by Fission Product Barrier Degradation or Radiological ICs.

If the Emergency Director is not confident that adequate plant controls are functioning at the ASP, escalation to a Site Area Emergency is warranted.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

SITE AREA EMERGENCY

HS3 Miscellaneous Events Affect the Ability to Shutdown the Plant or maintain it in a Safe Shutdown Condition.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Other conditions exist which in the judgment of the Emergency Director indicate actual or likely major failures of plant functions needed for protection of the public.

BASIS:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the emergency class description for Site Area Emergency.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

SITE AREA EMERGENCY

HS4 Site Attack

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A notification from Security that an armed attack, explosive attack, airliner impact, or other HOSTILE ACTION is occurring or has occurred within the protected area.

BASIS**:**

This class of security events represents an escalated threat to plant safety above that contained in the Alert IC in that a hostile force has progressed from the Owner Controlled Area to the Protected Area.

Although nuclear power plant security officers are well trained and prepared to protect against HOSTILE ACTION, it is appropriate for Offsite Response Organizations to be notified and encouraged to begin preparations for public protective actions to be better prepared should it be necessary to consider further actions.

This EAL is intended to address the potential for a very rapid progression of events due to a dedicated attack. It is not intended to address incidents that are accidental or acts of civil disobedience, such as hunters or physical disputes between employees within the OCA. That initiating condition is adequately addressed by other EALs. Terrorist action identified above encompasses various acts including:

- Air attack (airliner impacting the protected area)
- Land-based attack (HOSTILE FORCE penetrating protected area)
- Waterborne attack (HOSTILE FORCE on water penetrating protected area)
- Bombs breeching the protected area

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

This EAL is intended to address the contingency for a very rapid progression of events due to an airborne hostile attack such as that experienced on September 11, 2001 and the possibility for additional attacking aircraft. It is not intended to address accidental aircraft impact as that initiating condition is adequately addressed by other EALs. This EAL is not premised solely on the potential for a radiological release. Rather the issue includes the need for assistance due to the possibility for significant and indeterminate damage from additional attack elements. Although vulnerability analyses show Nuclear Power Plants to be robust, it is appropriate for Offsite Response Organizations to be notified and to activate in order to be better prepared to respond should protective actions become necessary. If not previously notified by NRC that the aircraft impact was intentional, then it would be expected, although not certain, that notification by an appropriate Federal agency would follow. In this case, appropriate federal agency is intended to be NORAD, FBI, FAA or NRC. However, the declaration should not be unduly delayed awaiting Federal notification. Airliner is meant to be a large aircraft with the potential for causing significant damage to the plant. The NRC Headquarters Operations Officer (HOO) will communicate to the licensee if the threat involves an airliner. The status of the plane is provided by NORAD through the NRC

This EAL addresses the immediacy of a threat to impact site vital areas within a relatively short time. The fact that the site is under serious attack with minimal time available for additional assistance to arrive requires ORO readiness and preparation for the implementation of protective measures.

Licensees should consider upgrading the classification to a General Emergency based on actual plant status after impact.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

GENERAL EMERGENCY

HG1 Security Event Resulting in Loss of Physical Control of the Facility.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 A HOSTILE FORCE has taken control of plant equipment such that plant personnel are unable to operate equipment required to maintain safety functions.

BASIS**:**

This IC encompasses conditions under which a HOSTILE FORCE has taken physical control of VITAL AREAs (containing vital equipment or controls of vital equipment) required to maintain safety functions and control of that equipment cannot be transferred to and operated from another location. Typically, these safety functions are reactivity control (ability to shut down the reactor and keep it shutdown), RCS inventory, and secondary heat removal. If control of the plant equipment necessary to maintain safety functions can be transferred to another location, then the above initiating condition is not met.

This EAL should also address loss of physical control of spent fuel pool cooling systems if imminent fuel damage is likely (e.g., freshly offloaded reactor core in pool).

Loss of physical control of the control room or remote shutdown capability alone may not prevent the ability to maintain safety functions per se. Design of the remote shutdown capability and the location of the transfer switches should be taken into account.

HAZARDS & OTHER CONDITIONS AFFECTING PLANT SYSTEMS

GENERAL EMERGENCY

HG2 Miscellaneous Events Which May Potentially Result in a Hazard to the Public.

OPERATING MODE APPLICABILITY: At All Times

EMERGENCY ACTION LEVELS:

EAL-1 Other conditions exist which in the judgment of the Emergency Director indicate:

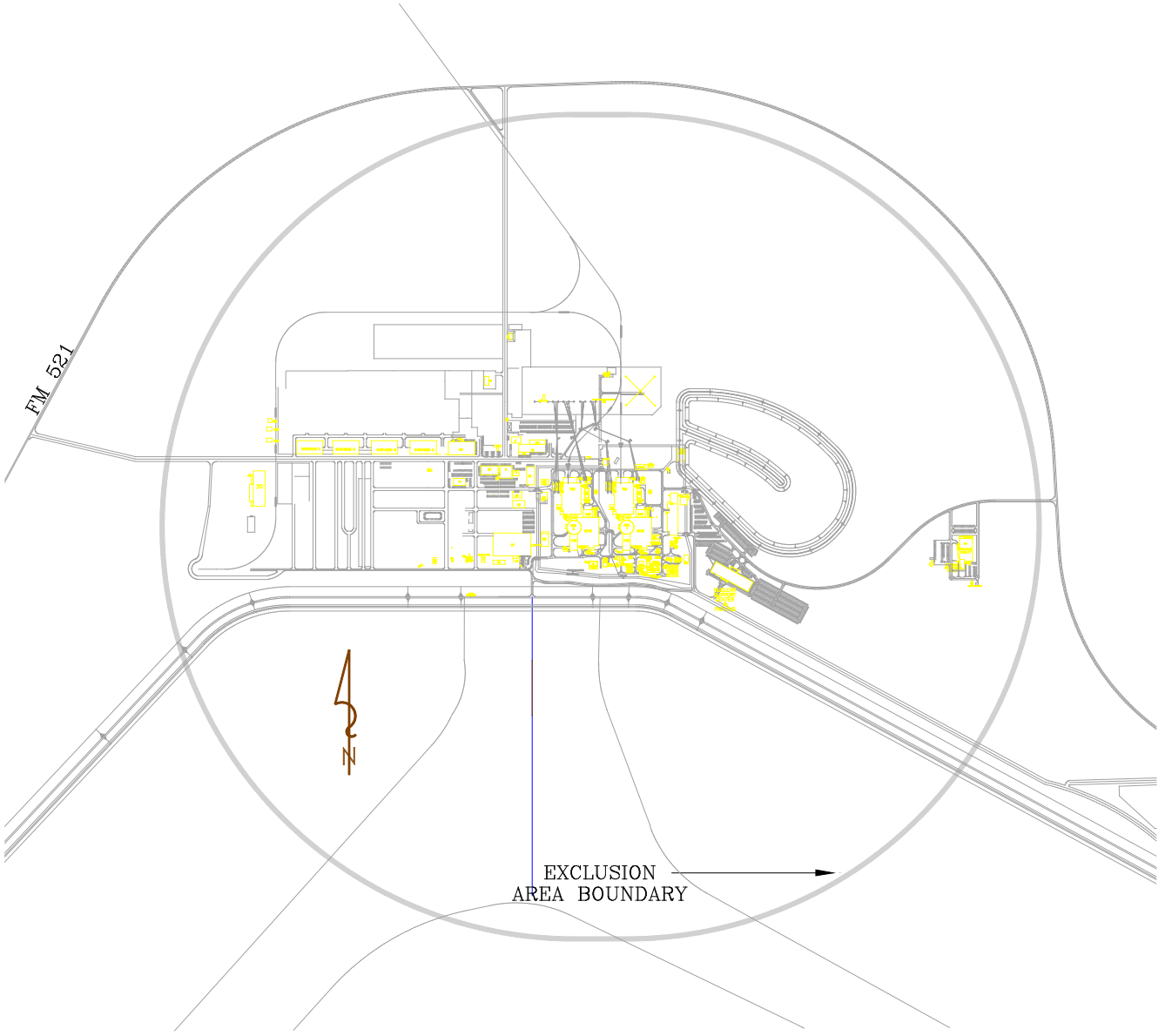
a. Actual or imminent substantial core degradation with potential for loss of containment.

OR

b. Potential for uncontrolled radionuclide releases. These releases can reasonably be expected to exceed EPA PAG plume exposure levels outside the site boundary.

BASIS:

This EAL is intended to address unanticipated conditions not addressed explicitly elsewhere but that warrant declaration of an emergency because conditions exist which are believed by the Emergency Director to fall under the General Emergency class.



E-0010.DWG
REV. 0

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

Determine which combination of the three barriers are lost or have a potential loss and use the following matrix to classify the event. Also, an event (or multiple events) could occur which result in the conclusion that the loss or potential loss is IMMINENT (within 1 to 2 hours). In this IMMINENT loss situation use judgment and classify as if the thresholds are exceeded.

UNUSUAL EVENT (1-2)	ALERT (3-4)	SITE AREA EMERGENCY (5-8)	GENERAL EMERGENCY (9-10)
FU1 ANY Loss or ANY Potential Loss of Containment **FU2** Fuel Clad Degradation See SU6 **FU3** RCS Leakage - See SU7	**FA1** ANY Loss or ANY Potential Loss of Fuel Clad or RCS	**FS1** Loss of BOTH Fuel Clad and RCS OR Potential Loss of BOTH Fuel Clad and RCS **OR** Potential Loss of EITHER Fuel Clad or RCS **AND** Loss of ANY Additional Barrier	**FG1** Loss of ANY Two Barriers AND Potential Loss or Loss of Third Barrier

Operating Modes 1 through 4

Note: 1. At the Site Area Emergency level, there must be some ability to dynamically assess how far present conditions are from General Emergency.

2. The ability to escalate to higher emergency classes as an event degrades must be maintained. RCS leakage steadily increasing would represent an increasing risk to public health and safety.

Determination of Emergency Classification Level

Select values from the top of the columns on the next page, which describe specific Fission Product Barrier degradation. Select the higher value that applies from each barrier. Add the values to arrive at the total challenge to the Fission Product Barriers. The emergency classification is determined from the range of values shown in parentheses in the table above.

RECOGNITION CATEGORY F
FISSION PRODUCT BARRIER DEGRADATION
INITIATING CONDITION MATRIX

EAL	FUEL CLAD		RCS		CONTAINMENT	
	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (3)	LOSS (4)	POTENTIAL LOSS (1)	LOSS (2)
1	CSF Core Cooling - Orange **OR** Heat Sink - Red[2]	CSF Core Cooling - Red	CSF RCS Integrity – Red **OR** Heat Sink - Red[2]	CSF Core Cooling - Yellow with subcooling < 0 °F	CSF Containment - Red **OR** Core Cooling - Orange > 15 min.	–
2	RCS Activity Failed Fuel Monitor, RT-8039, equal to or greater than 870 µCi/ml	RCS Activity Dose Equivalent Iodine greater than 300 µCi/gm	RCS Leak Rate Unisolable leak exceeding the capacity of one centrifugal pump in the normal mode.	RCS Leak Rate Leak rate greater than CVCS System's ability to maintain RCS inventory as indicated by loss of RCS subcooling.	Containment Pressure Greater than 6% hydrogen concentration in containment **OR** Containment pressure greater than 9.5 psig with neither containment spray nor RCFC running.	Containment Pressure Initial increase followed by rapid unexplained decrease **OR** Containment pressure or sump level not increasing as expected with LOCA conditions.
3	Core Exit Thermocouple ≥ 708°F	Core Exit Thermocouple 1200°F	SG Tube Rupture SG Tube has ruptured and the primary to secondary leak rate is greater than the capacity of one centrifugal charging pump.	SG Tube Rupture SG Tube is ruptured and has a non-isolable secondary steam release		SG Tube Leak Primary to secondary leakage greater than 150 gpd through any one steam generator with direct secondary side leakage to atmosphere
4	Reactor Vessel Water Level Plenum level less then 20%	–		–	Containment Bypass VALID increase in reading on area or ventilation monitors in areas adjacent to the containment boundary with a known LOCA inside containment.	Containment Isolation Containment isolation signal **AND** Valves not closed **AND** A pathway to the environment exists.
5	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	–	RCB Rad Monitor RT-8050 or RT-8051 greater than 100 R/hr **OR** Hatch Monitor greater than 222 mR/hr	RCB Rad Monitor RT-8050 or RT-8051 greater than 1,000 R/hr **OR** Hatch Monitor greater than 2,222 mR/hr	–

either of these (3)

plus this one (2)

plus either of these two (4)

Note: 1. The Fuel Clad barrier and the RCS barrier are weighted more heavily than the Containment Barrier. Unusual Event Initiating Conditions (ICs) associated with RCS and Fuel Clad barriers are addressed under SU6 and SU7.

2. CSF indicators must be valid; outside the immediate control of the operator.

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: RETURN GWPS TO SERVICE

JPM NO: P1

REVISION: 0

LOCATION: UNIT 1 or 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	RETURN GWPS TO SERVICE
JPM No.:	P1
Rev. No.:	0
STP Task:	T031200, Operate the Gaseous Waste Processing System (GWPS).
STP Objective:	NLO031200, Given the specified procedure(s), logs/forms, tools and equipment, operate the GWPS in accordance with the specified procedure(s), with no assistance allowed in operating the system.
Related K/A Reference:	071 A2.02 [3.3/3.6], Ability to (a) predict the impacts of the following malfunctions or operations on the WGDS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Use of waste gas release monitors, radiation, gas flow rate, and totalizer.
References:	0POP02-WG-0001, Rev. 25, Gaseous Waste Processing System Operations
Task Normally Completed By:	PO
Method of Testing:	Simulated
Location of Testing:	Plant
Time Critical Task:	NO
Alternate Path JPM:	YES
Validation Time:	30 Minutes

Required Materials (Tools/Equipment):

Student Handout copy of 0POP02-WG-0001, Gaseous Waste Processing System Operations

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the applicant):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A one hour PMT was just completed on the GWPS system and it is time to return the system to normal.

INITIATING CUE:

The Unit Supervisor requests you to perform a system startup of the GWPS utilizing Section 7 of 0POP02-WG-0001, Gaseous Waste Processing System Operations. All applicable prerequisites have been completed.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Satisfactory startup of GWPS, completing steps 7.1 through 7.9.

HANDOUTS:

Student Handout copy of 0POP02-WG-0001, Gaseous Waste Processing System Operations.

NOTES:

1) Room 068K in Unit 2 may be posted as a Radiation Area. (Applicable to JPM steps 9 and 11)

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, …).

SAT / UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of the procedure.

Standard:

Obtains a copy of 0POP02-WG-0001, Gaseous Waste Processing System Operations.

Comment:

Cue:

Provide the applicant with the handout copy of 0POP02-WG-0001, Gaseous Waste Processing System Operations.

Notes:

SAT / UNSAT Performance Step: 2

Review the Prerequisites and the Notes and Precautions. (sections 3.0 and 4.0)

Standard:

Reviews the Prerequisites, Notes and Precautions of 0POP02-WG-0001, Gaseous Waste Processing System Operations.

Comment:

Cue:

Inform the applicant that all prerequisites have been satisfied as per the Initiating Cue.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 3

Verify Chiller Glycol temperature less than or equal to 35°F. (step 7.1)

Standard:

Verifies Chiller Glycol temperature is less than or equal to 35°F on "1(2)-WG-TI-4659 GWPS GLYCOL CHILLER TANK TEMPERATURE ELEMENT".

Comment:

1(2)-WG-TI-4659 is located on ZLP-116 in the Rad Waste Control Room 41' MAB.
(one of 6 indicators on ZLP-116)

Cue:

Temperature indication on 1(2)-WG-TI-4659 is 34°F.

Notes:

SAT / UNSAT Performance Step: 4

Inform the Control Room that the inlet O2 monitor will be inoperable when the GWPS Inlet 1(2)-WG-FV-4657 and Outlet 1(2)-WG-FV-4671 Flow Valve Handswitches are placed in the OPEN position and requires TRM compensatory actions. (step 7.2)

Standard:

Informs the Control Room that the inlet O2 monitor will be inoperable when the GWPS Inlet 1(2)-WG-FV-4657 and Outlet 1(2)-WG-FV-4671 Flow Valve Handswitches are placed in the OPEN position and TRM compensatory actions are required.

Comment:

Cue:

As the Control Room, acknowledge that the inlet O2 monitor will be inoperable when the GWPS inlet and outlet flow valve handswitches are placed in the OPEN position and TRM compensatory actions will be taken.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 5 (C)

Place 1(2)-WG-FV-4671, GWPS Discharge Flow Valve control switch in OPEN. (step 7.3)

Standard:

Places 1(2)-WG-FV-4671, GWPS Discharge Flow Valve control switch in OPEN.

Comment:

Located on 41' MAB Radwaste Control Panel ZLP-116.

Cue:

FV-4671 Handswitch: Initially – CLOSE
"Green Light - LIT, Red Light – OFF"
Finally – OPEN
"Green Light – OFF, Red Light – LIT"

Notes:

SAT / UNSAT Performance Step: 6 (C)

Place 1(2)-WG-FV-4657, GWPS Inlet Header Valve control switch in OPEN. (step 7.4)

Standard:

Places 1(2)-WG-FV-4657, GWPS Inlet Header Valve control switch in OPEN.

Comment:

Located on 41' MAB Radwaste Control Panel ZLP-116.

Cue:

FV-4657 Handswitch: Initially – CLOSE
"Green Light - LIT, Red Light - OFF"
Finally – OPEN
"Green Light - OFF, Red Light - LIT"

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 7 (C)

If inlet header oxygen is greater than 1%, then start a nitrogen purge. (step 7.5)

Standard:

Determines that inlet header oxygen is greater than 1% and that a nitrogen purge must be performed.

Comment:

1(2)-WG-AI-4655 Oxygen Monitor is a Tech Spec related piece of equipment and has a hinged cover over the controls. To preclude having the applicant open the cover and affect a piece of Tech Spec related equipment, Attachment 1, a picture of the Oxygen Monitor with the cover open is provided. DO NOT ALLOW THE APPLICANT TO OPEN THE DOOR OF THE OXYGEN MONITOR.

Attachment 1 shows the normal configuration of the Oxygen Monitor and the reading during normal operations. The following cues will provide the applicant with the needed information to determine that a nitrogen purge is required.

The following are the meter ranges for the indicated range switch positions on the Oxygen Monitor:

LO: 0 – 1%
MED: 0 – 5%
HI: 0 – 25% (There is no scale marked on the meter for this range.)

STEP CONTINUED ON NEXT PAGE

JOB PERFORMANCE MEASURE CHECK SHEET

Cue:

1) If the applicant goes to open the cover to the Oxygen Monitor, provide Attachment 1 to the applicant.

2) If applicant asks what position that the range switch is in, inform the applicant that the switch is in the MED position.

3) If the applicant uses Attachment 1 to determine Oxygen level, it has a black meter needle on 3 (indicating 3% oxygen).

4) If the applicant uses the meter on the actual Oxygen Monitor, indicate that the needle is pointing to the 3 (indication 3% oxygen). DO NOT ALLOW THE APPLICANT TO OPEN THE COVER TO THE OXYGEN MONITOR.

5) If the applicant indicates that they would change the range switch to the "LO" position and asks what the Oxygen Monitor is reading is in this position, inform the applicant that the meter is pegged high.

6) If applicant contacts the Control Room informing them of the requirement to start a nitrogen purge, acknowledge that a nitrogen purge must be performed.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 8

Inform Main Control Room of increased nitrogen usage during nitrogen purge. (step 7.5.1)

Standard:

Informs Main Control Room of increased nitrogen usage during nitrogen purge.

Comment:

Cue:

As the control room, acknowledge that there will be an increased usage of nitrogen during the nitrogen purge.

Notes:

SAT / UNSAT Performance Step: 9 (C)

Open 1(2)-NL-0116, Low Pressure Nitrogen to Gaseous Waste System Isolation Valve. (step 7.5.2)

Standard:

Opens 1(2)-NL-0116, Low Pressure Nitrogen to Gaseous Waste System Isolation Valve.

Comment:

1) NL-0116 is located on the 10' MAB Room 068K.

2) Valve is a 90° turn valve.

Cue:

NL-0116: Initially - CLOSED
Finally - OPEN

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 10 (C)

Throttle open 1(2)-NL-0029, Low Pressure Nitrogen to Gaseous Waste System Isolation Valve while maintaining system pressure less than 2.5 psig. (steps 7.5.3 and 7.5.4)

Standard:

Slowly throttles open 1(2)-NL-0029, LOW PRESSURE NITROGEN TO GWPS ISOLATION VALVE, to maintain less than 2.5 psig as indicated on 1(2)WG-PI-4656, GLYCOL CHILLER TANK INLET HEADER PRESSURE INDICATOR.

Comment:

Valve is located on MAB 10' in Room 068J.

Pressure Indicator is located on the 41' MAB on the Radwaste Control Panel ZLP-116. (of the 6 indicators located on the top right corner of ZLP-116, it is the second from left)

Applicant will require assistance from another operator to monitor pressure while nitrogen valve is throttled open.

Cue:

- NL-0029: Initially - CLOSED
  Finally - THROTTLED OPEN

- As the operator monitoring pressure, report pressure gradually rising, at 0.3 psig increments, as the valve is throttled open. Final pressure on PI-4656 is 2.3 psig.

- When proper nitrogen pressure is obtained, cue that it is desired to secure the nitrogen purge lineup.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 11 (C)

When desired to secure Nitrogen Purge, THEN perform the following: (steps 7.5.5 and 7.5.6)

- CLOSE 1(2)-NL-0029
- CLOSE 1(2)-NL-0116
- Inform Control Room of completion of Nitrogen usage.

Standard:

CLOSES 1(2)-NL-0029 and 1(2)-NL-0116 and informs the Control Room of completion of nitrogen usage.

Comment:

Located on 10' MAB in Rooms 068J and 068K, respectively.

Cue:

1(2)-NL-0029 and 1(2)-NL-0116:
Initially: OPEN
Finally: CLOSED

Acknowledge as Control Room that nitrogen usage is complete.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 12 (C)

Place 1(2)-WG-FV-4671, GWPS Discharge Flow Valve control switch in NORMAL. (step 7.6)

Standard:

Places 1(2)-WG-FV-4671, GWPS Discharge Flow Valve control switch in NORMAL.

Comment:

Located on 41' MAB Radwaste Control Panel ZLP-116.

Cue:

FV-4671 Handswitch: Initially – OPEN
"Green Light – OFF, Red Light – LIT"

Finally – NORMAL
"Green Light – OFF, Red Light – LIT"

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 13 (C)

Place 1(2)-WG-FV-4657, GWPS Inlet Header Valve control switch in NORMAL. (step 7.7)

Standard:

Places 1(2)-WG-FV-4657, GWPS Inlet Header Valve control switch in NORMAL.

Comment:

Located on 41' MAB Radwaste Control Panel ZLP-116.

Cue:

FV-4657 Handswitch: Initially – OPEN
"Green Light - OFF, Red Light – LIT"

Finally – NORMAL
"Green Light - OFF, Red Light – LIT"

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 14 (C)

Ensure Inlet Header Oxygen (O2) Detector is selected to the mid range. (step 7.8)

Standard:

Ensures that the Inlet Header Oxygen (O2) Detector is selected to the mid range.

Comment:

1(2)-WG-AI-4655 Oxygen Monitor is a Tech Spec related piece of equipment and has a hinged cover over the controls. To preclude having the applicant open the cover and affect a piece of Tech Spec related equipment, Attachment 2, a picture of the Oxygen Monitor with the cover open is provided. DO NOT ALLOW THE APPLICANT TO OPEN THE DOOR OF THE OXYGEN MONITOR.

Cue:

1) If the applicant goes to open the cover to the Oxygen Monitor, provide Attachment 2 to the applicant.

2) If applicant asks what position that the range switch is in, inform the applicant that the switch is in the MED position as shown.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 15

Inform Main Control Room that GWPS Inlet 1(2)-WG-FV-4657 and Outlet 1(2)-WG-FV-4671 Flow Valve Handswitches are placed in NORMAL and the O2 monitor may be considered OPERABLE which may permit exiting the ACTIONS of TRM 3/4.3.3.11 and 3/4.11.2.5. (step 7.9)

Standard:

Informs the Main Control Room that GWPS Inlet 1(2)-WG-FV-4657 and Outlet 1(2)-WG-FV-4671 Flow Valve Handswitches are returned to NORMAL and the O2 monitor may be considered OPERABLE which may permit exiting the ACTIONS of TRM 3/4.3.3.11 and 3/4.11.2.5.

Comment:

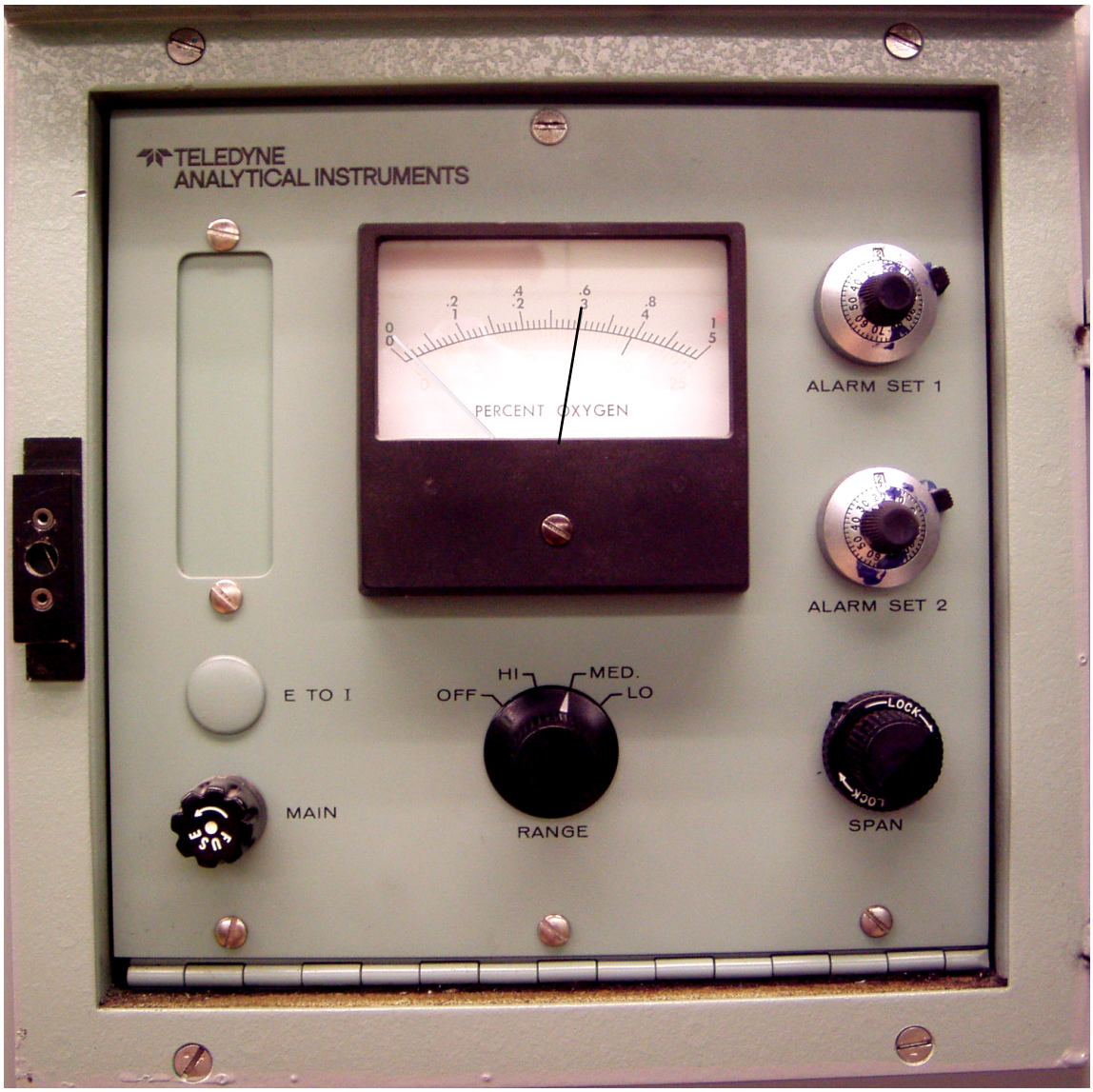
Cue:

As the control room, acknowledge that GWPS Inlet 1(2)-WG-FV-4657 and Outlet 1(2)-WG-FV-4671 Flow Valve Handswitches are returned to NORMAL and the O2 monitor may be considered OPERABLE.

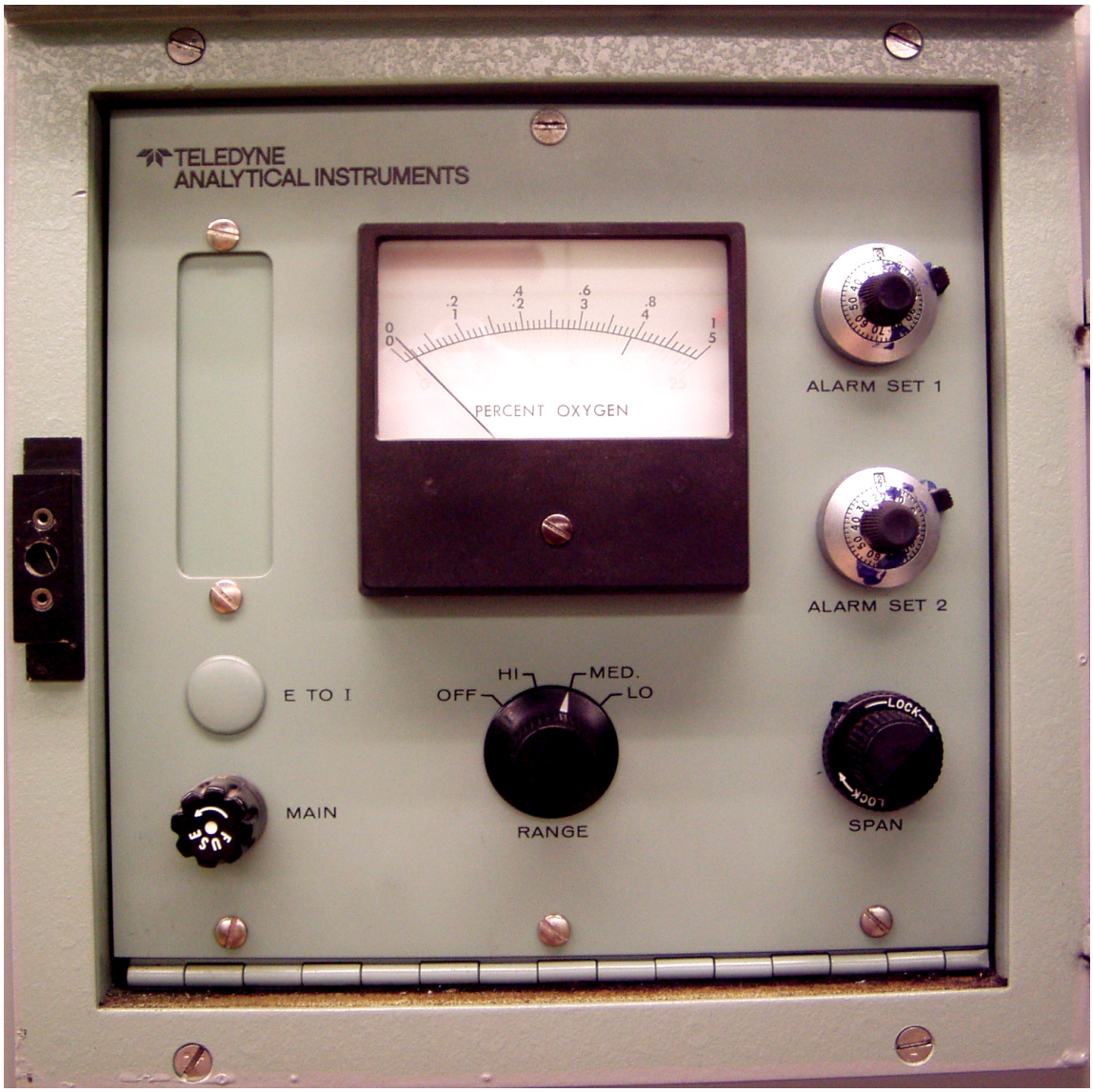
Notes:

- TERMINATE THE JPM - **Stop time: _____**

ATTACHMENT 1



ATTACHMENT 2



VERIFICATION OF COMPLETION

Job Performance Measure: P1, RETURN GWPS TO SERVICE

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator:_____ **Signature:**_____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

A one hour PMT was just completed on the GWPS system and it is time to return the system to normal.

INITIATING CUE:

The Unit Supervisor requests you to perform a system startup of the GWPS utilizing Section 7 of 0POP02-WG-0001, Gaseous Waste Processing System Operations. All applicable prerequisites have been completed.

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Gaseous Waste Processing System Operations			
Quality	Non Safety-Related	Usage: **IN HAND**	Effective Date: 06/04/2013

Frank Jacobus	Austin Cocke	Crew 2C	Plant Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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Usage

1 - IN HAND
2 - IN HAND CONTROLLING STATION
3 - REFERENCED
4 - AVAILABLE

3.0 Prerequisites

3.1 Instrument air is available.

3.2 A minimum of one MAB ventilation supply and one exhaust fan is in operation.

3.3 Radioactive Vents and Drains System is in operation.

3.4 Radiation Monitors 1(2)-RA-RT-8031 and 1(2)-RA-RT-8032 are in service or an alternate method of radiation monitoring is provided.

3.5 Nitrogen is available to GWPS.

3.6 Glycol level should be in the top 1/3 of the Glycol Chiller Tank sightglass. (30% glycol solution is recommended for Chiller Tank refills).

3.7 System aligned in accordance with Lineup 1, 2 & 3.

3.8 Health Physics should be notified of any process flow changes.

3.9 Inlet Header Oxygen (O_2) Detector is in service and in the mid range.

3.10 0PGP03-ZA-0090, Work Process Program should be referred to for guard bed loading chute flange removal and installation.

3.11 Control power is available to 120/208V Distribution Panels DPJ-334, DPL-334 and DPL-434.

3.12 The following will be needed for performance of Section 26.0 or 27.0:

- Vacuum cleaner and appropriate attachments with adequate radiological protection as determined by Health Physics
- Drum inverter
- Charcoal loading chutes
- Appropriate scale to weigh charcoal
- Modified drum lid and charcoal addition funnel for loading charcoal

4.0 Notes and Precautions

4.1 The following will result in a GWPS shutdown: WHEN Inlet Header Oxygen (O_2) Detector is OPERABLE AND selected to the mid range AND GWPS Inlet (1(2)-WG-FV-4657) and Outlet (1(2)-WG-FV-4671) Flow Valve Hand switches are in "NORMAL":

- High system inlet oxygen content of 1% as indicated on 1(2)-WG-AI-4655. (ZLP-116)
- High system discharge flow of 5.8 scfm as indicated on 1(2)-WG-FIT-4671. (ZLP-116)
- **(UNIT 1 ONLY)** Low pressure of -14 inches H_2O at the Bellows Compressor suction as indicated on 1-WG-PI-4650. (ZLP-116)
- **(UNIT 2 ONLY)** Low pressure of -35 inches H_2O at the Bellows Compressor suction as indicated on 2-WG-PI-4650. (ZLP-116)
- High system inlet pressure of 2.5 psig as indicated on 1(2)-WG-PI-4656. (ZLP-116)
- High Hydrogen Room Monitor Level of 87.5% of Lower Flammable Limit (LFL) as indicated on 1(2)-WG-AIT-4661. (ZLP-116)
- System high discharge radiation of 1.8E+1 μci/cc on N1(2)RA-RT-8032 as indicated by annunciator window (C-3). (ZLP-115)
- Bellows Compressor failure (leak) of -8 inches H_2O as indicated by annunciator window (A-2). (ZLP-116)

4.2 WHEN GWPS Inlet Flow Valve OR Outlet Flow Valve handswitches are in the "OPEN" position, THEN the automatic shutdowns are bypassed **AND** the Inlet Header O_2 Detector is INOPERABLE. Reference 3/4.3.3.11 and TRM 3/4.11.2.5 for compensatory actions. (Reference 2.6.12, 2.6.3, and Step 4.14)

4.3 Moisture Separator Drain Tank level above 8 inches H_2O as indicated on 1(2)-WG-LI-4662 may result in moisture carry over into the gas stream. (ZLP-116)

4.4 Glycol Chiller Tank temperature should be maintained between 32°F and 37°F.

4.5 Maximum allowable Moisture Separator discharge temperature is 60°F as indicated on 1(2)-WG-TI-4664. (ZLP-116)

4.6 Ethylene glycol disposal SHALL be per 0PGP03-ZH-0003, Packaging of Nonradioactive Waste Materials For Disposal.

4.7 Maximum allowable HEPA Filter ΔP is 9.5 inches H_2O as indicated on 1(2)-WG-PDI-4670.

4.8 Operation of Inlet Header O_2 Detector on 0-25% scale (High Range) increases trip setpoint to 5%, which is above TRM limit of 3% per TRM 3/4.11.2.5.

4.9 Inlet Header O2 Detector is required to be OPERABLE when GWPS is lined up to any process flow other than N2. IF Inlet Header O2 Detector is inoperable and the GWPS is lined up to any process flow except N2, Then TRM 3/4.3.3.11 is applicable and shall be referred to for compensatory action. (Reference 2.6.13)

4.10 No open flames, spark producing or heat producing equipment SHALL be permitted in charcoal loading or charcoal removal area.

4.11 Operator performing charcoal loading evolution SHALL exercise caution and comply with radiological controls when transferring and handling radioactively contaminated charcoal.

4.12 All liquids SHALL be contained or routed to floor drains.

4.13 Inlet Header O2 Detector is **NOT** required to be **OPERABLE** when GWPS is lined up solely to N2 for purge. TRM 3/4.3.3.11 is **NOT** applicable when **only** N2 purging of GWPS. (Reference 2.6.13)

4.14 The requirements of TRM Action 1 of TABLE 3.3 – 13, four (4) hour grab samples and analysis are satisfied when the Inlet Header O_2 Detector is functional and the reading is verified by the Operator logging the reading every 4 hours to be less than 3% limit of TRM 3/4.11.2.5 IAW LCO time requirements. The temporary logs of the Inlet Header O_2 Detector SHALL be retained. (Reference 2.6.3)

4.15 WHEN the VCT is isolated from GWPS (for maintenance, monitor calibration, etc.), THEN coordinate with the control room to maintain VCT hydrogen overpressure between 15 and 30 psig. The intent is to maintain RCS hydrogen concentration less than Action Level 1.

4.16 Any of the conditions listed below will cause a system shutdown, bring in their individual annunciator, and the "SYSTEM RESET" alarm (C8) on ZLP-116.

- Boron Recycle holdup vent low pressure.
- Bellows compressor leak detection.
- High oxygen level in process stream.
- System inlet high pressure.
- High hydrogen content in skid cubicle.
- High system outlet flow.
- High radiation at system discharge.

4.17 The system shutdown relay, CR-9, is normally de-energized and energizes when one of the above (Step 4.16) conditions comes in. It will remain energized until the initiating condition clears and the System Reset pushbutton is depressed.

4.18 The following actions occur on a system shutdown:

Boron Recycle Holdup Vent Inlet Valve closes (FV-4651)

Bellows Compressor stops

System inlet valve closes (FV-4657)

System outlet valve closes (FV-4671)

Annunciator C8 "SYSTEM RESET"

4.19 Once the initiating condition (Step 4.16) has cleared, depressing the System Reset Pushbutton (ZLP-116) will de-energize CR-9, and restart the system, if no switch lineup changes have occurred.

4.20 Do **NOT** place Gaseous waste system loads on the GWPS until the applicable system startup minimum purge times (Step 5.12 or Step 6.23) are completed. Minimum system purge times are necessary to prevent explosive conditions.

4.21 Handswitch HS-4653 on ZLP116 provides input to allow WG-FIT-4653 or WG-FIT-4658 to control WG-FV-4653, either position may be selected as necessary.

4.22 WG-FIT-4653 will continue to display flow (even during erratic operation) from WG-FE-4653 and alarm on panel ZLP-116 during high flow, per the FSAR. WG-FIT-4658 will continue to display flow when WG-FIT-4653 is selected to on WH-HS-4653.

4.23 IF handswitch HS-4653 on ZLP116 is selected to the WG-FIT-4658, THEN "WG-FIC-4653 VOLUME CONTROL TANK FLOW" will be controlled by total GWPS outlet flow instead of only by VCT outlet flow.

4.24 The GWPS should normally be operated, as much as possible, utilizing FE-4658 for control (both in Auto and Manual) when starting up the system or when running in low flow conditions (<1 SCFM). (Reference 2.6.9)

4.25 It is preferred to maintain control of FV-4653 in Manual until a consistent flow-rate is displayed on FE-4671 (indicating that the system has filled and is flowing consistently). It may take as much as 4 hours for this to occur. (Reference 2.6.9)

4.26 The GWPS must be closely monitored during non-steady state operations, as frequent pressure changes in the VCT can cause one or more of the 4653 valves to inadvertently close and shut down the GWPS. (Reference 2.6.9)

4.27 Erratic indication may be observed on FIT-4653 due to moisture contamination of the sensor AND this may be considered an expected condition. (Reference 2.6.11)

7.0 System Startup Following Short Shutdown

7.1 VERIFY Chiller Glycol temperature less than or equal to 35°F as indicated on "1(2)-WG-TI-4659 GWPS GLYCOL CHILLER TANK TEMPERATURE ELEMENT". (ZLP-116) _____

NOTE

IF GWPS has shutdown automatically, THEN depressing the system "RESET" pushbutton will cause both inlet and discharge flow valves to open ONLY if condition causing shutdown has cleared.

CAUTION

WHEN GWPS Inlet (1(2)-WG-FV-4657) OR Outlet (1(2)-WG-FV-4671) Flow Valve Handswitches are in "OPEN", THEN all automatic shutdowns are bypassed **AND** the Inlet Header O_2 Detector is INOPERABLE. Reference TRM 3/4.3.3.11 and TRM 3/4.11.2.5 for compensatory actions. (Reference 2.6.12, 2.6.3, and Step 4.14)

7.2 INFORM Main Control Room that GWPS Inlet and Outlet Flow Valve Handswitches are to be placed in "OPEN" which will render the Inlet Header O_2 Detector **INOPERABLE** AND require compensatory actions of TRM 3/4.3.3.11 and TRM 3/4.11.2.5. (Reference 2.6.12, 2.6.3, and Step 4.14) _____

7.3 PLACE "1(2)-WG-FV-4671 GWPS DISCHARGE FLOW VALVE" control switch in "OPEN". (ZLP-116) _____

7.4 PLACE "1(2)-WG-FV-4657 GWPS INLET HEADER VALVE" control switch in "OPEN". (ZLP-116) _____

7.5 IF Inlet Header oxygen is greater than 1% as indicated on 1(2)-WG-AI-4655, THEN PERFORM a nitrogen purge as follows: (ZLP-116)

7.5.1 INFORM Main Control Room of increased nitrogen usage during performance of this evolution _____

7.5.2 OPEN "1(2)-NL-0116 LOW PRESSURE NITROGEN TO GASEOUS WASTE SYSTEM ISOLATION VALVE". (MAB 10' Room 068K) _____

7.5.3 THROTTLE OPEN "1(2)-NL-0029 LOW PRESSURE NITROGEN TO GASEOUS WASTE SYSTEM ISOLATION VALVE". (MAB 10' Room 068J) _____

7.5.4 MAINTAIN system pressure less than 2.5 psig as indicated on "1(2)-WG-PI-4656 GWPS GLYCOL CHILLER TANK INLET HEADER PRESSURE INDICATOR". (ZLP-116) _____

7.5.5 WHEN desired to secure the nitrogen purge, THEN PERFORM the following:

7.5.5.1 CLOSE "1(2)-NL-0029 LOW PRESSURE NITROGEN TO GASEOUS WASTE SYSTEM ISOLATION VALVE". (MAB 10' Room 068J). _____

7.5.5.2 CLOSE "1(2)-NL-0116 LOW PRESSURE NITROGEN TO GASEOUS WASTE SYSTEM ISOLATION VALVE". (MAB 10' Room 068K). _____

7.5.6 INFORM Main Control Room of completion of N_2 usage. _____

7.6 PLACE "1(2)-WG-FV-4671 GWPS DISCHARGE FLOW VALVE" control switch in "NORMAL". _____

7.7 PLACE "1(2)-WG-FV-4657 GWPS INLET HEADER VALVE" control switch in "NORMAL". _____

7.8 ENSURE Inlet Header Oxygen (O_2) Detector is selected to the mid range. _____

7.9 INFORM Main Control Room that GWPS Inlet and Outlet Flow Valve Handswitches are placed in "NORMAL" **AND** the Inlet Header O_2 Detector may be considered **OPERABLE** which may permit exiting the ACTIONS of TRM 3/4.3.3.11 and TRM 3/4.11.2.5. (Reference 2.6.12, 2.6.3, and Step 4.14) _____

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: LOCAL START OF ESF DG

JPM NO: P2

REVISION: 0

LOCATION: UNIT 1 or 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	LOCAL START OF ESF DG
JPM No.:	P2
Rev. No.:	0
STP Task:	T97863, Manually start a diesel generator locally.
STP Objective:	NLO97863, When directed, due to a control room evacuation, locally start a standby diesel generator and restore power to the associated bus, IAW 0POP04-ZO-0001, Control Room Evacuation, Addendum 7.
Related K/A Reference:	064 A4.01 [4.0/4.3], Ability to manually operate and/or monitor in the control room: Local and Remote operation of the ED/G.
References:	0POP04-ZO-0001, Rev. 35 Control Room Evacuation
Task Normally Completed By:	PO
Method of Testing:	Simulated
Location of Testing:	Plant
Time Critical Task:	NO
Alternate Path JPM:	No
Validation Time:	20 Minutes

Required Materials (Tools/Equipment):

Handout copy of 0POP02-ZO-0001, Control Room Evacuation

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the applicant):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The control room has been evacuated and shift personnel are performing the actions of 0POP04-ZO-0001, Control Room Evacuation. A Loss of Offsite Power (LOOP) has also occurred and only ESF DG 11(21) is operating.

INITIATING CUE:

The Shift Manager directs you to locally start and load ESF DG 12(22) using Addendum 7 of 0POP04-ZO-0001, Control Room Evacuation.

-DO NOT DISCLOSE INFORMATION BELOW THIS LINE-

COMPLETION CRITERIA:

ESF DG 12(22) is running with cooling water flow established in accordance with 0POP04-ZO-0001, Control Room Evacuation.

HANDOUTS:

JPM handout copy of 0POP04-ZO-0001

NOTES:

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, …).

SAT / UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of the procedure

Standard:

Obtains a copy of 0POP04-ZO-0001, Addendum 7

Comment:

Cue:

Provide the applicant with JPM handout copy of 0POP04-ZO-0001, Addendum 7.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 2 (C)

Check Standby Diesel Generator status – RUNNING (addendum step 1)

Standard:

Determines DG 12(22) is NOT running

Comment:

Cue:

- If asked, as the Train B ESF Switchgear Operator and the Operator at the Essential Cooling Water Intake Structure (ECWIS), inform the applicant that you have located the required controls and are ready to proceed.
- ENGINE SPEED indicator is reading 0 rpm.
- You do not hear the engine running.

Notes:

Communication will be by headphones with the switchgear operator (located in the local locked procedure box) and by radio with the ECWIS operator.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 3

ENSURE that any existing alarm(s) will not hinder startup or cause damage to the Standby Diesel Generator. (addendum step 1 RNO a)

Standard:

Determines startup is not hindered.

Comment:

Cue:

- The following annunciators are illuminated:
  - D-2 – Auxiliary Service Trip Status
  - F-1 – Raw Water Low Pressure
- If alarm status is reported to the Auxiliary Shutdown Panel (Shift Manager), inform the applicant that these alarms are expected during this condition and to continue with engine startup.

Notes:

D-2 is lit due to several auxiliary components being de-energized (due to the LOOP).

F-1 is lit due to the Essential Cooling Water pump being secured

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 4

ENSURE switch positions are correct. (addendum step 1 RNO b-d)

Standard:

Verifies the following switch positions:

___ *LOCAL/REMOTE TRANSFER SW in LOCAL*

___ *ESF BUS SUPPLY BKR TRANSFER SWITCH in LOCAL*

___ *VOLTAGE REG SEL SWITCH in AUTO*

Comment:

Cue:

- Both transfer switches as found position is LOCAL with the key inserted
- VOLTAGE REG SEL SWITCH as found position is AUTO

Notes:

The transfer switches would have been aligned by the Train B Switchgear Operator earlier in the procedure. AUTO is the normal position for the VOLTAGE REG SEL SWITCH.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 5 (C)

ENSURE that personnel are in position to start the associated ECW pump and open the ECW pump discharge valve within 2 minutes after starting the Standby Diesel Generator. (addendum step 1 RNO e)

Standard:

Contacts the Train B Switchgear Operator and ECWIS Operator to verify they are in position

Comment:

Cue:

- Both operators report that they are in position and ready to continue

Notes:

Communication will be by headphones with the switchgear operator (located in the local locked procedure box) and by radio with the ECWIS operator.

SAT / UNSAT Performance Step: 6 (C)

Obtain key and place Diesel Generator TEST MODE START switch to the ON position. (addendum step 1 RNO f, g)

Standard:

Obtains key and places the TEST MODE START switch in the ON position

Comment:

Cue:

- Initially, key not inserted. Finally, key inserted and rotated clockwise.
- Initially, TEST MODE START switch in OFF position. Finally in ON position.

Notes:

The key is obtained from the local locked procedure box (simulated).

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 7 (C)

DEPRESS the ENGINE START pushbutton. (addendum step 1 RNO h)

Standard:

Depresses the ENGINE START pushbutton.

Comment:

Cue:

- When start button is depressed, engine can be heard starting up in the background. Engine speed rises to ~540 rpm in approximately 8 seconds.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 8 (C)

Energize the 4.16 KV bus with the Diesel Generator. (addendum steps 5-8)

Standard:

Performs the following:

___ *Places the SYNCHRONIZING METER SEL switch in the ON position*

___ *Verifies the synchroscope is STATIONARY*

___ *Momentarily places the ESF BUS 4.16 KV SUPPLY BRKR switch to the TRIP position*

___ *CLOSES the EMERG DIESEL GEN 12(22) OUTPUT BRK E1B(E2B)/14*

Comment:

Cue:

- SYNCHRONIZING METER SEL switch initially in the OFF position, finally in the ON position
- Synchroscope is stationary (as is)
- ESF BUS 4.16 KV SUPPLY BRKR initially closed (red light on, green light off), finally open (green light on, red light off)
- EMERG DIESEL GEN 12(22)OUTPUT BRK E1B(E2B)/14 initially open (green light on, red light off, finally closed (red light on, green light off)

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 9 (C)

CLOSE applicable 4.16 KV/480V Supply Breakers. (addendum step 9)

Standard:

Contacts the Train B Switchgear Operator to close the following breakers:

___ *SPLY BKR E1B(E2B) TO XFMR E1B1(E2B1)*

___ *SPLY BKR FROM XFMR E1B1(E2B1) to LC E1B1(E2B2)*

___ *TO 480V ESF MCC E1B3(E2B3)*

Comment:

Cue:

- As the Train B switchgear operator, report the requested breakers CLOSED.

Notes:

Communication with the ESF Train Switchgear Operator is by headphones.

SAT / UNSAT Performance Step: 10 (C)

NOTIFY the Applicable ESF Train Switchgear Operator to start the ECW Pump associated with the running Standby Diesel Generator. (addendum step 10)

Standard:

Contacts the Train B Switchgear Operator to start ECW Pump 'B'.

Comment:

Cue:

- As the Train B switchgear operator, report ECW Pump 'B' running.

Notes:

Communication with the ESF Train Switchgear Operator is by headphones.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 11 (C)

Open ECW pump discharge valve . (addendum step 11, 12)

Standard:

Contacts the ECWIS Operator to perform the following:

___ *Place ECW PUMP DISCHARGE MOV 0137 in LOCAL*

___ *OPEN ECW PUMP DISCHARGE MOV 0137*

Comment:

Cue:

- As the ECWIS operator, report MOV-0137 OPEN.

Notes:

Communication with the ECWIS operator is by radio.

-TERMINATE THE JPM- **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure:

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator:_____ **Signature:**_____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The control room has been evacuated and shift personnel are performing the actions of 0POP04-ZO-0001, Control Room Evacuation. A Loss of Offsite Power (LOOP) has also occurred and only ESF DG 11(21) is operating.

INITIATING CUE:

The Shift Manager directs you to locally start and load ESF DG 12(22) using Addendum 7 of 0POP04-ZO-0001, Control Room Evacuation.

Addendum 7	Local Manual Standby Diesel Generator Starting	Addendum 7 Page 1 of 6

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- IF the Standby Diesel Generator is operating in the Emergency Mode when control is transferred to LOCAL, THEN the Standby Diesel Generator will NOT shut down.
- IF the Standby Diesel Generator is operating in the Test Mode when control is transferred to LOCAL, THEN the Standby Diesel Generator will shut down. IF a subsequent undervoltage signal is received, THEN the Standby Diesel Generator will auto start.
- All stations involved should find switches and indications for their actions prior to starting the Standby Diesel Generator to ensure ECW is aligned within two minutes.

_____ **1.0 CHECK Standby Diesel Generator Status – RUNNING {STBY DG Control Panel}**

PERFORM the following at the Standby Diesel Generator Control Panels:

a. ENSURE that any existing alarm(s) will not hinder startup or cause damage to the Standby Diesel Generator.

b. ENSURE the "LOCAL/REMOTE TRANSFER SW" key lock switch in "LOCAL".

c. ENSURE the "ESF BUS SUPPLY BKR TRANSFER SWITCH" key lock switch in "LOCAL".

d. ENSURE the "VOLTAGE REG SEL SWITCH" in the AUTO position.

e. ENSURE that personnel are in position to start the associated ECW pump and open the ECW pump discharge valve within 2 minutes after starting the Standby Diesel Generator.

f. OBTAIN key for operation of the "TEST MODE START" Switch.

g. PLACE Diesel Generator "TEST MODE START" switch to the ON position.

h. DEPRESS the "ENGINE START" Pushbutton.

i. GO TO Step 5 of this Addendum.

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**2.0 PLACE The "ESF BUS SUPPLY BKR TRANSFER SWITCH" In The LOCAL Position {STBY DG Control Panel}**	
_____	**3.0 PLACE The "LOCAL/REMOTE TRANSFER SW" In The LOCAL Position {STBY DG Control Panel}**	
_____	**4.0 ENSURE The "VOLTAGE REG SEL SWITCH" In AUTO {STBY DG Control Panel}**	
_____	**5.0 PLACE The "SYNCHRONIZING METER SEL" Switch In The ON Position {STBY DG Control Panel}**	
_____	**6.0 VERIFY The Synchroscope Status - STATIONARY {STBY DG Control Panel}**	PERFORM the following: **a.** IF STBY DG is running without ECW Cooling, THEN SECURE the STBY DG. **b.** PLACE the "SYNCHRONIZING SWITCH" in the OFF position. {STBY DG Control Panel} **c.** NOTIFY the ASP that there is indication of the 4.16 KV ESF bus being energized. **d.** WAIT for further instructions from the ASP.
_____	**7.0 Momentarily PLACE The ESF BUS 4.16 KV SUPPLY BRKR Switch To The TRIP Position {STBY DG Control Panel}**	

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The ESF Train Switchgear Operator and the TGB/ECWIS Operator actions should be coordinated to ensure the ECW pump is started and the associated ECW pump discharge valve is opened to minimize the time the Standby Diesel Generator is operating without ECW.

_____ **8.0 CLOSE The Standby Diesel Generator Output Breaker**

- EMERG DIESEL GEN 11(21) OUTPUT BRK E1A(E2A)/14 {ZLP-101}
- EMERG DIESEL GEN 12(22) OUTPUT BRK E1B(E2B)/14 {ZLP-103}
- EMERG DIESEL GEN 13(23) OUTPUT BRK E1C(E2C)/14 {ZLP-105}

_____ **9.0 CLOSE Applicable 4.16 KV/480V Supply Breakers**

Train A {ZLP-653}	Train B {ZLP-654}	Train C {ZLP-655}
_____ "SPLY BKR E1A(E2A) TO XFMR E1A1(E2A1)"	_____ "SPLY BKR E1B(E2B) TO XFMR E1B1(E2B1)"	_____ "SPLY BKR E1C(E2C) TO XFMR E1C1(E2C1)"

Train A {ZLP-700}	Train B {ZLP-701}	Train C {ZLP-709}
_____ "SPLY BKR FROM XFMR E1A1(E2A1) TO LC E1A1(E2A1)"	_____ "SPLY BKR FROM XFMR E1B1(E2B1) TO LC E1B1(E2B1)"	_____ "SPLY BKR FROM XFMR E1C1(E2C1) TO LC E1C1(E2C1)"

Train A	Train B	Train C
_____ "TO 480V ESF MCC E1A3(E2A3)" **{LC E1A1(E2A1)/3D}**	_____ "TO 480V ESF MCC E1B3(E2B3)" **{LC E1B1(E2B1)/4E}**	_____ "TO 480V ESF MCC E1C3(E2C3)" **{LC E1C1(E2C1)/1D}**

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

_____ **10.0 NOTIFY The Applicable ESF Train Switchgear Operator To Start The ECW Pump Associated With The Running Standby Diesel Generator**

- "ECW PUMP 1A(2A)" {ZLP-653}
- "ECW PUMP 1B(2B)" {ZLP-654}
- "ECW PUMP 1C(2C)" {ZLP-655}

_____ **11.0 DIRECT Operator At ECWIS To Place Handswitch For Applicable ECW Pump Discharge Valve In LOCAL**

ECW Train A ECWIS Room 104(101) MCC E1A3(E2A3)/C1	ECW Train B ECWIS Room 105(102) MCC E1B3(E2B3)/C1	ECW Train C ECWIS Room 106(103) MCC E1C3(E2C3)/B2
_____ "ECW PUMP DISCHARGE MOV 0121"	_____ "ECW PUMP DISCHARGE MOV 0137"	_____ "ECW PUMP DISCHARGE MOV 0151"

_____ **12.0 DIRECT Operator At ECWIS To Open Applicable ECW Pump Discharge Valve**

ECW Train A ECWIS Room 104(101) MCC E1A3(E2A3)/C1	ECW Train B ECWIS Room 105(102) MCC E1B3(E2B3)/C1	ECW Train C ECWIS Room 106(103) MCC E1C3(E2C3)/B2
_____ "ECW PUMP DISCHARGE MOV 0121"	_____ "ECW PUMP DISCHARGE MOV 0137"	_____ "ECW PUMP DISCHARGE MOV 0151"

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**13.0 PERFORM Addendum 8, ESF LC and MCC Power Verification, To Restore Power To The ESF Load Centers And Motor Control Centers**	
_____	**14.0 PLACE The "SYNCHRONIZING METER SEL" Switch In The OFF Position {STBY DG Control Panel}**	
_____	**15.0 VERIFY ECW Cooling Water Pressure To The Standby Diesel Generator - GREATER THAN 6 PSIG {STBY DG Control Panel}**	PERFORM the following: **o.** SECURE the Standby Diesel Generator. **p.** RETURN TO the procedure step in effect.

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**16.0 NOTIFY The Applicable ESF Train Switchgear Operator To Ensure The Appropriate Addendum Is Completed** • Addendum 2, ESF Train A Switchgear Room Alignment • Addendum 3, ESF Train B Switchgear Room Alignment • Addendum 4, ESF Train C Switchgear Room Alignment	----------
_____	**17.0 VERIFY Status Of Standby Diesel Generator Emergency Fan - RUNNING {STBY DG Fan Rm}**	NOTIFY the associated ESF Train Switchgear Operator to start the Emergency Supply Fan on the 700 series Transfer Cabinet. ----------
_____	**18.0 VERIFY Status Of Standby Diesel Generator Normal Fan – SECURED {STBY DG Fan Rm}**	STOP the Standby Diesel Generator Normal Fan. {STBY DG Fan Rm At AHU} ----------
_____	**19.0 RETURN TO The Procedure Step In Effect**	----------

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: FAILING AIR TO MSIVs AND MSIBs

JPM NO: P3

REVISION: 0

LOCATION: UNIT 1 or 2

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	FAILING AIR TO MSIVs AND MSIBs
JPM No.:	P3
Rev. No.:	0
STP Task:	T82044, Respond to a Loss of All AC Power
STP Objective:	CRO 82044, Respond to a Loss of All AC Power in accordance with 0POP05-EO-EC00, Loss of All AC Power
Related K/A Reference:	039 A4.01[2.9/2.8] Ability to manually operate and/or monitor in the control room: Main steam supply valves
References:	0POP05-EO-EC00, LOSS OF ALL AC POWER, Rev. 23
Task Normally Completed By:	PO
Method of Testing:	Simulated
Location of Testing:	Plant
Time Critical Task:	NO
Alternate Path JPM:	YES
Validation Time:	20 Minutes

Required Materials (Tools/Equipment):

Student handout addendum 1 0POP05-EO-EC00

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the applicant):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The unit has experienced a loss of all AC power, and procedure 0POP05-EO-EC00, LOSS OF ALL AC, is being performed. The crew is currently at step 7 and has determined that there are no ESF busses energized.

INITIATING CUE:

The Unit Supervisor directs you to perform Addendum 4, VITAL DC BUS MONITORING, starting at step 4.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Instrument air to one train of MSIVs and MSIBs has been isolated and vented.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Handout copy of POP05-EO-EC00 Addenda

NOTES:

Applicant may make reference for the need to use gloves while manipulating valves and equipment in the field. If the candidate indicates that they will have to get a pair of gloves, acknowledge it and tell them because we will be simulating operations and that gloves will not be required.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, …).

SAT / UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of the procedure Addendum

Standard:

Obtains a copy of the procedure Addendum 4, Vital DC Bus Monitoring.

Comment:

Cue:

Provide the handout copy of 0POP05-EO-EC00 Addenda

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 2 (C)

Train A AND B bus voltages – greater than 105.5 VDC. (Addendum 4, step 4a)

Standard:

The operator determines the voltage on one bus is less than required and transitions to the RNO actions.

Comment:

This step can be accomplished locally at the battery or in the Control Room at CP-003

The voltage on first battery checked will be low (Train A or B)

Cue:

Locally (Train A or B battery):

- On the first train checked, the battery switchboard analog meter or the battery charger digital output indicator (on the charger with its output breaker closed) is reading 103 VDC.
- If a second train is checked (Train A or B), the same indications described above will read 107 VDC.

Control Room (CP-003)

- The analog meter for the first train checked reads 103 VDC. If the second train is checked, it reads 107 VDC.

If the result of the voltage check is reported to the Control Room/Unit Supervisor, as the Unity Supervisor, direct the operator to perform Addendum 3 of POP05-EO-EC00, Loss of All AC Power.

Notes:

The RNO directs the operator to perform Addendum 3

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 3 (C)

CLOSE IA isolation to MSIV and MSIB (58 ft IVC, on wall by MSIV).
(Addendum 3, step 1)

Standard:

The operator simulates CLOSING one of the following air isolation valves:

_____ *S/G A - "1(2)-IA-0555 INSTRUMENT AIR SUBHEADER ISOLATION VALVE"*

_____ *S/G B - "1(2)-IA-0551 INSTRUMENT AIR SUBHEADER ISOLATION VALVE"*

_____ *S/G C - "1(2)-IA-0547 INSTRUMENT AIR SUBHEADER ISOLATION VALVE"*

_____ *S/G D - "1(2)-IA-0559 INSTRUMENT AIR SUBHEADER ISOLATION VALVE"*

Comment:

1) Valve located 58 ft. IVC, on wall by MSIV.

2) This valve is operated by a hand lever that rotates 90° to open or close the valve.

Cue:

Selected Instrument Air Subheader Isolation Valve:

Initially - OPEN
Finally - CLOSED

As the operator simulates rotating the hand lever, indicate to the operator that the valve is closed once the lever reaches a position 90° clockwise from where it began.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 4 (C)

VENT IA line to atmosphere by uncapping and opening vent valve to the affected train. (Addendum 3, step 2)

Standard:

The operator simulates uncapping and opening the valve associated with the MSIB/MSIB isolated previously:

_____ *S/G A - "1(2)-IA-7783 INSTRUMENT AIR TO A1(2)MSFSV7414 VENT VALVE"*

_____ *S/G B - "1(2)-IA-7784 INSTRUMENT AIR TO A1(2)MSFSV7424 VENT VALVE"*

_____ *S/G C - "1(2)-IA-7785 INSTRUMENT AIR TO A1(2)MSFSV7434 VENT VALVE"*

_____ *S/G D - "1(2)-IA-7782 INSTRUMENT AIR TO A1(2)MSFSV7444 VENT VALVE"*

Comment:

1) Valve located 58 ft. IVC, on wall by MSIV.

2) This valve is operated by a small hand wheel to open or close the valve.

Cue:

Selected Vent Valve:

Initially - CLOSED
Finally - OPEN

After valve is opened, you hear air venting.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 4

Check that MSIV and MSIB are closed.

Standard:

Determines the MSIV and MSIB are closed.

Comment:

1) There is no procedural requirement to do this, however, it will substantiate that the intended actions took place. Whether the valves closed or not is academic at this point since the operator can do nothing more to effect closure if it hasn't occurred by now.

2) Both the MSIB and MSIV have stem indicators that can be used to determine valve position.

3) The MSIB was originally closed as this is its normal position at power.

Cue:

MSIB (Main Steam Isolation Bypass Valve)

Initially - CLOSED
Finally - CLOSED

MSIV (Main Steam Isolation Valve)

Initially - OPEN
Finally - CLOSED

Notes:

-TERMINATE THE JPM- **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: FAILING AIR TO MSIVs AND MSIBs

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator:_____ **Signature:**_____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The unit has experienced a loss of all AC power, and procedure 0POP05-EO-EC00, LOSS OF ALL AC, is being performed. The crew is currently at step 7 and has determined that there are no ESF busses energized.

INITIATING CUE:

The Unit Supervisor directs you to perform Addendum 4, VITAL DC BUS MONITORING, starting at step 4.

ADDENDUM 1
TRANSFER ESF BUSSES TO THE EMERGENCY TRANSFORMER

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

The emergency transformer can carry only one bus in each unit.

NOTE

- **The preferred emergency bus for loading on emergency transformer is E1C(E2C), E1A(E2A), E1B(E2B).**
- **WHEN loading the emergency transformer, THEN each unit SHALL coordinate with the opposite unit to prevent simultaneous starting of large equipment.**

___1 **VERIFY power available from the emergency transformer**

RETURN TO procedure Step 6.

___2 **OPEN feeder breakers from normal power source to deenergized ESF busses:**

- E1C(E2C) - "STBY BUS 1H(2H)"
  "TO XFMR E1C(E2C)"
  "BKR SW - NORM"
- E1A(E2A) - "STBY BUS 1F(2F)"
  "TO XFMR E1A(E2A)"
  "BKR SW - NORM"
- E1B(E2B) - "STBY BUS 1G(2G)"
  "TO XFMR E1B(E2B)"
  "BKR SW - NORM"

ADDENDUM 1
TRANSFER ESF BUSSES TO THE EMERGENCY TRANSFORMER

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
___3	**OPEN motor operated disconnects from normal power source to deenergized ESF busses:** o E1C(E2C) - "STBY BUS 1H(2H)" "TO XFMR E1C(E2C)" "DISC SW - NORM" o E1A(E2A) - "STBY BUS 1F(2F)" "TO XFMR E1A(E2A)" "DISC SW - NORM" o E1B(E2B) - "STBY BUS 1G(2G)" "TO XFMR E1B(E2B)" "DISC SW - NORM"	DISPATCH operator to OPEN motor operated disconnects to deenergize ESF busses from normal power source, REFER TO 0POP02-AE-0001, AC ELECTRICAL DISTRIBUTION BREAKER LINEUP (located next to associated ESF transformer): o "E1C(E2C)" "MOTOR OPERATED DISCONNECT" "FROM STBY BUS 1H(2H)" o "E1A(E2A)" "MOTOR OPERATED DISCONNECT" "FROM STBY BUS 1F(2F)" o "E1B(E2B)" "MOTOR OPERATED DISCONNECT" "FROM STBY BUS 1G(2G)"
___4	**VERIFY open emergency feeder breakers from 1L(2L) to ESF busses:** o E1C(E2C) - "EMER BUS 1L(2L)" "TO XFMR E1C(E2C)" "BKR SW - EMER" o E1A(E2A) - "EMER BUS 1L(2L)" "TO XFMR E1A(E2A)" "BKR SW - EMER" o E1B(E2B) - "EMER BUS 1L(2L)" "TO XFMR E1B(E2B)" "BKR SW - EMER"	OPEN emergency feeder breakers from 1L(2L) to ESF busses.

ADDENDUM 1
TRANSFER ESF BUSSES TO THE EMERGENCY TRANSFORMER

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
___5	**CLOSE motor operated disconnects from emergency bus 1L(2L) to one deenergized ESF bus:** o E1C(E2C) - "EMER BUS 1L(2L)" "TO XFMR E1C(E2C)" "DISC SW - EMER" o E1A(E2A) - "EMER BUS 1L(2L)" "TO XFMR E1A(E2A)" "DISC SW - EMER" o E1B(E2B) - "EMER BUS 1L(2L)" "TO XFMR E1B(E2B)" "DISC SW - EMER"	DISPATCH operator to close motor operated disconnects to one deenergized ESF bus from the emergency transformer, REFER TO 0POP02-AE-0001, AC ELECTRICAL DISTRIBUTION BREAKER LINEUP (located next to associated ESF transformer): o "E1C(E2C)" "MOTOR OPERATED DISCONNECT" "FROM EMERGENCY BUS 1L(2L)" o "E1A(E2A)" "MOTOR OPERATED DISCONNECT" "FROM EMERGENCY BUS 1L(2L)" o "E1B(E2B)" "MOTOR OPERATED DISCONNECT" "FROM EMERGENCY BUS 1L(2L)" ----------
___6	**CLOSE emergency transformer feeder breaker to emergency bus 1L(2L)** "EMER XFMR TO BUS 1K/1L(2K/2L) SPLY"	
___7	**CLOSE emergency feeder breakers from emergency bus 1L(2L) to energize desired ESF transformer:** o E1C(E2C) - "EMER BUS 1L(2L)" "TO XFMR E1C(E2C)" "BKR SW - EMER" o E1A(E2A) - "EMER BUS 1L(2L)" "TO XFMR E1A(E2A)" "BKR SW - EMER" o E1B(E2B) - "EMER BUS 1L(2L)" "TO XFMR E1B(E2B)" "BKR SW - EMER"	
___8	**CLOSE supply breaker from ESF transformer to ESF bus**	
___9	**RETURN TO procedure Step 6.b**	

ADDENDUM 2
EQUIPMENT IN PULL TO LOCK

_____ o RCFCs

_____ o CS pumps

_____ o CCW pumps

_____ o HHSI pumps

_____ o LHSI pumps

_____ o CCPs

_____ o Motor-driven AFW pumps

_____ o Control RM supply fans

_____ o Control RM return fans

_____ o Control RM C/U fans

_____ o Control RM makeup fans

_____ o EAB supply fans

_____ o EAB return fans

_____ o FHB exhaust fans

_____ o FHB exhaust booster fans

_____ o Essential chillers

_____ o Essential chilled water pumps

_____ o Battery RM exhaust fans

ADDENDUM 3
FAILING AIR TO MSIVs AND MSIBs

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- **The following steps will vent air from both the MSIV and MSIB.**
- **A pipe wrench for removing vent cap can be found in Emergency Locker 15(25) on 55 ft TGB next to SE exit door**

___ 1 **CLOSE IA isolation to MSIV and MSIB:**
(58 ft IVC on wall by MSIV)

- o A - "1(2)-IA-0555"
  "INSTRUMENT AIR SUBHEADER ISOLATION VALVE"
- o B - "1(2)-IA-0551"
  "INSTRUMENT AIR SUBHEADER ISOLATION VALVE"
- o C - "1(2)-IA-0547"
  "INSTRUMENT AIR SUBHEADER ISOLATION VALVE"
- o D - "1(2)-IA-0559"
  "INSTRUMENT AIR SUBHEADER ISOLATION VALVE"

___ 2 **VENT MSIV IA line to atmosphere by uncapping and opening vent valve to the affected train(s):**
(58 ft IVC on wall by MSIV)

- o A - "1(2)-IA-7783"
  "INSTRUMENT AIR TO A1(2)MSFSV7414"
  "VENT VALVE"
- o B - "1(2)-IA-7784"
  "INSTRUMENT AIR TO A1(2)MSFSV7424"
  "VENT VALVE"
- o C - "1(2)-IA-7785"
  "INSTRUMENT AIR TO A1(2)MSFSV7434"
  "VENT VALVE"
- o D - "1(2)-IA-7782"
  "INSTRUMENT AIR TO A1(2)MSFSV7444"
  "VENT VALVE"

___ 3 **RETURN TO procedure step in effect**

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

___1 **DISPATCH operator to deenergize ESF Load Sequencers: (EAB 10')**

- o "ESF LOAD SEQUENCER"
  "A 3N091(2)ZLP801"
  "MAIN POWER BKR"
- o "ESF LOAD SEQUENCER"
  "B 3N091(2)ZLP802"
  "MAIN POWER BKR"
- o "ESF LOAD SEQUENCER"
  "C 3N091(2)ZLP803"
  "MAIN POWER BKR"

NOTE

The Station Blackout Coping Study assumes that Step 2 will be completed within 30 minutes of the initial blackout event.

___2 **CHECK if NSSS inverters should be deenergized:**

___a. Expected event duration - LESS THAN FOUR HOURS

a. PERFORM the following:

1) DISPATCH operator to **OPEN** breakers:

DP 1201: (EAB 10')

Breaker 1 _____
Breaker 2 _____
Breaker 3 _____
Breaker 4 _____
Breaker 5 _____
Breaker 6 _____
Breaker 7 _____
Breaker 8 _____
Breaker 22 _____

Step 2 continued on next page.

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 2 continued from previous page.

2) ENSURE following breakers - CLOSED:

DP 1201: Breaker 13 ____

(EAB 10') Breaker 15 ____

Breaker 17 ____

3) DISPATCH operator to **OPEN** breakers:

DP 1204: Breaker 1 ____

(EAB 60') Breaker 2 ____

Breaker 3 ____

Breaker 4 ____

Breaker 5 ____

Breaker 6 ____

Breaker 8 ____

Breaker 22 ____

4) ENSURE following breakers - CLOSED:

DP 1204: Breaker 13 ____

(EAB 60') Breaker 15 ____

Breaker 17 ____

5) REFER TO 0POP04-VA-0001, LOSS OF 120 VAC CLASS VITAL DISTRIBUTION, for loads lost.

6) GO TO Step 3 of this Addendum

Step 2 continued on next page.

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 2 continued from previous page.

___b. CHECK Channel I battery, E1A11(E2A11) - NO CELLS JUMPERED OUT

b. PERFORM the following:

1) DISPATCH operator to OPEN the following DP1201 Breakers:

DP 1201: Breaker 1 ____

(EAB 10') Breaker 2 ____

Breaker 3 ____

Breaker 4 ____

Breaker 5 ____

Breaker 6 ____

Breaker 7 ____

Breaker 8 ____

Breaker 22 ____

2) ENSURE following breakers - CLOSED:

DP 1201: Breaker 13 ____

(EAB 10') Breaker 15 ____

Breaker 17 ____

3) REFER TO 0POP04-VA-0001, LOSS OF 120 VAC CLASS VITAL DISTRIBUTION, for loads lost.

Step 2 continued on next page.

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 2 continued from previous page.

___c. CHECK Channel IV battery, E1C11(E2C11) - NO CELLS JUMPERED OUT

c. PERFORM the following:

1) DISPATCH operator to OPEN the following DP1204 Breakers:

DP 1204: Breaker 1 ____

(EAB 60') Breaker 2 ____

Breaker 3 ____

Breaker 4 ____

Breaker 5 ____

Breaker 6 ____

Breaker 8 ____

Breaker 22 ____

2) ENSURE following breakers - CLOSED:

DP 1204: Breaker 13 ____

(EAB 60') Breaker 15 ____

Breaker 17 ____

3) REFER TO 0POP04-VA-0001, LOSS OF 120 VAC CLASS VITAL DISTRIBUTION, for loads lost.

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

___3 **DISPATCH operator to deenergize the following 120 VAC NON 1E loads:**

(10 ft EAB hallway)

___o "MN TURB EMER TRIP CAB ZRR037"
DP005 / BKR 25

___o "TURBINE SUPERVISORY CONTROL"
"CABINET PWR SPLY ZRR035 & ZRR059"
DP005 / BKR 26 (DP005 / BKR 28)

___o "EH CONTROLLER CABINET RR036"
DP006 / BKR 9

___o "EMERGENCY TRIP CABINET ZRR037"
"(SECOND FEED)"
DP006 / BKR 13

___o "REHEAT CONTROL CABINET RR043"
DP006 / BKR 15

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Do NOT allow battery voltages to drop to LESS THAN 105 VDC for plant equipment protection.

NOTE

Train A, B, and C bus voltages should be monitored for the duration of the event, and their respective battery output breakers opened if bus voltages lowers to LESS THAN OR EQUAL TO 105.5 VDC in order to conserve the battery should a STBY DG become available.

___4 **MONITOR Class 1E 125 VDC system Train A, B, & C bus voltage.**

___a. Train A AND B bus voltages - GREATER THAN 105.5 VDC

a. PERFORM the following:

1) DISPATCH operator to perform ADDENDUM 3, FAILING AIR TO MSIVs AND MSIBs for all MSIV(s) and MSIB(s).

2) WHEN ADDENDUM 3, FAILING AIR TO MSIVs AND MSIBs is complete, THEN GO TO Step 4.b of this Addendum.

___b. Train A, B, OR C bus voltages - GREATER THAN 105.5 VDC.

b. DISPATCH operator to open the associated battery output breaker:

- "BTRY E1A11(E2A11) MAIN BKR" E1A11(E2A11) BKR 1B (EAB 10')
- "BTRY E1B11(E2B11) MAIN BKR" E1B11(E2B11) BKR 1B (EAB 35')
- "BTRY E1C11(E2C11) MAIN BKR" E1C11(E2C11) BKR 1B (EAB 60')

___5 **CHECK Sequencer(s) ready for restoration following bus energization**

RETURN TO procedure step in effect.

ADDENDUM 4
VITAL DC BUS MONITORING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

___6 **DISPATCH an operator to ENERGIZE the affected sequencer as follows:**

___a. ENSURE MAIN POWER breaker for the affected sequencer - OPEN

___b. OPEN CB1 AND CB2 breakers for the affected sequencer

___c. ENSURE associated SWBD breaker - CLOSED:

- o "ESF LOAD SEQUENCER"
  "CABINET A - ZLP801"
  E1A11(E2A11) BKR 5C

- o "ESF LOAD SEQUENCER"
  "CABINET B - ZLP802"
  E1B11(E2B11) BKR 5B

- o "ESF LOAD SEQUENCER"
  "CABINET C - ZLP803"
  E1C11(E2C11) BKR 7B

___d. CLOSE the MAIN breaker for the affected sequencer

___e. CLOSE the CB2 breaker for the affected sequencer

___f. After 2 seconds - CLOSE the CB1 breaker for the affected sequencer

___7 **RETURN TO procedure step in effect**

ADDENDUM 5
EMERGENCY MAKEUP TO AFWST FROM FIRE PROTECTION SYSTEM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
___1	**CONNECT two 50 ft sections of connected fire hose from fire hose box located on top of the AFWST**	
___2	**CONNECT fire hose to emergency fill connection on top of AFWST**	
___3	**OPEN emergency fill valve on top of AFWST** "1(2)-AF-0357" "AUX FEEDWATER STORAGE TANK" "EMERGENCY FILL FROM FIRE PROT" "ISOLATION VALVE"	
___4	**ALLOW fire hose, located on top of AFWST, to be lowered to ground**	
___5	**CONNECT two 50 ft sections of fire hose from fire hose cabinet located west of the L.O. Reservoir to the fire hose connected to the AFWST emergency fill connection**	
___6	**ESTABLISH fire hose connection to fire hydrant, FH-07 (FH-20), located inside fire hose cabinet**	
___7	**OPEN fire hydrant valve to fill AFWST**	
___8	**VERIFY a diesel fire pump starts**	START diesel fire pumps as necessary. ----------
___9	**VERIFY flow to AFWST via walkdown of fire hose and connections**	
___10	**MAINTAIN AFWST level - GREATER THAN 138,000 GALLONS (26%)**	
___11	**RETURN TO procedure step in effect**	

ADDENDUM 6
SG PORV LOCAL OPERATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- **IF the radiation dose rate in the area of the PORV is GREATER THAN 1.0 REM/HR, THEN personnel should minimize exposure by adjusting the PORV to the desired position and exiting the area.**
- **There is sufficient stored energy in the PORV hydraulic unit accumulators for only one and one half strokes. SG PORVs should NOT** be **opened GREATER THAN 50%.**
- **IF the SG PORV was open when power was lost, THEN the amount of available stroke is reduced and SG PORV available stroke COULD be limited to only one half stroke.**

___ 1 **DEENERGIZE power to the desired PORV**

	SG A PV-7411	SG B PV-7421	SG C PV-7431	SG D PV-7441
Servo Amplifiers	"SG 1A(2A)" "PORV SERVO AMP" "PY-7411" 120 VAC DP1201 BKR 17 (10 ft EAB RM 007)	"SG 1B(2B)" "PORV SERVO AMP" "PY-7421" 120 VAC DP1203 BKR 14 (35 ft EAB RM 213)	"SG 1C(2C)" "PORV SERVO AMP" "PY-7431" 120 VAC DP1204 BKR 17 (60 ft EAB RM 319)	"SG 1D(2D)" "PORV SERVO AMP" "PY-7441" 120 VAC DP1202 BKR 12 (10 ft EAB RM 009)

___ 2 **ESTABLISH continuous communications between control room and local operators**

___ 3 **CONTROL PORV position per Steps 4 and 5 of this Addendum.**

ADDENDUM 6
SG PORV LOCAL OPERATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Steps 4 and 5 assume the PORV is initially closed with the manual override knobs in the full OPEN position (counterclockwise).

___ 4 **To open PORV:**

___ a. Simultaneously TURN manual override knobs on solenoids A and B to the CLOSE direction (clockwise)

___ b. WHEN the desired PORV position is reached, THEN TURN knob of solenoid A to the full OPEN position (counterclockwise)

PORV	58 ft IVC	UNIT 1		UNIT 2	
		Solenoid A Location	Solenoid B Location	Solenoid A Location	Solenoid B Location
PV-7411	A Train RM 503	West	East	West	East
PV-7421	B Train RM 502	North	South	West	East
PV-7431	C Train RM 501	West	East	West	East
PV-7441	D Train RM 504	North	South	North	South

ADDENDUM 6
SG PORV LOCAL OPERATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

___ 5 **To close PORV:**

___ a. TURN manual override knob for solenoid B in the OPEN direction (counterclockwise)

___ b. WHEN desired position of PORV is reached, THEN TURN knob of solenoid B to the full CLOSED position (clockwise)

___ 6 **CONSULT TSC Staff regarding installation of portable manual pump on affected SG PORV**

___ 7 **WHEN local operation of PORV is no longer desired, THEN:**

___ a. ENSURE PORV is closed

___ b. VERIFY hydraulic unit pump is operable

___ c. NOTIFY control room to perform the following:

- PLACE affected PORV MANUAL/AUTO controller to MANUAL
- DEPRESS and HOLD the lower pushbutton for GREATER THAN 20 seconds

___ d. TURN manual override knobs for solenoids A and B to the full OPEN position (counterclockwise)

___ e. ENSURE manual pump suction valve is closed

(Step 7 continued on next page.)

ADDENDUM 6
SG PORV LOCAL OPERATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 7 continiued from previous page.)

___ f. ENSURE accumulator drain valve is closed

___ g. RESTORE power to PORV; REFER TO Step 1 of this Addendum.

___ h. ENSURE SG PORV STATION BLACKOUT PWR switches are in "NORM".

- o SG 1A(2A) PORV(ZLP653)EAB 10'
- o SG 1D(2D) PORV(ZLP100)EAB 10'
- o SG 1B(2B) PORV(ZLP654)EAB 35'
- o SG 1C(2C) PORV(ZLP655)EAB 60'

___ i. NOTIFY control room that SG PORV can now be controlled remotely

___ j. IF manual pump was installed, THEN CONSULT TSC staff regarding manual pump removal

___ 8 **RETURN TO procedure step in effect**

ADDENDUM 7
PHASE A ISOLATION VERIFICATION

DEVICE	ACTUATION TRAINS			POSITION	CHECK
Fire Water to Containment					
"FIRE WTR OCIV MOV-0756"			C	CLOSED	_____
Instrument Air to Containment					
"IA OCIV FV-8565"		B		CLOSED	_____
Containment H2 Monitoring					
"VPI FV-4101"	A			CLOSED	_____
"VPI FV-4127"	A			CLOSED	_____
"VPI FV-4104"			C	CLOSED	_____
"VPI FV-4133"			C	CLOSED	_____
"H2 SAMPLE INL ICIV FV-4135"	A			CLOSED	_____
"H2 SAMPLE DISCH ICIV FV-4128"	A			CLOSED	_____
"H2 SAMPLE INL ICIV FV-4136"			C	CLOSED	_____
"H2 SAMPLE DISCH ICIV FV-4134"			C	CLOSED	_____
Primary Sampling System					
"RHR SAMPLE ICIV FV-4823"		B		CLOSED	_____
"RHR SAMPLE OCIV FV-4461"			C	CLOSED	_____
"SI ACC SAMPLE ICIV FV-4824"			C	CLOSED	_____
"SI ACC SAMPLE OCIV FV-4466"		B		CLOSED	_____
"RCS LOOP 1A(2A) Th SAMPLE ICIV" "FV-4454"			C	CLOSED	_____

ADDENDUM 7
PHASE A ISOLATION VERIFICATION

DEVICE	ACTUATION TRAINS			POSITION	CHECK
Primary Sampling System (con't)					
"RCS LOOP 1C(2C) Th SAMPLE ICIV" "FV-4455"			C	CLOSED	_____
"RCS SAMPLE OCIV FV-4456"		B		CLOSED	_____
"PRZR LIQ SAMPLE OCIV FV-4451B"			C	CLOSED	_____
"PRZR LIQ SAMPLE ICIV FV-4451"		B		CLOSED	_____
"PRZR VAPOR SAMPLE OCIV FV-4452"			C	CLOSED	_____
"PRZR VAPOR SAMPLE ICIV FV-4450"		B		CLOSED	_____
Post Accident Sample System					
"CNTMT SUMP SAMPLE OCIV FV-2453"	A			CLOSED	_____
"RHR SAMPLE OCIV FV-2454"	A			CLOSED	_____
"RCS SAMPLE OCIV FV-2455/2455A"		B		CLOSED	_____
"CNTMT AIR SAMPLE OCIV FV-2456"			C	CLOSED	_____
"RETURN TO PRT OCIV FV-2458"			C	CLOSED	_____
"CNTMT AIR RETURN OCIV FV-2457"			C	CLOSED	_____
SI Accumulators					
"TEST LN ICIV FV-3970"		B		CLOSED	_____
"TEST LN OCIV FV-3971"	A			CLOSED	_____
"N2 SPLY OCIV FV-3983"	A			CLOSED	_____

ADDENDUM 7
PHASE A ISOLATION VERIFICATION

DEVICE	ACTUATION TRAINS			POSITION	CHECK
Pressurizer Relief Tank					
"OCIV FV-3652"		B		CLOSED	_____
"ICIV FV-3653"	A			CLOSED	_____
"OCIV FV-3651"		B		CLOSED	_____
Reactor Coolant Drain Tank					
"OCIV FV-4913"		B		CLOSED	_____
"ICIV MOV-0312"	A			CLOSED	_____
"OCIV FV-4919"		B		CLOSED	_____
"ICIV FV-4920"	A			CLOSED	_____
Containment Normal Sump					
"DISCH ICIV MOV-0064"		B		CLOSED	_____
"DISCH OCIV FV-7800"	A			CLOSED	_____
CVCS Letdown					
"OCIV MOV-0024"		B		CLOSED	_____
"ICIV MOV-0023"			C	CLOSED	_____
"LTDN ORIF HDR ISOL FV-0011"			C	CLOSED	_____
CVCS Seal Return					
"SEAL RTN ICIV MOV-0077"			C	CLOSED	_____
"SEAL RTN OCIV MOV-0079"		B		CLOSED	_____

ADDENDUM 7
PHASE A ISOLATION VERIFICATION

DEVICE	ACTUATION TRAINS			POSITION	CHECK
CVCS Charging					
"OCIV MOV-0025"	A			CLOSED	_____
Personnel Airlock Seal OCIVs					
"INNER SEAL FV-1025"	A			CLOSED	_____
"INNER SEAL FV-1028"	A			CLOSED	_____
"OUTER SEAL FV-1026"	A			CLOSED	_____
"OUTER SEAL FV-1027"	A			CLOSED	_____

ADDENDUM 8
PHASE A OCIV VERIFICATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

DEVICE	LOCATION	POSITION	CHECK
"1(2)-CV-0025" "CVCS CHARGING ORC" "CONTAINMENT ISOLATION MOV"	30 ft MAB RM 108C Penetration M-48	CLOSED	_____
"1(2)-CV-0024" "CVCS LETDOWN ORC" "CONTAINMENT ISOLATION MOV"	30 ft MAB RM 108C Penetration M-46	CLOSED	_____

ADDENDUM 9
EMERGENCY MAKEUP TO SFP FROM FIRE PROTECTION SYSTEM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Makeup to the SFP during long term loss of cooling may be required to maintain level GREATER THAN 65.5 FT. Makeup without boric acid addition capabilities should be minimized to maintain SFP boron concentration GREATER THAN 2500 ppm.

___1 **ENSURE a diesel fire pump - RUNNING**

___2 **INITIATE makeup to SFP with fire hose reel**

(68 ft FHB, east end)

"1(2)-FP-0810"
"FP HOSE REEL FHR-0810"
"ISOLATION VALVE"

___3 **DIRECT Chemistry to sample Spent Fuel Pool for boron concentration**

___4 **CHECK SFP level - GREATER THAN 65.5 FT**

Continue makeup to SFP with fire hose reel.

WHEN SFP level is GREATER THAN 65.5 FT, THEN PERFORM the following:

a. SECURE makeup to the SFP.

b. GO TO Step 5 of this Addendum.

___5 **VERIFY Spent Fuel Pool boron concentration - GREATER THAN 2500 ppm, AND PERFORM the following:**

___a. ENSURE makeup to the SFP secured.

___b. RETURN TO procedure step in effect.

GO TO Step 6 of this Addendum, observe the NOTE prior to Step 6.

ADDENDUM 9
EMERGENCY MAKEUP TO SFP FROM FIRE PROTECTION SYSTEM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Spent Fuel Pool level may need to be lowered during the following steps to provide adequate makeup volume to restore boron concentration.

___6 **INITIATE Boration of the Spent Fuel Pool**

___a. Check A/C ESF power restored

a. EVALUATE adding boric acid directly to the Spent Fuel Pool.

1) Coordinate with Chemistry to determine amount of boric acid to add to the Spent Fuel Pool.

2) Coordinate efforts to move boric acid drums to SFP area AND ADD desired amount of boric acid to SFP.

3) RETURN TO Step 3 of this Addendum.

___b. Coordinate with Chemistry to determine amount of makeup required from selected source

___c. Makeup to the Spent Fuel Pool per 0POP02-FC-0001, Spent Fuel Pool Cooling and Cleanup System

___d. RETURN TO Step 3 of this Addendum

___7 **RETURN TO procedure step in effect**

ADDENDUM 10
EMERGENCY ELECTRICAL LOADING REQUIREMENTS

Components	Train A (KW)	Train B (KW)	Train C (KW)
Pressurizer Heaters 1A/1B (2A/2B)	431.0	N/A	431.0
Hydrogen Recombiners	N/A	75.0	75.0
RHR Pumps	222.2	222.2	222.2
RMW Pumps	N/A	41.0	41.0
SFPC Pumps	N/A	140.4	140.4
SFP Air Handling Unit	N/A	0.5	0.5
Centrifugal Charging Pumps	450.0	N/A	450.0
BA Transfer Pump Room Fans	0.4	N/A	0.4
BAT Pumps	27.0	N/A	27.0
RMW Pumps Air Handling Unit	N/A	1.9	1.9
480V MCCs 1A5/1B5/1C5 (2A5/2B5/2C5)	171.5	72.5	92.2

ADDENDUM 11
RESETTING ESF SEQUENCER MODE I LOGIC

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

___ 1 **DISPATCH operator with sequencer keys to sequencer rooms (10 ft EAB):**

- o Train A - Room 015D, ZLP801
- o Train B - Room 015C, ZLP802
- o Train C - Room 015B, ZLP803

___ 2 **Momentarily PLACE "MODE I LOGIC" switch at ESF load sequencer panels to "RESET"**

___ 3 **VERIFY "M1 LOGIC PRESENT" indicator - OFF**

___ 4 **Momentarily DEPRESS "SEQUENCER COMPLETE/RESET PUSH" button at ESF load sequencer panels**

___ 5 **VERIFY sequencer mode one annunciator in control room is clear for the respective sequencer**

___ 6 **RETURN TO procedure and step in effect**

ADDENDUM 12
Isolating MSR Cooldown Path

___ 1 DISPATCH operator to CLOSE the following Isolation Valves:

	Component	Description	Location
____	1(2)-MS-MOV-0085	"MAIN STEAM TO MSR 11(21)" "SOUTH TV-7450A" "INLET ISOLATION MOV"	(55 ft TGB SE of COND 13(23))
____	1(2)-MS-MOV-0327	"MAIN STEAM TO MSR 11(21)" "SOUTH TV-7450G" "INLET ISOLATION MOV"	(55 ft TGB SE of COND 13(23))
____	1(2)-MS-MOV-0329	"MAIN STEAM TO MSR 12(22)" "SOUTH TV-7450E" "INLET ISOLATION MOV"	(55 ft TGB SW of COND 13(23))
____	1(2)-MS-MOV-0089	"MAIN STEAM TO MSR 12(22)" "SOUTH TV-7450C" "INLET ISOLATION MOV"	(55 ft TGB SW of COND 13(23))
____	1(2)-MS-MOV-0087	"MAIN STEAM TO MSR 12(22)" "NORTH TV-7450B" "INLET ISOLATION MOV"	(55 ft TGB NW of COND 11(21))
____	1(2)-MS-MOV-0328	"MAIN STEAM TO MSR 12(22)" "NORTH TV-7450D" "INLET ISOLATION MOV"	(55 ft TGB NW of COND 11(21))
____	1(2)-MS-MOV-0084	"MAIN STEAM TO MSR 11(21)" "NORTH TV-7450" "INLET ISOLATION MOV"	(55 ft TGB NE of COND 11(21))
____	1(2)-MS-MOV-0326	"MAIN STEAM TO MSR 11(21)" "NORTH TV-7450F" "INLET ISOLATION MOV"	(55 ft TGB NE of COND 11(21))

___ 2 RETURN TO procedure and step in effect

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: TRANSFER MFW CONTROL TO MFW REGULATING VALVES

JPM NO.: S1

REVISION: 0

LOCATION: SIMULATOR

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	TRANSFER MFW CONTROL TO MFW REGULATING VALVES
JPM No.:	S1
Rev. No:	0
STP Task:	21050 - Place the Main Feedwater Regulating Valves in auto.
STP Objective:	21050 - Place the Main Feedwater Regulating Valves in auto in accordance with POP03-ZG-0005
Related K/A Reference:	035 A4.01 [3.7/3.6] Ability to manually operate and/or monitor in the control room: Shift of S/G controls between manual and automatic control, by bumpless transfer.
References:	0POP03-ZG-0005, Rev. 81, Plant Startup to 100%
Task Normally Completed By:	RO
Method of Testing:	Actual Performance
Location of Testing:	Simulator
Time Critical Task:	NO
Alternate Path JPM:	NO
Validation Time:	15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A plant startup is in progress per 0POP03-ZG-0005, Plant Startup to 100%.

- Reactor power is at ~17%.
- The turbine is on the grid and the startup feedwater pump is in service.

INITIATING CUE:

The Unit Supervisor directs you to transfer steam generator water level control **from the low power feedwater regulating valve to the main feedwater regulating valve** for 'C' Steam Generator in accordance with Addendum 11 of 0POP03-ZG-0005, Plant Startup to 100%.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Steam Generator 'C' water level control has been transferred to the main feedwater regulating valve in accordance with 0POP03-ZG-0005, Plant Startup to 100%.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

1. Ensure Radio volume for both stations are set to a reasonable level.

2. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3. Reset to IC #205 and verify:

   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up

4. Check and clean the following procedures:

   - 0POP03-ZG-0005, Plant Startup to 100%

5. Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6. Place the simulator in "FREEZE" until the examiners are ready to proceed.

7. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain the procedure.

Standard:

Obtain a copy of Addendum 11 of 0POP03-ZG-0005, Plant Startup to 100%.

Comment:

The applicant should use the simulator copy of the procedure.

Cue:

Notes:

SAT/UNSAT Performance Step: 2

Ensure a pre-job briefing performed IAW Conduct of Operations Chapter 2. (step 1.0)

Standard:

Verifies that a pre-job briefing has been conducted.

Comment:

Cue:

As the Unit Supervisor, give the following briefing points to the applicant:

- Closely monitor steam generator levels during the transfer
- Perform the transfer on 'C' SG only.
- Immediately inform me of any problems encountered

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

Ensure the SG 1C narrow range level is stable between 65% and 75%. (step 2.1.1)

Standard:

Verifies that SG 1C narrow range level indication is stable between 65% and 75%.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 4

ENSURE SG 1C main feedwater regulating valve is in manual and fully closed. (step 2.1.2)

Standard:

Verifies that SG 1C "NORM FCV-0553" Main Feed Regulating valve is in manual and closed.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5

Ensure the SG 1C main feedwater regulating valve isolation valve is open. (step 2.1.3)

Standard:

Dispatches a Plant Operator to open 1-FW-0093, SG 1C Feedwater Reg. Valve Isolation Valve.

Comment:

The manual isolation valve is already open.

Cue:

Plant Operator Reports that 1-FW-0093 is open.

Notes:

SAT/UNSAT Performance Step: 6 (C*)

Place SG 1C low power feedwater regulating valve in manual and NOTE SG feedwater flow. (steps 2.1.4 and 2.1.5)

Standard:

*1) * Depresses MANUAL pushbutton on SG 1C "LOW PWR FV-7153".*

2) Notes SG 1C Flowrate by recording or marking flow.

* Denotes critical action

Comment:

Recording flow is optional. Other methods such as grease mark on the control board flow instrument may be used (as approved by the Unit Supervisor/Shift Manager).

Flowrate should be approximately .55 - .65 (M lbm/hr)

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7 (C)

Begin transfer from low power to main feedwater regulating valve. (steps 2.1.6-2.1.9)

Standard:

Maintains SG 1C Feedwater flowrate approximately constant while transferring control as follows:

___ *Throttles OPEN "NORM FCV-0553" or until feed flow increase is noticed.*

___ *Throttles CLOSED "LOW PWR FV-7153" until feed flow returns to initial value.*

___ *Repeats these steps until "LOW PWR FV-7153" is approximately 8% to 10% open.*

Comment:

Cue:

If permission is requested to use 2 handed operations, as the Unit Supervisor, give permission to use 2 handed operation.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8 (C)

Complete transfer from low power to main feedwater regulating valves. (steps 2.1.10 and 2.1.11)

Standard:

___ *Places "NORM FCV-0553" in AUTO*

THEN

___ *Slowly CLOSES "LOW PWR FV-7153", ensuring SG Narrow Range Level is within the normal control band (65%-75%).*

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S1, TRANSFER MFW CONTROL TO MFW REGULATING VALVES

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

A plant startup is in progress per 0POP03-ZG-0005, Plant Startup to 100%.

- Reactor power is at ~17%.
- The turbine is on the grid and the startup feedwater pump is in service.

INITIATING CUE:

The Unit Supervisor directs you to transfer steam generator water level control **from the low power feedwater regulating valve to the main feedwater regulating valve** for 'C' Steam Generator in accordance with Addendum 11 of 0POP03-ZG-0005, Plant Startup to 100%.

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: **MANUALLY LOAD AN ESF BUS**

JPM NO.: **S2**

REVISION: **0**

LOCATION: **SIMULATOR**

Comment [COMMENT1]: NOTE TO DEVELOPER:
THE DEVELOPER WILL BE GUIDED WITH NOTES THROUGHOUT THIS DOCUMENT. THESE NOTES WILL START WITH THE FOLLOWING PHRASE: "NOTE TO DEVELOPER". PLEASE READ AND ABIDE BY THESE NOTES. THEY WILL NOT APPEAR ON THE DOCUMENT WHEN PRINTED AND MAY BE DELETED FROM THE SOFTWARE BY DELETING THE "COMMENT" CODE.

Comment [COMMENT2]: NOTE TO DEVELOPER:
PLEASE DO NOT LEAVE ANY BLANKS AT THE BEGINNING OR END OF UNDERLINE CODES.

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title: MANUALLY LOAD AN ESF BUS

JPM No.: S2

Rev. No: 0

STP Task: T63100, Respond to a Loss of Power on a 4.16KV ESF Bus

STP Objective: CRO 63100, Respond to a Loss of Power on a 4.16KV ESF Bus per 0POP04-AE-0001

Related K/A Reference: 064 A4.01 [4.0/4.3] Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G

References: 0POP04-AE-0001, Rev. 43, First Response to Loss of Any or All 13.8 KV or 4.16 KV Bus

0POP09-AN-03M3-A-6, Rev. 31, Annunciator Lampbox 3M3 Response Instructions

Task Normally Completed By: RO

Comment [COMMENT3]: NOTE TO DEVELOPER:
SELECT APPROPRIATE LEVEL OF PERFORMANCE BY DELETING THOSE THAT DO NOT APPLY.

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: No

Comment [COMMENT4]: NOTE TO DEVELOPER:
IDENTIFY WHETHER TASK IS TIME CRITICAL AND/OR ALTERNATE PATH BY DELETING "YES" OR "NO".

Alternate Path JPM: No

Validation Time: 15 min.

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Reactor power is ~17% power. The feeder breaker from 13.8 KV Standby Bus 1G has tripped open causing a loss of normal power to 4160v ESF Bus E1B. The control switch for this breaker on CP-010 has been placed in PTL.

ESF DG #12 has JUST started. A Plant Operator (Yard Watch) has been dispatched to ESF DG #12, but has not yet arrived.

It has been determined that the Train 'B' Sequencer did not function

INITIATING CUE:

The Unit Supervisor has directed you to manually load ESF DG #12 by performing 0POP04-AE-0001, Steps 3, 4 and 5.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Establishes ECW cooling flow to ESF DG #12 and completes loading ESF DG # 12.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

1) Ensure Radio volume for both stations are set to a reasonable level.

2) Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3) Reset to IC # 205 and verify:

- Red light at the end of CP-010 is out
- ICS annunciators have stopped counting up

4) Check and clean the following procedures:

- 0POP04-AE-0001, First Response to Loss of Any or All 13.8 kV or 4.16 kV Bus

5. Place simulator in run. Quickly silence/acknowledge/reset alarms as appropriate.

6. Place the simulator in "FREEZE" until the examiners are ready to proceed.

7. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS:

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain the procedure.

Standard:

Obtains a copy of 0POP04-AE-0001, First Response to Loss of Any or All 13.8 KV or 4.16 KV Bus

Comment:

The applicant should use the simulator copy of the procedure.

Cue:

Notes:

SAT/UNSAT Performance Step: 2 (C)

CHECK 4.16 KV ESF Bus Status (step 3.0)

Standard:

From 0POP04-AE-0001, Step 3, Determines ESF DG #12 should be running and is running with its output breaker closed.

Comment:

Comment [COMMENT5]: NOTE TO DEVELOPER:
BE CAREFUL TO TYPE THE STANDARD BETWEEN THE TWO FONT CODES.

This is the procedure entry point for the specified task.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C)

Check ECW Status (step 4.0):

- ECW Pump running
- ECW Pump Discharge Isolation Valve open
- ECW Blowdown Isolation Valve closed

Standard:

Checks status per above, determines ECW Pump 1B is not in service and starts the pump.

Comment:

1. Manually starting the ECW pump is per the RNO actions of the procedure.

2. The applicant may close the load center supply breakers to verify pump discharge valve position (or verify flows on QDPS).

Cue:

Notes:

Comment [COMMENT6]: NOTE TO DEVELOPER:
BE CAREFUL NOT TO LOSE THE HORIZONTAL LINE CODE BETWEEN STEPS . . .

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Check Sequencer loading for any running STBY DG per Addendum 1. (step 5.0)

Standard:

Refers to Addendum 1 and starts the following 'B' Train equipment ensuring at least 5 seconds has elapsed between motor starts:

___ *480V Load Centers*
___ *ECW Pump*
___ *RCFCs*
___ *CCW Pump*
___ *AFW Pump*
___ *Essential Chilled Water Pump*
___ *EAB HVAC Supply fan*
___ *EAB HVAC Return fan*
___ *Control Room supply, return and cleanup HVAC fans*
___ *FHB Main Exhaust HVAC fan*
___ *Essential Chiller*

Comment:

Cue:

If asked as the Unit Supervisor which loads are to be energized from procedure Addendum 1, inform him/her to start all Train 'B' loads cited on Addendum 1.

Notes:

Comment [COMMENT7]: NOTE TO DEVELOPER:
BE CAREFUL NOT TO LOSE THE HORIZONTAL LINE CODE BETWEEN STEPS . . .

-TERMINATE THE JPM- **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: MANUALLY LOAD AN ESF BUS

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature**

Date

Comment [COMMENT8]: NOTE TO DEVELOPER:
BE CAREFUL NOT TO LOSE THE HORIZONTAL LINE CODE BETWEEN STEPS . . .

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Reactor power is ~17% power. The feeder breaker from 13.8 KV Standby Bus 1G has tripped open causing a loss of normal power to 4160v ESF Bus E1B. The control switch for this breaker on CP-010 has been placed in PTL.

ESF DG #12 has JUST started. A Plant Operator (Yard Watch) has been dispatched to ESF DG #12, but has not yet arrived.

It has been determined that the Train 'B' Sequencer did not function

INITIATING CUE:

The Unit Supervisor has directed you to manually load ESF DG #12 by performing 0POP04-AE-0001, Steps 3, 4 and 5.

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: POWER RANGE NI FAILURE

JPM NO.: S3

REVISION: 0

LOCATION: SIMULATOR

JOB PERFORMANCE MEASURE INFORMATION SHEET

JPM Title:	POWER RANGE NI FAILURE
JPM No.:	S3
Rev. No:	0
STP Task:	T81650, Respond to a Loss of Power Range Instrument
STP Objective:	CRO 81650, Respond to a Loss of Power Range Instrument per 0POP04-NI-0001.
Related K/A Reference:	015 A4.03, [3.8/3.9] Ability to manually operate and/or monitor in the control room: Trip Bypasses.
References:	0POP04-NI-0001, Nuclear Instrument Malfunction, Rev 22
Task Normally Completed By:	RO
Method of Testing:	Perform
Location of Testing:	Simulator
Time Critical Task:	No
Alternate Path JPM:	No
Validation Time:	10 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Unit is at approximately 48% power by RCS ΔT.

INITIATING CUE:

I&C was in the process of adjusting NI channels to agree with RCS ΔT power when Power Range NI-0043 failed 5 minutes ago. The Immediate Actions (Step 1) of 0POP04-NI-0001, Nuclear Instrument Malfunction, have been completed.

You are directed to perform Addendum 3 of 0POP04-NI-0001, Nuclear Instrument Malfunction.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Power Range Channel N-43 has been bypassed and P-7, P-8, P-9, and P-10 have been determined to be in the correct state.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Handout copy of POP04-NI-0001, Nuclear Instrument Malfunction, Addendum 3.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

JPMs S3 and S4 are to be run together. The following steps will set up the simulator for **BOTH** JPMs:

1. Ensure Radio volume for both stations are set to a reasonable level.

2. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3. Reset to IC #206 and verify:

   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up

4. Check and clean the following procedures:

   - 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation

5. Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6. Place the simulator in "FREEZE" until the examiners are ready to proceed.

7. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time: _____**

Obtain a copy of 0POP04-NI-0001, Nuclear Instrumentation Malfunction.

Standard:

Obtains a copy of 0POP04-NI-0001, Nuclear Instrumentation Malfunction.

Comment:

Cue:

Give the applicant the handout copy of POP04-NI-0001, Nuclear Instrument Malfunction, Addendum 3.

Notes:

SAT/UNSAT Performance Step: 2

STOP any Main Turbine Load Changes. (step 1)

Standard:

Determines Main Turbine load is not being changed.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

MAINTAIN RCS Tavg within 1.5°F or Tref using Manual Rod Motion. (step 2)

Standard:

Verifies that Tavg is within 1.5°F of Tref.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 4 (C)

Bypass the Malfunctioning Power Range Channel by selecting the affected channel on the following switches: (step 3)

- COMPARATOR CHANNEL DEFEAT
- POWER MISMATCH BYPASS
- ROD STOP BYPASS
- DETECTOR CURRENT COMPARATOR UPPER SECTION
- DETECTOR CURRENT COMPARATOR LOWER SECTION

Standard:

Bypasses Power Range NI N-43 by selecting the indicated position on the following switches:

	SWITCH	*POSITION*
_____	*COMPARATOR CHANNEL DEFEAT*	*BYPASS N43*
_____	*POWER MISMATCH BYPASS*	*BYPASS PR N43*
_____	*ROD STOP BYPASS*	*BYPASS PR N43*
_____	*DETECTOR CURRENT COMPARATOR UPPER SECTION*	*PR N43*
_____	*DETECTOR CURRENT COMPARATOR LOWER SECTION*	*PR N43*

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5 (C)

ENSURE the following Permissives are in the correct state within one hour of the Power Range Failure: (step 4)

- P-7 POWER OPER RX TRIPS BLKD, Lampbox 5M24 Window B-2
- P-8 THREE LOOP OPERATION PERMITTED, Lampbox 5M24 Window B-3
- P-9 RX/TURB TRIP BLOCKED, Lampbox 5M24 Window B-4
- P-10 MAN BLOCK INT/LO PR RX TRP PERM, Lampbox 5M24 Window A-2

Standard:

Ensures that the following Permissives are in the correct state within one hour of the Power Range Channel N-43 Failure:

	PERMISSIVE	*REQUIRED STATE*
_____	*P-7 POWER OPER RX TRIPS BLKD* *Lampbox 5M24 Window B-2*	*OFF*
_____	*P-8 THREE LOOP OPERATION PERMITTED* *Lampbox 5M24 Window B-3*	*OFF*
_____	*P-9 RX/TURB TRIP BLOCKED* *Lampbox 5M24 Window B-4*	*LIT*
_____	*P-10 MAN BLOCK INT/LO PR RX TRP PERM* *Lampbox 5M24 Window A-2*	*LIT*

Comment:

Cue:

Notes:

–TERMINATE THE JPM – **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S3, POWER RANGE NI FAILURE

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The Unit is at approximately 48% power by RCS ΔT.

INITIATING CUE:

I&C was in the process of adjusting NI channels to agree with RCS ΔT power when Power Range NI-0043 failed 5 minutes ago. The Immediate Actions (Step 1) of 0POP04-NI-0001, Nuclear Instrument Malfunction, have been completed.

You are directed to perform Addendum 3 of 0POP04-NI-0001, Nuclear Instrument Malfunction.

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**1.0 STOP Any Main Turbine Load Changes**	
_____	**2.0 *MAINTAIN* RCS Tavg Within 1.5°F Of Tref Using Manual Control Rod Motion**	RESTORE RCS Tavg to within 1.5°F of Tref by any combinations of the following methods: • ADJUST Turbine load. OR • ADJUST Boron concentration. OR • REDUCE steam loads.
_____	**3.0 BYPASS The Malfunctioning Power Range Channel By Selecting The Affected Channel On The Following Switches: {CP011}** • "COMPARATOR CHANNEL DEFEAT" • "POWER MISMATCH BYPASS" • "ROD STOP BYPASS" • "DETECTOR CURRENT COMPARATOR" "UPPER SECTION" • "DETECTOR CURRENT COMPARATOR" "LOWER SECTION"	

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**4.0 ENSURE The Following Permissives Are In The Correct State Within One Hour Of The Power Range Channel Failure:** • "P-7 POWER OPER RX TRIPS BLKD" Lampbox 5M24 Window B-2 • "P-8 THREE LOOP OPERATION PERMITTED" Lampbox 5M24 Window B-3 • "P-9 RX/TURB TRIP BLOCKED" Lampbox 5M24 Window B-4 • "P-10 MAN BLOCK INT/LO PR RX TRP PERM" Lampbox 5M24 Window A-2	ENTER Technical Specification 3.0.3.
_____	**5.0 CHECK Reactor Power Meets One Of the Following -** • GREATER THAN 75% OR • WILL BE GREATER THAN 75%	PERFORM the following: **a.** RESTRICT Reactor Power to LESS THAN OR EQUAL to 75%. **b.** DIRECT I&C personnel to reduce the operable Power Range Channel trip setpoints to LESS THAN OR EQUAL TO 85% per 0PSP02-NI-0040, Power Range Channels N-0041, N-0042, N-0043, and N-0044 Overpower Trip High Range Setpoint Adjustment, within four hours after the channel inoperability time. **c.** GO TO Addendum 3 Step 8.0.

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Technical Specifications 3.3.1 Table 3.3-1 Action 2 requires a QPTR Core Power Distribution Measurement verified every **12 Hours** for inoperable power range NI when Reactor Power is GREATER THAN 75% **OR** Reactor Power is restricted to LESS THAN OR EQUAL to 75% with Power Range Channel trip setpoints to LESS THAN OR EQUAL to 85% within **four hours** of channel inoperability. Steps 6.0 and 7.0 are written to ensure timely completion of QPTR power distribution measurements to meet Technical Specifications.

_____ **6.0 VERIFY Within One Hour That Beacon Power Distribution Monitoring System (PDMS) Is Available With Reactor Engineering**

a. IF Beacon Power Distribution Monitoring System (PDMS) is **NOT** available, THEN PERFORM the following to use Movable Incore Detector System:

1) ENERGIZE the system in accordance with 0POP02-II-0001, Movable Incore Detector System Operation, to setup for flux mapping no later than six hours after the channel inoperability time.

2) DIRECT Reactor Engineering to begin flux mapping per 0PSP10-II-0004, Determination of QPTR using a Core Power Distribution Measurement, no later than seven hours after the channel inoperability time to ensure completing the Incore QPTR surveillance within the 12 hour Technical Specifications action statement.

Step 6.0 of this Addendum continued next page

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 6.0 of this Addendum continued from previous page

b. IF QPTR can **NOT** be obtained within 12 hours of channel inoperability time per 0PSP10-II-0004, Determination of QPTR using a Core Power Distribution Measurement, THEN PERFORM the following within **four hours** of channel inoperability time:

1) REDUCE Reactor Power to LESS THAN OR EQUAL to 75% per the following:

- 0POP03-ZG-0006, Plant Shutdown From 100% to Hot Standby

OR

- 0POP03-ZG-0008, Power Operations

2) DIRECT I&C personnel to reduce the operable Power Range Channel trip setpoints to LESS THAN OR EQUAL to 85% per 0PSP02-NI-0040, Power Range Channels N-0041, N-0042, N-0043, and N-0044 Overpower Trip High Range Setpoint Adjustment.

c. GO TO Addendum 3 Step 8.0

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**7.0 DIRECT Reactor Engineering To Commence 0PSP10-II-0004, Determination Of QPTR Using A Core Power Distribution Measurement, No Later Than 10 Hours After The Channel Inoperability Time To ENSURE An Adequate Amount Of Time To Complete The Beacon PDMS QPTR Surveillance Within The 12 Hour Technical Specifications Action Statement.**	IF QPTR can **NOT** be obtained within 12 hours of channel inoperability time per 0PSP10-II-0004, Determination of QPTR using a Core Power Distribution Measurement, THEN PERFORM the following within **four hours** of channel inoperability time: **a.** REDUCE Reactor Power to LESS THAN OR EQUAL to 75% per the following: • 0POP03-ZG-0006, Plant Shutdown From 100% to Hot Standby OR • 0POP03-ZG-0008, Power Operations **b.** DIRECT I&C personnel to reduce the operable Power Range Channel trip setpoints to LESS THAN OR EQUAL to 85% per 0PSP02-NI-0040, Power Range Channels N-0041, N-0042, N-0043, and N-0044 Overpower Trip High Range Setpoint Adjustment. ----------
_____	**8.0 VERIFY Steam Generator Level Being - CONTROLLED BY LOW POWER FEED REGULATING VALVES** _____ **a. PLACE any Low Power Feed Regulating valves being used to feed steam generators in AUTO at discretion of the Shift Manager/Unit Supervisor** _____ **b. CONTROL Steam Generator levels between 68 and 74% NR level indication**	GO TO Addendum 3 Step 9.0. ----------

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**9.0 PLACE "ROD BANK SELECTOR SW" In AUTO At Discretion Of The Shift Manager/Unit Supervisor**	---
_____	**10.0 INITIATE A Condition Report To Repair The Inoperable Channel**	---
_____	**11.0 REVIEW Applicable Technical Specifications. REFER TO Addendum 8**	---

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The OTDT reactor trip uses input from the 7300 Protection Channel Set and from NIS. WITH the Nuclear Instrumentation Bypass Panel Modification installed, THEN bypassing different 7300 and NIS Protection Sets could result in inadvertent entry into Technical Specification 3.0.3.

_____ **12.0 BYPASS The Malfunctioning Power Range Channel By Performing The Following:**

_____ **a. VERIFY no other Power Range Channel in bypassed or tripped condition:**

- Annunciator Lampbox 5M03 window C-7 "RX PROTECTION CHANNEL BYPASSED" – EXTINGUISHED
- Annunciator Lampbox 5M03 Window C-6 "CHANNEL I NIS BYPASS ENABLED" – EXTINGUISHED
- Annunciator Lampbox 5M03 Window D-6 "CHANNEL II NIS BYPASS ENABLED" – EXTINGUISHED
- Annunciator Lampbox 5M03 Window E-6 "CHANNEL III NIS BYPASS ENABLED" – EXTINGUISHED
- Annunciator Lampbox 5M03 Window F-6 "CHANNEL IV NIS BYPASS ENABLED" – EXTINGUISHED
- NUCLEAR INSTR Power Range "HI" BSMP LIGHT - PANEL CP005 for non-malfunctioning channels – EXTINGUISHED
- NUCLEAR INSTR Power Range "RATE" BSMP LIGHT - PANEL CP005 for non-malfunctioning channels – EXTINGUISHED
- OTDT Rx Trip Loop BSMP LIGHT - PANEL CP005 for non-malfunctioning channels – EXTINGUISHED

a. PERFORM the following:

1) CHECK any 7300 Protection Set Channel different from the NIS channel to be bypassed in a tripped or bypass condition.

2) IF a 7300 Protection Set Channel different from the NIS channel to be bypassed is in a tripped or bypass condition, THEN:

a) NOTIFY the Shift Manager.

b) IF the channel is bypassed, THEN EVALUATE functions bypassed in other channel.

Step 12.0 of this Addendum continued next page

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 12.0 of this Addendum continued from previous page

_____ **b. ENSURE circuit breakers located on the Nuclear Instrumentation Bypass Panel are ON: {CP011}**

- "NON-SAFETY"
- "SAFETY"

_____ **c. ENSURE all individual function bypass switches in NORMAL {CP011}**

_____ **d. OBTAIN the key for the "BYPASS ENABLE" switch {CP011}**

_____ **e. INSERT key AND PLACE "BYPASS ENABLE" keyswitch in BYPASS ENABLE {CP011}**

Step 12.0 of this Addendum continued next page

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Step 12.0 of this Addendum continued from previous page

_____ **f. VERIFY the following:**

- Red bypass LED above the "BYPASS ENABLE" keyswitch {CP011} - LIT
- Applicable Annunciator Lampbox 5M03 window - LIT

  Window C-6 "CHANNEL I NIS BYPASS ENABLED"

  OR

  Window D-6 "CHANNEL II NIS BYPASS ENABLED"

  OR

  Window E-6 "CHANNEL III NIS BYPASS ENABLED"

  OR

  Window F-6 "CHANNEL IV NIS BYPASS ENABLED"

f. PERFORM the following: {CP011}

1) PLACE "BYPASS ENABLE" keyswitch in NORMAL.

2) ENSURE circuit breakers on the Nuclear Instrumentation Bypass Panel are ON:

- "NON-SAFETY"
- "SAFETY"

3) PLACE "BYPASS ENABLE" keyswitch in BYPASS ENABLE.

4) VERIFY the following - LIT

- Red bypass LED
- Applicable Annunciator Lampbox 5M03 window

_____ **g. PLACE the following bypass switches on Nuclear Instrumentation Bypass Panel in BYPASS: {CP011}**

- "POSITIVE RATE TRIP"
- "OVER POWER TRIP - LOW"
- "OVERPOWER TRIP - HIGH"

_____ **h. BYPASS the OTDT Reactor Trip bistable for the failed channel per Addendum 7**

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**13.0 ENSURE An OAS Log Entry Has Been Made Indicating The Technical Specification Surveillance(s) To Be Performed Prior To Returning The Out Of Service Channel To Service**	----------
_____	**14.0 REVIEW 0PGP03-ZO-0042, Reactivity Management Program**	----------

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
_____	**15.0 PERFORM the following within 72 hours of the Power Range channel failure:**	
_____	**a. CHECK the OTDT Reactor Trip bistable for the failed channel - BYPASSED**	**a.** GO TO Addendum 3 Step 15.0c.
_____	**b. NOTIFY I&C to remove the OTDT Reactor Trip bistable for the failed channel from bypass. REFER TO Addendum 7**	
_____	**c. ENSURE all individual function bypass switches in NORMAL {CP011}**	
_____	**d. ENSURE "BYPASS ENABLE" keyswitch in NORMAL {CP011}**	
_____	**e. ENSURE key from the "BYPASS ENABLE" keyswitch is REMOVED {CP011}**	
_____	**f. TRIP the protective bistables for the failed channel per Addendum 5**	
_____	**g. REMOVE the control power fuses on the affected power range drawer {CP011}**	
_____	**h. VERIFY the bistable monitoring lights listed in Addendum 6 for the failed channel are illuminated**	

STEP	ACTIONS/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

0PGP03-ZO-0039, Operations Configuration Management, provides guidance for tracking computer points off-scan.

_____ **16.0 PERFORM Addendum 9, Power Range NI Channel Computer Points To Make U1118 And U1169 Reliable, As Directed By US/SM To REMOVE Computer Points From Scan To Allow Using U1118 and U1169 With One Power Range NI Out Of Service**

_____ **17.0 PERFORM Addendum 10, Power Range NI Channel Computer Points Restoration, As Directed By US/SM To RESTORE Computer Points To Normal When Power Range NI Channel Is Returned To Service**

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: **PRT FEED AND BLEED**

JPM NO.: **S4**

REVISION: **0**

LOCATION: **SIMULATOR**

JOB PERFORMANCE MEASURE INFORMATION SHEET

JPM Title: PRT FEED AND BLEED

JPM No.: S4

Rev. No: 0

STP Task: 4700 - Feed and bleed the Pressurizer Relief Tank.

STP Objective: 4700 - When directed by the Unit Supervisor, feed and bleed the PRT per 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation.

Related K/A Reference: 007 A2.01 [3.9/4.2] Ability to (a) predict the impacts of the following malfunctions or operations on the PRTS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Stuck-open PORV or code safety

References: 0POP02-RC-0001, Rev. 19, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation

Task Normally Completed By: RO

Method of Testing: Actual Performance

Location of Testing: Simulator

Time Critical Task: No

Alternate Path JPM: No

Validation Time: 15 min.

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

Annunciator 04M7, Window D-1, PRT PRESS HI and E-1, PRT TEMP HI was received when a PRZR PORV inadvertently lifted during a surveillance test. Current Pressurizer Relief Tank temperature is 90°F as read on PRT TEMP, TI-0668 and Current Pressurizer Relief Tank pressure is 6 psig as read on PRT PRESS, PI-0669. The actions of 0POP09-AN-04M7 have been taken for both Annunciators.

INITIATING CUE:

The Unit Supervisor directs you to reduce PRT pressure to 4 to 5 psig and clear the PRT PRESS HI alarm using Section 7 of 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation, and then cool the PRT using the **FEED AND BLEED METHOD** per 0POP02-RC-0001, Section 8.0. Procedure prerequisites have been verified.

Notify the Unit Supervisor when PRT Feed and Bleed is initiated.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

PRT pressure has been reduced and cooling of the PRT using the feed and bleed method has been initiated per 0POP02-RC-0001.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

JPMs S3 and S4 are to be run together. The following steps will set up the simulator for **BOTH** JPMs:

1. Ensure Radio volume for both stations are set to a reasonable level.
2. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.
3. Reset to IC #206 and verify:
   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up
4. Check and clean the following procedures:
   - 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation
5. Place simulator in run. Silence/acknowledge/reset alarms as appropriate.
6. Place the simulator in "FREEZE" until the examiners are ready to proceed.
7. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS

For Step 7(C) perform the following when cued by the examiner:

1. Select REMOTE FUNCTIONS from the BROWSE menu.
2. Select REACTOR COOLANT SYSTEM from the system drop down menu.
3. Select HH-07, RC-0025, and insert a value of 1.0.

This will align the vent path for the PRT.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain the procedure.

Standard:

Obtain a copy of 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation, and transition to section 7.0

Comment:

The applicant should use the simulator copy of the procedure.

Cue:

If asked, inform the applicant the Prerequisites have been completed.

Notes:

Comment [COMMENT1]: NOTE TO DEVELOPER:
BE CAREFUL NOT TO LOSE THE HORIZONTAL LINE CODE BETWEEN STEPS . . .

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

VERIFY GWPS is in operation. (step 7.1)

Standard:

Contacts MEAB watch to verify GWPS is in service.

Comment:

The applicant may use indications on the control panels such as VCT vent open which vents to GWPS.

Cue:

If applicant is going to contact the plant operator to verify GWPS is in service, respond as the MEAB watch that GWPS is in service.

Notes:

SAT/UNSAT Performance Step: 3(C)

ENSURE "1(2)-NL-0039 Low Pressure Nitrogen to PRT and Pressurizer Purge Isolation Valve" is CLOSED. (step 7.2)

Standard:

Contacts MEAB watch to ensure "1(2)-NL-0039 Low Pressure Nitrogen to PRT and Pressurizer Purge Isolation Valve" is CLOSED.

Comment:

Cue:

When the applicant contacts a plant operator to close NL-0039 inform the applicant the valve is closed.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

RECORD positions of the following: (step 7.3)

- "1(2)-RC-FV-3652 OCIV" (PRT to GWPS) (step 7.3.1)
- "1(2)-RC-FV-3653 ICIV" PRT to GWPS (step 7.3.2)

Standard:

Checks position of the valves as indicated on CP004 and enters it in the procedure.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 5 (C)

ENSURE OPEN the following valves: (step 7.4)

- "1(2)-RC-FV-3652 OCIV" (PRT to GWPS)
- "1(2)-RC-FV-3653 ICIV" (PRT to GWPS)

Standard:

Opens the valves on CP004.

Comment:

1(2)-RC-FV-3653 ICIV, PRT to GWPS, takes about 10 seconds to open. During that time the operator has to hold the valve handswitch in the open position. Both the red and green lights will go out while opening.

Cue:

Because of the way that 1(2)-RC-FV-3653 ICIV, PRT to GWPS, operates; if the operator tries to change light bulbs then tell the operator that the light bulbs are good.

Notes:

Step 7.5 and 7.6 will be N/A

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6 (C)

OPEN "1(2)-WG-0022 Pressurizer Relief Tank Vent to Water Removal Inlet Header Isolation Valve". (step 7.7)

Standard:

Comment:

Cue:

When the applicant contacts a plant operator to open WG-0022, inform the applicant the valve is open.

Notes:

SAT/UNSAT Performance Step: 7 (C)

Slowly OPEN "1(2)-RC-0028 Pressurizer Relief Tank Gas Sample Bottle Bypass Valve". (step 7.8)

Standard:

The applicant contacts a plant operator to slowly open RC-0028

Comment:

Cue:

When the applicant contacts a plant operator to slowly open RC-0028, after 5 seconds inform the applicant that RC-0028 is open.

Notes:

Evaluator has to cue the booth operator to perform this step.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8

OBTAIN flow rate as indicated on "1(2)-WG-FI-4652 Pressurizer Relief Tank Vent To Water Removal Inlet Header". (step 7.9)

Standard:

Contacts MEAB watch and request flow rate as indicated on "1(2)-WG-FI-4652 Pressurizer Relief Tank Vent To Water Removal Inlet Header". (ZLP-116)
Comment:

Cue:

When the applicant requests the flowrate as indicated on WG-FI-4652, report a rate of 0.9 scfm

Notes:

After a short period, the high pressure alarm will clear. Once pressure is less than 5 psig, the applicant should continue.

SAT/UNSAT Performance Step: 9(C)

WHEN PRT venting is no longer desired, THEN CLOSE "1(2)-RC-0028 Pressurizer Relief Tank Gas Sample Bottle Bypass Valve". (step 7.10)

Standard:

When PRT press indicated on RC-PI-0669 is between 4 to 5 psig contacts plant operator and directs them to close RC-0028 Pressurizer Relief Tank Gas Sample Bottle Bypass Valve.
Comment:

Cue:

When applicant contacts a plant operator to close RC-0028, inform the applicant that RC-0028 is closed.

Notes:

PRT pressure can be outside the band of 4 to 5 psig. The critical part of the step is to have 1-RC-0028 re-closed.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10

POSITION "1(2)-RC-FV-3652 OCIV" to position recorded in Step 7.3.1. (PRT to GWPS) (step 7.11)

Standard:

Positions RC-FV-3652 OCIV to the position recorded in step 7.3.1

Comment:

Initial valve position was closed

Cue:

Notes:

SAT/UNSAT Performance Step: 11

POSITION "1(2)-RC-FV-3653 ICIV" to position recorded in Step 7.3.2. (step 7.12)

Standard:

Positions RC-FV-3653 ICIV to the position recorded in step 7.3.2

Comment:

Initial position was closed

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 12

CLOSE "1(2)-WG-0022 Pressurizer Relief Tank Vent To Water Removal Inlet Header Isolation Valve". (step 7.13)

Standard:

Contact MEAB watch and directs them to CLOSE "1(2)-WG-0022 Pressurizer Relief Tank Vent To Water Removal Inlet Header Isolation Valve".

Comment:

Cue:

When the applicant contacts a plant operator to close WG-0022, inform the applicant that WG-0022 is closed.

Notes:

Step 7.14 will be N/A

SAT/UNSAT Performance Step: 13

OPEN "1(2)-NL-0039 Low Pressure Nitrogen to PRT and Pressurizer Purge Isolation Valve". (step 7.15)

Standard:

Contacts plant operator and directs them to open "1(2)-NL-0039 Low Pressure Nitrogen to PRT and Pressurizer Purge Isolation Valve".

Comment:

Cue:

When applicant contacts a plant operator to open NL-0039, inform the applicant that NL-0039 is open.

Notes:

When this step is complete, the applicant will continue to section 8.0.

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 14

VERIFY Nitrogen pressure control valve 1(2)-RC-PV-3654 is maintaining a positive pressure (2 to 6 psig) on the PRT as indicated by "PRT PRESS PI-0669". (step 8.1)

Standard:

Checks PRT PRESS PI-0669 to be between 2 and 6 psig.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 15(C*)

ALIGN RCDT System to pump down the PRT. (step 8.2)

Standard:

Performs the following:

____ **Stops any running RCDT PUMP by placing handswitch in PTL*
____ **Closes RCDT outlet DRAIN ISOL FV-4903*
____ **CLOSES RCDT recirc flow control valve ISOL FV-4910*
____ **Opens RCDT LEVEL CONT VLV LV-4911*
____ **Opens PRT to RCDT Isolation Valve DRAIN LV-3655*
____ **Opens RCDT pump discharge to PRT ISOL FV-4907*
____ *Verifies RMW to PRT and RCP standpipe valve OCIV FV-3651 is OPEN*

* Denotes critical portion of the step

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 16(C*)

Cool the PRT. (step 8.3)

Standard:

Performs the following to cool the PRT:

____ *a) Start one RMW PUMP*

____ **b) Start one RCDT PUMP*

____ *c) Ensures RM-0025 is open (see cue #1 below)*

____ **d) Opens FV-3650, SPRAY ISOL*

Comment:

Cue:

(1) When the applicant contacts a Plant Operator to check RM-0025, inform him/her that it is open.

Notes:

Once this step is complete, feed and bleed has been initiated.

-TERMINATE THE JPM- **Stop time _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S4, PRT FEED AND BLEED

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

Annunciator 04M7, Window D-1, PRT PRESS HI and E-1, PRT TEMP HI was received when a PRZR PORV inadvertently lifted during a surveillance test. Current Pressurizer Relief Tank temperature is 90°F as read on PRT TEMP, TI-0668 and Current Pressurizer Relief Tank pressure is 6 psig as read on PRT PRESS, PI-0669. The actions of 0POP09-AN-04M7 have been taken for both Annunciators.

INITIATING CUE:

The Unit Supervisor directs you to reduce PRT pressure to 4 to 5 psig and clear the PRT PRESS HI alarm using Section 7 of 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation, and then cool the PRT using the **FEED AND BLEED METHOD** per 0POP02-RC-0001, Section 8.0. Procedure prerequisites have been verified.

Notify the Unit Supervisor when PRT Feed and Bleed is initiated.

NUCLEAR TRAINING DEPARTMENT

JOB PERFORMANCE MEASURE

TITLE: **Trip an RCP**

JPM NO.: **S5**

REVISION: **0**

LOCATION: **SIMULATOR**

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	Trip an RCP
JPM No.:	S5
Rev. No.:	0
STP Task:	86350 – Respond to a Reactor Coolant Pump Malfunction
STP Objective:	Respond to a Reactor Coolant Pump Malfunction in accordance with 0POP04-RC-0002
Related K/A Reference:	002 A3.03 [4.4/4.6] Ability to monitor automatic operation of the RCS, including: Pressure. Temperatures and flows
References:	0POP02-RC-0004, Rev. 29, Operation of Reactor Coolant Pump 0POP04-RC-0002, Rev. 30, Reactor Coolant Pump Off Normal
Task Normally Completed By:	RO
Method of Testing:	Actual Performance
Location of Testing:	Simulator
Time Critical Task:	NO
Alternate Path JPM:	YES
Validation Time:	15 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A plant is in Mode 3 at no-load temperature and pressure.

INITIATING CUE:

The Unit Supervisor directs you to start the "C" RCP. All Section 3.0 Prerequisites of 0POP02-RC-0004, Operation of Reactor Coolant Pump have been met and Section 6.0 has been completed satisfactorily.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Starts the "C" RCP and then trips it in response to the high temperature condition.

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

Working copy of 0POP02-RC-0004, Operation of Reactor Coolant Pump, with section 6 signed off.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

JPMs S5 and S6 are to be run together. The following steps will set up the simulator for **BOTH** JPMs:

1. Ensure Radio volume for both stations are set to a reasonable level.

2. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3. Reset to IC #207 and verify:

   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up

4. Check and clean the following procedures:

   - 0POP04-RC-0002, Reactor Coolant Pump Off Normal
   - 0POP02-EW-0001, Essential Cooling Water Operations
   - 0POP09-AN-02M3, Annunciator Lampbox 2M03 Response Instructions

5. Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6. Ensure RCP C seal injection flow is >8 gpm.

7. Place the simulator in “FREEZE” until the examiners are ready to proceed.

8. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain the procedure.

Standard:

Obtains a procedure and reviews the Notes and Precautions in 0POP02-RC-0004.

Comment:

Cue:

Provide the applicant a JPM handout copy of 0POP02-RC-0004.

Notes:

SAT/UNSAT Performance Step: 2

Ensure Section 6.0 has been completed. (step 9.1)

Standard:

Ensures applicable portions of Section 6.0 are complete.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3

Ensure the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. (step 9.2)

Standard:

Ensures Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status.

Comment:

Cue:

AS Unit Supervisor, report 7300/SSPS normalization is not installed.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4

Verify RCP annunciators extinguished. (step 9.3)

Standard:

Verifies the following annunciators are extinguished.

____ *"MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4*
____ *"RCP 1C SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-5*
____ *"RCP 1C NO 1 SEAL DP LO" Lampbox 4M07, Window A-6*
____ *"RCP 1C NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-5*
____ *"RCP 1C STDPIPE LVL HI" Lampbox 4M07, Window B-6*
____ *"RCP 1C NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-5*
____ *"RCP 1C STDPIPE LVL LO" Lampbox 4M07, Window C-6*
____ *"RCP 1C THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-6*
____ *"SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1*
____ *"RCP 1C(2C) UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-3*
____ *"RCP 1C(2C) LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-3*
____ *"RCP CCW FLOW LO" Lampbox 5M02, Window E-1*

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5

Verify RCP 1C SEAL INJ FLOW FT-0146 is between 8 and 13 gpm on "RCP 1C(2C) SEAL FLOW FR-0158". (step 9.4)

Standard:

Verifies seal injection flow is between 8 and 13 gpm on SEAL FLOW FR-0158.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 6

VERIFY RCP 1C(2C) No. 1 seal water leakoff flow, as indicated on "RCP 1C(2C) SEAL FLOW FR-0158", is in the normal operating range per Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range. (step 9.5)

Standard:

Verifies seal leakoff flow, on SEAL FLOW FR-0158, is in the normal operating range.

Comment:

Cue:

Seal water leakoff flow - 3.0 gpm (FT-0158A).

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 7

Verify RCP 1C No. 1 seal differential pressure is greater than 250 psid as indicated on "Seal 1 DP PI-0154". (step 9.6)

Standard:

Verifies seal differential pressure is greater than 250 psid as indicated on Seal 1 DP PI-0154.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 8

Ensure RCP 1C "Seal NO 1 LKF ISOL FV-3156" is open. (step 9.7)

Standard:

Verifies FV-3156, NO 1 LKF ISOL is open.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 9

Verify seal water injection temperature less than 135°F on "TEMP TI-0216". (step 9.8)

Standard:

Verifies seal water injection temperature less than 135°F on TEMP TI-0216.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 10(C)

Start the RCP 1C OIL LIFT PPUMP. (step 9.10)

Standard:

Starts RCP 1C OIL LIFT PUMP.

Comment:

Procedure step 9.9 was N/A since RCS temperature is greater than 140°F

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 11

Verify the RCP 1C(2C) blue "START PERM" indicator light illuminates. (step 9.11)

Standard:

Verifies RCP 1C(2C) blue START PERM light illuminates.

Comment:

Cue:

Notes:

SAT/UNSAT Performance Step: 12(C*)

Start and monitor RCP C after blue permissive light has been on at least 2 minutes.
(steps 9.12 – 9.14)

Standard:

____ **Starts RCP C after blue light has been on for at least 2 minutes.*
____ *Verifies LOOP C FLOW FI-0437A increases to greater than 90%.*
____ *Verifies RCP C - SEAL 1 DP PI-0154 greater than 220 psid.*

* Denotes critical action

Comment:

Cue:

Notes:

High stator temperature alarm will come in on the Integrated Computer System (ICS) after flow reaches ~90%

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 13(C)

Respond to the high stator temperature.

Standard:

Determines RCP C high stator temperature alarm is in on the Integrated Computer System (ICS) and performs the actions of 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

Comment:

Procedure step 4.15 directs the operator to 0POP04-RC-0002, Reactor Coolant Pump Off Normal, when stator temperature exceeds 310°F.

Cue:

If the applicant seeks to just inform the Unit Supervisor of the high temperature condition, direct the applicant to perform the actions of 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

Notes:

SAT/UNSAT Performance Step: 14(C)

Immediately trip RCP C per the Conditional Information Page of 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

Standard:

Trips RCP C.

Comment:

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S5, TRIP AN RCP

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature** _____

Date _____

JPM - STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

A plant is in Mode 3 at no-load temperature and pressure.

INITIATING CUE:

The Unit Supervisor directs you to start the "C" RCP. All Section 3.0 Prerequisites of 0POP02-RC-0004, Operation of Reactor Coolant Pump have been met and Section 6.0 has been completed.

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Operation of Reactor Coolant Pump			
Quality	Safety-Related	Usage: **IN HAND**	Effective Date: 07/24/2012

Frank Jacobus	M. Ghrist	Crew 2D	Operations
PREPARER	TECHNICAL	USER	COGNIZANT DEPT.

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Usage

1 - IN HAND
2 - IN HAND CONTROLLING STATION
3 - REFERENCED
4 - AVAILABLE

1.0 Purpose

1.1 Provide instructions for operation of the Reactor Coolant Pumps (RCPs).

1.2 Provide instructions for un-coupled operation of the Reactor Coolant Pumps (RCPs).

2.0 References

2.1 Technical Specifications 3.2.5, 3.4.1.1, 3.4.1.2, 3.4.1.3 and TRM 3.4.9.2

2.2 UFSAR

2.2.1	Section 3.9.1,	Special Topics for Mechanical Components
2.2.2	Section 15.4.4,	Startup of an Inactive Reactor Coolant Loop at an Incorrect Temperature
2.2.3	Section 5.2.2.11.3	Administrative Procedures, RCS Pressure Control During Low Temperature Operation.

2.3 P&IDs

2.3.1	5R149F05001,	RCS Primary Coolant Loop
2.3.2	4R149F05002,	RCS Typical RTD Manifold Loop
2.3.3	5R179F05005,	Chemical and Volume Control System
2.3.4	5R179F05006,	Chemical and Volume Control System
2.3.5	5R179F05007,	Chemical and Volume Control System
2.3.6	5R179F05008,	Chemical and Volume Control System BTRS Sub System
2.3.7	5R209F05017,	Component Cooling Water System
2.3.8	5R209F05018,	Component Cooling Water System
2.3.9	5R209F05019,	Component Cooling Water System
2.3.10	5R209F05020,	Component Cooling Water System
2.3.11	5R209F05021,	Component Cooling Water System
2.3.12	5R309F05022,	Liquid Waste Processing System

2.4 Elementary Diagrams:

2.4.1	9-E-RC01-01,	Reactor Coolant Pump 1A(2A), 1B(2B), 1C(2C), 1D(2D)
2.4.2	9-E-RC03-02,	Class 1E 15KV RCP Cubicle 1A
2.4.3	9-E-RC03-03,	Class 1E 15KV RCP Cubicle 1B
2.4.4	9-E-RC03-04,	Class 1E 15KV RCP Cubicle 1C
2.4.5	9-E-RC03-05,	Class 1E 15KV RCP Cubicle 1D
2.4.6	9-E-RC06-01,	Reactor Coolant Pumps 1A(2A), 1B(2B), 1C(2C), & 1D(2D) Space Heaters HT101A, HT101B, HT101C, & HT101D
2.4.7	9-E-RC09-01,	RCP Oil Lift Pump 1A(2A), 1B(2B), 1C(2C) & 1D(2D)

2.5 Procedures

2.5.1	0POP03-ZG-0006,	Plant Shutdown From 100% To Hot Standby
2.5.2	0POP09-AN-04M8,	Annunciator Lampbox 4M08 Response Instructions
2.5.3	0POP02-CC-0001,	Component Cooling Water
2.5.4	0POP02-CV-0005,	Chemical and Volume Control System Pre-Start System Alignment
2.5.5	0POP02-RC-0001,	Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation
2.5.6	0POP02-RC-0002,	Reactor Coolant Pump Oil Changing System
2.5.7	0POP02-RC-0003,	Filling and Venting the Reactor Coolant System
2.5.8	0POP02-SB-0002,	Steam Generator Wet Layup Recirc
2.5.9	0POP02-AF-0001,	Auxiliary Feedwater
2.5.10	0POP02-RM-0001,	Reactor Makeup Water System Operations
2.5.11	0POP04-RC-0002,	Reactor Coolant Pump Off Normal

2.6 5R149MB1027, Reactor Coolant System DBD

2.7 Reactor Coolant Pump Manual, 125-(01)-00039 (125-(02)-00037)

2.8 Request for Action 91-1129, Reactor Coolant Pump Restart Criteria

2.9 Commitments

2.9.1 MATS Item 8501209-866 (SER 85-19) RCP Seal Failure Resulting From a Loss of CCW

2.9.2 ST-HL-AE-2182, Attachment 2, Revised Response to Generic Letter 85-12

2.9.3 LER 880001 & SPR 880002, MATS Item 8800309-936, PZR PORV Lifting Due to RCS Pressure Spike From RCS & SG Delta T

2.9.4 SPR-920135; LCTS 9200520-936, Pump B Was Started Causing Air/Steam to Exhaust From Port

2.9.5 ST-HS-HS-27039, Minutes of NSRB Meeting 93-07, Item 8

2.9.6 IEN 84-69, Operation of ESF DGs

2.9.7 LCTS 9400114-936 (IEN 94-02), Breaker springs failure to charge

2.10 Engineering Calculation, EC-5001, Fault Study Analysis

2.11 CREE 98-17053, RCP starts on the Standby Transformer

2.12 ST-HS-HS-13461, Telephone Minutes, Subject: UFSAR Section 15.4.4

2.13 CR 00-8569 RHR flow condition with 4 RCP's running.

2.14 CR 00-4057, At Low RCS Pressure and No RCP Running RCS Flow Indicators May Indicate 20-25% Flow.

2.15 CR 03-949, RCPs were lost power due to switchyard north bus lockout. During restoration Pressurizer PORV 655A lifted due to high system pressure on start of an RCP.

2.16 CR 03-1149, fuel assemblies to be loaded with the XL win top nozzles with integral spring clamps [no holddown spring screws] and mid-grids [for improved thermal performance].

2.17 CR 07-7596, Westinghouse Letters ST-WN-NOC-07-28 (4/26/07) and LTR-PMO-07-45 (4/16/07) identified that two STP RCP motors refurbished by Westinghouse (Presently installed in position 2B have oil lift fittings which are susceptible to leaking which may lead to dry thrust shoe condition. (RCP 2C motor replaced in 2RE15)

2.18 CR 08-14868, RCP Seal Injection Flows Low Out of Band When RCPs Secured

3.0 Prerequisites

3.1 IF un-coupled operations of the Reactor Coolant Pumps (RCPs) are desired, THEN GO TO Addendum 2, Un-coupled Run of RCPs Motors . KS

NOTE

Prerequisite requirement Step 3.2 in Lineup 1 for RCP breakers to be racked-in, is **NOT** required for hand rotation of RCP's.

3.2 ENSURE Lineup 1, RCP Electrical Lineup is completed. KS

3.3 The Chemical and Volume Control System is in operation per 0POP02-CV-0005, Chemical and Volume Control System Pre-Start System Alignment. KS

3.4 The Component Cooling Water System is in operation per 0POP02-CC-0001, Component Cooling Water. KS

3.5 The Reactor Coolant System is filled and vented per 0POP02-RC-0003, Filling and Venting the Reactor Coolant System or per 0POP03-RC-0100, RCS Vacuum Fill. **NOT** applicable when performing 0POP02-RC-0003. KS

3.6 The Reactor Makeup Water System is in operation per 0POP02-RM-0001, Reactor Makeup Water System Operations. KS

3.7 The Reactor Coolant Drain Tank System is in operation per 0POP02-RC-0001, Pressurizer Relief Tank and Reactor Coolant Drain Tank System Operation. KS

3.8 RCP lubricating oil drain and fill operations for the pump(s) to be started are complete per 0POP02-RC-0002, Reactor Coolant Pump Oil Changing System. KS

3.9 IF **NO** RCPs are running AND the RCS has been filled and vented, THEN a steam bubble exists in the Pressurizer. (Ref. 2.2.3) N/A

NOTE

The preferred electrical lineup prior to RCP start is the associated Auxiliary and Standby Busses being split. RCPs may be started on the Standby Transformers. Bus voltage will drop during pump start. (References 2.10, 2.9.6, and 2.11)

3.10 IF the Auxiliary Transformer is available, THEN ENSURE the associated Auxiliary and Standby Busses are split prior to starting an RCP. KS

3.11 IF the Auxiliary Transformer is **NOT** available, THEN ENSURE the associated Standby Bus is energized prior to starting an RCP. N/A

4.0 Notes and Precautions

4.1 IF un-coupled operations of the Reactor Coolant Pumps (RCPs) are desired, THEN GO TO Addendum 2, Un-coupled Run of RCPs Motors .

4.2 The principles of 0PGP03-ZO-0042, Reactivity Management Program, are in effect at all times during Operations in this procedure.

4.3 RCS pressure transients will occur when starting an RCP. Solid plant conditions and/or Steam Generator and seal water temperatures different from RCS temperatures will magnify these transients.

4.4 A RCS cooldown may occur if Steam Generator temperatures are significantly lower than RCS temperatures when starting an RCP.

4.5 RCP Number 1 Seal differential pressure SHALL be maintained greater than or equal to 220 psid during RCP operation.

4.6 A Reactor Coolant Pump SHALL **NOT** be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 350°F unless the secondary water temperature of each steam generator is less than 10°F above each of the Reactor Coolant System cold leg temperatures. (Reference 2.9.3)

4.7 IF forced RCS flow is **NOT** present,

- THEN an RCP should **NOT** be started in any loop which has diluted charging going to it to avoid a positive reactivity insertion.
- IF it is likely that diluted seal injection flow has accumulated in the Loops, THEN contact engineering to determine likely reactivity effects and course of action such as entering 0POP04-RC-0008, Boron Dilution Event. (CR 04-5526)

4.8 The following starting duty SHALL be observed for an RCP:

4.8.1 Two successive starts are permitted, provided the RCP motor coasts to a complete stop between start attempts.

4.8.2 Subsequent RCP start attempts are permitted, provided the RCP has been idle for 45 minutes following the last attempted start OR the RCP had run for greater than 20 minutes following the last start.

4.9 WHEN Reactor Coolant System temperature is greater than 400°F, THEN the Reactor Coolant Pump seal water injection supply temperature SHALL **NOT** exceed 135°F.

4.10 One of the following conditions SHALL exist to ensure back pressure is greater than or equal to 15 psig on RCP Number 1 Seal.

- IF excess letdown "DIVERT FV-3123" is in the "VCT" position, THEN VCT pressure is being maintained such that the indicated pressure on "HX OUTL PRESS PI-0228" is greater than or equal to 15 psig.

- IF excess letdown "DIVERT FV-3123" is in the "RCDT" position, THEN pressure indicated on "1(2)-CV-PI-0119A SEAL WATER RETURN FILTER 1(2)A INLET PRESSURE" is being maintained at greater than or equal to 15 psig.

4.11 WHEN RCS level is above RCP seal package level, THEN RCP seal injection flow should be maintained to prevent infiltration of crud from the RCS to the RCP seal package.

4.12 WHEN RCP seal injection water is **NOT** being supplied AND RCS pressure is less than 100 psig, THEN the RCP Number 1 Seal Leakoff valves SHALL be closed to prevent contaminants from the seal leakoff line being forced back into the seal chamber.

4.13 WHEN the Reactor is critical, THEN an RCP SHALL **NOT** be started.

4.14 IF an ESF Diesel Generator is paralleled to its associated bus on either Unit, THEN an RCP may be started provided the following: (References 2.10 and 2.9.6)

4.14.1 The RCP is **NOT** powered from the same Auxiliary OR Standby Transformer that is in parallel with the running ESF Diesel.

4.14.2 The Unit running the ESF Diesel Generator is notified.

4.15 IF any of the conditions listed below occur, THEN GO TO 0POP04-RC-0002, Reactor Coolant Pump Off Normal:

- Motor Upper or Lower Radial Bearing Temperature - GREATER THAN OR EQUAL TO 195°F
- Motor Upper or Lower Thrust Bearing Temperature - GREATER THAN OR EQUAL TO 195°F
- Motor Stator Winding Temperature - GREATER THAN OR EQUAL TO 310°F
- Seal 1 Water Inlet Temperature - GREATER THAN OR EQUAL TO 230°F
- Lower Seal Water Bearing Temperature - GREATER THAN OR EQUAL TO 230°F
- SHAFT Vibration (Brg2-Vert OR Brg2-Horiz) -
  a. GREATER THAN OR EQUAL TO 20 MILS
  OR
  b. GREATER THAN OR EQUAL TO 15 MILS AND THE RATE OF VIBRATION INCREASE IS GREATER THAN OR EQUAL TO 1.0 MIL PER HOUR
- CASE Vibration (Mtr_Accel-Vert OR Mtr_Accel-Horiz) -
  a. GREATER THAN OR EQUAL TO 5 MILS
  OR
  b. GREATER THAN OR EQUAL TO 3 MILS AND THE RATE OF VIBRATION INCREASE IS GREATER THAN OR EQUAL TO 0.2 MIL PER HOUR
- Number 1 Seal DP - LESS THAN 220 PSID

4.16 WHEN a RCP is to be stopped, TURN the desired RCP handswitch to STOP and maintain it in the STOP position until the RCP motor breaker opens. The Pull-to-Lock (PTL) position does **NOT** have a STOP contact and rapidly placing the handswitch to PTL may **NOT** allow time for the relays to position. (CR 05-1339)

4.17 IF an RCP experiences a simultaneous loss of seal water injection flow AND loss of CCW flow to the thermal barrier, THEN GO TO 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

4.18 IF an RCP No. 1 Seal Leakoff flow increases into the "ABOVE NORMAL OPERATING RANGE" region as per Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range, THEN GO TO 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

4.19 IF an RCP No. 1 Seal Leakoff flow increases to GREATER THAN 6 gpm, OR decreases to LESS THAN 0.8 gpm, THEN GO TO 0POP04-RC-0002, Reactor Coolant Pump Off Normal.

4.20 WHEN starting RCPs, THEN monitor the Loose Parts Monitoring System audio output.

4.21 The preferred electrical lineup prior to RCP start is the associated Auxiliary and Standby Busses being split. RCPs may be started on the Standby Transformers. Bus voltage will drop during pump start. (References 2.10, 2.9.6, and 2.11)

4.22 IF an RCP upper or lower oil reservoir HI/LO level annunciator is illuminated coincident with the Plant Computer being down, THEN the following SHALL be performed:

4.22.1 IF Reactor Power is GREATER THAN OR EQUAL TO 10%, THEN COMMENCE a power reduction per 0POP03-ZG-0006, Plant Shutdown From 100% To Hot Standby, to LESS THAN 10% or a power level that will allow containment entry for RCP inspection.

4.22.2 CONSULT System Engineering AND Plant Management to determine a plan of action.

4.23 With 3 or 4 Reactor Coolant Pumps running, and the Residual Heat Removal system in service, RHR loop flow may drop below 3000 gpm. Refer to 0POP02-RH-0001 before starting the third or fourth RCP. (Reference 2.13)

4.24 Lineup 1 for RCP breakers to be racked-in, is **NOT** required for hand rotation of RCP's.

4.25 WHEN a RCP is to be started following maintenance the following actions are recommended:

- The pump is inspected for any interferences with operation:
- The pump shaft is rotated by hand to ensure free movement. The oil lift pump may need to be in operation to do this.
- Hand rotation of coupled pumps can only reasonably be accomplished prior to starting other RCPs due to back flow in the Loops.
- Hand rotation can be accomplished with other pumps running but the data is non-conclusive and it required strap wrenches and extension bars.
- IF possible, THEN hand rotate all four (4) RCPs prior to performing the final starting of any RCP for Plant Heatup.
- Un-Coupled RCP motors are **NOT** impacted by Loop flows and may be hand rotated, as required.
- Hand rotation only needs to be performed one (1) time during a series of multiple starts.

4.26 The following are RCP Plant Computer Points that may be utilized to monitor RCP operation. (ICS: Display RC-010)

	1A(2A)	1B(2B)	1C(2C)	1D(2D)
RCP Motor Stator Winding Temp	T0412	T0432	T0452	T0472
RCP Motor Upper Radial Bearing Temp	T0413	T0433	T0453	T0473
RCP Motor Upper Thrust Bearing Temp	T0414	T0434	T0454	T0474
RCP Motor Lower Radial Bearing Temp	T0415	T0435	T0455	T0475
RCP Motor Lower Thrust Bearing Temp	T0416	T0436	T0456	T0476
RCP Lower Seal Water Bearing Temp	T0417	T0437	T0457	T0477
RCP Seal 1 Water Inlet Temp	T0181	T0182	T0183	T0184

4.27 IF the Plant Computer is down, THEN RCP operation may continue provided available operating parameters are monitored (case and shaft vibration, related RCP annunciators, etc.) AND monitored parameters remain stable.

4.28 IF the Plant Computer is out of service AND maintenance has been performed on an RCP, THEN that RCP SHALL **NOT** be started without the permission of the Unit Operations Manager.

4.29 Static pressure zero and span shifts on the RCS flow transmitters will effect flow indication when the RCS is **NOT** at normal operating pressure. When the RCS is at low pressure with no RCP running, there may be RCS flow indication up to 25% flow even when there is no actual flow through the loop. This is an expected indication that occurs due to static pressure effect on the flow transmitters measuring differential pressure across elbow taps on the RCS piping. (Reference 2.14)

4.30 Four (4) RCPs operations are **NOT** permitted WHEN RCS average temperature is less than 140°F. Do **NOT** run all 4 RCPs UNTIL RCS average temperature reaches greater than 140°F. (3 pumps or less restriction RCS < 140°F, This limitation is required to demonstrate acceptable fuel assembly top nozzle hold down spring forces in the Cold Zero Power lift force calculation.) (CR 03-1149)

4.31 Experience has shown that starting RCP(s) MAY cause spikes in Nuclear Instruments indications due to induced electrical noise in the instrument cables.

4.32 Westinghouse recommends that RCP motor 2B should **NOT** be started when RCS pressure is > 1800 psig in order to prevent potential damage to the upper thrust bearing. This may occur if the oil lift system does **NOT** function properly. (IF RCS pressure is < 1800 psig, design calculations show that malfunction of the oil lift system during starting will **NOT** cause upper bearing damage.) This restriction will be removed when the associated oil lift fittings are replaced. This restriction does **NOT** apply to RCP starts IAW Emergency Operating Procedures. (CR 07-7596)

4.33 Abnormal maintenance breakaway torque results should be investigated to determine the cause (CR 07-7596, CR 06-14197).

5.0 Hand Rotation of RCPs

NOTE

- This section may be performed as directed by the Unit Supervisor/Shift Manager.
- Prerequisite requirement Step 3.2 in Lineup 1 for RCP breakers to be racked-in, is **NOT** required for hand rotation of RCP's
- Rotation of multiple pumps at the same time may be performed as manpower permits.
- WHEN a RCP is to be started following maintenance the following actions are recommended:
  - The pump is inspected for any interferences with operation:
  - The pump shaft is rotated by hand to ensure free movement. The oil lift pump may need to be in operation to do this.
  - Hand rotation of coupled pumps can only reasonably be accomplished prior to starting other RCPs due to back flow in the Loops.
  - Hand rotation can be accomplished with other pumps running but the data is non-conclusive and it required strap wrenches and extension bars.
  - IF possible, THEN hand rotate all four (4) RCPs prior to performing the final starting of any RCP for Plant Heatup.
  - Un-Coupled RCP motors are **NOT** impacted by Loop flows and may be hand rotated, as required.
  - Hand rotation only needs to be performed one (1) time during a series of multiple starts.
  - Abnormal maintenance breakaway torque results should be investigated to determine the cause (CR 07-7596, CR 06-14197).

5.1 IF desired by the Unit Supervisor/Shift Manager and **NOT** previously performed following maintenance, THEN perform the following to hand rotate RCPs:

5.1.1 ENSURE Health Physics personnel are NOTIFIED of pending efforts to hand rotate RCPs. _____

5.1.2 ENSURE personnel performing this activity are briefed IAW Conduct of Operations. _____

5.1.3 ENSURE the RCPs to be rotated handswitch(s) are in the Pull-to-Lock (PTL) position. (CP005)

- RCP 1A(2A) _____
- RCP 1B(2B) _____
- RCP 1C(2C) _____
- RCP 1D(2D) _____

5.1.4 START the RCPs to be rotated "OIL LIFT PUMP" by momentarily turning its handswitch to the START position. (CP005) _____

- RCP 1A(2A) _____
- RCP 1B(2B) _____
- RCP 1C(2C) _____
- RCP 1D(2D) _____

5.1.5 VERIFY the RCPs to be rotated blue "START PERM" indicator light illuminates. (CP005) _____

- RCP 1A(2A) _____
- RCP 1B(2B) _____
- RCP 1C(2C) _____
- RCP 1D(2D) _____

5.1.6 IF desired by the Unit Supervisor/Shift Manager and **NOT** previously performed following maintenance, THEN rotate the selected RCPs by hand to ensure free movement:

- RCP 1A(2A) _____
- RCP 1B(2B) _____
- RCP 1C(2C) _____
- RCP 1D(2D) _____

5.1.7 IF desired by the Unit Supervisor/Shift Manager, THEN STOP the selected RCPs "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (CP005)

- RCP 1A(2A) _____
- RCP 1B(2B) _____
- RCP 1C(2C) _____
- RCP 1D(2D) _____

CAUTION

Do **NOT** proceed with pump starts until that all personnel performing hand rotations are clear of the of pump motor shaft.

5.2 ENSURE **ALL** personnel located at the RCP are NOTIFIED to stand clear of motor for the pending start. _____

6.0 Pre First RCP start Temperature Difference Verifications

6.1 IF un-coupled operations of the Reactor Coolant Pumps (RCPs) are desired, THEN GO TO Addendum 2, Un-coupled Run of RCPs Motors . N/A

6.2 IF directed by the Unit Supervisor/Shift Manager to perform hand rotations of the Reactor Coolant Pumps (RCPs), THEN ENSURE the applicable portions of Section 5.0, Hand Rotation of RCPs are complete. N/A

CAUTION

- A rapid RCS cooldown may occur if Steam Generator temperatures are significantly lower than RCS temperatures when starting an RCP. (Symptoms: PZR out surge and RCS depressurization)
- A rapid RCS Heatup may occur if Steam Generator temperatures are significantly higher than RCS temperatures when starting an RCP, this may cause a rapid RCS pressure spike. (Symptoms: PZR in surge and RCS over pressurization, PORV Lifts)
- A Reactor Coolant Pump SHALL **NOT** be started with one or more of the Reactor Coolant System cold leg temperatures less than or equal to 350°F unless the secondary water temperature of each steam generator is less than 10°F above each of the Reactor Coolant System cold leg temperatures. (Reference 2.9.3)
- The temperature differential between the pressurizer liquid and the reactor coolant SHALL **NOT** exceed 320°F to minimize the effects of surge line thermal stratification.

6.3 IF at least one reactor coolant pump is operating (min of 5 minutes), THEN GO TO Step 7.0, Step 8.0, Step 9.0, or Step 10.0, as appropriate, OTHERWISE N/A this step and continue this Section. (Assume the RCS cold leg – SG temperature difference is minimal with forced circulation from one RCP after 5 min) KS

6.4 ENSURE the Reactivity Management principles of Steps 4.2, 4.7 and 4.13 are reviewed. (CR 04-5526)

NOTE

Expect a RCS pressure drop upon starting the first (1st) RCP. The amount of pressure drop is largely dependant upon the method and quality of the RCS fill that was performed. RCS fills using 0POP03-RC-0100, RCS Vacuum Fill generally see a smaller pressure drop than RCS fill using 0POP02-RC-0003, Filling and Venting the Reactor Coolant System. The Shift Manager should consider this variable when determining the amount of the minimum RCP No. 1 seal differential pressure margin to be used above the 250 psid required. Generally, this equates to an RCS pressure between 375 and 400 psig but lower RCS pressures may be used when problems exist obtaining the correct temperature differential between the pressurizer liquid and the RCS cold leg temperatures of greater than or equal to 320°F.

6.5 WHEN any reactor coolant system cold leg temperature is less than 350°F, THEN the following conditions SHOULD be met for the performance of Step 6.6 through Step 6.8, N/A this Step if **ALL** cold leg temperature are greater than 350°F: (to ensure accurate and stable temperature readings)

- A minimum of two trains of RHR SHOULD be in service to ensure adequate thermal mixing of the RCS. _____
- All RCP No. 1 seal differential pressures are greater than a 250 psid minimum by a margin determined by the Shift Manager. (CP004) _____

NOTE

The most common method of reducing the temperature differential between the pressurizer liquid and the RCS cold leg temperatures is to allow the RCS to heatup.

6.6 IF the temperature differential between the pressurizer liquid and the RCS cold leg temperatures is greater than or equal to 320°F, THEN REDUCE the differential temperature prior to starting the first RCP. _____

6.7 IF reactor coolant system cold leg temperature is greater than 220°F AND a Reactor Coolant Pumps is **NOT** in operation (for 5 min), THEN PERFORM the following substeps, OTHERWISE N/A the substeps:

6.7.1 RECORD steam generator pressures and RCS cold leg temperatures on Form 1. _____

6.7.2 IF any steam generator temperature is greater than any RCS cold leg temperature by more than 10°F, THEN DUMP steam from the hotter SGs to cool them to less than 10°F greater than RCS cold leg temperature. _____

6.7.3 IF any steam generator temperature is **NOT** within 10°F of the other steam generator temperatures, THEN reduce steaming of the colder SGs and adjust the steam from the hotter SGs to obtain SGs temperatures within 10°F of RCS cold leg temperature. _____

6.7.4 WHEN all steam generator temperatures AND the RCS cold leg temperatures are within 10°F of each other, THEN GO TO Step 7.0, Step 8.0, Step 9.0, or Step 10.0, as appropriate. _____

6.8 IF any reactor coolant system cold leg temperature is less than or equal to 220°F AND a Reactor Coolant Pump is **NOT** in operation (for 5 min), THEN PERFORM the following substeps, OTHERWISE N/A the substeps:

6.8.1 Place all steam generators on bottom recirculation per 0POP02-SB-0002, Steam Generator Wet Layup Recirc. _____

6.8.2 WHEN all SGs have been on bottom suction recirculation for GREATER THAN one hour, THEN RECORD SG recirculation pump suction temperature and RCS cold leg temperatures on Form 2. _____

CAUTION

RCS temperature SHALL **NOT** be allowed to increase, causing an unintentional mode change.

6.8.3 IF any SG recirculation pump suction temperature is above any RCS cold leg temperature by more than 10°F, THEN REDUCE the temperature difference using, at the discretion of the Shift Manager, one or a combination of the methods given below:

- REDUCE heat removal from the RHR System to raise RCS temperature. _____
- INCREASE RHR system flow by placing more trains in operation to equalize temperature. _____
- ESTABLISH SG feed per 0POP02-AF-0001, Auxiliary Feedwater, and bleed per 0POP02-SB-0002, Steam Generator Wet Layup Recirc, as required to lower SG secondary side temperature. _____
- Minimize charging and letdown to raise RCS temperature _____

6.8.4 WHEN BOTH of the following are met, THEN GO TO Step 7.0, Step 8.0, Step 9.0, and/or Step 10.0, as appropriate:

- All S/G temperatures are verified to be Less Than 10°F above the Reactor Coolant Cold Leg temperatures. _____

AND

- Any changes in S/G temperatures are consistent with changes in the RCS temperature as determined by the Shift Manager. _____

7.0 RCP 1A(2A) Startup

NOTE

- The preferred order for starting RCPs is 1D(2D), 1A(2A), 1B(2B) and 1C(2C). RCPs 1D(2D) and 1A(2A) provide pressurizer spray flow.
- Startup preparations for two or more RCPs may proceed simultaneously; however, more than one RCP SHALL **NOT** be started at the same time.
- With 3 or 4 Reactor Coolant Pumps running, and the Residual Heat Removal system in service, RHR loop flow may drop below 3000 gpm. Refer to 0POP02-RH-0001 before starting the third or fourth RCP. (Reference 2.13)

7.1 ENSURE Section 6.0 of this procedure has been completed. _____

7.2 ENSURE the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. _____

NOTE

Due to plant conditions, some annunciators may **NOT** be extinguished prior to pump start, but are expected to reset shortly after the pump is placed in service. (Example, "RCP NO 1 SEAL LKF FLOW HI/LO")

7.3 CHECK the following annunciators extinguished, IF any annunciators listed below are **NOT** extinguished, THEN PERFORM an evaluation of the annunciator's impact on RCP operation PRIOR to pump start:

7.3.1 "MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4 _____

7.3.2 "RCP 1A(2A) SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-1 _____

7.3.3 "RCP 1A(2A) NO 1 SEAL DP LO" Lampbox 4M07, Window A-2 _____

7.3.4 "RCP 1A(2A) NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-1 _____

7.3.5 "RCP 1A(2A) STDPIPE LVL HI" Lampbox 4M07, Window B-2 _____

7.3.6 "RCP 1A(2A) NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-1 _____

7.3.7 "RCP 1A(2A) STDPIPE LVL LO" Lampbox 4M07, Window C-2 _____

7.3.8 "RCP 1A(2A) THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-2 _____

7.3.9 "SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1 _____

7.3.10 "RCP 1A(2A) UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-1 _____

7.3.11 "RCP 1A(2A) LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-1 _____

7.3.12 "RCP CCW FLOW LO" Lampbox 5M02, Window E-1 _____

7.4 VERIFY RCP 1A(2A) seal water injection flow is between 8 and 13 gpm on "RCP 1A(2A) SEAL FLOW FR-0156". (CP004) _____

7.5 VERIFY RCP 1A(2A) No. 1 seal water leakoff flow, as indicated on "RCP 1A(2A) SEAL FLOW FR-0156", is in the normal operating range per Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range. (CP004) _____

7.6 VERIFY RCP 1A(2A) No. 1 seal differential pressure is greater than 250 psid on "SEAL 1 DP PI-0152". (CP004) _____

7.7 ENSURE RCP 1A(2A) "SEAL NO 1 LKF ISOL FV-3154" is OPEN. (CP004) _____

7.8 VERIFY seal water injection temperature less than 135°F on "TEMP TI-0216". (CP004) _____

7.9 WHEN RCS Temperature is LESS THAN 140°F, THEN ENSURE **NO** more than (3) three RCPs are in operation. (CR 03-1149) _____

7.10 IF RCP 1D(2D) is **NOT** running, THEN PERFORM the following:

7.10.1 PLACE the Loop 4 “PRZR SPR PCV-0655B” in “MAN” and CLOSED. _____

7.11 START RCP 1A(2A) "OIL LIFT PUMP" by momentarily turning its handswitch to the START position. (CP005) _____

7.12 VERIFY the RCP 1A(2A) blue "START PERM" indicator light illuminates. (CP005) _____

CAUTION

- IF the secondary side of a SG(s) is **NOT** intact, THEN starting a reactor coolant pump may pose a hazard to personnel in the vicinity of the SG(s). (Reference 2.9.4)
- WHEN the Reactor is critical, THEN an RCP SHALL **NOT** be started.

NOTE

- WHEN Step 7.13 is performed, THEN the start sequence for RCP 1A(2A) SHALL be completed through Step 7.17 before continuing the start sequence of any other RCP.
- The RCP ammeter will peg high due to starting current but will drop back on scale within 20 seconds after the RCP is started.
- Experience has shown that starting RCP(s) MAY cause spikes in Nuclear Instruments indications due to induced electrical noise in the instrument cables.

7.13 WHEN the RCP 1A(2A) blue "START PERM" has been ON for at least two minutes, THEN START "RCP 1A(2A)" by momentarily turning its handswitch to the START position. (CP005) _____

7.14 VERIFY loop A flow increases to greater than 90% on "LOOP A FLOW FI-0417A". (CP005) _____

7.15 VERIFY RCP 1A(2A) No. 1 seal differential pressure is greater than 220 psid on "SEAL 1 DP PI-0152". (CP004) _____

7.16 CHECK RCP 1A(2A) vibration level. (CP014) _____

SHAFT Vibration
Brg2-Vert
Brg2-Horiz — Normal: 0 to 15 mils

_____ mils

CASE Vibration
Mtr_Accel-Vert
Mtr_Accel-Horiz — Normal: 0 to 3 mils

_____ mils

7.17 WHEN RCP 1A(2A) has run for at least one minute, THEN PERFORM the following:

7.17.1 STOP RCP 1A(2A) "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (CP005) _____

7.17.2 ADJUST Pressurizer Spray Valve Controllers “PRZR SPR PCV-0655B” and “PRZR SPR PCV-0655C”, as required. _____

7.18 DISPATCH an Operator to verify RCP 1A(2A) breaker charging springs charged. {AUX BUS 1F(2F)/11} (Reference 2.9.7) _____

8.0 RCP 1B(2B) Startup

NOTE

- The preferred order for starting RCPs is 1D(2D), 1A(2A), 1B(2B) and 1C(2C). RCPs 1D(2D) and 1A(2A) provide pressurizer spray flow.
- Startup preparations for two or more RCPs may proceed simultaneously; however, more than one RCP SHALL **NOT** be started at the same time.
- With 3 or 4 Reactor Coolant Pumps running, and the Residual Heat Removal system in service, RHR loop flow may drop below 3000 gpm. Refer to 0POP02-RH-0001 before starting the third or fourth RCP. (Reference 2.13)
- Westinghouse recommends that RCP motor 2B should **NOT** be started when RCS pressure is > 1800 psig in order to prevent potential damage to the upper thrust bearing. This may occur if the oil lift system does **NOT** function properly. (IF RCS pressure is < 1800 psig, design calculations show that malfunction of the oil lift system during starting will **NOT** cause upper bearing damage.) This restriction will be removed when the associated oil lift fittings are replaced. This restriction does **NOT** apply to RCP starts IAW Emergency Operating Procedures. (CR 07-7596)

8.1 ENSURE Section 6.0 of this procedure has been completed. _____

8.2 ENSURE the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. _____

NOTE

Due to plant conditions, some annunciators may **NOT** be extinguished prior to pump start, but are expected to reset shortly after the pump is placed in service. (Example, "RCP NO 1 SEAL LKF FLOW HI/LO")

8.3 CHECK the following annunciators extinguished, IF any annunciators listed below are **NOT** extinguished, THEN PERFORM an evaluation of the annunciator's impact on RCP operation PRIOR to pump start:

8.3.1 "MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4 _____

8.3.2 "RCP 1B(2B) SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-3 _____

8.3.3 "RCP 1B(2B) NO 1 SEAL DP LO" Lampbox 4M07, Window A-4 _____

8.3.4 "RCP 1B(2B) NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-3 _____

8.3.5 "RCP 1B(2B) STDPIPE LVL HI" Lampbox 4M07, Window B-4 _____

8.3.6 "RCP 1B(2B) NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-3 _____

8.3.7 "RCP 1B(2B) STDPIPE LVL LO" Lampbox 4M07, Window C-4 _____

8.3.8 "RCP 1B(2B) THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-4 _____

8.3.9 "SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1 _____

8.3.10 "RCP 1B(2B) UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-2 _____

8.3.11 "RCP 1B(2B) LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-2 _____

8.3.12 "RCP CCW FLOW LO" Lampbox 5M02, Window E-1 _____

8.4 VERIFY RCP 1B(2B) seal water injection flow is between 8 and 13 gpm on "RCP 1B(2B) SEAL FLOW FR-0157". (CP004) _____

8.5 VERIFY RCP 1B(2B) No. 1 seal water leakoff flow, as indicated on "RCP 1B(2B) SEAL FLOW FR-0157", is in the normal operating range per Addendum 1. (CP004) _____

8.6 VERIFY RCP 1B(2B) No. 1 seal differential pressure is greater than 250 psid on "SEAL 1 DP PI-0153". (CP004) _____

8.7 ENSURE RCP 1B(2B) "SEAL NO 1 LKF ISOL FV-3155" is OPEN. (CP004) _____

8.8 VERIFY seal water injection temperature less than 135°F on "TEMP TI-0216". (CP004) _____

8.9 WHEN RCS Temperature is LESS THAN 140°F, THEN ENSURE **NO** more than (3) three RCPs are in operation. (CR 03-1149) _____

8.10 START RCP 1B(2B) "OIL LIFT PUMP" by momentarily turning its control switch to the START position. (CP005) _____

8.11 VERIFY the RCP 1B(2B) blue "START PERM" indicator light illuminates. (CP005) _____

CAUTION

- IF the secondary side of a SG(s) is **NOT** intact, THEN starting a reactor coolant pump may pose a hazard to personnel in the vicinity of the SG(s). (Reference 2.9.4)
- WHEN the Reactor is critical, THEN an RCP SHALL **NOT** be started.

NOTE

- WHEN Step 8.12 is performed, THEN the start sequence for RCP 1B(2B) SHALL be completed through Step 8.16 before continuing the start sequence of any other RCP.
- The RCP ammeter will peg high due to starting current but will drop back on scale within 20 seconds after the RCP is started.
- Experience has shown that starting RCP(s) MAY cause spikes in Nuclear Instruments indications due to induced electrical noise in the instrument cables.

8.12 WHEN the RCP 1B(2B) blue "START PERM" has been ON for at least two minutes, THEN START "RCP 1B(2B)" by momentarily turning its handswitch to the START position. (CP005) _____

8.13 VERIFY loop B flow increases to greater than 90% on "LOOP B FLOW FI-0427A". (CP005) _____

8.14 VERIFY RCP 1B(2B) No. 1 seal differential pressure is greater than 220 psid on "SEAL 1 DP PI-0153". (CP004) _____

8.15 CHECK RCP 1B(2B) vibration level. (CP014) _____

SHAFT Vibration
Brg2-Vert
Brg2-Horiz — Normal: 0 to 15 mils

_____ mils

CASE Vibration
Mtr_Accel-Vert
Mtr_Accel-Horiz — Normal: 0 to 3 mils

_____ mils

8.16 WHEN RCP 1B(2B) has run for at least one minute, THEN STOP RCP 1B(2B) "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (CP005) _____

8.17 DISPATCH an Operator to verify RCP 1B(2B) breaker charging springs charged. {AUX BUS 1G(2G)/11} (Reference 2.9.7) _____

9.0 RCP 1C(2C) Startup

NOTE

- The preferred order for starting RCPs is 1D(2D), 1A(2A), 1B(2B) and 1C(2C). RCPs 1D(2D) and 1A(2A) provide pressurizer spray flow.
- Startup preparations for two or more RCPs may proceed simultaneously; however, more than one RCP SHALL **NOT** be started at the same time.
- With 3 or 4 Reactor Coolant Pumps running, and the Residual Heat Removal system in service, RHR loop flow may drop below 3000 gpm. Refer to 0POP02-RH-0001 before starting the third or fourth RCP. (Reference 2.13)
- Westinghouse recommends that RCP motor 2B should **NOT** be started when RCS pressure is > 1800 psig in order to prevent potential damage to the upper thrust bearing. This may occur if the oil lift system does **NOT** function properly. (IF RCS pressure is < 1800 psig, design calculations show that malfunction of the oil lift system during starting will **NOT** cause upper bearing damage.) This restriction will be removed when the associated oil lift fittings are replaced. This restriction does **NOT** apply to RCP starts IAW Emergency Operating Procedures. (CR 07-7596)

9.1 ENSURE Section 6.0 of this procedure has been completed. _____

9.2 ENSURE the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. _____

NOTE

Due to plant conditions, some annunciators may **NOT** be extinguished prior to pump start, but are expected to reset shortly after the pump is placed in service. (Example, "RCP NO 1 SEAL LKF FLOW HI/LO")

9.3 CHECK the following annunciators extinguished, IF any annunciators listed below are **NOT** extinguished, THEN PERFORM an evaluation of the annunciator's impact on RCP operation PRIOR to pump start:

9.3.1 "MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4 _____

9.3.2 "RCP 1C(2C) SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-5 _____

9.3.3 "RCP 1C(2C) NO 1 SEAL DP LO" Lampbox 4M07, Window A-6 _____

9.3.4 "RCP 1C(2C) NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-5 _____

9.3.5 "RCP 1C(2C) STDPIPE LVL HI" Lampbox 4M07, Window B-6 _____

9.3.6 "RCP 1C(2C) NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-5 _____

9.3.7 "RCP 1C(2C) STDPIPE LVL LO" Lampbox 4M07, Window C-6 _____

9.3.8 "RCP 1C(2C) THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-6 _____

9.3.9 "SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1 _____

9.3.10 "RCP 1C(2C) UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-3 _____

9.3.11 "RCP 1C(2C) LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-3 _____

9.3.12 "RCP CCW FLOW LO" Lampbox 5M02, Window E-1 _____

9.4 VERIFY RCP 1C(2C) seal water injection flow is between 8 and 13 gpm on "RCP 1C(2C) SEAL FLOW FR-0158". (CP004) _____

9.5 VERIFY RCP 1C(2C) No. 1 seal water leakoff flow, as indicated on "RCP 1C(2C) SEAL FLOW FR-0158", is in the normal operating range per Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range. (CP004) _____

9.6 VERIFY RCP 1C(2C) No. 1 seal differential pressure is greater than 250 psid on "SEAL 1 DP PI-0154". (CP004) _____

9.7 ENSURE RCP 1C(2C) "SEAL NO 1 LKF ISOL FV-3156" is OPEN. (CP004) _____

9.8 VERIFY seal water injection temperature less than 135°F on "TEMP TI-0216. (CP004) _____

9.9 WHEN RCS Temperature is LESS THAN 140°F, THEN ENSURE **NO** more than (3) three RCPs are in operation. (CR 03-1149) _____

9.10 START RCP 1C(2C) "OIL LIFT PUMP" by momentarily turning its handswitch to the START position. (CP005) _____

9.11 VERIFY the RCP 1C(2C) blue "START PERM" indicator light illuminates. (CP005) _____

CAUTION

- IF the secondary side of a SG(s) is **NOT** intact, THEN starting a reactor coolant pump may pose a hazard to personnel in the vicinity of the SG(s). (Reference 2.9.4)
- WHEN the Reactor is critical, THEN an RCP SHALL **NOT** be started.

NOTE

- WHEN Step 9.12 is performed, THEN the start sequence for RCP 1C(2C) SHALL be completed through Step 9.16 before continuing the start sequence of any other RCP.
- The RCP ammeter will peg high due to starting current but will drop back on scale within 20 seconds after the RCP is started.
- Experience has shown that starting RCP(s) MAY cause spikes in Nuclear Instruments indications due to induced electrical noise in the instrument cables.

9.12 WHEN the RCP 1C(2C) blue "START PERM" has been ON for at least two minutes, THEN START "RCP 1C(2C)" by momentarily turning its handswitch to the START position. (CP005) _____

9.13 VERIFY loop C flow increases to greater than 90% on "LOOP C FLOW FI-0437A". (CP005) _____

9.14 VERIFY RCP 1C(2C) No. 1 seal differential pressure is greater than 220 psid on "SEAL 1 DP PI-0154". (CP004) _____

9.15 CHECK RCP 1C(2C) vibration level. (CP014) _____

SHAFT Vibration
Brg2-Vert
Brg2-Horiz — Normal: 0 to 15 mils

_____ mils

CASE Vibration
Mtr_Accel-Vert
Mtr_Accel-Horiz — Normal: 0 to 3 mils

_____ mils

9.16 WHEN RCP 1C(2C) has run for at least one minute, THEN STOP RCP 1C(2C) "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (CP005) _____

9.17 DISPATCH an Operator to verify RCP 1C(2C) breaker charging springs charged. {AUX BUS 1H(2H)/11} (Reference 2.9.7) _____

10.0 RCP 1D(2D) Startup

NOTE

- The preferred order for starting RCPs is 1D(2D), 1A(2A), 1B(2B) and 1C(2C). RCPs 1D(2D) and 1A(2A) provide pressurizer spray flow.
- Startup preparations for two or more RCPs may proceed simultaneously; however, more than one RCP SHALL **NOT** be started at the same time.
- With 3 or 4 Reactor Coolant Pumps running, and the Residual Heat Removal system in service, RHR loop flow may drop below 3000 gpm. Refer to 0POP02-RH-0001 before starting the third or fourth RCP. (Reference 2.13)

10.1 ENSURE Section 6.0 of this procedure has been completed. _____

10.2 ENSURE the Unit Supervisor/Shift Manager has reviewed 7300/SSPS normalization status. _____

NOTE

Due to plant conditions, some annunciators may **NOT** be extinguished prior to pump start, but are expected to reset shortly after the pump is placed in service. (Example, "RCP NO 1 SEAL LKF FLOW HI/LO")

10.3 CHECK the following annunciators extinguished, IF any annunciators listed below are **NOT** extinguished, THEN PERFORM an evaluation of the annunciator's impact on RCP operation PRIOR to pump start:

10.3.1 "MTR AIR CLR CCW FLOW LO" Lampbox 2M03, Window A-4 _____

10.3.2 "RCP 1D(2D) SEAL WTR INJ FLOW LO" Lampbox 4M07, Window A-7 _____

10.3.3 "RCP 1D(2D) NO 1 SEAL DP LO" Lampbox 4M07, Window A-8 _____

10.3.4 "RCP 1D(2D) NO 1 SEAL LKF FLOW HI/LO" Lampbox 4M07, Window B-7 (CP004) _____

10.3.5 "RCP 1D(2D) STDPIPE LVL HI" Lampbox 4M07, Window B-8 _____

10.3.6 "RCP 1D(2D) NO 2 SEAL LKF FLOW HI" Lampbox 4M07, Window C-7 _____

10.3.7 "RCP 1D(2D) STDPIPE LVL LO" Lampbox 4M07, Window C-8 _____

10.3.8 "RCP 1D(2D) THERM BAR CCW FLOW/TEMP TRBL" Lampbox 4M07, Window D-8 _____

10.3.9 "SEAL WTR INJ TEMP HI" Lampbox 4M08, Window C-1 _____

10.3.10 "RCP 1D(2D) UPPR OIL RSVR LVL HI/LO" Lampbox 5M02, Window C-4 _____

10.3.11 "RCP 1D(2D) LOWR OIL RSVR LVL HI/LO" Lampbox 5M02, Window D-4 _____

10.3.12 "RCP CCW FLOW LO" Lampbox 5M02, Window E-1 _____

10.4 VERIFY RCP 1D(2D) seal water injection flow is between 8 and 13 gpm on "RCP 1D(2D) SEAL FLOW FR-0159". (CP004) _____

10.5 VERIFY RCP 1D(2D) No. 1 seal water leakoff flow, as indicated on "RCP 1D(2D) SEAL FLOW FR-0159", is in the normal operating range per Addendum 1. (CP004) _____

10.6 VERIFY RCP 1D(2D) No. 1 seal differential pressure is greater than 250 psid on "SEAL 1 DP PI-0155". (CP004) _____

10.7 ENSURE RCP 1D(2D) “SEAL NO 1 LKF ISOL FV-3157” is OPEN. (CP004) _____

10.8 VERIFY seal water injection temperature less than 135°F on “TEMP TI-0216”. (CP004) _____

10.9 WHEN RCS Temperature is LESS THAN 140°F, THEN ENSURE **NO** more than (3) three RCPs are in operation. (CR 03-1149) _____

10.10 IF RCP 1A(2A) is **NOT** running, THEN PERFORM the following:

10.10.1 PLACE the Loop 1 “PRZR SPR PCV-0655C” in “MAN” and CLOSED. _____

10.11 START RCP 1D(2D) “OIL LIFT PUMP” by momentarily turning its handswitch to the START position. (CP005) _____

10.12 VERIFY the RCP 1D(2D) blue "START PERM" indicator light illuminates. (CP005) _____

CAUTION

- IF the secondary side of a SG(s) is **NOT** intact, THEN starting a reactor coolant pump may pose a hazard to personnel in the vicinity of the SG(s). (Reference 2.9.4)
- WHEN the Reactor is critical, THEN an RCP SHALL **NOT** be started.

NOTE

- WHEN Step 10.13 is performed, THEN the start sequence for RCP 1D(2D) SHALL be completed through Step 10.17 before continuing the start sequence of any other RCP.
- The RCP ammeter will peg high due to starting current but will drop back on scale within 20 seconds after the RCP is started.
- Experience has shown that starting RCP(s) MAY cause spikes in Nuclear Instruments indications due to induced electrical noise in the instrument cables.

10.13 WHEN the RCP 1D(2D) blue "START PERM" has been ON for at least two minutes, THEN "START RCP 1D(2D)" by momentarily turning its handswitch to the START position. (CP005) _____

10.14 VERIFY loop D flow increases to greater than 90% on "LOOP D FLOW FI-0447A". (CP005) _____

10.15 VERIFY RCP 1D(2D) No. 1 seal differential pressure is greater than 220 psid on "SEAL 1 DP PI-0155". (CP004) _____

10.16 CHECK RCP 1D(2D) vibration level. (CP014) _____

SHAFT Vibration
Brg2-Vert
Brg2-Horiz — Normal: 0 to 15 mils

_____ mils

CASE Vibration
Mtr_Accel-Vert
Mtr_Accel-Horiz — Normal: 0 to 3 mils

_____ mils

10.17 WHEN RCP 1D(2D) has run for at least one minute, THEN PERFORM the following:

10.17.1 STOP RCP 1D(2D) "OIL LIFT PUMP" by momentarily turning its handswitch to the STOP position. (CP005) _____

10.17.2 ADJUST Pressurizer Spray Valve Controllers “PRZR SPR PCV-0655B” and “PRZR SPR PCV-0655C”, as required. _____

10.18 DISPATCH an Operator to verify RCP 1D(2D) breaker charging springs charged. {AUX BUS 1J(2J)/11} (Reference 2.9.7) _____

11.0 Reactor Coolant Pump Shutdown

CAUTION

- One RCP shutdown above P-8 will cause a reactor trip. Two RCPs shutdown above P-7 will cause a reactor trip.
- IF the RCS is operating at reduced pressure AND at least one RCP is secured, stopping of any remaining RCP(s) will cause seal injection flow to decrease to the secured RCP(s), while flowrate to the running RCP(s) will increase.

NOTE

- CCW to motor bearing oil coolers should be maintained for at least 30 minutes after stopping the last running RCP.
- WHEN a RCP is to be stopped, TURN the desired RCP handswitch to STOP and maintain it in the STOP position until the RCP motor breaker opens. The Pull-to-Lock (PTL) position does **NOT** have a STOP contact and rapidly placing the handswitch to PTL may **NOT** allow time for the relays to position. (CR 05-1339)

11.1 STATION an operator at the seal injection throttle valves to perform RCP Seal Injection flow adjustments as required in Step 11.3. (Reference 2.18) {MAB 29', Room 108D} _____

11.2 STOP the desired RCP by momentarily turning its handswitch to the STOP position. (CP005)

RCP 1A(2A) _____

RCP 1B(2B) _____

RCP 1C(2C) _____

RCP 1D(2D) _____

11.3 ADJUST seal injection throttle valve(s) as required to return Seal Injection Flow to 8 to 13 gpm for all RCPs.

1(2)-CV-0032A _____

1(2)-CV-0032B _____

1(2)-CV-0032C _____

1(2)-CV-0032D _____

12.0 Support Documents

12.1 Addendum 1, RCP Number 1 Seal Leakoff Normal Operating Range, RCP Number 1 Seal Leakoff Normal Operating Range

12.2 Addendum 2, Un-coupled Run of RCPs Motors Lineup 1, RCP Electrical Lineup

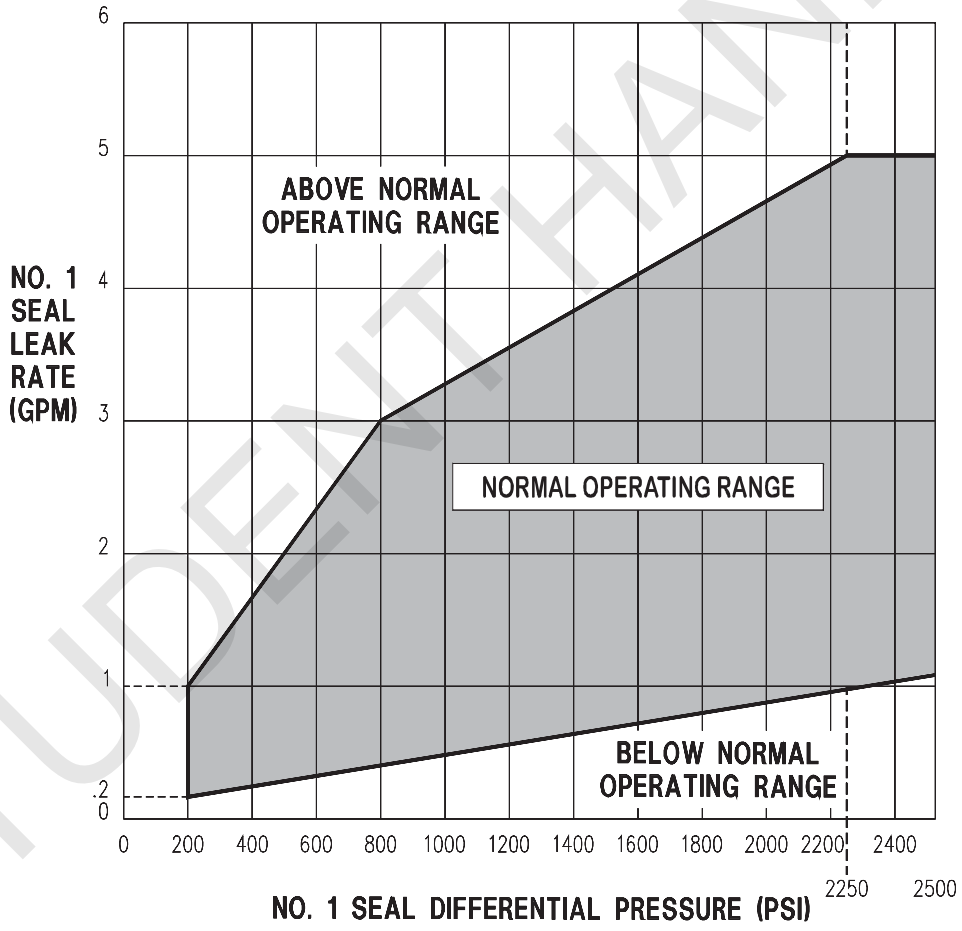
12.3 Form 1, Determination of the RCS Cold Leg - SG Temperature Difference Using the SG Pressure Method

12.4 Form 2, Determination of the RCS Cold Leg - SG Temperature Difference Using the SG Bottom Recirculation Method

NOTE

WHEN the RCP Number 1 Seal DP indicator is off scale high, THEN Number 1 Seal DP SHALL be approximated as RCS pressure minus VCT pressure.

NO. 1 SEAL NORMAL OPERATING RANGE



NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: RESPOND TO ECW LOW DISCHARGE PRESSURE

JPM NO.: S6

REVISION: 0

LOCATION: SIMULATOR

JOB PERFORMANCE MEASURE INFORMATION SHEET

JPM Title:	RESPOND TO ECW LOW DISCHARGE PRESSURE
JPM No.:	S6
Rev. No:	0
STP Task:	T42200, Respond to ECW alarms
STP Objective:	CRO 42200, Respond to an Essential Cooling Water Pump trip alarm in accordance with POP09-AN-02M3.
Related K/A:	008 A4.01, [3.3/3.1] Ability to manually operate and/or monitor in the control room: CCW indications and controls.
References:	0POP02-EW-0001, Essential Cooling Water Operations, Rev. 66 0POP09-AN-02M3, Annunciator Lampbox 2M03 Response Instructions, Rev. 28
Task Normally Completed By:	RO
Method of Testing:	Actual Performance
Location of Testing:	Simulator
Time Critical Task:	No
Alternate Path JPM:	Yes
Validation Time:	10 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The plant is in Mode 3 at no-load temperature and pressure.

11 ESF Diesel Generator is running unloaded in Emergency Mode for a maintenance test run.

INITIATING CUE:

CCW and ECW Trains need to be shifted to accommodate upcoming maintenance. As part of this evolution, the Unit Supervisor directs you to place 'B' ECW Train in service in accordance with 0POP02-EW-0001, Essential Cooling Water Operations, Section 5.7, ECW Pump Startup For Product Lubricated Pumps.

- A major overhaul has NOT been performed on ECW Pump 'B' (fill and vent is NOT required).
- An uncoupled run on the ECW pump motor will NOT be done.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

#11 ESF Diesel Generator is stopped following indication of a loss of cooling water (ECW).

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. (No indication type cues are provided.)

SIMULATOR SETUP:

JPMs S5 and S6 are to be run together. The following steps will set up the simulator for **BOTH** JPMs:

1. Ensure Radio volume for both stations are set to a reasonable level.

2. Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3. Reset to IC #207 and verify:

   - Red light at the end of CP-010 is out
   - ICS annunciators have stopped counting up

4. Check and clean the following procedures:

   - 0POP04-RC-0002, Reactor Coolant Pump Off Normal
   - 0POP02-EW-0001, Essential Cooling Water Operations
   - 0POP09-AN-02M3, Annunciator Lampbox 2M03 Response Instructions

5. Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6. Ensure RCP C seal injection flow is >8 gpm.

7. Place the simulator in “FREEZE” until the examiners are ready to proceed.

8. There is no simulator lesson for this JPM

INSTRUCTOR ACTIONS

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of 0POP02-EW-0001, Essential Cooling Water Operations.

Standard:

Obtains a copy of 0POP02-EW-0001, Essential Cooling Water Operations.

Comment:

The student should use the simulator copy of the procedure.

The student should review Notes and Precautions.

Cue:

If the applicant asks if the Prerequisites are met, inform him/her that they are met.

If the applicant wants to know if applicable Tech Spec sections have been reviewed, inform him/her the Unit Supervisor has reviewed the Tech Spec.

If the applicant seeks to contact Chemistry Dept. to ensure the Chlorine Process Analyzer is aligned to a running ECW pump, respond that the Chlorine Analyzer is aligned to Train 'A'.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2

If a major overhaul has been performed on an ECW Pump, THEN PERFORM' Section 9.0 for the affected ECW Pump. (step 5.7.1)

Standard:

Determines a major overhaul of 'B' ECW Pump has not occurred (from initiating cue) and NA's the step.

Comment:

Cue:

If asked if a major overhaul has been done on 'B' ECW Pump, inform the applicant that there has been NO MAJOR OVERHAUL ON 'B' ECW PUMP.

Notes:

SAT/UNSAT Performance Step: 3

If uncoupled operations of the ECW Pump Motor is desired, THEN GO TO Addendum 2, Uncoupled Run of ECW Pump Motors. (step 5.7.2)

Standard:

Determines an uncoupled run will NOT be performed (from initiating cue) and NA's the step.

Comment:

Cue:

If asked if an uncoupled run is needed, as the Unit Supervisor, inform the applicant that an uncoupled run will NOT be required.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 4 **(C)**

Start the desired ECW Pump. (step 5.7.3)

Standard:

Starts ECW Pump 1B.

Comment:

45 seconds after the start of ECW Pump 'B', a low discharge pressure alarm will come in for ECW Pump 'A'. This is the alternate path portion of the JPM. Appropriate actions for the applicant to take begin at JPM step 9.

Cue:

If asked as a Plant Operator to check 'B' ECW Pump ready for start, inform the applicant that it is ready for start.

If asked as a Plant Operator to check 'B' ECW Pump after start, report it is running satisfactory.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 5

Performs the following to verify proper ECW Pump Operation: (step 5.7.4)

- Verify associated ECW Pump discharge valve starts to open within 11 seconds after the ECW Pump starts.
- Verify the associated ECW pump discharge pressure increases to a nominal value of 45 psig (40 to 55 psig).

Standard:

- *Verifies 'B' ECW Pump discharge valve starts to open within 11 seconds after the ECW Pump starts (MOV-0137).*
- *Verify the 'B' ECW pump discharge pressure increases to a nominal value of 45 psig (40 to 55 psig).*

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 6

IF the ECW pump is started for maintenance (e.g. PMT, continuity check) or weekly chlorination AND will **NOT** remain running, THEN N/A Steps 5.7.6 through 5.7.8 as determined by the Unit Supervisor/Shift Manager. (step 5.7.5)

Standard:

Determines the pump will remain running and NA's this step..

Comment:

Cue:

If asked if this is a maintenance start, as the Unit Supervisor, inform the applicant that the pump will remain in service.

Notes:

SAT/UNSAT Performance Step: 7

Notify I&C Maintenance to perform instrument venting per Instrument Vent Lineup 23 for the ECW Train started. (step 5.7.6)

Standard:

Notifies I&C Maintenance to perform instrument venting per Instrument Vent Lineup 23 for 'B' ECW Train.

Comment:

Cue:

When asked to perform the venting lineup for 'B' ECW Train, report that it is complete.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 8

When I&C Maintenance has completed Instrument Vent Lineup 23, then verify flow to the following components is within the specified range for the ECW Train started. (step 5.7.7)

- CCW HX - 14,040 to 17, 400 gpm (QDPS)
- STBY DG HX – 1486 to 1743 gpm (QDPS)

Standard:

Verifies flows are within specified ranges by checking the QDPS screen for 'B' Train ECW

Comment:

This is essentially the final step to placing 'B' Train ECW in service. The low discharge pressure alarm should have come in by now. Appropriate actions for the candidate to take begin at JPM step 9.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 9

ECW PUMP 1A DISCH PRESS LO alarm annunciates.

Standard:

Acknowledges and responds to the ECW PUMP 1A DISCH PRESS LO alarm by referencing the Annunciator Response procedure.

Comment:

Cue:

- If asked about #11 Diesel Trouble alarm, as Plant Operator respond that the local alarm is 'Raw Water Pressure Low'.
- If the applicant seeks to inform the Unit Supervisor of the alarm condition, acknowledge this information as the Unit Supervisor.
- If the applicant doesn't take action for the alarm, as the Unit Supervisor, inform him/her to take appropriate action for the alarm.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 10 (C*)

Performs the following in accordance with 0POP09-AN-02M3, Window D-7, ECW PUMP 1A DISCH PRESS LO: (POP09-AN-02M3, step 1)

If ECW header pressure decreased to less than or equal to 30 psig, then perform the following:

- Ensure the standby ECW/CCW train running
- Stop ECW Train 'A' Pump
- Place Standby DG 11 (21) "EMERG STOP" plunger in the PULL TO STOP position to prevent diesel operation without cooling water.

Standard:

____ **Starts CCW Train C Pump*

____ *Stop ECW Train A Pump*

____ **Place Standby DG 11 "EMERG STOP" plunger in the PULL TO STOP position to prevent diesel operation without cooling water.*

* denotes critical action

Comment:

The Diesel Generator has a trip feature of high Jacket water temperature, but this feature is bypassed when in Emergency Mode as it is on the JPM.

To stop ECW Pump 'A', the applicant will have to place the pump control switch in Pull-To-Lock (PTL) instead of just going to STOP because the Mode Sw. for that Train is in RUN so the pump will restart if not placed in PTL.

Cue:

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S6, RESPOND TO ECW LOW DISCHARGE PRESSURE

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator:_____ **Signature:**_____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The plant is in Mode 3 at no-load temperature and pressure.

11 ESF Diesel Generator is running unloaded in Emergency Mode for a maintenance test run.

INITIATING CUE:

CCW and ECW Trains need to be shifted to accommodate upcoming maintenance. As part of this evolution, the Unit Supervisor directs you to place 'B' ECW Train in service in accordance with 0POP02-EW-0001, Essential Cooling Water Operations, Section 5.7, ECW Pump Startup For Product Lubricated Pumps.

- A major overhaul has NOT been performed on ECW Pump 'B' (fill and vent is NOT required).
- An uncoupled run on the ECW pump motor will NOT be done.

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: RE-ESTABLISH RCP SEAL INJECTION

JPM NO.: S7

REVISION: 0

LOCATION: SIMULATOR

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	RE-ESTABLISH RCP SEAL INJECTION
JPM No.:	S7
Rev. No:	0
STP Task:	T502700, Place the Positive Displacement Charging Pump in service.
STP Objective:	CRO 502700, When directed by plant procedure or at Unit Supervisor direction, START the Positive Displacement Charging Pump in accordance with 0POP02-CV-0004, Chemical and Volume Control System Subsystem operating procedure.
Related K/A Reference:	004 A4.11 [3.4, 3.3] Ability to manually operate and/or monitor in the control room: RCP seal injection.
References:	0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions, Rev. 38.
Task Normally Completed By:	RO
Method of Testing:	Actual Performance
Location of Testing:	Simulator
Time Critical Task:	NO
Alternate Path JPM:	YES
Validation Time:	10 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the student):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

A plant startup is in progress with reactor power at 17%.

INITIATING CUE:

CCP 1A has tripped due to motor overload and cannot be restarted. CCP 1A control switch has been placed in PTL. Charging Flow Control Valve, FCV-0205 has been taken to manual and closed. Letdown Orifice Header Isolation Valve, FV-0011 has been closed.

The Unit Supervisor directs you to re-establish RCP seal injection flows of 8-13 gpm per RCP in accordance with 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions, Window F-3 (CHG FLOW HI/LO).

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

Positive Displacement Charging Pump is started and RCP seal injection for each RCP is established between 8-13 gpm.

JOB PERFORMANCE MEASURE CHECK SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. NO indication type cues are provided.

SIMULATOR SETUP:

JPMs S7 and S8 are to be run together. The following steps will set up the simulator for **BOTH** JPMs.

1) Ensure Radio volume for both stations are set to a reasonable level.

2) Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3) Reset to IC # 208 and verify:

   - Red light at the end of CP-010 is out.
   - ICS Annunciators have stopped counting up.

4) Check and clean the following procedures:

   - 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions
   - 0POP02-SI-0001, Safety Injection Accumulators

5) Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6) Verify the following:

   - FV-0011 is CLOSED.
   - FCV-0205 is in MANUAL and CLOSED.
   - CCP 1A is not running. Control Room Handswitch is in the PTL Position.
   - PDP Control Room Handswitch is in PTL and Green light is ON for PDP

7) Place the simulator in 'FREEZE' until the examiners are ready to proceed.

8) There is no simulator lesson for either of these JPM's.

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, . . .).

SAT/UNSAT Performance Step: 1 **Start time:** _____

Obtains a copy of 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions.

Standard:

Obtains a copy of 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions.

Comment:

The applicant should use the simulator copy of the procedure.

The Applicant may choose to review applicable Annunciator Response Procedures for alarms caused by this plant condition; however it is intended that he/she perform the indicated section as quickly as possible for time considerations. Provide cues as necessary to ensure this occurs.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 2 (C*)

Attempts to place Charging Pump 1B in service: (step 1)

Standard:

Performs the following:

_____ *Ensures "CHG FLOW CONT VLV FCV-0205" is CLOSED.*

_____ *Ensures 1B Charging Pump Discharge Valve, MOV-8377B, is OPEN.*

_____ *Ensures the miniflow, FCV-0202, is OPEN for 1B Charging Pump.*

_____ *Verifies the white "L.O. AVAILABLE" light is lit for 1B Charging Pump.*

_____ **Starts 1B Charging Pump.*

_____ **Determines 1B Charging Pump trips after starting; reports status to Unit Supervisor*

***** Denotes critical action.

Comment:

The student may want to make a Plant announcement prior to starting the CCP. DO NOT allow him/her to actually use the Communications Console (see cue below).

1B Charging Pump will trip after starting. This will require additional steps to be performed to place the Positive Displacement Pump (PDP) in service to supply RCP seals.

RCP 1A has a lower # 1 seal leakoff flow than the other RCP's. Because of this, when a Charging Pump is started, the RCP 1A NO 1 SEAL LKF FLOW HI/LO alarm may annunciate, but should clear as flow stabilizes. (see cue below)

Cue:

If the student attempts to make a Plant announcement, tell him/her that it has been done by another operator.

If asked, as the Plant Operator report that Centrifugal Charging Pump 1B is ready for start.

As the Unit Supervisor, If the RCP 1A NO 1 SEAL LKF FLOW HI/LO alarm comes in, acknowledge the students report and inform him/her to continue in the Annunciator Response Procedure to re-establish RCP seal injection.

If the operator reports 1B Charging Pump tripped, as the Unit Supervisor, direct the operator to continue re-establishing RCP seal injection of 8-13 gpm per RCP.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT/UNSAT Performance Step: 3 (C*)

Places the Positive Displacement Pump (PDP) in service. (step 2)

Standard:

Performs the following:

_____ *Ensures "CHG FLOW CONT VLV FCV-0205" is CLOSED.*

_____ *Closes "LETDN ORIF HDR ISOL FV-0011" to isolate Letdown.*

_____ *Ensures CCW is supplying RCP Thermal Barrier Cooling.*

_____ *Ensures the PDP Recirculation Valve, HCV-0285, is OPEN to 100%.*

_____ **Starts the PDP*

_____ **Slowly closes the PDP Recirculation Valve, HCV-0285, to obtain seal injection flows of 8-13 gpm per RCP.*

***** Denotes critical action.

Comment:

1. The applicant will likely want to make PA announcement before starting the pump **(DO NOT let him/her make an actual announcement).**
2. RCP seal injection flow/pressure may have to be adjusted using a coordination of HCV-0285, Recirc Throttle Valve and Seal Injection Control Valve, HCV-0218.
3. Thermal Barrier CCW cooling flow can be checked by:
    - Absence of THERM BAR CCW FLOW/TEMP TRBL alarms on CP-004 and RCP CCW FLOW LOW alarms on CP-005
    - Valve lineup for CCW to RCP's on panels CP-002 and CP-003
4. RCP seal injection flow will start to rise when HCV-0285 is ≈ 25% open.

Cue:

1. If the applicant seeks to contact a Plant Operator to check the PDP ready for start, inform him/her that it is ready for start.
2. If the applicant seeks to contact a Plant Operator to check the PDP started OK, inform him/her that it has a good start.

Notes:

- TERMINATE THE JPM - **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S7, RE-ESTABLISH RCP SEAL INJECTION

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator: _____ **Signature:** _____

Date: _____

JPM STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

A plant startup is in progress with reactor power at 17%.

INITIATING CUE:

CCP 1A has tripped due to motor overload and cannot be restarted. CCP 1A control switch has been placed in PTL. Charging Flow Control Valve, FCV-0205 has been taken to manual and closed. Letdown Orifice Header Isolation Valve, FV-0011 has been closed.

The Unit Supervisor directs you to re-establish RCP seal injection flows of 8-13 gpm per RCP in accordance with 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions, Window F-3 (CHG FLOW HI/LO).

NUCLEAR TRAINING DEPARTMENT

OPERATING JOB PERFORMANCE MEASURE

TITLE: FILL AN SI ACCUMULATOR

JPM NO: S8

REVISION: 0

LOCATION: SIMULATOR

JOB PERFORMANCE MEASURE WORKSHEET

JPM Title:	FILL AN SI ACCUMULATOR
JPM No.:	S8
Rev. No.:	0
STP Task:	T29650, Fill a Safety Injection Accumulator
STP Objective:	CRO29650, Fill an SI accumulator to the normal operating range per POP02-SI-0001
Related K/A Reference:	006 A4.07 [4.4/4.4] Ability to manually operate and/or monitor in the control room: ECCS pumps and valves.
References:	0POP02-SI-0001, Rev. 35, Safety Injection Accumulators
Task Normally Completed By:	RO
Method of Testing:	Actual Performance
Location of Testing:	Simulator
Time Critical Task:	NO
Alternate Path JPM:	NO
Validation Time:	20 minutes

Required Materials (Tools/Equipment):

None

JOB PERFORMANCE MEASURE INFORMATION SHEET

READ TO PERFORMER (a copy of this information is included at the end of the JPM as a tear-away sheet to be given to the applicant):

I will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: Do not operate or alter equipment configuration in the plant without proper authorization.

INITIAL CONDITIONS:

The Unit is in Mode 1 at 17% power. The "ACC TK 1A LEVEL HI/LO" (1M02-B3) alarm was received. The "1A" Accumulator low level alarm is verified to be valid.

The current "1A" SI Accumulator Boron Concentration is 2850 ppm.

All other accumulator pressures and levels are in their normal green bands.

INITIATING CUE:

The Unit Supervisor directs you to raise level in the "1A" Accumulator to within 9000 – 9050 gallons using 0POP02-SI-0001, Safety Injection Accumulators.

- DO NOT DISCLOSE INFORMATION BELOW THIS LINE -

COMPLETION CRITERIA:

SI Accumulator 1A level is filled such that the "ACC TK 1A LEVEL HI/LO" annunciator is cleared. (8858 – 9074 gallons)

JOB PERFORMANCE MEASURE INFORMATION SHEET

HANDOUTS:

None, the applicant is expected to use the simulator copy of the procedure.

NOTES:

This JPM is formatted for dynamic simulator performance only. The cues provided are related to communications and other general information needed for dynamic performance. No indication type cues are provided.

SIMULATOR SETUP

JPMs S7 and S8 are to be run together. The following steps will set up the simulator for **BOTH** JPMs.

1) Ensure Radio volume for both stations are set to a reasonable level.

2) Ensure the PA buttons on the communications consoles are taped to help eliminate usage.

3) Reset to IC # 208 and verify:

   - Red light at the end of CP-010 is out.
   - ICS Annunciators have stopped counting up.

4) Check and clean the following procedures:

   - 0POP09-AN-04M8, Annunciator Lampbox 4M08 Response Instructions
   - 0POP02-SI-0001, Safety Injection Accumulators

5) Place simulator in run. Silence/acknowledge/reset alarms as appropriate.

6) Verify the following:

   - FV-0011 is CLOSED.
   - FCV-0205 is in MANUAL and CLOSED.
   - CCP 1A is not running. Control Room Handswitch is in the PTL Position.
   - PDP Control Room Handswitch is in PTL and Green light is ON for PDP

7) Place the simulator in 'FREEZE' until the examiners are ready to proceed.

8) There is no simulator lesson for either of these JPM's.

INSTRUCTOR ACTIONS

None

JOB PERFORMANCE MEASURE CHECK SHEET

NOTE:

- Critical steps are identified by (C).
- Sequenced steps are identified by (S_1, S_2, …).

SAT / UNSAT Performance Step: 1 **Start time:** _____

Obtain a copy of 0POP02-SI-0001, Safety Injection Accumulators procedure.

Standard:

Obtains a copy of 0POP02-SI-0001, Safety Injection Accumulators.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 2

Review the Prerequisites (section 3.0) and Notes and Precautions (Section 4.0) and proceed to Section 5.0.

Standard:

Reviews the Prerequisites, Notes, and Precautions for procedure 0POP02-SI-0001, Safety Injection Accumulators.

Comment:

Cue:

If asked:

1) Safety Injection System Initial Lineup is complete.
2) Instrument Air is available.
3) Nitrogen is available.
4) No ESF D/G is in operation or is scheduled to be started and paralleled with off-site power.
5) 0PSP03-RC-0006, RCS Inventory is NOT in progress.
6) RCS pressure is 2235 psig.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 3

Verify Train A HHSI Pump Mini Flow valves are open. (step 5.2)

Standard:

Verifies Train A HHSI Pump "MINI FLOW" valves open:

____ *1-SI-MOV-0011A*

____ *1-SI-MOV-0012A*

Comment:

Procedure step 5.1 should have been marked NA since RCS pressure is >1900 psig.

Cue:

Notes:

SAT / UNSAT Performance Step: 4

Verify HHSI Pump 1A Discharge valve open. (step 5.3)

Standard:

Verifies 1-SI-MOV-0004A, HHSI "PUMP 1A DISCH" valve open.

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 5

Verify Train A RWST to SI Suction Header valve open. (step 5.4)

Standard:

Verifies 1-SI-MOV-0001A, "RWST TO SI SUCT HDR" valve open.

Comment:

Cue:

Notes:

SAT / UNSAT Performance Step: 6

Ensure that #11 ESF D/G is not operating in parallel with off-site power. (step 5.5)

Standard:

Ensures that #11 ESF D/G is not operating in parallel with off-site power.

Comment:

Cue:

If asked, if #11 ESF D/G is scheduled to be started and paralleled with off-site power, inform the applicant that #11 ESF D/G is not scheduled to be started or paralleled with off-site power.

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 7 (C)

Start Train A HHSI pump. (step 5.6)

Standard:

Starts "HHSI Pump 1A" using handswitch on CP-001.

Comment:

Applicant may make Plant PA announcement informing plant personnel of HHSI Pump 1A start. Plant announcement is to be made **WITHOUT THE USE OF THE PLANT PA SYSTEM**.

Cue:

If asked, as the plant operator in the Fuel Handling Building – report that the HHSI Pump 1A is ready for start.

If asked, as the plant operator in the Fuel Handling Building, if the pump start was satisfactory, report that the pump is running satisfactory.

Notes:

SAT / UNSAT Performance Step: 8 (C)

Open Train A HHSI Pump Discharge to Accumulator Fill Isolation valve. (step 5.7)

Standard:

Opens 1-SI-FV-3973, "ACC 1A FILL ISOL" valve using handswitch on CP-001.

Comment:

When this valve is opened, a BYP/INOP alarm will sound. This is an expected condition for re-positioning this valve.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 9

Monitor and Fill SI Accumulator "A". (step 5.8)

Standard:

____ *Monitors Level and Pressure of SI Accumulator "A" using ICS Computer (Plant Computer) points "SILA0950 / SILA0961" and "SIPA0960 / SIPA0961"*

____ *Fills Accumulator "A" to a level above the reset of the low level annunciator.*

____ *Ensures Accumulator "A" level does not exceed 9076 gallons.*

____ *Ensures Accumulator "A" pressure does not exceed 643.7 psig.*

Comment:

As a good practice and per the NOTE prior to procedure step 5.8, the applicant should also be monitoring the Control Board indications for SI Accumulator "A" conditions due to the delay between ICS Computer (Plant Computer) point updates.

Cue:

Notes:

SAT / UNSAT Performance Step: 10 (C)

Close Train "A" HHSI Pump Discharge to Accumulator Fill Isolation valve. (step 5.9)

Standard:

Closes 1-SI-FV-3973, "ACC 1A FILL ISOL" after the "ACC TK 1A LEVEL HI/LO" alarm clears and prior to the alarm actuationg again on high level. (8858 – 9074 gallons)

Comment:

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 11 (C)

Stop Train "A" HHSI Pump. (step 5.10)

Standard:

Stops "HHSI Pump 1A"

Comment:

Cue:

Notes:

SAT / UNSAT Performance Step: 12

Secure SI Train "A" Cubicle Fans. (steps 5.11 and 5.12)

Standard:

Stops Train A "LHSI/HHSI/CSS PUMP CUBICLES" and "CNTMT SUMP ISOL VLV CUBICLES" Fans.

Comment:

Fans are labeled as:

- TRN A/RM 006
  SUPP CLR 11A

- TRN A/RM 007
  SUPP CLR 11A

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 13

Verify Train A SI Accumulator Level between 8822.8 and 9076.0 gallons. (step 5.13)

Standard:

Verifies correct SI Accumulator Level band using ICS Computer (Plant Computer).

Comment:

Applicant should use computer points SILA0950 and SILA0951.

Cue:

Notes:

SAT / UNSAT Performance Step: 14

Verify Train A SI Accumulator Pressure between 616.3 and 643.7 psig. (step 5.14)

Standard:

Verifies correct SI Accumulator pressure band using ICS Computer (Plant Computer).

Comment:

Applicant should use computer points SIPA0960 and SIPA0961.

Cue:

Notes:

JOB PERFORMANCE MEASURE CHECK SHEET

SAT / UNSAT Performance Step: 15

Restore altered ECCS flow path. (step 5.15)

Standard:

Determines that ECCS flow path was not altered per procedure step 5.1. This makes procedure step 5.15 N/A.

Comment:

Cue:

Notes:

SAT / UNSAT Performance Step: 16

Determine sampling requirements of the SI Accumulator 1A. (Procedure Step 5.16)

Standard:

Determines that the SI Accumulator 1A does not require sampling and boron concentration verified because the fill source was the RWST and that the SI Accumulator 1A boron concentration was within specification prior to the fill.

Comment:

The initial conditions Boron Concentration was 2850 ppm (limit is 2700 – 3000 ppm)

Cue:

Notes:

-TERMINATE THE JPM- **Stop time: _____**

VERIFICATION OF COMPLETION

Job Performance Measure: S8, FILL AN SI ACCUMULATOR

Applicant's Name: _____

Date Performed: _____

Time to Complete: _____

JPM Results: **Sat / Unsat**

Evaluator:_____ **Signature:**_____

Date: _____

JPM – STUDENT HANDOUT

READ TO PERFORMER:

The evaluator will explain the initial conditions, which step(s) to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this job performance measure will be satisfied.

YOU ARE TO INFORM THE EVALUATOR WHEN YOU'VE COMPLETED THE TASK.

CAUTION: **Do not operate or alter equipment configuration in the plant without proper authorization.**

INITIAL CONDITIONS:

The Unit is in Mode 1 at 17% power. The "ACC TK 1A LEVEL HI/LO" (1M02-B3) alarm was received. The "1A" Accumulator low level alarm is verified to be valid.

The current "1A" SI Accumulator Boron Concentration is 2850 ppm.

All other accumulator pressures and levels are in their normal green bands.

INITIATING CUE:

The Unit Supervisor directs you to raise level in the "1A" Accumulator to within 9000 – 9050 gallons using 0POP02-SI-0001, Safety Injection Accumulators.

LOT 19 NRC EXAM

OPERATING TEST #1

SCENARIO #1

Revision #0

Week of 09/30/2013

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 1** **Op-Test No.: LOT19 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **100% Power and Stable.**

Turnover:

- **Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.**
- **Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.**
- **Lower Reactor Power to 98% per 0POP03-ZG-0008, Power Operations, to allow performance of 0POP07-MS-0003, Main Turbine Steam Inlet Valve Test.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	N/A	RO (R) BOP (R) SRO (R)	Lower Reactor Power to 98%.
2 (20 min)	02-19-03 True	RO (I) SRO (I, TS)	Controlling Channel of PZR Pressure PT-0457 Fails High.
3 (N/A)	50-HV-01 True	RO (C) SRO (C, TS)	Pressurizer PORV 655A fails to close after opening. Occurs with Pressurizer PT-0457 malfunction. (**CT)**
4 (35 min)	08-15-02 True	BOP (I) SRO (I)	SG B Controlling Feed Flow Channel FT-0520 Fails Low.
5 (45 min)	06-15-01 .24	BOP (C) SRO (C)	EHC Leak forces crew to manually trip Reactor, Main Turbine and SGFPTs
6 (60 min)	05-02-03 .5	RO (M) BOP (M) SRO (M)	Major Steam Line Break inside Containment on SG 1C. (5 min after RX Trip)
7 (N/A)	01-12-06 True	BOP (C) SRO (C)	MSL Isolation fails to Auto Actuate. (Integral to Scenario) **(CT)**

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor.**

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

Refer to the Instructor Guide for directions on Simulator Setup, Expected Booth Communications and Expected Booth Actions.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be automatically recorded during the scenario. Once the scenario is complete for each crew, printout the Critical Parameters and label the printout with date, time, Crew # and scenario #.

- SG Pressure
- PZR Pressure
- PZR PORV 0655A Isolation Valve RC-MOV-0001A Red Light
- All MSIV Red Lights
- Extended Range NI45 Recorder Red Pen
- Intermediate Range Startup Rate
- All Loop Wide Range Tcold
- Wide Range RCS Pressure

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.

2. Actions required throughout the event are indicated as "(continuous)" in the position column.

3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 1

Event Description: Lower Reactor Power to 98% at 0.5%/min per 0POP03-ZG-0008, Power Operations, prior to performing 0POP07-MS-0003, Main Turbine Steam Inlet Valve Test.

Time	Position	Required Operator Actions	Notes
	SRO/RO/ BOP	Crew will note the Unit, Date and Time.	
	SRO/RO/ BOP	Pre-Job Briefing and review of Reactivity Management Program.	*This briefing and review will be conducted by crew prior to entering the simulator.*
	SRO/RO/ BOP	Review and Implement Forms associated with the reducing power.	*This will be part of briefing prior to entering the simulator.*
	RO	IF directed by the Shift Manager/Unit Supervisor and Plant conditions can support it, THEN the Backup Heaters may be energized as necessary to aid in PZR turnover flow.	
	BOP	MAINAIN Main Generator cold gas temperature greater than or equal to 90°F during the Main Generator load reduction.	
	BOP	ENSURE the Main Turbine Exhaust Pressure is within the limits of Addendum 2, Main Turbine Operating Guidelines.	
	RO	COMMENCE RCS boration to establish the desired Tavg ramp rate to the desired Reactor Power level.	
	BOP	COMMENCE Main Turbine load reduction at the desired ramp rate to the desired Reactor Power level.	
	RO/BOP	ADJUST Main Turbine load reduction or RCS boron concentration, as necessary, to maintain Tavg within 1.5°F of Program RCS Tavg (Refer to Addendum 8, Percent Power vs Program RCS Tavg).	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 1

Event Description: Lower Reactor Power to 98% at 0.5%/min per 0POP03-ZG-0008, Power Operations, prior to performing 0POP07-MS-0003, Main Turbine Steam Inlet Valve Test.

Time	Position	Required Operator Actions	Notes
	BOP	WHEN Reactor Power less than or equal to 98%, THEN PERFORM the following: • ARM the Modulate Signal for the Main Steam to DA valves by performing the following: (A single handswitch controls both valves) PLACE 1(2)-MS-PV-7174 and 1(2)-MS-PV-7174A handswitch to the "MOD" position and return to "AUTO". • IF directed by the Shift Manager/Unit Supervisor, THEN PLACE Main Turbine in the IMP-IN mode by depressing the IMP PRESS FEEDBACK "IN" push-button, OTHERWISE N/A.	***Event 2/3*** *can be triggered after the NRC examiners have adequately evaluated the crew during the power reduction.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2/3

Event 2 Description: Controlling PZR Pressure Channel PT-0457 fails high. (Tech Spec)
Event 3 Description: Pressurizer PORV 655A fails to close and the associated block valve must be closed – integral with scenario, occurs with above malfunction. (**CT)**

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators on 04M8: PRZR PRESS HI RX TRIP ALERT (A-7) PRZR PRES DEV HI (C-7)	*RO uses annunciator response procedures but will also recognize the need to perform immediate actions.*
	SRO/RO	Determines PZR Pressure Channel PT-0457 failed high. Performs immediate actions of 0POP04-RP-0001: • IF any channel has failed HIGH, THEN POSITION Pressurizer Pressure Control Selector Switch to remove failed channel from control.	*Failed Channel is RC-PI-0457.* *Immediate Action - RO selects P455/456 or P455/458 for control.*
	SRO (continuous)	Directs actions of 0POP04-RP-0001, Loss of Automatic Pressurizer Pressure Control.	
	RO	CHECK Pressurizer Pressure Channels - ALL OPERABLE	*Failed High Channel is RC-PI-0457.* *RO selects P455/456 or P455/458 for control.*
	RO	CHECK Pressurizer Pressure Controller RC-PK-0655A - OPERABLE	

	SRO/RO **(C)**	CHECK Pressurizer PORVs - CLOSED {CP004}
		• PCV-0655A
		• PCV-0656A
		PERFORM the following:
		• Manually CLOSE Pressurizer PORVs.
		• IF a PORV will NOT close, THEN CLOSE associated PORV isolation valve.
		  • "ISOL MOV-0001A" for PCV-0655A
		  • "ISOL MOV-0001B" for PCV-0656A
			PZR PORV 655A will open and stick open on the instrument failure. The SRO will direct the RO (possible before this step) to close RC-MOV-0001A before a RX trip occurs on low PRZ pressure.
			
			CRITICAL TASK

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2/3

Event 2 Description: Controlling PZR Pressure Channel PT-0457 fails high. (Tech Spec)
Event 3 Description: Pressurizer PORV 655A fails to close and the associated block valve must be closed – integral with scenario, occurs with above malfunction. (**CT)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK Normal Pressurizer Spray Valves: {CP004}
		• Normal Pressurizer Spray Valves – CLOSED
		  • "PRZR SPR PCV-0655B"
		  • "PRZR SPR PCV-0655C"
		• Pressurizer Spray Line temperature - NORMAL	

	RO	CHECK Pressurizer Auxiliary Spray Valve LV-3119 CLOSED.	
	RO	CHECK Pressurizer Pressure - GREATER THAN 2210 PSIG.	*If no then ensure PZR Backup Heaters energized and go to step 11.0.*
	RO	CHECK Pressurizer Pressure - GREATER THAN 2250 PSIG.	*PZR Pressure will probably be less than 2250 and SRO/RO will go to step 11.0.*
	RO	ENSURE An Operable Pressurizer Pressure Channel Is Selected On The Pressurizer Pressure Recorder Selector Switch	
	RO	CHECK Pressurizer Pressure Controller RC-PK-0655A – OPERABLE.	
	RO	CHECK Pressurizer Pressure - BETWEEN 2220 AND 2250 PSIG.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2/3

Event 2 Description: Controlling PZR Pressure Channel PT-0457 fails high. (Tech Spec)
Event 3 Description: Pressurizer PORV 655A fails to close and the associated block valve must be closed – integral with scenario, occurs with above malfunction. (**CT)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK The Following:
		• Pressurizer Pressure Controller RC-PK-0655A demand signal - INDICATING NORMAL FOR EXISTING PLANT CONDITIONS
		• Pressurizer spray valves - IN AUTO
		  • "PRZR SPR PCV-0655B"
		  • "PRZR SPR PCV-0655C"
		• Pressurizer heater controls - IN AUTO
		  • HTR CONT GRP 1C(2C)
		  • HTR B/U GRP 1A(2A)
		  • HTR B/U GRP 1B(2B)
		  • HTR B/U GRP 1D(2D)
		  • HTR B/U GRP 1E(2E)
		• Pressurizer PORVs - IN AUTO
		  • PCV-0655A
		  • PCV-0656A
		• Pressurizer PORV Isolation Valves - OPEN
		  • "ISOL MOV-0001A" for PCV-0655A
		  • "ISOL MOV-0001B" for PCV-0656A
		• Pressurizer Pressure Controller RC-PK-0655A - IN AUTO
		• Pressurizer pressure being maintained - BETWEEN 2220 AND 2250 PSIG
			These checks allow the RO to place PZR Pressure Control back in Auto.
			
			PCV-0655A may not be put in Auto because of the failure.
			
			RC-MOV-0001A will remain closed because of the failure.
			
			Places Controller in Auto

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 2/3

Event 2 Description: Controlling PZR Pressure Channel PT-0457 fails high. (Tech Spec)
Event 3 Description: Pressurizer PORV 655A fails to close and the associated block valve must be closed – integral with scenario, occurs with above malfunction. (**CT)**

Time	Position	Required Operator Actions	Notes
	RO	CHECK Pressurizer Pressure Channels - ALL OPERABLE. **(RNO)** • NOTIFY I&C to place the affected Channel in trip or bypass. REFER TO Addendum 1, Procedure List for the appropriate procedure. • CHECK P-11 permissive in proper state for plant conditions per Technical Specification Table 3.3-3, Item 9.a .	*Crew will notify I/C of failed PZR Pressure Channel.*
	SRO/RO	REFER TO Addendum #3 For Applicable Technical Specifications. TS 3.3.1.8, 10 & 11 Action 6 (PZR Press Event 2) TS 3.3.2.1.e Action 20 (PZR Press Event 2) TS 3.4.4 Action b (PZR PORV Event 3)	*SRO will check TS.* ***Most Limiting Condition:*** *Within 1 hour restore the PZR PORV or close the associated block valve and remove power from the block valve.* *If not already done, SRO should direct power to be removed from RC-MOV-0001A per TS 3.4.4 Action b.* ***Event 4*** *can be triggered after SRO has checked TS.* *NOTE: TS 3.4.6.2 Action b for RCS leakage applies while the PZR PORV is stuck open until the block valve is closed.*
	RO	CHECK Reactor Coolant Pumps - ALL OPERATING	
	SRO	INITIATE Corrective Action For Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 4

Event Description: SG B Controlling Feed Flow Channel FT-0520 fails low.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators on 06M3: SG 1B STM/FW FLOW MSMTCH (E-7)	*BOP uses annunciator response procedures but will also recognize the need to perform immediate actions.*
	SRO/BOP	Determines SG 1B Controlling Feed Flow Channel FT-0520 fails low. Performs immediate actions of 0POP04-FW-0001: • PLACE any SG Feedwater Regulating Valve(s) not properly responding in MANUAL AND ADJUST as necessary to restore affected SG NR level(s) to between 68% and 74%.	*Failed Channel is FW-FT-0520.* *Immediate Action – BOP takes Manual control of SG 1B MFRV.*
	SRO (continuous)	Directs actions of 0POP04-FW-0001, Loss of Steam Generator Level Control.	
	BOP	CHECK SG Feedwater Regulating Valve(s) - RESPONDING IN AUTOMATIC	
	BOP	CHECK SGFP Speed Controllers - RESPONDING IN AUTOMATIC	
	BOP	CHECK Main Feedwater Regulating Valves: • CHECK Main Feedwater Regulating Valve(s) - IN SERVICE • CHECK Main Feedwater Regulating Valve(s) - ANY IN MANUAL • CHECK Affected Main Feedwater Regulating Valve(s) - RESPONDING IN MANUAL	
	BOP	CHECK Low Power Feedwater Regulating Valves:	*LPFRVs are not in service.*
	BOP	CHECK SGFP Master Speed Controller - IN MANUAL	*Controller should be in Auto.*
	BOP	CHECK Individual SGFP Speed Controllers - ANY IN MANUAL	*Controllers should be in Auto.*
	BOP	MONITOR Feedwater/Steam Header DP	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 4

Event Description: SG B Controlling Feed Flow Channel FT-0520 fails low.

Time	Position	Required Operator Actions	Notes
	BOP	RESTORE Affected SG NR Level(s) To Between 68% And 74%	
	BOP	MONITOR SG NR Levels - GREATER THAN 20%	
	BOP	MONITOR SG NR Levels - LESS THAN 87.5%	
	BOP	CHECK SG NR Level Indicators - ALL OPERABLE	

	BOP	CHECK Feedwater Flow Transmitters - ALL OPERABLE
		• SELECT the operable feedwater flow channel for affected SG(s) level control.
		• IF DA Storage Tank Level is not responding in AUTO, THEN PERFORM the following:
		  • ENSURE DA Storage Tank Level Control LK-7406 in Manual.
		  • MAINTAIN DA Storage Tank level between 65% and 80%
			Feedwater FT-0520 is an input to DA level control but the controller is level dominate. The US may or may not place DA level control in manual.

	BOP	CHECK Steam Flow Transmitters - ALL OPERABLE	
	BOP	CHECK Steam Pressure Transmitters - ALL OPERABLE	
	BOP	CHECK SG NR Levels - BETWEEN 68% And 74%	
	BOP	CHECK Main Feedwater Regulating And Low Power Feedwater Regulating Valves Automatic Control - OPERABLE	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 4

Event Description: SG B Controlling Feed Flow Channel FT-0520 fails low.

Time	Position	Required Operator Actions	Notes
	BOP	CHECK Main Feedwater Regulating OR Low Power Feedwater Regulating Valve(s) - IN AUTO WHEN SG levels return to between 68% and 74%, THEN PERFORM the following: • PLACE in-service Feedwater Regulating Valve(s) with operable Automatic Control in Auto. • *MONITOR* proper operation of Feedwater Regulating Valve(s) in Auto.	*When the NRC Examiners are ready **Event 5** can be triggered.*
	BOP	CHECK SGFP Master Speed Controller - IN AUTO	
	SRO	TAKE Appropriate Actions Per Technical Specifications 3.3.1, 3.3.2, 3.3.3.6 and TRM 3.7.1.7	*There are no TS associated with a failed Feedwater Flow Transmitter.*
	SRO	NOTIFY I&C To Place The Affected Channel In Trip Or Bypass. REFER TO Addendum 2, Procedure List For The Appropriate Procedure.	
	SRO	INITIATE Corrective Actions For Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5

Event Description: EHC Leak on EHC Discharge Header at the EHC Reservoir.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following alarms from 06M3 & 06M4: SGFPT 11 CONT OIL PRESS LO (06M3 C-5) SGFPT 12 CONT OIL PRESS LO (06M4 C-1) SGFPT 13 CONT OIL PRESS LO (06M4 C-5)	*EHC Pump #11 is running and #12 is in Auto. When the leak starts, these alarms come in but then clear when EHC Pump #12 auto starts.*
	BOP	Acknowledges and announces alarms for a lowering EHC Reservoir level; 0POP09-AN-07M3, Window E-2, EHC RSVR LVL LO, D-2, EHC RSVR LVL HI/LO-LO, and B-2, EHC RSVR EXTREME LO-LO LVL.	*EHC Reservoir level will be lowering at such a rate that repairs will not be feasible prior to removing the Main Turbine and SGFPTs from service.*
	SRO (continuous)	Directs/ensures operator actions of 0POP09-AN-07M3.	*Only a few actions of 0POP09-AN-07M3 will be performed because the leak rate quickly escalates to a point requiring a Reactor/Turbine trip.*
	BOP	DISPATCH an Operator to perform the following: • CHECK the EHC Reservoir level. • CHECK for decreasing level. • IF level is decreasing at a significant rate, THEN INFORM control room that tripping the turbine should be considered. • CHECK EHC System for leaks.	*0POP09-AN-07M3, Window E-2, EHC RSVR LVL LO.*
	BOP	NOTIFY Maintenance to fill the EHC Reservoir per 0POP02-EH-0001, Adding EHC fluid.	*0POP09-AN-07M3, Window E-2, EHC RSVR LVL LO.*
	BOP	IF the cause of the alarm is an EHC Reservoir LO-LO alarm, THEN DIRECT an Operator to Emergency fill the EHC Reservoir per 0POP02-EH-0001, Rapidly Adding EHC fluid (Emergency Fill).	*0POP09-AN-07M3, D-2, EHC RSVR LVL HI/LO-LO.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5

Event Description: EHC Leak on EHC Lines in the High Pressure Turbine Housing.

Time	Position	Required Operator Actions	Notes

	BOP	IF alarm comes in after the low level alarm, THEN:
		• IF Reactor Power is greater than P-9 (50%) AND EHC pressure is approaching 1300 psig, THEN PERFORM the following:
		  • ENSURE the Reactor tripped.
		  • ENSURE the Turbine and Generator tripped.
		  • ENSURE all SGFPTs tripped.
		  • GO TO 0POP05-EO-EO00, Reactor Trip or Safety Injection.
			0POP09-AN-07M3, B-2, EHC RSVR EXTREME LO-LO LVL.

	BOP	IF directed by the US/SM, THEN SECURE any running EHC pumps.	*0POP09-AN-07M3, B-2, EHC RSVR EXTREME LO-LO LVL.*
	SRO (continuous)	Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection, and directs the crew to perform their immediate actions.	
	RO/BOP	Completes immediate actions of EO00. Reactor Trip/SI: • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI status.	*RO will announce status of immediate action steps as he/she performs them.* *BOP Operator will monitor the plant and make an announcement of the Reactor trip.*
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	*Before beginning the verification of immediate actions, the US may direct the BOP operator to throttle AFW flow to limit RCS cooldown.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 5

Event Description: EHC Leak on EHC Lines in the High Pressure Turbine Housing.

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Transitions to 0POP05-EO-ES01, Reactor Trip Response	*This procedure transition should apply since an SI DID NOT occur after the Reactor trip.*
	SRO/RO	Monitor RCS Tave to determine if it's stable or trending to 567 °F. If not: • Ensures AFW is appropriately throttled. • Isolate steam dump drains • Isolate steam chest drains • Isolate steam to MSR's and steam line drains to MSR's. • Trip all SGFPT's • Stop dumping steam • Isolate SG Blowdown • If cooldown continues, close all MSIV's and MSIB's.	
	SRO/BOP	Checks FW status if Tave < 574 °F: • FWIV's and FWIB's closed • FW Preheater Bypass Valves closed • FW Main and Low Power Feed Reg Valves closed. • Trip all SGFPT's	*All SGFPTs should already be tripped due to EHC leak.*
	SRO/BOP	Verifies feedflow to ≥ 3 SG's from either MFW or AFW.	*AFW will be in service to all SGs at this time.*
	SRO/RO	Verifies all control rods are fully inserted.	***Event 6 and 7*** *will be triggered five minutes after the Reactor is tripped.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 6 and 7

Event 6 Description: Major Steam Line Break inside Containment on SG 1C.
Event 7 Description: Main Steam Line Isolation fails to Auto Actuate. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes
	ALL	A large steam line break in containment will cause a Safety Injection and Main Steam Line Isolation except the Main Steam Lines will fail to Auto Actuate causing the crew to have to Manually initiate the actuation.	***Event 6 & 7*** *are integral to the scenario.*
	SRO (continuous)	Re-Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection.	
	RO/BOP	Completes read through of 0POP05-EO-EO00, Reactor Trip or Safety Injection. • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated.	
	SRO/BOP (C)* *** denotes critical item**	Directs BOP to perform Addendum 5, Verification of SI Equipment Operation • FW Isolation • ***Check for Steamline Isolation*** • AFW Status • Phase 'A' Containment Isolation • ECW and CCW • Containment Cooling • ECCS pump and valve status • Containment Ventilation Isolation • HVAC systems (CR/EAB/FHB)	*If not already done, will initiate a Manual Main Steam Line Isolation.* ***CT – Manually initiate a Main Steam Isolation or manually close all Main Steam Isolation valves prior to an orange path on Subcriticality or Integrity CSF or before transition to 0POP05-EO-EC21, Uncontrolled Depressurization of all Steam Generators, which ever happens first.***

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 6 and 7

Event 6 Description: Major Steam Line Break inside Containment on SG 1C.
Event 7 Description: Main Steam Line Isolation fails to Auto Actuate. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes
	SRO/RO	Check plant status: • Containment pressure: normal • RCP Seal cooling: 6-13 gpm • RCS cooldown: at or trending to 567°F • Pzr PORV and Spray valve status: closed • Excess Letdown Isol Valves: closed • Monitor RCP trip criteria to determine if RCP's should be stopped: criteria will NOT be met. • Selected Containment Isolation Valves: closed.	*Check Containment Isolation Phase B Valves closed and Trip RCPs due to Containment Spray Actuation.* *If all 3 CS Pumps injecting then stop one CS Pump (Both action also on CIP)*

	RO	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE
		• IF any faulted SG is NOT isolated, AND is NOT needed for cooldown, THEN PERFORM the following:
		  • GO TO 0POP05-EO-EO20, FAULTED STEAM GENERATOR ISOLATION, Step 1.
		  • MONITOR Critical Safety Functions.
		  • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.
			SG 1C is faulted inside Containment and an Orange Path on Containment will be present.

	BOP	Completes 0POP05-EO-EO00, Addendum 5.	*Will not transition to FRZ1 until Addendum 5 is complete.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 6 and 7

Event 6 Description: Major Steam Line Break inside Containment on SG 1C.
Event 7 Description: Main Steam Line Isolation fails to Auto Actuate. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-FRZ1, Response to High Containment Pressure.	

	RO	VERIFY Containment Spray – ESTABLISHED
		• Containment Pressure LESS THAN 56.5 PSIG.
		• At least one Containment Spray pump –RUNNING
		  • Discharge valve OPEN
		  • FLOW indication
		• RETURN TO procedure step in effect and PERFORM this procedure as time permits.
			Conditions will allow exit from FRZ1 and the SRO will go to 0POP05-EO-EO20, Faulted SG Isolation.

	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO20, Faulted Steam Generator Isolation, and to monitor Critical Safety Functions	
	BOP	Checks MSIV's and MSIB's closed.	*MSIVs and MSIBs should have been manually closed using 0POP05-EO-EO00, Addendum 5 as identified earlier.*
	BOP	CHECK If Any SG Secondary Pressure Boundary Intact: • CHECK pressures in all SGs – ANY SG PRESSURE CONTROLLED OR RISING	*SG's 'A', 'B' and 'D' pressures are 'controlled'. SG 'C' pressure is NOT controlled.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 6 and 7

Event 6 Description: Major Steam Line Break inside Containment on SG 1C.
Event 7 Description: Main Steam Line Isolation fails to Auto Actuate. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes

	SRO/BOP	IDENTIFY Faulted SG(s):
		• CHECK pressure in all SGs –
		  • ANY SG PRESSURLOWERING IN AN UNCONTROLLED MANNER
		  OR
		  • ANY SG COMPLETELY DEPRESSURIZED
			SG 1C is Faulted

	SRO/BOP	Isolates the faulted SG
		• Verifies all FWIV's closed.
		• Verifies all FWIB's closed.
		• Verifies all FW Preheater bypass valves closed.
		• Verifies all FW Regulating and Low Power FW Regulating Valves closed.
		• Isolates AFW flow to 'C' SG
		  • Resets SI
		  • Resets ESF load sequencers
		  • Resets SG LO-LO level AFW actuations
		  • Checks SG 1D intact
		  • Closes 'C' SG AFW OCIV
		• Verifies SG "C" PORV closed
		• Verifies SG 'C' Blowdown and sample isolation valves closed
			SG 1D is intact.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 1 **Event No.:** 6 and 7

Event 6 Description: Major Steam Line Break inside Containment on SG 1C.
Event 7 Description: Main Steam Line Isolation fails to Auto Actuate. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes

	BOP/SRO	Check Secondary Radiation:
		• Resets SI
		• Resets SG LO-LO level AFW actuations
		• Resets SG Blowdown and Sampling Isolations
		• Notifies Chemistry to sample all SG's hourly for activity.
		• Checks the following Rad Monitors:
		  • Main Steamline
		  • SG Blowdown
		  • CARS Pump
		• WHEN SG sample results are received, THEN VERIFY SG sample activity - NORMAL
			The first 3 resets have already been done so the operator will just check that they are still reset.
			
			CARS = Condenser Air Removal System.

	ALL	Check if SI flow should be terminated • RCS subcooling - >35°F [45°F] • Secondary heat sink – NR level in one SG > 14%[34%] OR total AFW Flow > 576 gpm. • RCS pressure > 1745 psig and stable or rising • Pressurizer level > 8%	*If conditions are met, a transition to 0POP05-EO-ES11, SI Termination, will be made.* *Conditions will likely NOT be met for transition at this time. If not met (expected), the crew will transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant.*
	SRO	Announces transition from 0POP05-EO-EO20 (to ES11 or E010, as appropriate).	***Terminate the scenario.***

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**MANUALLY CLOSE BLOCK VALVE FOR STUCK OPEN PRESSURIZER PORV 655A.**	Manually close block valve for stuck open PZR PORV 655A such that a manual or automatic Reactor Trip does not unintentionally occur**.**	
SRO/BOP	**MANUALLY PERFORMS A MAIN STEAM ISOLATION ACTUATION OR MANUALLY CLOSES ALL MSIVs AND MISBs.**	Manually initiate a Main Steam Isolation or manually close all Main Steam Isolation valves prior to an orange path on Subcriticality or Integrity CSF or before transition to 0POP05-EO-EC21, Uncontrolled Depressurization of all Steam Generators, which ever happens first.	

TURNOVER INFORMATION

- Reactor Power is at 100% Power and Stable.
- Plans are to lower power to 98% at 0.5%/min per 0POP03-ZG-0008, Power Operations, to allow performance of 0POP07-MS-0003, Main Turbine Steam Inlet Valve Testing.
- Train 'A' Outage is in progress: HHSI & LHSI Pumps 1A, AFW Pump #11 and SI-MOV-0016A are OOS.
- Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.
- Cycle Burnup is 150 MWD/MTU. (BOL)
- RCS Boron Concentration is 1362 ppm.
- Boric Acid Tank 'A' is at 7315 ppm and 'B' is at 7309 ppm.
- No liquid waste discharges are in progress or planned.
- No personnel are in containment.
- FHB Truck Bay doors are closed.
- No ESF DG FOST's are on recirc.

LOT 19 NRC EXAM

OPERATING TEST #1

SCENARIO #2

Revision #0

Week of 09/30/2013

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 2** **Op-Test No.: LOT 19 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **75% power and stable. Maintaining power at 75% due to an offsite grid issue.**

Turnover:

- **Train B Outage in progress. CCW Pump 1B, RCFCs 11B and 12B and AFW Pump #12 are OOS.**
- **Start-up Feed Pump #14 is OOS for scheduled maintenance.**

Event No.	Malf. No.	Event Type*	Event Description
1 (1 min)	02-25-02 0	RO (I) SRO (I, TS)	Loop 1A Cold Leg RTD T-0410B Fails Low.
2 (10 min)	SA-PT545TV 0	BOP (I) SRO (I, TS)	SG D Controlling Pressure Channel PT-0545 Fails Low.
3 (20 min)	03-05-01 True	RO (I) SRO (I)	VCT Level Transmitter LT-0112 fails high. (Occurs when PT-0545 is de-selected.)
4 (30 min)	Proteus-AIP-T6147ZM 1.119	BOP (C) SRO (C)	Main Generator Stator Cooling DT Alarm due to high DT across Stator Bars 36B and 36T.
5 (35 min)	50-GG-01 True	RO (R) BOP (R) SRO (R)	The crew will receive a Generator Condition Monitor alarm with an associated GCM Verified Alarm, ICS Point BD-6023. The crew will perform a Fast Load Reduction at a rate 2% to 5% per minute. After the Fast Load Reduction begins the Main Generator will have a complete Fault that will cause a Reactor and Turbine Trip. (Integrated at 64% NI Power)
6 (N/A)	05-03-01 0.02 05-04-01 True 50-SA-10 0.1	RO (M) BOP (M) SRO (M)	Faulted and Ruptured SG 1A **(CT)** (Integrated and Ramped in to Scenario)
7 (N/A)	50-AF-03 True AF-04 True 08-02-01 True	BOP (C) SRO (C)	AFW Pump #11 manual recirc valve was left open. AFW Pump #13 fails to auto start. AFW Pump Turbine #14 trips on overspeed. The crew will have to manually start AFW Pump #13 and/or close the manual recirc valve on AFW Pump #11 and cross connect to supply water to the intact SGs **(CT)** (Integral to Scenario)

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor.**

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

Refer to the Instructor Guide for directions on Simulator Setup, Expected Booth Communications and Expected Booth Actions.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be automatically recorded during the scenario. Once the scenario is complete for each crew, printout the Critical Parameters and label the printout with date, time, Crew # and scenario #.

- AFW Flow SGs B, C and D
- CVCS Charging Flow
- CVCS Emergency Boration Flow
- CVCS Normal Boration Flow

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.

2. Actions required throughout the event are indicated as "(continuous)" in the position column.

3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1

Event Description: LOOP A Cold Leg RTD T-0410B Fails Low.

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 05M2: OPDT RX PRETRIP (A-6) T AVG/AUCT T AVG DEV (C-6) DT/AUCT DT DEV (D-6)	*RO uses annunciator response procedures.*
	SRO/RO	Determines LOOP A Cold Leg RTD T-410B failed low.	
	SRO (continuous)	Directs actions of 0POP04-RP-0004, Failure of RCS Loop RTD Protection Channel.	
	RO	ENSURE "ROD BANK SEL" Switch In MANUAL	
	SRO/RO	CHECK The Following Indications - NORMAL • RCS loop temperature indicators (Tavg, Th, Tc, and ΔT) {CP005} • QDPS DETAIL DATA Page 2 for RCS Loop Th • Plant Computer IF any RCS loop RTD channel is **NOT** operable, THEN PERFORM the following: {CP005} • SELECT The Failed Loop On "BYP SEL ΔT" Switch. • SELECT The Failed Loop On "BYP SEL T AVG" Switch.	
	RO	CHECK Tavg - WITHIN 1.5°F OF Tref (REFER TO Addendum 1)	
	RO	CHECK Pressurizer Level - • AT PRESSURIZER PROGRAM LEVEL OR • TRENDING TO PRESSURIZER PROGRAM LEVEL	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 1

Event Description: LOOP A Cold Leg RTD T-0410B Fails Low.

Time	Position	Required Operator Actions	Notes
	SRO/RO	Establish Automatic Rod Control: • DETERMINE if it is desired to place Rod Control System in Automatic • CHECK Tavg - WITHIN 0.5°F OF TREF • PLACE "ROD BANK SEL" Switch In AUTO {CP005} • VERIFY Rod Control System - PROPER RESPONSE IN AUTOMATIC	*The Unit Supervisor may elect NOT to place Control Rods in Auto at this time.*
	RO	CHECK "ΔT AND ΔT SETPTS TR-0412" Recorder - SELECTED TO OPERABLE CHANNEL (CP-018) • SELECT an operable channel on "ΔT AND ΔT SETPTS TR-0412" Recorder.	*Will have to select an operable channel for the recorder.*
	SRO	TAKE Appropriate Actions Per Technical Specifications. TS 3.3.1.8 & 9 OT & OPDT Action 6 TS 3.3.2.5.f LOW Tavg P4 Action 20	*SRO will check TS.* ***Most Limiting Condition:*** *Place the failed channel in the tripped condition within 72 hours.* ***Event 2*** *can be triggered after the SRO has checked TS.*
	SRO	NOTIFY I&C To Place The Affected Channel In Trip Or Bypass. REFER TO Addendum 2, Procedure List For The Appropriate Procedure	
	SRO	INITIATE A Condition Report To Repair Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 2

Event Description: Steam Generator 1D Controlling Pressure Channel PT-0545 Fails Low.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 06M4: SG 1D STM PRESS RATE HI ALERT (B-8) SG 1D STM PRESS LO ALERT (D-8) SG 1D STM/FW FLOW MSMTCH (E-7)	*BOP uses annunciator response procedures but will also recognize the need to perform immediate actions.*
	SRO/BOP	Determines SG 1D Controlling Pressure Channel PT-0545 fails low. Performs immediate actions of 0POP04-FW-0001: • PLACE any SG Feedwater Regulating Valve(s) not properly responding in MANUAL AND ADJUST as necessary to restore affected SG NR level(s) to between 68% and 74%.	*Failed Channel is MS-PT-0545.* *Immediate Action – BOP takes Manual control of SG 1D MFRV.*
	SRO (continuous)	Directs actions of 0POP04-FW-0001, Loss of Steam Generator Level Control.	
	BOP	CHECK SG Feedwater Regulating Valve(s) - RESPONDING IN AUTOMATIC	
	BOP	CHECK SGFP Speed Controllers - RESPONDING IN AUTOMATIC	*The Unit Supervisor may elect to place the Master Speed Controller in Manual because the failure will affect the ΔP setpoint.*
	BOP	CHECK Main Feedwater Regulating Valves: • CHECK Main Feedwater Regulating Valve(s) - IN SERVICE • CHECK Main Feedwater Regulating Valve(s) - ANY IN MANUAL • CHECK Affected Main Feedwater Regulating Valve(s) - RESPONDING IN MANUAL	
	BOP	CHECK Low Power Feedwater Regulating Valves:	*LPFRVs are not in service.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 2

Event Description: Steam Generator 1D Controlling Pressure Channel PT-0545 Fails Low.

Time	Position	Required Operator Actions	Notes
	SRO/BOP	CHECK SGFP Master Speed Controller - IN MANUAL	*The Unit Supervisor may elect to place the Master Speed Controller in Manual because the failure will affect the ΔP setpoint.*
	BOP	CHECK Individual SGFP Speed Controllers - ANY IN MANUAL	*Controllers should be in Auto.*
	BOP	MONITOR Feedwater/Steam Header DP	*If the Master Speed Controller was placed in Manual then the crew may adjust to the correct ΔP. However, this failure does not create a drastic affect on controller response if left in Auto.*
	BOP	RESTORE Affected SG NR Level(s) To Between 68% And 74%	
	BOP	MONITOR SG NR Levels - GREATER THAN 20%	
	BOP	MONITOR SG NR Levels - LESS THAN 87.5%	
	BOP	CHECK SG NR Level Indicators - ALL OPERABLE	
	BOP	CHECK Feedwater Flow Transmitters - ALL OPERABLE	
	BOP	CHECK Steam Flow Transmitters - ALL OPERABLE • SELECT the operable steam flow channel for affected SG(s) level control.	*A failure of the steam pressure transmitter will affect the steam flow transmitter. De-select the failed channel in one of the next 2 steps.*
	BOP	CHECK Steam Pressure Transmitters - ALL OPERABLE • SELECT the operable steam flow channel for affected SG(s) level control.	***Event 3*** *is triggered when the steam flow channel is de-selected.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 2

Event Description: Steam Generator 1D Controlling Pressure Channel PT-0545 Fails Low.

Time	Position	Required Operator Actions	Notes
	BOP	CHECK SG NR Levels - BETWEEN 68% And 74%	
	BOP	CHECK Main Feedwater Regulating And Low Power Feedwater Regulating Valves Automatic Control - OPERABLE	
	BOP	CHECK Main Feedwater Regulating OR Low Power Feedwater Regulating Valve(s) - IN AUTO WHEN SG levels return to between 68% and 74%, THEN PERFORM the following: • PLACE in-service Feedwater Regulating Valve(s) with operable Automatic Control in Auto. • *MONITOR* proper operation of Feedwater Regulating Valve(s) in Auto.	
	BOP	CHECK SGFP Master Speed Controller - IN AUTO	*If the Master Speed Controller was placed in Manual, then it can now be placed back in Auto.*
	SRO	TAKE Appropriate Actions Per Technical Specifications. TS 3.3.2.1.f Compensated Steam Line Pressure – Low Action 20 TS 3.3.2.4.c. Steam Line Pressure Negative Rate – High Action 20 TS 3.3.2.4.e. Compensated Steam Line Pressure – Low Action 20	*SRO may not check TS because of timing of the next event. The SRO may have to demonstrate TS knowledge at the end of the scenario.* ***Most Limiting Condition:*** *Place the failed channel in the tripped condition within 72 hours.*
	SRO	NOTIFY I&C To Place The Affected Channel In Trip Or Bypass. REFER TO Addendum 2, Procedure List For The Appropriate Procedure	
	SRO	INITIATE Corrective Actions For Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3

Event Description: VCT Level Transmitter LT-0112 Fails High

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 04M8: VCT LEVEL HI/LO (E-2)	*RO uses annunciator response procedures.* *The RO may be able to diagnose this event prior to the alarm coming in.*
	SRO/RO	Determines VCT Level Transmitter LT-0112 has failed high.	
	SRO (continuous)	Directs actions of 0POP09-AN-04M8, Window E-2, VCT LEVEL HI/LO.	
	RO	CHECK VCT level.	
	RO	VERIFY VCT level by checking the following Plant Computer Points: • CVLA0112 • CVLA0113	*CVLA0112 will be indicating HI.* *CVLA0113 will be lowering due to Divert Valve LCV-0112A being fully diverted to the RHT.*
	RO	IF a VCT level transmitter is failed, THEN CONTROL VCT level by closely monitoring Plant Computer Points.	
	RO	IF annunciator window "VCT LEVEL LO-LO" F-2 is alarming, THEN RESPOND to that annunciator.	*If VCT level lowers to 3% or less then the crew will respond to this alarm.*
	RO	IF VCT level is greater than 95%, THEN ENSURE the following: • Divert valve LCV-0112A fully diverted to RHT. • Reactor Coolant Makeup stopped.	*Actual VCT level will be lowering.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3

Event Description: VCT Level Transmitter LT-0112 Fails High

Time	Position	Required Operator Actions	Notes
	RO	IF VCT level is less than 28%, THEN PERFORM the following: • ENSURE Divert valve LCV-0112A is aligned to the VCT. • ENSURE Reactor Water Makeup System started in AUTO. • IF makeup can NOT be started in AUTO, THEN Manually INITIATE makeup to the RCS per 0POP02-CV-0001, Makeup to the Reactor System. • IF VCT level decreases to 3%, THEN ENSURE charging pump suction aligns to the RWST.	*The crew will align LCV-0112A to the VCT due to the failure of LT-0112.* *If needed the crew will perform a manual make up to the VCT. See next page.*
	RO	IF a VCT level transmitter (LT-0112 or LT-0113) is failing low, THEN PERFORM the following:	*With LT-0112 failed high the crew will contact I/C Maintenance.*
	SRO/RO	IF VCT low level is due to excessive RCS leakage, THEN GO TO the leakage procedure appropriate for plant conditions:	*When the NRC Examiners are ready **Event 4** can be triggered.*
	SRO	REFER TO TRM 3.1.2.1 and 3.1.2.2.	*These requirements are not applicable.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 3

Event Description: VCT Level Transmitter LT-0112 Fails High

Time	Position	Required Operator Actions	Notes
	RO	VERIFY the following switches in "AUTO": • "BA FLOW CONT VLV FCV-0110A" valve • "RMW FLOW CONT VLV FCV-0111A" valve	*IF manual makeup to the VCT is required the RO will perform these steps.*
	RO	ENSURE the following switches in "CLOSE": • Makeup stop to Charging Pumps "TO VCT OUTL FCV-0110B" Valve • Makeup stop to VCT "FILL FCV-0111B" valve	
	RO	TURN "RC M/U CONT SYS ON" switch to "STOP".	
	RO	PLACE the "RC M/U CONT" in "MAN".	
	RO	SET "BA BATCH/GALLONS FY-0110B" flow integrator for calculated gallons using the following formula:	*BA batch/gallons* = $\frac{\text{Tot M/U batch gallons x RCS Concentration}}{\text{BAT Concentration}}$
	RO	SET "TOT M/U BATCH GALLONS FY-0111B" flow integrator for desired gallons.	
	RO	SET "BA FLOW CONT FK-0110" setpoint, using the following formula:	*Setpoint* = $\frac{\{K\} \text{ x Boron Concentration of RCS}}{\text{Boron Concentration of BAT}}$
	RO	TURN "RC M/U CONT SYS ON" switch to "START".	
	RO	VERIFY "BA XFER PUMP 1A(2A)" OR "BA XFER PUMP 1B(2B)" starts.	
	RO	VERIFY "RMW PUMP 1A(2A)" OR "RMW PUMP 1B(2B)" starts.	
	RO	OPEN makeup stop to charging pumps "TO VCT OUTL FCV-0110B" or makeup stop to VCT "FILL FCV-0111B" as desired.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4

Event Description: Main Generator Stator Cooling ΔT Alarm due to high ΔT across Stator Bars 36B and 36T.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 07M3: STATR COIL WTR DIFF TEMP HI/TEMP HI (A-5)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines a high Stator Cooling Water differential temperature between Stator Bars 36B and 36T.	
	SRO (continuous)	Directs actions of 0POP09-AN-07M3, Window A-5, STATR COIL WTR DIFF TEMP HI/TEMP HI.	
	BOP	CHECK the following ICS Trends for an indication of stator coil water differential temperature greater than 19.0(17.0)°F (U5524 or U5525) OR stator coil water temperature greater than 174°F (U5520 or U5521): a) Generator Monitoring Global Trend - 63 b) Stator Coil Cooling Water Status Graphic - GC-011P	
	BOP	IDENTIFY the affected thermocouples (ICS points T6112-T6154 & T6156-T6184) from ICS Point Groups 190 through 196 OR Custom Graphic GC-011P Stator Coil Cooling Status.	*Stator Bars 36B and 36T have a high differential temperature.*
	SRO/BOP	IF the problem indication is Failed (Failed high, low or erratic), THEN GO TO Step 9.	*Will determine that temperature instruments are not failed.*
	SRO/BOP	IF the alarm is caused by a differential temperature alarm that is being driven by one lowering thermocouple temperature, THEN GO TO Step 9.	*Will determine that individual Stator Bar temperatures for Stator Bars 36B and 36T are NOT lowering.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4

Event Description: Main Generator Stator Cooling ΔT Alarm due to high ΔT across Stator Bars 36B and 36T.

Time	Position	Required Operator Actions	Notes
	SRO/BOP	IF either of the following conditions exist; • Stator coil water differential temperature (U5524 or U5525) is greater than or equal to 21.5°F • High stator coil water temperature (U5520 or U5521) is greater than or equal to 194°F THEN PERFORM the following: 1. IF Reactor Power is greater than P-9 (50%), THEN PERFORM the following: a) TRIP the Reactor. b) TRIP the Main Turbine. c) GO TO 0POP05-EO-EO00, Reactor Trip or Safety Injection. 2. IF Reactor Power is less than P-9 (50%), THEN PERFORM the following: a) TRIP the Main Turbine. b) GO TO 0POP04-TM-0003, Turbine Trip Below P-9.	*Neither temperature condition will exist on the affected Stator Bars at this time.*
	SRO/BOP	IF either of the following conditions exist, • Stator coil water differential temperature (U5524 or U5525) greater than 20.0°F • Stator coil water temperature (U5520 or U5521) greater than 180°F THEN PERFORM 0POP04-TM-0005, Fast Load Reduction, to reduce load at a rate of 2% to 5% Per Minute to maintain less than 20.0°F differential temperature **AND** less than 180°F stator coil water temperature.	*Stator Bar temperatures will be close to the temperature condition listed but will still NOT require a down power.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 4

Event Description: Main Generator Stator Cooling ΔT Alarm due to high ΔT across Stator Bars 36B and 36T.

Time	Position	Required Operator Actions	Notes
	SRO	REQUEST I&C VERIFY the indication locally using PM 12000075 (12000074) for the following thermocouples: • For Stator coil water temperature high alarm, the identified point for high temperature indication. • For Stator coil water differential temperature high alarm, both points for identified high differential temperature indication.	***Event 5*** *will trigger 5 minutes after the start of Event 4.*
	SRO	Contact Engineering to evaluate continued operation.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5

Event Description: The overheating of Stator Bar 36B and 36T causes degradation of the bars and a GCM Verified Alarm is received.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces annunciators associated with a Generator Condition Monitor Alarm.	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines a Generator Condition Verified Alarm.	
	SRO (continuous)	Directs actions of 0POP09-AN-07M3, Window A-4, GENERATOR CONDITION MON ALARM.	
	SRO/BOP	IF BD6023 "GCM VERIFIED ALARM" is in ALARM on the plant computer (ICS), THEN PERFORM the following: a) REDUCE load at a rate of 2% to 5% Per Minute in accordance with 0POP04-TM-0005, Fast Load Reduction. b) WHEN below P9 (50%), THEN TRIP the turbine AND ENTER 0POP04-TM-0003, Turbine Trip Below P-9. c) WHEN resources permit, THEN MONITOR ICS point A6028 "GM GCM MONITOR" for diagnostic data (expect less than 50% for verified GCM alarm).	*ICS point BD6023 will be in ALARM and the crew will begin a Fast Load Reduction.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5

Event Description: The overheating of Stator Bar 36B and 36T causes degradation of the bars and a GCM Verified Alarm is received.

Time	Position	Required Operator Actions	Notes
	BOP	IF BD6023 "GCM VERIFIED ALARM" is **NOT** in ALARM on the plant computer (ICS), THEN PERFORM the following: a) DISPATCH Operator to check local GCM alarm indication panel N1(2)GMAIT6028 inside ZLP-952 (TGB 55' Rm 203, Exciter Rm). b) IF local GCM alarm panel "VERIFIED ALARM" is lit, THEN PERFORM 0POP04-TM-0005, Fast Load Reduction, to reduce load at a rate of 2% to 5% Per Minute until the unit is offline. 1. WHEN resources permit, THEN MONITOR ICS point A6028 "GM GCM MONITOR" for diagnostic data (expect less than 50% for verified GCM alarm).	*If asked, a Plant Operator will report that the local GCM "VERIFIED ALARM" is lit.*
	SRO (continuous)	Directs actions of 0POP04-TM-0005, Fast Load Reduction, due to the GENERATOR CONDITION MON ALARM.	
	SRO	NOTIFY STP Co-Owners Using The EMS Website That Load Reduction Is Commencing.	*Normally performed by Shift Manager.*
	SRO/RO	DETERMINE Amount Of Boric Acid To Add To Reduce Reactor Power To Desired Level As Follows (Reference 11):	*SRO and RO will determine amount of Boric Acid based on chart in procedure.*
	RO	COMMENCE RCS Boration	
	RO	CHECK Rod Control System -IN AUTOMATIC	*May not put in Auto based on turnover.*
	RO	ENERGIZE Pressurizer Heaters For Boron Equalization	
	BOP	CHECK Main Turbine - IN THE IMPULSE PRESSURE FEEDBACK MODE IMP IN {CP007}	*Main Turbine will already by in IMP IN.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 5

Event Description: The overheating of Stator Bar 36B and 36T causes degradation of the bars and a GCM Verified Alarm is received.

Time	Position	Required Operator Actions	Notes
	BOP	REDUCE Turbine Load At A Rate Of Less Than Or Equal To 5% Per Minute Using Operator Auto	*Load rate will be between 2% and 5% per minute per the Annunciator Response Procedure.*
	BOP	MAINTAIN Main Generator Reactive Load (VARs) Within The Following: • Less Than 300 MVARs • Guidelines Of The Plant Curve Book	
	RO	MONITOR Rod Control System Responding To RCS TAVG/TREF Deviation By Ensuring The Following: • Control Rods Are Inserting AND RCS Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref	
	RO	MAINTAIN Pressurizer Level Within The Following: REFER TO Addendum 5, Pressurizer Level Table • Trending to Program Level OR • At Program Level	
	RO	MAINTAIN Pressurizer Pressure Within The Following: • Trending to between 2220 psig and 2250 psig OR • Between 2220 psig and 2250 psig	
	BOP	MAINTAIN Steam Generator NR Level Within The Following: • Trending to between 68% and 74% OR • Between 68% and 74%	*At 64% Reactor Power the Main Generator will develop a Ground Fault which will trip the Reactor and the Main Turbine. This will initiate* ***Event 6 and 7****.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	Announce Reactor Trip	*A ground fault on the Main Generator causes a Reactor Trip.* *A Faulted and Ruptured SG 1A will also causes an SI.*
	SRO (continuous)	Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection, and directs the crew to perform their immediate actions.	
	BOP/RO	Completes immediate actions of EO00. Reactor Trip/SI: • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated or will perform a manual SI due to degrading conditions.	*RO will announce status of immediate action steps as he/she performs them.* *BOP Operator will monitor the plant and make an announcement of the Reactor trip.*
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	*Before beginning the verification of immediate actions, the US may direct the BOP operator to throttle AFW flow to limit RCS cooldown.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	SRO/BOP (C)* * denotes critical item	Directs BOP to perform Addendum 5, Verification of SI Equipment Operation • FW Isolation • Check for Steamline Isolation • ***AFW Status*** **Determines that no AFW is aligned to any of the Steam Generators.** ***Establish 576 gpm AFW flow to the SGs before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection.*** • Phase 'A' Containment Isolation • ECW and CCW • Containment Cooling • ECCS pump and valve status • Containment Ventilation Isolation • HVAC systems (CR/EAB/FHB)	***AFW Pump #11 manual recirc valve has been left open, AFW Pump #12 is OOS, AFW Pump #13 will fail to auto start, and AFW Pump #14 will trip on overspeed. The crew will have to manually start AFW Pump #13, and/or AFW Pump #11 and cross connect, to supply AFW to the intact SGs. (Critical Task)***
	RO	Check plant status: • Containment pressure: normal • RCP Seal cooling: 6-13 gpm • RCS cooldown: at or trending to 567°F • Pzr PORV and Spray valve status: closed • Excess Letdown Isol Valves: closed • Monitor RCP trip criteria to determine if RCP's should be stopped: criteria will NOT be met. • Selected Containment Isolation Valves: closed.	*Will trip RCPs if criteria is met.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE
		• IF any faulted SG is NOT isolated, AND is NOT needed for cooldown, THEN PERFORM the following:
		  • GO TO 0POP05-EO-EO20, FAULTED STEAM GENERATOR ISOLATION, Step 1.
		  • MONITOR Critical Safety Functions.
		  • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.
			SG 1A will be faulted and ruptured.

	BOP	Completes 0POP05-EO-EO00, Addendum 5.	
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO20, Faulted Steam Generator Isolation, and to monitor Critical Safety Functions	
	BOP	Checks MSIV's and MSIB's closed.	
	BOP	CHECK If Any SG Secondary Pressure Boundary Intact: • CHECK pressures in all SGs – ANY SG PRESSURE CONTROLLED OR RISING	*SG's 'B', 'C' and 'D' pressures are 'controlled'. SG 'A' pressure is NOT controlled.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP	IDENTIFY Faulted SG(s):
		• CHECK pressure in all SGs –
		  • ANY SG PRESSURLOWERING IN AN UNCONTROLLED MANNER
		  OR
		  • ANY SG COMPLETELY DEPRESSURIZED
			SG 1A is Faulted and Ruptured.

	BOP	Isolates the faulted SG
		• Verifies all FWIV's closed.
		• Verifies all FWIB's closed.
		• Verifies all FW Preheater bypass valves closed.
		• Verifies all FW Regulating and Low Power FW Regulating Valves closed.
		• Isolates AFW flow to 'A' SG
		  • Resets SI
		  • Resets ESF load sequencers
		  • Resets SG LO-LO level AFW actuations
		  • Checks SG 1D intact
		  • Closes 'A' SG AFW OCIV
		• Verifies SG 'A' PORV closed
		• Verifies SG 'A' Blowdown and sample isolation valves closed
			SG 1D is intact.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	BOP	Check Secondary Radiation:
		• Resets SI
		• Resets SG LO-LO level AFW actuations
		• Resets SG Blowdown and Sampling Isolations
		• Notifies Chemistry to sample all SG's hourly for activity.
		• Checks the following Rad Monitors:
		  • Main Steamline
		  • SG Blowdown
		  • CARS Pump
		• WHEN SG sample results are received, THEN VERIFY SG sample activity - NORMAL
			The first 3 resets have already been done so the operator will just check that they are still reset.
			
			Radiation will indicate a need to transition to 0POP05-EO-EO30, Steam Generator Tube Rupture.

	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO30, Steam Generator Tube Rupture.	
	RO	MONITOR If RCPs Should Be Stopped:	*Will trip RCPs if criteria is met.*
	BOP	IDENTIFY Ruptured SG(s):	*SG 1A*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
		ISOLATE Flow From Ruptured SG(s): • ADJUST ruptured SG(s) PORV controller setpoint to BETWEEN 1260 PSIG AND 1265 PSIG (QDPS PRI/SEC) • CHECK ruptured SG(s) PORV controller - IN AUTO • CHECK ruptured SG(s) PORV – CLOSED • VERIFY blowdown isolation valve(s) from ruptured SG(s) –CLOSED • CHECK SG 1D(2D) – RUPTURED • CLOSE ruptured SG(s) MSIV(s) and MSIB(s)	*Manual adjustment of SG PORV 1A setpoint will be required.* *Will transition to Step 3.h.*
	BOP	MONITOR Ruptured SG(s) Level:	*SG 1A is Faulted and Ruptured. Crew will not align AFW flow.*
	SRO/BOP	CHECK Ruptured SG(s) Pressure - GREATER THAN 468 PSIG GO TO 0POP05-EO-EC31, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED, Step 1.	*SG 1A pressure by this time will have lowered to less than 468 PSIG.*
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EC31, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.	
	RO	RESET SI	
	RO	RESET SI AUTO RECIRC	
	RO	RESET ESF Load Sequencers	
	RO	RESET Containment Isolation Phase A and Phase B	
	RO	ENERGIZE MCCs And Distribution Panels Per ADDENDUM 1, MCC POWER RESTORATION	*Will contact a Plant Operator.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	RO	RESET ESF Load Sequencers Mode I Logic Per ADDENDUM 2, RESETTING ESF SEQUENCER MODE I LOGIC	*Will contact a Plant Operator.*
	RO	ESTABLISH IA To Containment: • IA pressure - GREATER THAN 95 PSIG • OPEN IA OCIV	
	RO	ENSURE SFPC In Service Within 2.5 HOURS Of Loss Of SFPC: • CHECK CCW pumps - AT LEAST TWO RUNNING • ALIGN CCW flow to SFPC heat exchanger(s) • CHECK SFPC pump - RUNNING	
	BOP	VERIFY All 13.8KV And 4.16KV AC Busses - ENERGIZED BY OFFSITE POWER	
	RO	TURN OFF All Pressurizer Heaters:	*Caution prior to this step states that PZR Heaters should not be energized prior to consulting with TSC Staff.*
	RO	MONITOR If Containment Spray Should Be Stopped:	*Containment Spray is not actuated.*
	BOP	MONITOR Ruptured SG(s) Level:	*SG 1A is Faulted and Ruptured. Crew will not align AFW flow.*

	RO	MONITOR If LHSI Pumps Should Be Stopped:
		• CHECK RCS pressure:
		  • Pressure - GREATER THAN 415 PSIG
		  • Pressure - STABLE OR RISING
		• STOP LHSI pumps and PLACE in AUTO	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**

Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes

	SRO	INITIATE Evaluation Of Plant Status:
		• CHECK MAB and FHB radiation – NORMAL
		• NOTIFY Chemistry to implement 0PCP08-AP-0003, POST-ACCIDENT SAMPLING OF LIQUIDS AND RCB ATMOSPHERE AT PASS
		• ENSURE the following ventilation systems in service:
		  • At least two CRDM ventilation fans - RUNNING
		  • At least one Reactor cavity and supports supply fan - RUNNING
		  • At least one Reactor cavity and supports exhaust fan - RUNNING	

	RO	CHECK If Charging Flow Has Been Established:
		• CCPs - AT LEAST ONE RUNNING
		• Charging flow – ESTABLISHED
		  • PERFORM the following:
		  • CLOSE charging flow control valve.
		  • ENSURE CCP discharge valves open.
		  • ENSURE normal or alternate charging isolation valve open.
		  • ENSURE charging OCIV open.
		• VERIFY pressurizer level GREATER THAN 22% [50%]
		• CONTROL charging to MAINTAIN pressurizer level BETWEEN 22% [50%] and 70% [55%]
			Will open CV-MOV-0025

	BOP	CHECK If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 2 **Event No.:** 6 and 7

Event 6 Description: Steam Generator 1A Faulted and Ruptured. **(Critical Task)**
Event 7 Description: Failures with AFW require manual alignment. **(Critical Task)**

Time	Position	Required Operator Actions	Notes
	BOP	MONITOR INTACT SG Levels: • NR levels - GREATER THAN 14% [34%] • CONTROL AFW flow to maintain NR levels BETWEEN 22% [34%] and 50%	
	ALL **(C)**	INITIATE RCS Cooldown To Cold Shutdown: a. MAINTAIN cooldown rate in RCS cold legs - LESS THAN 100_F/HR b. Shutdown margin – RCS Cb GREATER THAN OR EQUAL TO SHUTDOWN MARGIN LIMIT PER PLANT CURVE BOOK, FIGUIRE 5.5, 68ºF CURVE. BORATE RCS to GREATER THAN OR EQUAL TO shutdown margin per PLANT CURVE BOOK, FIGUIRE 5.5, 68ºF CURVE.	*Crew will start an RCS Boration using normal makeup to the RCS. Emergency boration is also acceptable.* ***CT - Initiate RCS Boration such that the Shutdown Margin will be met for cool down of the Unit per the Plant Curve Book, Figure 5.5, 68ºF curve.*** ***Terminate the scenario.***

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/BOP	**MANUALLY START AFW PUMP #13, AND/OR AFW PUMP #11 AND CROSS CONNECT, TO SUPPLY AFW TO THE INTACT SGS.**	Establish 576 gpm AFW flow to the SGs before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection.	
SRO/RO	**PERFORM AN RCS BORATION USING NORMAL MAKEUP TO THE RCS. OTHER BORATION METHODS ARE ACCEPTABLE. (I.E. EMERGENCY BORATION)**	Initiate RCS Boration such that the Shutdown Margin will be met for cooling down the Unit per the Plant Curve Book, Figure 5.5, 68ºF curve.	

TURNOVER INFORMATION

- 75% power and stable. Maintaining power at 75% due to an offsite grid issue.
- Train B Outage in progress. CCW Pump 1B, RCFCs 11B and 12B and AFW Pump #12 are OOS.
- Start-up Feed Pump #14 is OOS for scheduled maintenance.
- Cycle Burnup is 150 MWD/MTU. (BOL)
- RCS Boron Concentration is 1450 ppm.
- Boric Acid Tank 'A' is at 7315 ppm and 'B' is at 7309 ppm.
- No liquid waste discharges are in progress or planned.
- No personnel are in containment.
- FHB Truck Bay doors are closed.
- No ESF DG FOST's are on recirc.

LOT 19 NRC EXAM

OPERATING TEST #1

SCENARIO #3

Revision #0

Week of 09/30/2013

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 3** **Op-Test No.: LOT 19 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **100% Power and Stable.**

Turnover:

- **Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.**
- **Maintenance has been trouble shooting an issue with pressure fluctuations in the EHC system. Maintenance has requested that Operations start EHC Pump #12 and secure EHC Pump #11.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	NA	BOP (N) SRO (N)	Start EHC Pump #12 and secure EHC Pump #11.
2 (5 min)	OC_IAC66M 137643PICK UPCA 0.005	BOP (C) SRO (C)	CW Pump #13 trip and Discharge valve fails to close.
3 (15 min)	01-14-08 True	RO (I) SRO (I, TS)	DRPI indication for rod H6 fails both channels. (Occurs 9 minutes after Event #2)
4 (25 min)	06-04-01 0	RO (R) BOP (C) SRO (C)	Loss of load. GV #1 fails closed.
5 (35 min)	02-03-04 0.08	RO (C) SRO (C, TS)	30 GPM RCS Leak.
6 (45 min)	02-03-04 1.0	RO (M) BOP (M) SRO (M)	RCS Loop flow low on Loop D and SBLOCA (Integral to Scenario)
7 (N/A)		RO (C) SRO (C)	Auto Reactor Trip and Actuation Train C fail. Crew will have to manually trip the Reactor. **(CT)** (Integral to Scenario)
8 (N/A)		RO (C) SRO (C)	HHSI Pump 1B trip. Crew must manually start HHSI Pump 1C. **(CT)** (Integral to Scenario)

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor.**

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

Refer to the Instructor Guide for directions on Simulator Setup, Expected Booth Communications and Expected Booth Actions.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be automatically recorded during the scenario. Once the scenario is complete for each crew, printout the Critical Parameters and label the printout with date, time, Crew # and scenario #.

- Wide Range RCS Pressure
- HHSI Pump 1C Cold Leg Injection Flow
- Reactor Trip Breaker Green Light
- Loop D Low Flow Bistable

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.

2. Actions required throughout the event are indicated as "(continuous)" in the position column.

3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 1

Event Description: Start EHC Pump #12 and secure EHC Pump #11.

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Directs BOP to start EHC Pump #12 and secure EHC Pump #11 per 0POP02-EH-0001, Main Turbine Electro-Hydraulic Control System.	
	BOP	Uses 0POP02-EH-0001, Main Turbine Electro-Hydraulic Control System, Section 8 to start EHC Pump #12 and secure EHC Pump #11.	
	BOP	RECEIVE US/SM permission to transfer EHC Pumps at Power.	*Permission has been given.*
	BOP	IF this is the first start of the Standby EHC Pump OR the EHC Pump is returning from maintenance, THEN VERIFY EHC Pump Lineups are complete (Lineups 1, 3 and 4): (CP007) • "EHC SPLY PUMP 11(21)" • "EHC SPLY PUMP 12(22)"	*This start is per approved trouble shooting and performance of lineups is not required.*
	BOP	ENSURE the STBY EHC Pump Handswitch is in AUTO: • "EHC SPLY PUMP 11(21)" • "EHC SPLY PUMP 12(22)"	*Will ensure EHC Pump #11 is in AUTO.*
	BOP	START the selected EHC Pump: (CP007) • "EHC SPLY PUMP 11(21)" • "EHC SPLY PUMP 12(22)"	*Will start EHC Pump #12.*
	BOP	CHECK EHC Pumps Discharge pressure, for the EHC Pump just started, is stable between 1850 – 2100 psig as indicated on PI-6303 or PI-6303A. (EHC skid)	*Will have Plant Operator Check local EHC Pump Discharge Pressure.*
	BOP	IF pressure is LESS THAN 1850 psig, THEN EVALUATE the EHC Filter D/P and determine if the EHC Filter SHOULD be changed.	*Pressure will be within band set by procedure.*
	BOP	IF EHC Pump discharge pressure is **NOT** between 1850 – 2100 psig, THEN GO TO Section 17.0, EHC Pressure Control Adjustments during System Operation for adjustment to EHC Pump pressure compensator.	*Pressure will be within band set by procedure.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 1

Event Description: Start EHC Pump #12 and secure EHC Pump #11.

Time	Position	Required Operator Actions	Notes
	BOP	CHECK EHC System piping and valves for leaks and report results of inspection to Control Room personnel.	*Plant Operator will report that there are no EHC leaks.*
	BOP	IF MORE THAN one EHC Pump Running, THEN STOP one EHC Pump AND PLACE control switch in "AUTO": (CP007) • "EHC SPLY PUMP 11(21)" • "EHC SPLY PUMP 12(22)"	*Will stop EHC Pump #11.*
	BOP	VERIFY EHC System Pressure is stable between 1850 – 2100 psig as indicated on PI-6306 OR PI-6308. (EHC skid/ZC007) (Reference 2.8) IF EHC System Pressure is NOT met, THEN RETURN to Section 17.0.	*Pressure will be within band set by procedure.* *When the NRC Examiners are ready **Event 2** can be triggered.*
	BOP	VERIFY running EHC Pump casing drain flow indicating LESS THAN 1.5 gpm as read on respective "EHC PUMP CASING DRAIN FLOW INDICATOR": • EHC Pump 11(21) "FI-0014" (S side of EHC RSVR) • EHC Pump 12(22) "FI-0015" (N side of EHC RSVR)	*Plant Operator will report that EHC Pump #12 Casing Drain Flow is less than 1.5 gpm.*
	BOP	VERIFY EHC Reservoir level is between 1/2 and 3/4 as indicated on LI-6302. (TGB 55', EHC skid)	*Level will be within band set by procedure.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2

Event Description: Circ Water Pump #13 trips and Discharge Valve fails to close.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 09M1: CWP TRIP/FAIL START (A-3)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines that CW Pump #13 has tripped and the Discharge Valve failed to go closed.	
	SRO (continuous)	Directs actions of 0POP04-CW-0001, Loss of Circulating Water Flow.	
	BOP	CHECK Two Or More Circulating Water Pumps RUNNING.	
	BOP	CHECK All Secured/Tripped Circulating Water Pumps Discharge Valves – CLOSED IF affected circulating water pump discharge valve is NOT closed, THEN PERFORM the following: • PLACE the affected circulating water pump hand switch to STOP and RETURN to NORMAL. • IF affected circulating water pump discharge valve is still NOT closed, THEN DISPATCH operator to close valve with the local hand switch OR manually.	*CW Pump #13Discharge Valve will close when BOP takes the CW Pump #13 Handswitch to stop and back to normal.*
	BOP	START A Standby Circulating Water Pump Per Addendum 1, Circulating Water Pump Start.	
	BOP	VERIFY "SEAL WATER PRESSURE" GREATER THAN 30 psig at each CW Pump. {CWIS Pit in ZLC Cabinet Next to Pump}	*Plant Operator will verify Seal Water pressure greater than 30 psig.*
	BOP	VERIFY blue "PERM SATISFIED" light for CW pump to be started has been illuminated for GREATER THAN 2 minutes. {CP009}	
	BOP	ENSURE no change has been made to CW System (e.g., pump starts or stops, water box valve position changes, outfall vacuum breaker valve position changes) for at least 5 minutes.	*5 minutes since the CW Pump tripped.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2

Event Description: Circ Water Pump #13 trips and Discharge Valve fails to close.

Time	Position	Required Operator Actions	Notes
	BOP	(UNIT 1 ONLY) ENSURE the vacuum breaker isolation valve for the CW pump to be started is CLOSED: {CWIS} • CW Pump 11 "1-CW-0348" • CW Pump 12 "1-CW-0349" • CW Pump 13 "1-CW-0350" • CW Pump 14 "1-CW-0351"	
	BOP	START The Selected CIRCULATING WATER PUMP: {CP008} "CW PUMP 11(21)" "CW PUMP 12(22)" "CW PUMP 13(23)" "CW PUMP 14(24)"	*Will start CW Pump #14.* ***Event 3*** *will occur 9 minutes after trip of CW Pump #13.*
	BOP	ENSURE "WTRBOX INLET AND OUTLET" valves OPEN {29 ft TGB Next to Water Box Inlet/Outlet by Handrail}	
	BOP	ENSURE "CONDENSER ISOLATION" Valve To CARS Pump OPEN For Water Box(es) That Are In Service. {29 ft above condenser PIT TGB E Side of CNDSR}	
	BOP	VERIFY Locally "CW PUMP DISCHARGE MOV" For CW Pump Started Strokes FULL OPEN. {CWIS N of Respective Pump}	
	BOP	(UNIT 1 ONLY) WHEN At Least 5 Minutes Has Elapsed Since The Start Of The CW Pump, THEN ENSURE The Vacuum Breaker Isolation Valve For Operating CW Pump Is OPEN: {CWIS} • CW Pump 11 "1-CW-0348" • CW Pump 12 "1-CW-0349" • CW Pump 13 "1-CW-0350" • CW Pump 14 "1-CW-0351"	
	BOP	RETURN To Procedure Step 3.0	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 2

Event Description: Circ Water Pump #13 trips and Discharge Valve fails to close.

Time	Position	Required Operator Actions	Notes
	BOP	CHECK Only Two Circulating Water Pumps Are Running	*3 CW Pumps should be running now.*
	BOP	MONITOR Main Condenser Vacuum – GREATER THAN 21 INCHES HG	
	BOP	(UNIT 1 ONLY) MONITOR Main Condenser Vacuum • GREATER THAN 80% (1110 MWe) Power – LESS THAN 24 INCHES HG • LESS THAN OR EQUAL TO 80% (1110 MWe) Power – LESS THAN 26 INCHES HG	
	BOP	MONITOR Circulating Water Pump Motor Stator Temperature - LESS THAN 250°F {Plant Computer Display CW-10}	
	BOP	*MONITOR* Circulating Water Pump Motor Bearing Temperature - LESS THAN 200°F {Plant Computer Display CW-10}	
	BOP	DISPATCH Plant Operator To MONITOR Circulating Water Pump For Surging And Vibration	
	BOP	CHECK Running Circulating Water Pump Discharge Pressure Minimum Of 3(2) psig {Plant Computer Display CW-01}	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 3

Event Description: DRPI indication for rod H6 fails (both channels).

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 05M3: RPI TRBL (A-5) ROD SUPV MNTR ROD POSITION TRBL (D-5) ROD BOTTOM (F-4)	*RO uses annunciator response procedures.*
	SRO/RO	Determines that both DRPI channels for rod H6 have failed.	
	SRO (continuous)	Directs actions of 0POP09-AN-05M3, Window A-5, RPI TRBL and Window D-5, ROD SUPV MNTR ROD POSITION TRBL.	*NOTE: 0POP09-AN-05M3, Window A-5, RPI TRBL, will provide the best guidance. Window D-5, ROD SUPV MNTR ROD POSITION TRBL, will send the crew to Window A-5.*
	RO	CHECK the following DRPI panels to determine the type of DRPI system failure: a) Display Panel. {CP005} b) Control Panel. {In the back of CP005}	*Panel in back of CP005 is not modeled. If RO checks panel in back of CP005 a cue will be provided.*
	SRO	CONTACT I&C to assist in diagnosis.	
	RO	IF DRPI non-urgent alarm for Data A or B failure, THEN SELECT "A" ONLY OR "B" ONLY position on the DRPI panel to determine rod position.	*This action may be performed early, however, an Urgent Alarm is indicated.*
	RO	VERIFY control rods are within 12 steps of the step counter demand position.	*Will not be able to determine position of Rod H6 due to Urgent Failure.*
	SRO	IF any control rod is misaligned greater than 12 steps from the step counter demand position, THEN GO TO 0POP04-RS-0001, Control Rod Malfunction.	*Only Rod indication has failed.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 3

Event Description: DRPI indication for rod H6 fails (both channels).

Time	Position	Required Operator Actions	Notes
	SRO	TAKE appropriate action per Technical Specifications. TS 3.1.3.2. Action a. for one rod on DRPI not indicating.	*SRO will check TS.* ***Most Limiting Condition:*** *Determine the position of the non-indicating rod(s) indirectly by the movable incore detectors or a core power distribution measurement at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or reduce power to less than 50% within 8 hours.* ***Event 4*** *can be triggered after SRO has checked TS.*
	SRO	INITIATE a Condition Report to investigate and correct cause.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4

Event Description: Main Turbine Governor Valve #1 fails closed.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 05M2: T REF/AUCT T AVG DEV (E-6)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines that Main Turbine Governor Valve #1 has failed closed.	
	SRO (continuous)	Directs actions of 0POP04-TM-0001, Turbine Load Rejection.	
	BOP	CHECK Rod Control System –IN AUTOMATIC	
	RO	MONITOR Rod Control System Responding To RCS TAVG/TREF Deviation By Ensuring The Following: Control Rods Are Inserting AND RCS • Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4

Event Description: Main Turbine Governor Valve #1 fails closed.

Time	Position	Required Operator Actions	Notes

	BOP	MONITOR Steam Dump Valves Responding To RCS TAVG/TREF Deviation By Ensuring The Following:
		• Steam Dumps Are Open AND RCS Tavg trending to within 3°F of Tref
		OR
		• RCS Tavg within 3°F of Tref
		(RNO)
		Manually CONTROL Steam Dumps to maintain RCS Tavg within 3°F of Tref as follows:
		• TRANSFER Steam Dumps to Pressure Mode.
		  • PLACE Steam Dump "HDR PRESS CONT" PK-0557 in MANUAL.
		  • ADJUST Steam Dump Controller PK-0557 Output to approximately match indicated demand on "DEMAND" UI-555.
		  • PLACE Steam Dump MODE SEL SWITCH to "STM PRESSURE" position.
		  • ADJUST Steam Dump Controller Potentiometer setpoint to current Steam Header pressure setting. REFER TO Addendum 2, Steam Dump Controller (PK-0557) Potentiometer Settings.
		  • PLACE Steam Dump Controller PK-0557 in "AUTO".
		  • *MONITOR* Steam Dumps for proper operation in Steam Pressure Mode.
		  • *MAINTAIN* RCS Temperature within 3°F of Tref by adjusting Steam Dump Controller Potentiometer.
			Not enough load reject to arm Steam Dumps, however, crew may elect to go to Steam Pressure MODE on the Steam Dumps

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4

Event Description: Main Turbine Governor Valve #1 fails closed.

Time	Position	Required Operator Actions	Notes
	SRO	DETERMINE Amount Of Boric Acid To Add To Reduce Reactor Power To Desired Level As Follows (Reference 8): • Current Reactor Power • Current Turbine Load • Amount of Boric Acid required to match current Reactor Power to current Turbine Load.	*Turbine Load will reduce about 7%. Crew may add about 70 to 100 gallons of boric acid at this time to allow rods to be withdrawn depending on Delta I indications.*
	RO	COMMENCE RCS Boration	
	RO	Energize Pressurizer Heaters As Necessary For Boron Equalization	
	RO	CHECK Pressurizer Pressure Within The Following: • Trending to between 2220 psig and 2250 psig OR • Between 2220 psig and 2250 psig	
	RO	CHECK Pressurizer Level Within The Following. REFER TO Addendum 1, Pressurizer Level Table • Trending to Program Level OR • At Program Level	
	BOP	CHECK Steam Generator NR Level Within The Following: • Trending to between 68% and 74% OR • Between 68% and 74%	
	BOP	MAINTAIN Main Generator Reactive Load (VARs) Within The following: • Less Than 300 MVARs • Guidelines Of The Plant Curve Book	*When the NRC Examiners are ready **Event 5** can be triggered.*
	RO	CHECK RCS Tavg - WITHIN 1.5°F OF TREF	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 4

Event Description: Main Turbine Governor Valve #1 fails closed.

Time	Position	Required Operator Actions	Notes

	BOP	CHECK Steam Dump Status:
		• CHECK Steam Dumps – IN RCS TAVG MODE
		• MONITOR the following:
		  • UI-0555 - AT MINIMUM DEMAND
		  • Steam Dumps – CLOSED
		• RESET Steam Dump Controller (C-7) by momentarily placing the Steam Dump "MODE SEL" Switch to the "RESET" position {CP007}
		• CHECK PERM Lampbox 5M24 Window D2 "C7 TURB IMP PRESS STM DUMP PERMISSIVE" extinguished {CP005}
		• CHECK the "STEAM DUMP UNBLOCK AVAILABLE" light extinguished {CP007}	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 5

Event Description: 30 GPM leak from the RCS at the high pressure flow tap for Loop D.

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces RM-011 Alert and High alarm for RT-8011.	*RO acknowledge RM-011 Rad Monitor Alarms.*
	SRO/RO	Determines there is an RCS leak of about 30 gpm.	
	SRO (continuous)	Directs actions of 0POP04-RC-0003, Excessive RCS Leakage.	
	RO	MAINTAIN Pressurizer Level On Program Level: • LOWER letdown flow • RAISE charging flow • START additional charging pump	
	RO	MAINTAIN VCT Level – GREATER THAN 15% WITH CHARGING PUMP SUCTION ALIGNED TO VCT {CP004} • Auto makeup OR • Manual makeup	
	SRO/RO	CHECK Trends For Any Of The Following Indications Of RCS Leakage: • Rad Monitor RT8011 Particulate – Rising • Reactor Coolant Drain Tank Level – Rising • Pressurizer Relief Tank Level – Rising • RCB Normal Sump Level – Rising	*It will be evident that the RCS leakage is in Containment. The CIP of the procedure will allow the Unit Supervisor to transition directly to Addendum #3, RCS Leakage in Containment*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 5

Event Description: 30 GPM leak from the RCS at the high pressure flow tap for Loop D.

Time	Position	Required Operator Actions	Notes
	SRO/RO	PERFORM One Of The Following To Determine The RCS Leak Rate: • 0PSP03-RC-0006, Reactor Coolant Inventory OR • DETERMINE the RCS leak rate using pressurizer level, VCT level, and comparing charging and letdown flows TS 3.4.6.2.b or d Action b	*The RCS leak is about 30gpm. The Unit Supervisor will need to check Technical Specifications but may not have time prior to the next event. If not, then the NRC Examiner will ask the Unit Supervisor about the TS after the conclusion of the Scenario.* ***Most Limiting Condition:*** *Reduce leakage to within limits within 4 hours or be in at least HOT STANBY within the next 6 hours.* ***Event 6, 7 & 8*** *will occur on a time delay after the start of Event 5.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 5

Event Description: 30 GPM leak from the RCS at the high pressure flow tap for Loop D.

Time	Position	Required Operator Actions	Notes
	SRO	NOTIFY Health Physics Of The Problem AND REQUEST Assistance	*Addendum 3 Steps for RCS leakage in containment.*
	RO	DISPATCH An Operator To The RCB To Attempt To IDENTIFY The Source Of The RCS Leakage	
	RO	CHECK RCP Seal Parameters – NORMAL: • Individual RCP injection flow • Seal inlet Temperature • Seal Injection Filter differential pressure	

	RO	REMOVE Normal Letdown And Charging From Service: {CP004}
		• CLOSE FV-0011 "LTDN ORIF HDR
		• ISOL" valve
		• CLOSE FCV-0205, "CHG FLOW
		• CONT VLV"
		• OPEN Centrifugal Charging Pump
		• miniflow valve for operating pump:
		  • CCP 1A(2A) "RECIRC FCV-0201"
		  • CCP 1B(2B) "RECIRC FCV-0202"
		• ADJUST HCV-0218, to maintain RCP seal injection flow – BETWEEN 6 AND 13 GPM
		• CLOSE orifice isolation valves
		  • CV-FV-0012 (120-150 gpm)
		  • CV-FV-0013 (85-100 gpm)
		  • CV-MOV-0014 (25-30 gpm)
		• CLOSE LCV-0465 and LCV-0468 "LETDN ISOL" valves
		• CLOSE MOV-0025 "OCIV" Charging valve	

	RO	PLACE Excess Letdown In Service Per 0POP02-CV-0004, Chemical And Volume Control System Subsystem	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 6/7/8

Event 6 Description: SBLOCA from the RCS at the high pressure flow tap for Loop D and the Reactor fails to Automatically Trip.
Event 7 Description: The Reactor fails to Automatically Trip. **(CT)**
Event 8 Description: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 05M2: RC LOOP 4 FLOW LO RX PRETRP (A-4)	*BOP uses annunciator response procedures but also realizes that immediate action needs to be performed because the reactor did not trip.*
	SRO/RO (C)	A SBLOCA will occur that will warrant a Reactor Trip and Safety Injection, however, the Reactor will not automatically trip. The RO will have to manually trip the Reactor.	***Event 7*** *is integral to the scenario.* ***CT - Manually trips the Reactor from the Control Room before completing Step 1 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.***
	SRO (continuous)	Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection.	
	RO/BOP	Completes immediate actions of EO00. Reactor Trip/SI: • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated or will perform a manual SI due to degrading conditions.	*RO will announce status of immediate action steps as he/she performs them.* *BOP Operator will monitor the plant and make an announcement of the Reactor trip.*
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	*Before beginning the verification of immediate actions, the US may direct the BOP operator to throttle AFW flow to limit RCS cooldown.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 6/7/8

Event 6 Description: SBLOCA from the RCS at the high pressure flow tap for Loop D and the Reactor fails to Automatically Trip.
Event 7 Description: The Reactor fails to Automatically Trip. **(CT)**
Event 8 Description: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(CT)**

Time	Position	Required Operator Actions	Notes

	SRO/BOP (C)* *** denotes critical item**	Directs BOP to perform Addendum 5, Verification of SI Equipment Operation
		• FW Isolation
		• Check for Steamline Isolation
		• AFW Status
		  • Start Train C AFW and open the OCIV
		• Phase 'A' Containment Isolation
		  • Close CV-MOVs-0023 and 0077
		• ECW and CCW
		  • Start Train C ECW, CCW, RCFCs and transfer Train C RCFC cooling to CCW
		• Containment Cooling
		• ***ECCS pump and valve status***
		  • Start Train C ***HHSI*** and LHSI Pumps
		• Containment Ventilation Isolation
		• HVAC systems (CR/EAB/FHB)
		  • Actuate Train C CRE and FHB HVAC
		  • Start Train A ECCS Fans and AFW Pump Fans (these pumps were tagged out so fans did not start)
			Event 8 *is integral to the scenario.*
			
			CT - Establish flow from at least one HHSI Pump before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection, during a SBLOCA when RCS pressure remains between 400 psig and 1680 psig

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 6/7/8

Event 6 Description: SBLOCA from the RCS at the high pressure flow tap for Loop D and the Reactor fails to Automatically Trip.
Event 7 Description: The Reactor fails to Automatically Trip. **(CT)**
Event 8 Description: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO/RO	Check plant status: • Containment pressure: normal • RCP Seal cooling: 6-13 gpm • RCS cooldown: at or trending to 567°F • Pzr PORV and Spray valve status: closed • Excess Letdown Isol Valves: closed • Monitor RCP trip criteria to determine if RCP's should be stopped. • Selected Containment Isolation Valves: closed.	*Stops RCPs if criteria is met.*
	SRO/RO	CHECK If SG Secondary Pressure Boundary Intact.	*No SG is Faulted.*
	SRO/RO	CHECK If SG Tubes Are Intact.	*All SG Tubes are intact.*
	SRO/RO	CHECK If RCS Is Intact: • Containment radiation – NORMAL • Containment pressure – NORMAL • Containment wide range water level – NORMAL GO TO 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	*May not complete until after transition to EO10.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 6/7/8

Event 6 Description: SBLOCA from the RCS at the high pressure flow tap for Loop D and the Reactor fails to Automatically Trip.
Event 7 Description: The Reactor fails to Automatically Trip. **(CT)**
Event 8 Description: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, and to monitor Critical Safety Functions	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pumps - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG • STOP all RCPs	*Stops RCPs if criteria are met.*

	BOP	DEPRESSURIZE Intact SGs To 1000 PSIG
		• CHECK RCS pressure - GREATER THAN 415 PSIG
		• CHECK pressurizer pressure LESS THAN 1985 PSIG
		• BLOCK Low Steamline Pressure SI
		• CHECK condenser – AVAILABLE
		• CHECK steam dump in steam pressure mode
		  • PLACE steam dump controller in MANUAL with zero demand.
		  • ADJUST "HDR PRESS CONT PK-0557" setpoint to BETWEEN 7.0 (980 PSIG) and 7.1 (994 PSIG).
		  • PLACE steam dump "MODE SEL" switch in the STEAM PRESS position.
		  • DEPRESSURIZE intact SGs to BETWEEN 980 PSIG and 994 PSIG using steam dumps in MANUAL.
		  • GO TO Step i.
			If Main Steam Isolation has occurred then the crew will use the SG PORVs to perform the SG depressurization.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 3 **Event No.:** 6/7/8

Event 6 Description: SBLOCA from the RCS at the high pressure flow tap for Loop D and the Reactor fails to Automatically Trip.
Event 7 Description: The Reactor fails to Automatically Trip. **(CT)**
Event 8 Description: Actuation Train C will fail on the Reactor trip. When SI is actuated, HHSI Pump 1B will trip right after it starts on over current. With no HHSI pumps running, the crew will have to manually start HHSI Pump 1C to supply ECCS flow during the SBLOCA. **(CT)**

Time	Position	Required Operator Actions	Notes
	BOP	• CHECK RCS TAVG - LESS THAN 563ºFCHECK RCS TAVG - LESS THAN 563ºF • PLACE steam dump "INTLK SEL" switches to BYPASS INTERLCK. • ENSURE "HDR PRESS CONT PK-0557" in AUTO • VERIFY steam dumps controlling SG pressures LESS THAN OR EQUAL TO 994 PSIG • ADJUST intact SG PORV controller setpoints to BETWEEN 995 PSIG and 1000 PSIG (QDPS PRI/SEC). • ENSURE SG PORV controllers in AUTO.	***Terminate the scenario.***

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**MANUALLY TRIP THE REACTOR.**	Manually trips the Reactor from the Control Room before completing Step 1 of 0POP05-EO-EO00, Reactor Trip or Safety Injection.	
SRO/BOP	**MANUALLY START HHSI PUMP 1C TO SUPPLY ECCS FLOW DURING THE SBLOCA.**	Establish flow from at least one HHSI Pump before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection, during a SBLOCA when RCS pressure remains between 400 psig and 1680 psig.	

TURNOVER INFORMATION

- Reactor Power is at 100% Power and Stable.
- Maintenance has been trouble shooting an issue with pressure fluctuations in the EHC system. Maintenance has requested that Operations start EHC Pump #12 and secure EHC Pump #11.
- Train ‘A’ Outage is in progress: HHSI & LHSI Pumps 1A, AFW Pump #11 and SI-MOV-0016A are OOS.
- Cycle Burnup is 150 MWD/MTU. (BOL)
- RCS Boron Concentration is 1362 ppm.
- Boric Acid Tank ‘A’ is at 7315 ppm and ‘B’ is at 7309 ppm.
- No liquid waste discharges are in progress or planned.
- No personnel are in containment.
- FHB Truck Bay doors are closed.
- No ESF DG FOST’s are on recirc.

LOT 19 NRC EXAM

OPERATING TEST #1

SCENARIO #4

Revision #0

Week of 09/30/2013

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: 4** **Op-Test No.: LOT19 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **Unit 1 just completed a 30 day outage. A Plant Startup is in progress and Reactor Power is currently at 12% to 14% and stable.**
- **The Unit is at step 6.38 of 0POP03-ZG-0005, Plant Startup to 100%, ready to perform OPC Test on Main Turbine.**

Turnover:

- **Condensate Pump #13 and CL-ACW Pump #13 are OOS.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	(N/A)	BOP (N) SRO (N)	Perform OPC Test on Main Turbine and then continue with Plant Startup.
2 (5 min)	01-37-01 True	RO (I) SRO (I, TS)	Intermediate Range Channel NI 35 fails low. (Integral to Scenario)
3 (10 min)	05-14-01 0.845	BOP (C) SRO (C)	Steam Header PT-0557 fails high.
4 (20 min)	Q1L013_TC_52_BC047GTA_SWIT1 True	RO (C) SRO (C, TS)	E1C11 Battery Charger #1 failure with loss of 125VDC power to Train 'C' Class 1E 4.16KV Bus Control Power.
5 (35 min)	08-23-01 True	BOP (C) SRO (C)	Condensate Pump #11 Trips and Condensate Pump #12 will not start.
6 (N/A)	50-HH-04 0.35	RO (M) BOP (M) SRO (M)	LBLOCA. (Integral to Scenario)
7 (N/A)		RO (C) SRO (C)	LHSI Pumps 1A & 1B fail to Auto Start. **(CT)** (Integral to Scenario)
8 (N/A)		RO (C) SRO (C)	The auto swap over to cold leg recirculation will fail and the crew will have to manually align. **(CT)** (Integral to Scenario)

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor.**

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

Refer to the Instructor Guide for directions on Simulator Setup, Expected Booth Communications and Expected Booth Actions.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be automatically recorded during the scenario. Once the scenario is complete for each crew, printout the Critical Parameters and label the printout with date, time, Crew # and scenario #.

- Wide Range RCS Pressure
- LHSI Pump 1A Cold Leg Injection Flow
- LHSI Pump 1B Cold Leg Injection Flow
- SI-MOV-0016 A,B,C Valve Position
- RWST Level

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.

2. Actions required throughout the event are indicated as "(continuous)" in the position column.

3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 1

Event Description: Start Perform OPC test on Main Turbine and then continue with Plant Startup.

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Uses 0POP03-ZG-0005, Plant Startup to 100%, to perform the Main Turbine OPC System test. Will start at step 6.38.	
	BOP	ENSURE CONTROL MODE SELECT is in the "OPER AUTO" mode. {CP007}	
	BOP	DEPRESS the "GOV VLV LIMIT CONT" raise pushbutton until the governor valve position limit indicates 100%. {CP007}	
	BOP	TURN the "OVERSP PROT CONT" three-position keyswitch counter-clockwise to the "TEST" position. {CP007} (Refer to Figure 3, 0POP01-TM-0001)	*BOP may refer to Figure 3, 0POP01-TM-0001*
	BOP	OBSERVE all Main Turbine Governor and Intercept Valves close rapidly. {CP007 or locally}	
	BOP	TURN the "OVERSP PROT CONT" Three-position keyswitch to the "IN SVC" position. {CP007}	
	BOP	OBSERVE all Main Turbine Governor and Intercept Valves open. {CP007 or locally}	*OPC testing is completed with this step.* ***Event 2*** *will be triggered when the Main Turbine is tripped in next step.*
	BOP	DEPRESS the "TURB TRIP" pushbutton. {CP007}	
	BOP	VERIFY the following valves closed: {CP007 or locally} • All Reheat Stop and Intercept Valves • Main Turbine Governor Valves • Extraction Steam Block Valves	
	BOP	DEPRESS the "GOV VLV LIMIT CONT" lower pushbutton until the valve position limit indicates 0%. {CP007}	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 2

Event Description: Intermediate Range Channel NI 35 fails low. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 05M3: IR HI VOLT FAIL (F-2)	*RO uses annunciator response procedures.*
	SRO/RO	Determines that Intermediate Range Channel NI 35 has failed low.	
	SRO (continuous)	Directs actions of 0POP04-NI-0001, Nuclear Instrument Malfunction.	
	RO	CHECK Power Range Nuclear Instruments - NORMAL	*No Power Range failures.*
	RO	CHECK Source Range Nuclear Instruments - NORMAL	*No Source Range failures.*
	RO	CHECK Intermediate Range Nuclear Instruments – NORMAL GO TO Addendum 2, Intermediate Range Nuclear Instrumentation Malfunction.	*Intermediate Range Channel NI 35 failed low.*
	RO	CHECK Intermediate Range Trip – BLOCKED	
	RO	CHECK Reactor Power - GREATER THAN P-6 (10^{-10} IR amps)	
	RO	CHECK Reactor Power - GREATER THAN 10%	
	RO	BYPASS The Malfunctioning Intermediate Range Channel By Placing The "LEVEL TRIP" Switch In BYPASS {CP011}	*This action is performed at the NI Panel.*
	RO	VERIFY Reactor Shutdown – IN PROGRESS GO TO Addendum 2 Step 9.0	
	RO	INITIATE A Condition Report To Repair the Inoperable Channel	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 2

Event Description: Intermediate Range Channel NI 35 fails low. (Integral to Scenario)

Time	Position	Required Operator Actions	Notes
	SRO	TAKE appropriate action per Technical Specifications. TS 3.3.1.5 & 19.a Action 3 & Action 8	*SRO will check TS.* ***Most Limiting Condition:*** *When Reactor Power is below 10% power then the Intermediate Range Channel has to be repaired prior to allowing Reactor Power to go above 10% power.* *NOTE: Action does not apply at the current power level.* ***Event 3*** *can be triggered after the SRO has checked TS.*
	SRO	ENSURE An OAS Log Entry Has Been Made Indicating The Technical Specification Surveillance(s) To Be Performed Prior To Returning The Out Of Service Channel To Service	
	SRO	REVIEW 0PGP03-ZO-0042, Reactivity Management Program	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3

Event Description: Steam Header PT-0557 fails high.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 04M8: PRZR DNBR PRESS LOW (B-5)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines that Steam Header PT-0557 has failed high.	
	SRO (continuous)	Directs actions of 0POP04-MS-0001, Excessive Steam Demand.	
	BOP	CHECK Reactor Power – LESS THAN OR EQUAL TO 100%	

	BOP	IDENTIFY And ISOLATE Steam Leak:
		• CHECK Condenser Steam Dump Valves – CLOSED
		(RNO)
		• IF Steam Dump(s) failed open, THEN PERFORM the following:
		  • IF Steam Dumps are operating improperly in AUTO for low power in Steam Pressure Mode, THEN PERFORM the following:
		  • PLACE Steam Dump "HDR PRESS CONT" PK-0557 in MANUAL.
		  • Manually ADJUST Steam Dumps to maintain RCS Tavg within 3ºF of Tref.
		GO to Step 3.0
			Failure high of PT-0557 will cause Steam Dumps to open. BOP will have to take manual control of Steam Dumps to control Tavg.
			
			NOTE: If PZR level goes below 17% letdown will isolate and the crew will have to isolate charging. If RCS temperature goes below 561ºF for more than 15 minutes the crew will have to be in Hot STANBY within the next 15 minutes. (TS 3.1.1.4)

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 3

Event Description: Steam Header PT-0557 fails high.

Time	Position	Required Operator Actions	Notes

	BOP	EVALUATE Unit Shutdown As Follows:
		• DETERMINE if unit shutdown or load reduction is warranted based on the following criteria:
		  • Size of leak
		  • Location of leak
		  • Rate of depletion of secondary inventory
		  • Will a Turbine Trip isolate Steam Leak OR will MSIVs need to be closed to isolate leak
		• CHECK Unit Shutdown or Load Reduction – REQUIRED
		(RNO)
		• PERFORM the following:
		  • MAINTAIN present plant conditions until leak can be isolated or repaired.
		  • GO TO the appropriate plant procedure as directed by the Shift Manager/Unit Supervisor.
			*When the NRC Examiners are ready **Event 4** can be triggered.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4

Event Description: E1C11 Battery Charger #1 will fail with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV ESF Bus.

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 03M2: 125V DC SYSTEM E1C11 TRBL (D-1)	*RO uses annunciator response procedures.*
	SRO/RO	Determines that E1C11 Battery Charger #1 failed with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV and 480V ESF Bus.	*There are no procedure steps to cover the loss of control power to the Train C Class 1E 4.16KV ESF Bus.* *If the SRO calls Electrical Maintenance for assistance the control power can be restored but only after manually starting a LHSI Pump for Event #7*
	SRO (continuous)	Directs actions of 1POP09-AN-03M2, Window D-1, 125V DC SYSTEM E1C11 TRBL.	
	RO	VERIFY the following "BUS E1C11 TRN C-CH IV" Control Room indications: {CP003} • Bus voltmeter "VOLTS" indicates between 124 and 140 VDC. • Bus ammeter "BATT CUR" indicates less than 200 amps charge/discharge. • Battery charger ammeter "BATT CHG 1 CUR" and "BATT CHG 2 CUR" indicates less than 300 amps.	
	RO	IF E1C11 Bus is de-energized, THEN GO TO 0POP04-DJ-0001, Loss of Class 1E 125 VDC Power.	*E1C11 Bus is not de-energized.*
	RO	CHECK the following Plant Computer points to determine cause of alarm: • DJQD0014 CGR 1 • DJZD0045 CGR 1 BKR • DJQD0015 CGR 2 • DJZD0046 CGR 2 BKR • DJQD0016 SWBD	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4

Event Description: E1C11 Battery Charger #1 will fail with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV ESF Bus.

Time	Position	Required Operator Actions	Notes
	RO	DISPATCH an Operator to determine the cause of alarm by checking the following: • "125V DC BATT CHGR E1C11-1 E1C1/Q2R" breaker position. {60 ft EAB Rm. 318} • "125V DC BATT CHGR E1C11-2 E1C2/H4L" breaker position. {60 ft EAB Rm. 318} • Battery Charger E1C11-1 output DC "VOLTMETER" value. {60 ft EAB Rm. 319} • Battery Charger E1C11-2 output DC "VOLTMETER" value. {60 ft EAB Rm. 319} • Battery chargers red "GROUND" light. {60 ft EAB Rm. 319} • E1C11 Main Bus Voltmeter value. {60 ft EAB Rm. 319} • E1C11 switchboard for tripped breakers. {60 ft EAB Rm. 319}	
	RO	IF battery voltage is NOT between 106 and 140 VDC, THEN DIRECT an Operator to PERFORM the following: • ENSURE "125V BATT E1C11 TO 125V DC SWBD E1C11"E1C11/1B" breaker open. {60 ft EAB Rm. 319} • WHEN ready to restore E1C11 Battery to 125V DC SWBD E1C11, THEN RESTORE per 0POP02-EE-0001, ESF (Class 1E) DC Distribution System.	*E1C11 DC volts will be within this range.*
	RO	IF battery voltage is less than 126 VDC or greater than 137.3 VDC, THEN DIRECT an Operator to place the standby battery charger in service per 0POP02-EE-0001, ESF (Class 1E) DC Distribution System.	*E1C11 DC volts will be below 126 VDC.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4

Event Description: E1C11 Battery Charger #1 will fail with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV ESF Bus.

Time	Position	Required Operator Actions	Notes
	RO	IF a Class 1E battery is realigned to an operating battery charger in less than or equal to 15 minutes AND only up to one battery cell is jumpered out, THEN VERIFY the operating battery charger normal float voltage is greater than or equal to 128.5 VDC. (Reference 8, 13, 14, 17)	*E1C11 does not have any battery cells jumpered out.*
	RO	IF a Class 1E battery is NOT realigned to an operating battery charger within 15 minutes OR more than one battery cell is jumpered out, THEN PERFORM the section for Class 1E Battery Operability Following a Discharge Transient in 0POP02-EE-0001, ESF (Class 1E) DC Distribution System. (Reference 9, 13, 14)	
	RO	IF Train C 4.16 KV ESF Bus is de-energized AND Channel IV battery bank has a jumpered cell, THEN PERFORM the following: • DISPATCH an operator to shed the Channel IV (EIV-1204) loads by opening below listed breakers on 120 VAC Vital Distribution Panel 1204 within 30 minutes of initiation of the event: • "120 VAC Vital Distribution Panel 3E241EDP1204" – Breakers 1 through 6, 8 and 22 • WHEN ready to restore to normal, THEN RESTORE per 0POP02-AE-0004, 120 VAC ESF Vital Distribution Power Supplies.	*E1C11 Bus is not de-energized.*
	RO	IF bus current is greater than or equal to 200 amps OR battery charger current is greater than or equal to 300 amps, THEN CONTACT Electrical Maintenance for assistance in determining the cause.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 4

Event Description: E1C11 Battery Charger #1 will fail with a loss of 125VDC Control Power to Train 'C' Class 1E 4.16KV ESF Bus.

Time	Position	Required Operator Actions	Notes
	RO	IF a ground is indicated, THEN DIRECT an Operator to isolate equipment as directed by the Unit/Shift Supervisor to attempt to isolate the fault. REFER TO 0POP01-ZO-0009, Ground Isolation.	*There is not a ground on the E1C11 Bus.*
	SRO	TAKE appropriate action per Technical Specifications. TS 3.8.1.1.b Action b (ESF DG #13) TS 3.8.2.1.d Action a (E1C11 Battery)	*SRO will check TS.* ***Most Limiting Condition:*** *Perform 0PSP03-AE-0002, ESF Power Availability within 1 hour.* *Restore E1C11 battery within 2 hours or apply the requirements of the CRMP.* *NOTE: If E1C11 Battery Charger #2 is placed in service within 15 minutes of Battery Charger #2 failure, then E1C11 Battery can be declared operable and both TS actions exited.* ***Event 5*** *can be triggered after SRO has checked TS.*
	SRO	INITIATE a CR to document faulted conditions and to repair the faulted condition.	
	RO	WHEN desired to return system to normal after repair, THEN PERFORM applicable section of 0POP02-EE-0001, ESF (Class 1E) DC Distribution System OR 0POP02-AE-0004, 120 VAC ESF Vital Distribution Power Supplies.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 5

Event Description: Condensate Pump #12 will trip and Condensate Pump #11 will not start.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 09M1: COND PMP TRIP (A-1)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines that Condensate Pump #11 tripped.	
	SRO (continuous)	Directs actions of 0POP04-CD-0001, Loss of Condensate Flow. Specifically the actions of the CIP for a loss of all Condensate Pumps.	
	BOP	CHECK Required number of Condensate Pumps Running: • LESS THAN 50% RTP – One Condensate Pump • GREATER THAN 50% RTP – Two Condensate Pumps **(RNO)** • IF a Standby Condensate Pump is available AND DOES NOT require venting prior to start, THEN PERFORM the following: • START Standby Condensate Pump.	*Condensate Pump#12 will fail to start and Condensate Pump #13 is not available. This will send the SRO to the CIP.* *Standby Condensate Pumps are normally kept vented.*

	BOP	IF Loss of all Condensate Pumps, THEN PERFORM the following:
		• START a Standby Condensate Pump AND OPEN Discharge Valve
		• IF a Condensate Pump can NOT be started, THEN PERFORM the following:
		  • TRIP the Reactor
		  • ENSURE Turbine Trip
		  • ENSURE MSIVs and MSIBs Closed
		  • ENSURE S/U SGFP in PTL
		  • TRIP all SGFP(s)
		  • TRIP all FWBP(s)
		  • GO TO 0POP05-EO-EO00, Reactor Trip or Safety Injection
			When the Reactor is tripped, ***Event 6,7 & 8*** *will occur.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: Auto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection, and directs the crew to perform their immediate actions.	*LBLOCA will also initiate an SI.*
	RO/BOP	Completes immediate actions of EO00. Reactor Trip/SI: • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated or will perform a manual SI due to degrading conditions.	*RO will announce status of immediate action steps as he/she performs them.* *BOP Operator will monitor the plant and make an announcement of the Reactor trip.*
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	*Before beginning the verification of immediate actions, the US may direct the BOP operator to throttle AFW flow to limit RCS cooldown.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: Auto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes

	SRO/BOP (C)*
	 *** denotes critical item**
		Directs BOP to perform Addendum 5, Verification of SI Equipment Operation
		• FW Isolation
		• Check for Steamline Isolation
		• AFW Status
		• Phase 'A' Containment Isolation
		• ECW and CCW
		• Containment Cooling
		• ***ECCS pump and valve status***
		  • **Start LHSI Pumps 1A and 1B**
		• Containment Ventilation Isolation
		• HVAC systems (CR/EAB/FHB)
		  • Stop Train C EAB HVAC
		  • Start Train C ECCS Fans
		  • Start Train C AFW Fan
			Event 7 *is integral to the scenario.*
			
			CT - Manually start at least one LHSI Pump before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection, during a LBLOCA when RCS pressure is less than 400 psig.
			
			NOTE: If the crew had earlier notified E/M about the loss of control power to Train C 4.16 KV ESF Buses then at this time the crew can be notified that the problem has been corrected and control power can be restored. See Expected Booth Communications.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO/RO	Check plant status: • Containment pressure: normal • RCP Seal cooling: 6-13 gpm • RCS cooldown: at or trending to 567°F • Pzr PORV and Spray valve status: closed • Excess Letdown Isol Valves: closed • Monitor RCP trip criteria to determine if RCP's should be stopped: criteria will NOT be met. • Selected Containment Isolation Valves: closed.	*Secure RCPs due to Phase B.*
	SRO/RO	CHECK If SG Secondary Pressure Boundary Intact.	*No SG is Faulted.*
	SRO/RO	CHECK If SG Tubes Are Intact.	*All SG Tubes are intact.*
	SRO/RO	CHECK If RCS Is Intact: • Containment radiation – NORMAL • Containment pressure – NORMAL • Containment wide range water level – NORMAL GO TO 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	*Will not transition to FRZ1 or FRP1 until Addendum 5 is complete.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-FRP1, Response to Imminent Pressurized Thermal Shock Condition.	*Entry in to the following two procedures will be dependent on CSF status.*
	RO	CHECK RCS pressure - GREATER THAN 415 PSIG IF LHSI pump flow GREATER THAN 415 PSIG 500 GPM, THEN RETURN TO procedure step in effect.	*Conditions will allow exit from FRP1.*
	SRO (continuous)	Informs crew of transition to 0POP05-EO-FRZ1, Response to High Containment Pressure.	

	RO	VERIFY Containment Spray – ESTABLISHED
		• Containment Pressure LESS THAN 56.5 PSIG.
		• At least one Containment Spray pump –RUNNING
		  • Discharge valve OPEN
		  • FLOW indication
		• RETURN TO procedure step in effect and PERFORM this procedure as time permits.
			Conditions will allow exit from FRZ1.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, and to monitor Critical Safety Functions	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pumps - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG • STOP all RCPs	*RCPs should already be stopped because of Phase B.*
	BOP	DEPRESSURIZE Intact SGs To 1000 PSIG • CHECK RCS pressure - GREATER THAN 415 PSIG **(RNO)** • GO TO Step 3.	*LBLOCA*

	BOP	MONITOR If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE	

	RO	RESET SI	
	RO	RESET ESF Load Sequencers	
	RO	RESET Containment Isolation Phase A	
	RO	RESET Containment Isolation Phase B	
	BOP	MONITOR INTACT SG Levels: • NR levels - GREATER THAN 14% [34%] • CONTROL AFW flow to maintain NR levels BETWEEN 22% [34%] and 50%	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes

	BOP	CHECK Secondary Radiation:
		• PERFORM the following:
		  • RESET SG LO-LO level AFW actuations
		  • RESET SG blowdown and sample isolations
		  • NOTIFY Chemistry to sample all SGs for activity
		• PERFORM the following:
		  • MONITOR secondary systems listed below radiation levels – NORMAL
		  • Main steamline radiation - NORMAL
		  • SG blowdown radiation - NORMAL
		  • CARS pump(s) radiation – NORMAL
		• MONITOR SG sample results - NORMAL
			No Faulted SGs

	RO	MONITOR Pressurizer PORVs And Isolation Valves: • Power to isolation valves – AVAILABLE • PORVs – CLOSED • Isolation valves - AT LEAST ONE OPEN	
	RO	ESTABLISH IA To Containment: • IA pressure - GREATER THAN 95 PSIG • OPEN IA OCIV	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR Containment H2 Concentration: • Containment H2 - GREATER THAN OR EQUAL TO ZERO (QDPS QUAL PAMS) • H2 concentration – GREATER THAN OR EQUAL TO 0.5% • H2 concentration - LESS THAN 4% BY VOLUME • PLACE hydrogen recombiners in service per 0POP02-CG-0001, ELECTRIC HYDROGEN RECOMBINERS	*Will place H2 Monitoring in service Per Addendum 1.* *H2 Recombiners will not be needed at this time.*
	RO	RESET SI	*Addendum 1 Steps*
	RO	RESET Containment Isolation Phase A	
	RO	OPEN H2 sample OCIVs for each train	

	RO	PLACE "CNTMT H2 SAMPLE SELECT" for each train to the desired position
		• TRAIN A
		  • FV-4100
		• TRAIN C
		  • FV-4103	

	RO	OPEN selected CNTMT H2 SAMPLE valve for each train	
	RO	OPEN H2 sample ICIVs for each train	
	RO	PLACE mode select switch to OPERATE for each train	
	RO	VERIFY H2 reading for each train GREATER THAN OR EQUAL TO ZERO after 1 minute of operation (QDPS DETAIL DATA MENU PAGE 7)	
	RO	RETURN TO procedure step in effect.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	ENSURE SFPC In Service Within 2.5 HOURS Of Loss Of SFPC: • CHECK CCW pumps - AT LEAST TWO RUNNING • ALIGN CCW flow to SFPC heat exchanger(s) • CHECK SFPC pump - RUNNING	*May or may not place SFP Cooling in service at this time.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.

Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**

Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK If Charging Flow Has Been Established:
		• CCPs - AT LEAST ONE RUNNING
		• Charging flow – ESTABLISHED
		(RNO)
		• PERFORM the following:
		  • CLOSE charging flow control valve.
		  • IF charging flow control valve will NOT close, THEN PERFORM the following:
		  • ESTABLISH charging flow per ADDENDUM 2, ESTABLISHING ALTERNATE CHARGING FLOW CONTROL.
		  • GO TO Step 14.c.
		  • ENSURE CCP discharge valves open.
		  • ENSURE normal or alternate charging isolation valve open.
		  • ENSURE charging OCIV open.
		  • IF charging OCIV will NOT open, THEN DISPATCH operator to open charging OCIV:
		  • (29 ft MAB RM 108C)
		  • "1(2)-CV-MOV-0025"
		  • "CVCS CHARGING ORC"
		  • "CONTAINMENT ISOLATION"
		  • "MOV OPERATOR"
		• CONTROL charging flow control valve to restore pressurizer level
			Charging Flow will be placed in service.

	BOP/RO	CHECK If SI Flow Should Be Terminated:	*LBLOCA*
	RO	MONITOR If Containment Spray Should Be Stopped:	*LBLOCA*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.

Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**

Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR If LHSI Pumps Should Be Stopped:	*LBLOCA*
	BOP/RO	CHECK RCS And SG Pressures:	

	RO	MONITOR If STBY DGs Should Be Stopped:
		• VERIFY AC ESF busses – ENERGIZED BY OFFSITE POWER
		  • 4.16KV ESF bus
		  • 480V ESF LCs
		  • 480V ESF MCCs
		• RESET any unloaded DG(s) non-emergency trips
		• RELEASE any unloaded DG(s) from EMERGENCY mode
		• STOP any unloaded DG(s)	

	RO	INITIATE Evaluation Of Plant Status: • VERIFY cold leg recirculation capability: • Power to LHSI pumps – AVAILABLE • Power to HHSI pumps – AVAILABLE • Power to emergency sump suction valves – AVAILABLE • Power to HHSI pump mini flow valves – AVAILABLE • Power to LHSI pump mini flow valves – AVAILABLE • Power to RWST suction isolation valves – AVAILABLE • CHECK MAB and FHB radiation – NORMAL • NOTIFY Chemistry to implement 0PCP08-AP-0003, POST ACCIDENT SAMPLING OF LIQUIDS AND RCB ATMOSPHERE AT PASS	*Cold Leg Recirculation will be available and MAB and FHB Radiation levels will be normal.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO	CHECK If RCS Cooldown And Depressurization Is Required:	*LBLOCA – Depressurization will not be required.*
	SRO	CHECK If Transfer To Cold Leg Recirculation Is Required:	*An RWST level of less than 75,000 gallons will require the crew to transition to 0POP05-EO-ES13, Transfer to Cold Leg Recirculation, before this step. If the crew gets to this step prior to RWST level reaching 75,000 gallons then the crew will loop through the last two steps until RWST level is less than 75,000 gallons.*
	SRO (continuous) (C)	Informs crew of transition to 0POP05-EO-ES13, Transfer to Cold Leg Recirculation	***Event #8*** *is integral to the scenario. Cold Leg Recirculation fails to auto actuate.* ***CT - Transfer to Cold Leg Recirculation and establish ECCS recirculation flow prior to RWST level lowering to 32,500 gallons (6% - "RWST EMPTY" alarm) or if RWST level lowers to 32,500 gallons, then stop all pumps taking suction from the RWST, manually align for Cold Leg Recirculation and re-establish ECCS recirculation flow.***

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	RESET SI	
	RO	RESET ESF Load Sequencers	
	RO	VERIFY CCW Flow To RHR Heat Exchangers	
	RO	STOP any running CCP(s)	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 4 **Event No.:** 6/7/8

Event 6 Description: LBLOCA.
Event 7 Description: LHSI Pumps 1A & 1B will fail to auto start and LHSI Pump 1C will not start due to loss of Control Power. The crew will have to manually start a LHSI Pump. **(CT)**
Event 8 Description: **A**uto swap over to Emergency Recirculation will fail to occur. **(CT)**

Time	Position	Required Operator Actions	Notes

	RO	VERIFY SI And Containment Spray Systems - ALIGNED FOR RECIRCULATION:
		• HHSI cold leg injection valves – OPEN
		• LHSI cold leg injection valves – OPEN
		• ENSURE SI pump mini flow valves - CLOSED
		  • HHSI pumps
		  • LHSI pumps
		• Containment sump to SI suction header valves – OPEN
		  • IF any train(s) containment sump valve did NOT open, THEN PERFORM
		  • the following for the affected train(s), one train at a time:
		  • STOP HHSI pump.
		  • STOP LHSI pump.
		  • STOP containment spray pump.
		  • CLOSE the RWST to SI suction header valve.
		  • OPEN the containment sump to SI suction header valve.
		  • START HHSI pump.
		  • START LHSI pump.
		  • IF containment spray was running, THEN START containment spray pump.
		• ENSURE RWST to SI suction header valves CLOSED
		• CHECK SI and Containment Spray Systems - AT LEAST ONE TRAIN ALIGNED FOR RECIRCULATION
			Cold Leg Recirculation will have to be manually aligned.
			
			Valves will not be open.
			
			Terminate Scenario

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**MANUALLY START A LHSI PUMP.**	Manually start at least one LHSI Pump before transitioning out of 0POP05-EO-EO00, Reactor Trip or Safety Injection, during a LBLOCA when RCS pressure is less than 400 psig.	
SRO/RO	**MANUALLY ALIGN SAFTEY INJECTION FOR COLD LEG RECIRCULATION.**	Transfer to Cold Leg Recirculation and establish ECCS recirculation flow prior to RWST level lowering to 32,500 gallons (6% - "RWST EMPTY" alarm) or if RWST level lowers to 32,500 gallons, then stop all pumps taking suction from the RWST, manually align for Cold Leg Recirculation and re-establish ECCS recirculation flow.	

TURNOVER INFORMATION

- Unit 1 just completed a 30 day outage. A Plant Startup is in progress and Reactor Power is currently at 12% to 14% and stable.
- The Unit is at step 6.38 of 0POP03-ZG-0005, Plant Startup to 100%, ready to perform OPC Test on Main Turbine.
- Condensate Pump #13 and CL-ACW Pump #13 are OOS.
- Cycle Burnup is 150 MWD/MTU. (BOL)
- RCS Boron Concentration is 1798 ppm.
- Boric Acid Tank 'A' is at 7315 ppm and 'B' is at 7309 ppm.
- No liquid waste discharges are in progress or planned.
- No personnel are in containment.
- FHB Truck Bay doors are closed.
- No ESF DG FOST's are on recirc.

LOT 19 NRC EXAM

OPERATING TEST #1

SCENARIO #5BU

Revision #0

Week of 09/30/2013

SCENARIO OUTLINE

Facility: South Texas Project **Scenario No.: #5 BU** **Op-Test No.: LOT19 NRC**

Examiners: _____ **Operators:** _____

_____ _____

_____ _____

Initial Conditions:

- **100% Power and Stable.**

Turnover:

- **Train 'A' Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.**
- **Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.**

Event No.	Malf. No.	Event Type*	Event Description
1 (0 min)	05-12-02A 1	BOP (I) SRO (I, TS)	SG B Controlling Level Channel LT-0572 Fails High.
2 (10 min)	H1A028_FT4 29TVSP 0	RO (I) SRO (I, TS)	RCS Loop 2 FT-0429 Fails Low.
3 (15 min)	08-28-03 True	BOP (C) SRO (C)	LPHDP #13 Trips
4 (25 min)	LA10M1-B_2 2	RO (R) BOP (C) SRO (C)	Main Transformer 1B Trouble, winding temperature and oil temperature rising.
5 (40 min)	02-01-02 0.6 10-08-01 True	RO (M) BOP (M) SRO (M)	Main Transformer 1B Fault cascades to a complete loss of offsite power and a subsequent LBLOCA.
6 (N/A)	04-09-11 True	RO (C) SRO (C)	ESF DG #12 Output Breaker fails to close and Phase – B Containment Isolation will fail to Auto Actuate. (Integral to Scenario) **(CT)**
7 (N/A)	10-12-02 True	RO (C) SRO (C)	Loss of Containment Emergency Recirculation capability. **(CT)** (Integral to Scenario)

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor.**

SCENARIO MISCELLANEOUS INFORMATION

INSTRUCTOR NOTES:

Refer to the Instructor Guide for directions on Simulator Setup, Expected Booth Communications and Expected Booth Actions.

CRITICAL PARAMETERS:

The following parameters may be of value in evaluating crew performance and should be automatically recorded during the scenario. Once the scenario is complete for each crew, printout the Critical Parameters and label the printout with date, time, Crew # and scenario #.

- CC-MOV-0404 Phase B Isolation Valve Green Light
- CC-FV-4493 Phase B Isolation Valve Green Light
- CS Pump Flow All Trains
- RWST Level
- Containment Pressure

OPERATOR ACTIONS TABLE NOTES:

1. Critical Tasks are indicated by "C" in the position column and indicated in bold type.

2. Actions required throughout the event are indicated as "(continuous)" in the position column.

3. Shaded cells indicate procedural entry points.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 1

Event Description: SG B Controlling Level Channel LT-0572 fails high.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 06M3: SG 1B(2B) LVL HI-HI ALERT (A-6) SG 1B(2B) LVL DEV HI/LO (B-6) SG 1B(2B) STM/FW FLOW MSMTCH (E-7)	*BOP uses annunciator response procedures but will also recognize the need to perform immediate actions.*
	SRO/BOP	Determines SG 1B Controlling Feed Flow Channel LT-0572 has failed high. Performs immediate actions of 0POP04-FW-0001: • PLACE any SG Feedwater Regulating Valve(s) not properly responding in MANUAL AND ADJUST as necessary to restore affected SG NR level(s) to between 68% and 74%.	*Failed Channel is FW-LT-0572.* *Immediate action step. Crew will take manual control of SG B MFRV.*
	SRO (continuous)	Directs actions of 0POP04-FW-0001, Loss of Steam Generator Level Control.	
	BOP	CHECK SG Feedwater Regulating Valve(s) - RESPONDING IN AUTOMATIC	
	BOP	CHECK SGFP Speed Controllers - RESPONDING IN AUTOMATIC	
	BOP	CHECK Main Feedwater Regulating Valves: • CHECK Main Feedwater Regulating Valve(s) - IN SERVICE • CHECK Main Feedwater Regulating Valve(s) - ANY IN MANUAL • CHECK Affected Main Feedwater Regulating Valve(s) - RESPONDING IN MANUAL	
	BOP	CHECK Low Power Feedwater Regulating Valves:	*LPFRVs are not in service.*
	BOP	CHECK SGFP Master Speed Controller - IN MANUAL	*Controller should be in Auto.*
	BOP	CHECK Individual SGFP Speed Controllers - ANY IN MANUAL	*Controllers should be in Auto.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 1

Event Description: SG B Controlling Level Channel LT-0572 fails high.

Time	Position	Required Operator Actions	Notes
	BOP	MONITOR Feedwater/Steam Header DP	
	BOP	RESTORE Affected SG NR Level(s) To Between 68% And 74%	
	BOP	MONITOR SG NR Levels - GREATER THAN 20%	
	BOP	MONITOR SG NR Levels - LESS THAN 87.5%	
	BOP	CHECK SG NR Level Indicators - ALL OPERABLE • SELECT the operable SG level channel for affected SG(s) level control. • CHECK status of "QDPS ALARM SGWLCS" Annunciator Lampbox 6M03, Window A-8. • IF Annunciator Lampbox 6M03, Window A-8 is illuminated, THEN DETERMINE the alarming channels(s) using the QDPS DETAIL DATA Menu, Page 5 display.	*Failed Channel is FW-LT-0572.* *Annunciator Lampbox 6M03, Window A-8 will be extinguished.*
	BOP	CHECK Feedwater Flow Transmitters - ALL OPERABLE	
	BOP	CHECK Steam Flow Transmitters - ALL OPERABLE	
	BOP	CHECK Steam Pressure Transmitters - ALL OPERABLE	
	BOP	CHECK SG NR Levels - BETWEEN 68% And 74%	
	BOP	CHECK Main Feedwater Regulating And Low Power Feedwater Regulating Valves Automatic Control - OPERABLE	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 1

Event Description: SG B Controlling Level Channel LT-0572 fails high.

Time	Position	Required Operator Actions	Notes
	BOP	CHECK Main Feedwater Regulating <u>OR</u> Low Power Feedwater Regulating Valve(s) - IN AUTO <u>WHEN</u> SG levels return to between 68% and 74%, <u>THEN</u> PERFORM the following: • PLACE in-service Feedwater Regulating Valve(s) with operable Automatic Control in Auto. • *MONITOR* proper operation of Feedwater Regulating Valve(s) in Auto.	
	BOP	CHECK SGFP Master Speed Controller - IN AUTO	
	SRO	TAKE appropriate action per Technical Specifications. TS 3.3.1.14 Action 6 TS 3.3.2.5.b & 6.d Action 20	*SRO will check TS.* ***Most Limiting Condition:*** *Place the failed channel in the tripped condition within 72 hours.* ***<u>Event 2</u>*** *can be triggered after SRO has checked TS.*
	SRO	NOTIFY I&C To Place The Affected Channel In Trip Or Bypass. REFER TO Addendum 2, Procedure List, For The Appropriate Procedure	
	SRO	INITIATE Corrective Actions For Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 2

Event Description: RCS Loop 2 FT-0429 fails low.

Time	Position	Required Operator Actions	Notes
	RO	Acknowledges and announces the following annunciators from 05M2: RC LOOP 2 FLOW LO RX PRETRP (A-2)	*BOP uses annunciator response.*
	SRO/RO	Determines RCS Loop 2 FT-0429 has failed low.	*Failed Channel is RC-FT-0429.*
	SRO (continuous)	Directs actions of 0POP04-RP-0003, Failure of RCS Loop Flow Transmitter.	

	RO	CHECK RCS Loop Flow Indicators – ALL OPERABLE
		• IDENTIFY the failed flow indicator.
		• CHECK all operable flow indicators in affected RCS loop - GREATER THAN 92%.
		• IF operating in MODE 1 AND more than one flow indicator per loop fails, THEN PERFORM the following:
		  • REFER TO Technical Specification 3.0.3.
		  • COMMENCE a load reduction per 0POP03-ZG-0006, Plant Shutdown From 100% to Hot Standby.
		• NOTIFY I&C to place the affected channel in trip or bypass. REFER TO Addendum 1, Procedure List for the appropriate procedure.
			Only one RCS flow transmitter, RC-FT-0429, has failed.

	SRO	TAKE appropriate action per Technical Specifications. TS 3.3.1.13.a & b Action 6	*SRO will check TS.* ***Most Limiting Condition:*** *Place the failed channel in the tripped condition within 72 hours.* ***Event 3*** *can be triggered after the SRO has checked TS.*
	SRO	INITIATE Corrective Action For Failed Component	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 3

Event Description: LPHDP #13 trips.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 08M3: LP HDP TRIP (A-4)	*BOP uses annunciator response procedures.*
	SRO/BOP	Determines that LPHD Pump #13 has tripped.	*Places LPHD Pump #13 in PTL*
	SRO (continuous)	Directs actions of 0POP04-CD-0001, Loss of Condensate Flow.	
	BOP	CHECK Required number of Condensate Pumps Running: • LESS THAN 50% RTP – One Condensate Pump • GREATER THAN 50% RTP – Two Condensate Pumps	
	BOP	CHECK LPHD Pump Status – All Running • IF LPHD Pump(s) tripped, THEN GO TO Addendum 2, LPHD Pump Trip	
	BOP	CHECK FWH 15(25) & 16(26) Strings – INSERVICE • FWH 15A(25A) AND 16A(26A) • FWH 15B(25B) AND 16B(26B) • FWH 15C(25C) AND 16C(26C)	
	BOP	CHECK DA Level Controller at 100% Demand	
	BOP	PERFORM The Following To START A Third Condensate Pump: • START Third Condensate Pump Per Addendum 1, Condensate Pump Start That Requires Venting Prior To Start	
	BOP	CHECK The Following Annunciators Lit: • "SGFPT 11(21) SEAL WTR DP LO" Lampbox 6M03, Window E-5 • "SGFPT 12(22) SEAL WTR DP LO" Lampbox 6M04, Window E-1 • "SGFPT 13(23) SEAL WTR DP LO" Lampbox 6M04, Window E-5	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 3

Event Description: LPHDP #13 trips.

Time	Position	Required Operator Actions	Notes
	BOP	TAKE Manual Control Of The DEAER Level Control Valves AND THROTTLE Closed Until Condensate Header Pressure Is High Enough To Clear All "SGFPT SEAL WTR DP LO" Alarms {CP009} (Approximately 400 To 450 PSIG)	*Only if needed.*
	BOP	VERIFY Miniflow Recirc Line Is Full By Venting "COND PUMP MINIFLOW RECIRC VENT" For Pump To Be Started: {29 ft TGB E CNDSR Pit} • PUMP 11(21) "1(2)-CD-0788" • PUMP 12(22) "1(2)-CD-0787" • PUMP 13(23) "1(2)-CD-0786"	*Will call Plant Operator*
	BOP	ENSURE "1(2)-CD-0801, COND PUMPS DISCH COMMON VENT LINE ISOL VALVE" Is OPEN {TGB 29 ft West of Condensate Pump Pit, In Overhead 10 ft above grating}	*Will call Plant Operator*
	BOP	OPEN "COND PUMP DISCH COMMON VENT LINE ISOL VALVE" For The Condensate Pump To Be Started: • "1(2)-CD-0803 COND PUMP 11(21) DISCH COMMON VENT LINE ISOL VALVE" {TGB East of Condensate Pump 11(21) in Pit along North Wall of Pit} • "1(2)-CD-0804 COND PUMP 12(22) DISCH COMMON VENT LINE ISOL VALVE" {TGB 29 ft East of Condensate Pump 12(22) at grating floor level} • "1(2)-CD-0802 COND PUMP 13(23) DISCH COMMON VENT LINE ISOL VALVE" {TGB East of Condensate Pump 13(23) in Pit along South Wall of Pit}	*Will call Plant Operator*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 3

Event Description: LPHDP #13 trips.

Time	Position	Required Operator Actions	Notes
	BOP	START The Selected Condensate Pump: {CP008} • "COND PUMP 11(21)" • "COND PUMP 12(22)" • **"COND PUMP 13(23)"**	*Will start CD Pump #13.*
	BOP	CLOSE "COND PUMP DISCH COMMON VENT LINE ISOL VALVE" For The Condensate Pump That Was Started: • "1(2)-CD-0803 COND PUMP 11(21) DISCH COMMON VENT LINE ISOL VALVE" {TGB 29 ft East of Condensate Pump 11(21)} • "1(2)-CD-0804 COND PUMP 12(22) DISCH COMMON VENT LINE ISOL VALVE" {TGB 29 ft East of Condensate Pump 12(22)} • "1(2)-CD-0802 COND PUMP 13(23) DISCH COMMON VENT LINE ISOL VALVE" {TGB 29 ft East of Condensate Pump 13(23)}	*Will call Plant Operator*
	BOP	PLACE DA Level Controller In Manual AND LOWER Demand To < 80% {CP008}	
	BOP	OPEN Condensate "PUMP DISCH ISOL" Valve For Condensate Pump Started To Place Pump In Service: {CP008} • PUMP 11(21) "MOV-0107" • PUMP 12(22) "MOV-0097" • **PUMP 13(23) "MOV-0088"**	*When the NRC Examiners are ready **Event 4** can be triggered.*
	BOP	CONTROL DA Level Control Valve To Restore DA Level	
	BOP	RETURN To Procedure And Step In Effect	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 4

Event Description: Main Transformer 1B Trouble.

Time	Position	Required Operator Actions	Notes
	BOP	Acknowledges and announces the following annunciators from 10M1: MAIN XFMR 1B TRBL (B-2)	*BOP uses annunciator response procedures.*
	SRO (continuous)	Directs actions of 0POP09-AN-10M1, Window B-2, MAIN XFMR 1B TRBL.	
	BOP	CHECK the following Plant Computer points: • BD3151, MAIN XFMR 1B CONT PWR trouble • BD3153, MAIN XFMR 1B COOLING trouble	*BD3153 will be in alarm.*
	BOP	IF Plant Computer point BD3153, MAIN XFMR 1B COOLING, is in alarm, THEN DISPATCH an Operator to Main Transformer 1B to perform the following: • CHECK transformer oil levels. (Constant Oil Preservation System (COPS) tanks) • VERIFY transformer cooling fans and oil pumps are operating per 0POP02-AE-0002, Transformer Normal Breaker and Switch Lineup. • CHECK Main Transformer winding and liquid temperatures. • CHECK local indications, including any pressure relief flags actuated or gas detector reading abnormally high.	*Two Banks of Fans and Pumps will not be working. All others are SAT.* *Main Transformer 1B winding and liquid temperatures will be going up.* *See Expected Booth Communications.*
	BOP	IF transformer oil level indicators are below the low mark AND transformer winding and liquid temperatures are elevated, THEN INITIATE action to de-energize Main Transformer 1B as soon as possible.	*Oil levels will be within the low and high marks.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 4

Event Description: Main Transformer 1B Trouble.

Time	Position	Required Operator Actions	Notes

	BOP	IF transformer oil temperature exceeds 98°C OR winding temperature exceeds 115°C, THEN MONITOR transformer temperatures and Hydran incipient fault monitor on 4 hours bases until temperatures stabilize.
		• IF Hydran incipient fault monitor reading rises OR the rate alarm actuates, THEN PERFORM the following:
		  • IMMEDIATELY NOTIFY Engineering
		  • PREPARE to reduce Main Turbine load and shutdown the main generator.
		• DO NOT raise Main Turbine load or Reactive load until temperatures stabilize.
		• NOTIFY Engineering of the condition and provide transformer oil temperature, winding temperature and Hydran data.
			The crew will have to work their way through the next two steps based on reported Main Transformer 1B oil and winding temperatures.

	BOP	IF transformer oil temperature exceeds 103°C OR transformer winding temperature exceeds 118° C, THEN PERFORM the following: • ESTABLISH temporary cooling • MONITOR oil temperature, winding temperature and Hydran incipient fault monitor every 2 hours until temperatures stabilize. • DO NOT raise Main Turbine load or Reactive load until temperatures stabilize AND Engineering concurs.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 4

Event Description: Main Transformer 1B Trouble.

Time	Position	Required Operator Actions	Notes
	BOP/RO	IF transformer winding temperature exceeds 140°C OR transformer oil temperature reaches 110°C, THEN PERFORM the following: • PERFORM a controlled Main Turbine load reduction per 0POP03-ZG-0008, Power Operations, or 0POP03-ZG-0006, Plant Shutdown From 100% to Hot Standby, to LESS THAN 75% of initial Main Turbine output and reduce Reactive loading to LESS THAN 100 MVAR. • **IF transformer winding temperature is continuing to rise 1 hour after the power reduction OR oil temperature exceeds 110°C, THEN GO TO 0POP04-TM-0005, Fast Load Reduction, to reduce load to LESS THAN 50% of initial Main Turbine output.** • Maintain this output level until winding temperature is LESS THAN OR EQUAL TO 125°C AND Engineering concur it is safe to raise load.	*Main Transformer liquid temperature will be exceeding 110°C and a reduction in power will be required.*
	BOP	IF transformer winding temperature continues to rise OR Hydran readings continue to rise after the final load reduction, THEN PERFORM the following: • GO TO 0POP04-TM-0005, Fast Load Reduction, to reduce load and take the main generator offline • Transfer Auxiliary Transformer loads to the Standby Transformer • Isolate the main transformers	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 4

Event Description: Main Transformer 1B Trouble.

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Directs actions of 0POP04-TM-0005, Fast Load Reduction, due to the Main Transformer 1B trouble.	
	SRO	NOTIFY STP Co-Owners Using The EMS Website That Load Reduction Is Commencing.	*Normally performed by Shift Manager.*
	SRO/RO	DETERMINE Amount Of Boric Acid To Add To Reduce Reactor Power To Desired Level As Follows (Reference 11):	*SRO and RO will determine amount of Boric Acid based on chart in procedure.*
	RO	COMMENCE RCS Boration	
	RO	CHECK Rod Control System -IN AUTOMATIC	
	RO	ENERGIZE Pressurizer Heaters For Boron Equalization	
	BOP	CHECK Main Turbine - IN THE IMPULSE PRESSURE FEEDBACK MODE IMP IN {CP007}	*Main Turbine will already by in IMP IN.*
	BOP	REDUCE Turbine Load At A Rate Of Less Than Or Equal To 5% Per Minute Using Operator Auto	
	BOP	MAINTAIN Main Generator Reactive Load (VARs) Within The Following: • Less Than 300 MVARs • Guidelines Of The Plant Curve Book	
	RO	MONITOR Rod Control System Responding To RCS TAVG/TREF Deviation By Ensuring The Following: • Control Rods Are Inserting AND RCS Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref	
	RO	MAINTAIN Pressurizer Level Within The Following: REFER TO Addendum 5, Pressurizer Level Table • Trending to Program Level OR • At Program Level	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 4

Event Description: Main Transformer 1B Trouble.

Time	Position	Required Operator Actions	Notes
	BOP	MAINTAIN Steam Generator NR Level Within The Following: • Trending to between 68% and 74% OR • Between 68% and 74%	*After the crew has begun the down power and when the NRC Examiners are ready then Event **5, 6 and 7** can be triggered.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	Announce Reactor Trip	*Fault on the Main Transformer 1B cascades to a complete loss of offsite power which causes a Reactor Trip. A LBLOCA also causes an SI.*
	SRO (continuous)	Enters 0POP05-EO-EO00, Reactor Trip or Safety Injection, and directs the crew to perform their immediate actions.	
	BOP/RO	Completes immediate actions of EO00. Reactor Trip/SI: • Reactor Tripped. • Turbine Tripped. • AC ESF Busses energized. • SI is actuated.	*RO will announce status of immediate action steps as he/she performs them.* *BOP Operator will monitor the plant and make an announcement of the Reactor trip.* *On the LOOP, DG #12 Output Breaker will fail to close affecting power to all Train 'B' equipment.* *DG #12 will have to be placed in the PTL position.*
	SRO	Directs/ensures the immediate actions of EO00, Reactor Trip/SI have been completed by performing a procedure read through of them.	*Before beginning the verification of immediate actions, the US may direct the BOP operator to throttle AFW flow to limit RCS cooldown.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO/BOP	Directs BOP to perform Addendum 5, Verification of SI Equipment Operation • FW Isolation • Check for Steamline Isolation • AFW Status • Phase 'A' Containment Isolation • ECW and CCW • Containment Cooling • ECCS pump and valve status • Containment Ventilation Isolation • HVAC systems (CR/EAB/FHB) • Start AFW Pump A Cubicle Fan	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes

	SRO/RO (C)* * denotes critical item	Check plant status:
		• Containment pressure: normal
		  • Containment pressure – GREATER THAN 9.5 PSIG (QDPS)
		  • VERIFY containment spray INITIATED
		  • ***VERIFY containment isolation Phase B valves – CLOSED***
		  • "INL OCIV MOV-0318"
		  • "INL OCIV MOV-0291"
		  • "OUTL ICIV MOV-0542"
		  • "OUTL ICIV MOV-0403"
		  • ***OUTL OCIV MOV-0404***
		  • ***OUTL OCIV FV-4493***
		  • STOP ALL RCPs
		• RCP Seal cooling: 6-13 gpm
		• PERFORM the following:
		• VERIFY CCW flow to RCPs.
		  • IF CCW to the RCP(s) is lost, THEN:
		  • TRIP the RCP(s).
		  • ENSURE one charging pump running and supplying seal injection.
		  • MAINTAIN seal injection flow between 6 and 13 gpm
		• RCS cooldown: at or trending to 567°F
		• Pzr PORV and Spray valve status: closed
		• Excess Letdown Isol Valves: closed
		• Monitor RCP trip criteria to determine if RCP's should be stopped: criteria will NOT be met.
		• Selected Containment Isolation Valves: closed.
			Containment Isolation Phase 'B' will fail to auto actuate.
			
			Crew will secure RCPs.
			
			CT - Restore Containment Integrity by closing containment isolation valves such that at least one valve is closed in each Phase 'B' penetration prior to exiting 0POP05-EO-EO00, Reactor Trip or Safety Injection. CC-MOV-0404 & CC-FV-4493, OUTL OCIVs, will have to be manually closed to satisfy this critical task.
			
			The crew may send out an operator to locally close CC-MOV-0318, INL OCIV but it has an inside containment isolation check valve that still isolates the penetration.
			
			The crew will start a CCP to supply RCP seals.
			
			RCPs will already be stopped due to LOOP.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO/RO	CHECK If SG Secondary Pressure Boundary Intact:	*No SGs are Faulted*
	SRO/RO	CHECK If SG Tubes Are Intact:	*No SGs are Ruptured*
	SRO/RO	CHECK If RCS Is Intact: • Containment radiation – NORMAL • Containment pressure – NORMAL • Containment wide range water level – NORMAL GO TO 0POP05-EO-EO10, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1. • MONITOR Critical Safety Functions. • WHEN Addendum 5 of this procedure is complete, THEN Functional Restoration Procedures may be IMPLEMENTED.	
	BOP	Completes 0POP05-EO-EO00, Addendum 5.	*Will not transition to FRP1 or FRZ1 until Addendum 5 is complete.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-FRP1, Response to Imminent Pressurized Thermal Shock Condition.	*Entry in to the following two procedures will be dependent on CSF status.*
	RO	CHECK RCS pressure - GREATER THAN 415 PSIG IF LHSI pump flow GREATER THAN 415 PSIG 500 GPM, THEN RETURN TO procedure step in effect.	*Conditions will allow exit from FRP1.*
	SRO (continuous)	Informs crew of transition to 0POP05-EO-FRZ1, Response to High Containment Pressure.	

	RO	VERIFY Containment Spray – ESTABLISHED
		• Containment Pressure LESS THAN 56.5 PSIG.
		• At least one Containment Spray pump –RUNNING
		  • Discharge valve OPEN
		  • FLOW indication
		• RETURN TO procedure step in effect and PERFORM this procedure as time permits.
			Conditions will allow exit from FRZ1.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, and to monitor Critical Safety Functions	
	RO	MONITOR If RCPs Should Be Stopped: • HHSI pumps - AT LEAST ONE RUNNING • RCS pressure - LESS THAN 1430 PSIG • STOP all RCPs	*RCPs should already be stopped because of Phase B.*
	BOP	DEPRESSURIZE Intact SGs To 1000 PSIG • CHECK RCS pressure - GREATER THAN 415 PSIG • GO TO Step 3.	*LBLOCA*

	BOP	MONITOR If SG Secondary Pressure Boundary Intact:
		• CHECK pressures in all SGs –
		  • CONTROLLED OR RISING
		  • GREATER THAN CONTAINMENT PRESSURE	

	RO	RESET SI	
	RO	RESET ESF Load Sequencers	
	RO	RESET Containment Isolation Phase A	
	RO	RESET Containment Isolation Phase B	
	BOP	MONITOR INTACT SG Levels: a. NR levels - GREATER THAN 14% [34%] b. CONTROL AFW flow to maintain NR levels BETWEEN 22% [34%] and 50%	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes

	BOP	CHECK Secondary Radiation:
		• PERFORM the following:
		  • RESET SG LO-LO level AFW actuations
		  • RESET SG blowdown and sample isolations
		  • NOTIFY Chemistry to sample all SGs for activity
		• PERFORM the following:
		  • MONITOR secondary systems listed below radiation levels – NORMAL
		  • Main steamline radiation - NORMAL
		  • SG blowdown radiation - NORMAL
		  • CARS pump(s) radiation – NORMAL
		• MONITOR SG sample results - NORMAL
			No Faulted SGs

	RO	MONITOR Pressurizer PORVs And Isolation Valves: • Power to isolation valves – AVAILABLE • PORVs – CLOSED • Isolation valves - AT LEAST ONE OPEN	
	RO	ESTABLISH IA To Containment: • IA pressure - GREATER THAN 95 PSIG • OPEN IA OCIV	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR Containment H2 Concentration: • Containment H2 - GREATER THAN OR EQUAL TO ZERO (QDPS QUAL PAMS) • H2 concentration – GREATER THAN OR EQUAL TO 0.5% • H2 concentration - LESS THAN 4% BY VOLUME • PLACE hydrogen recombiners in service per 0POP02-CG-0001, ELECTRIC HYDROGEN RECOMBINERS	*Will place H2 Monitoring in service Per Addendum 1.* *H2 Recombiners will not be needed at this time.*
	RO	RESET SI	*Addendum 1 Steps*
	RO	RESET Containment Isolation Phase A	
	RO	OPEN H2 sample OCIVs for each train	

	RO	PLACE "CNTMT H2 SAMPLE SELECT" for each train to the desired position
		• TRAIN A
		  • FV-4100
		• TRAIN C
		  • FV-4103	

	RO	OPEN selected CNTMT H2 SAMPLE valve for each train	
	RO	OPEN H2 sample ICIVs for each train	
	RO	PLACE mode select switch to OPERATE for each train	
	RO	VERIFY H2 reading for each train GREATER THAN OR EQUAL TO ZERO after 1 minute of operation (QDPS DETAIL DATA MENU PAGE 7)	
	RO	RETURN TO procedure step in effect.	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	ENSURE SFPC In Service Within 2.5 HOURS Of Loss Of SFPC: • CHECK CCW pumps - AT LEAST TWO RUNNING • ALIGN CCW flow to SFPC heat exchanger(s) • CHECK SFPC pump - RUNNING	*May or may not place SFP Cooling in service at this time.*

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes

	RO	CHECK If Charging Flow Has Been Established:
		• CCPs - AT LEAST ONE RUNNING
		• Charging flow – ESTABLISHED
		(RNO)
		• PERFORM the following:
		  • CLOSE charging flow control valve.
		  • IF charging flow control valve will NOT close, THEN PERFORM the following:
		  • ESTABLISH charging flow per ADDENDUM 2, ESTABLISHING ALTERNATE CHARGING FLOW CONTROL.
		  • GO TO Step 14.c.
		  • ENSURE CCP discharge valves open.
		  • ENSURE normal or alternate charging isolation valve open.
		  • ENSURE charging OCIV open.
		  • IF charging OCIV will NOT open, THEN DISPATCH operator to open charging OCIV:
		  • (29 ft MAB RM 108C)
		  • "1(2)-CV-MOV-0025"
		  • "CVCS CHARGING ORC"
		  • "CONTAINMENT ISOLATION"
		  • "MOV OPERATOR"
		• CONTROL charging flow control valve to restore pressurizer level	

	BOP/RO	CHECK If SI Flow Should Be Terminated:	
	RO	MONITOR If Containment Spray Should Be Stopped:	

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	RO	MONITOR If LHSI Pumps Should Be Stopped:	
	BOP/RO	CHECK RCS And SG Pressures:	

	RO	MONITOR If STBY DGs Should Be Stopped:
		• VERIFY AC ESF busses – ENERGIZED BY OFFSITE POWER
		  • 4.16KV ESF bus
		  • 480V ESF LCs
		  • 480V ESF MCCs
		• RESET any unloaded DG(s) non-emergency trips
		• RELEASE any unloaded DG(s) from EMERGENCY mode
		• STOP any unloaded DG(s)
			LOOP will force DGs to remain running.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes

	RO	INITIATE Evaluation Of Plant Status:
		• VERIFY cold leg recirculation capability:
		  • Power to LHSI pumps - AVAILABLE
		  • Power to HHSI pumps - AVAILABLE
		  • Power to emergency sump suction
		  • valves - AVAILABLE
		  • Power to HHSI pump mini flow valves – AVAILABLE
		  • Power to LHSI pump mini flow
		  • valves – AVAILABLE
		  • Power to RWST suction isolation
		  • valves – AVAILABLE
		• PERFORM the following:
		  • TRY to restore power.
		  • IF at least one train (HHSI OR LHSI) of cold leg recirculation capability can NOT be verified, THEN GO TO 0POP05-EO-EC11, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
			Event 7
			While performing 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, Class 1E 480V MCC E1C2 will lose power. Due to the initial conditions and previous events, a loss of Emergency Recirculation capability will occur because the crew will not be able to open any of the 3 Containment Emergency Sump Suction Valves.
			
			The CIP of 0POP05-EO-EO10, Loss of Reactor or Secondary Coolant, will also have the crew transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.

OPERATOR ACTIONS

Op-Test No.: 1 **Scenario No.:** 5BU **Event No.:** 5/6/7

Event 5 Description: LOOP and LBLOCA.
Event 6 Description: Phase 'B' penetration fails to isolate. **(CT)**
Event 7 Description: Loss of Emergency Recirculation Capability. **(CT)**

Time	Position	Required Operator Actions	Notes
	SRO (continuous)	Informs crew of transition to 0POP05-EO-EC11, Loss of Emergency Coolant Recirculation.	
	RO	CHECK If Emergency Coolant Recirculation Equipment - AVAILABLE	*Already determined that Containment Sump Suction Isolation Valves do not have power.*
	RO	RESET SI AUTO RECIRC	
	RO	VERIFY RCFC Status: • RCFCs – RUNNING • Cooling water - TRANSFERRED TO CCW	
	RO	MONITOR RWST Level - GREATER THAN 32,500 GALLONS (6%)	*RWST level will be above 32,500 gallons.*
	SRO/RO (C)	MONITOR Containment Spray Requirements (Suction From RWST): • Containment spray pump suction ALIGNED TO RWST • DETERMINE number of containment spray pumps required from table • Containment spray pumps running - EQUAL TO NUMBER REQUIRED • Manually OPERATE containment spray pumps.	*Number of required CS Pumps running is dependent on RWST level, Containment pressure and the number of RCFCs running.* ***CT - Reduce CS Pumps to minimum such that RWST level is conserved during a loss of Emergency Coolant Recirculation.*** *No CS Pumps were required during validation of this scenario.* ***Terminate Scenario***

CRITICAL TASK SUMMARY

POSITION	EXPECTED RESPONSE	ACCEPTANCE CRITERIA	SAT/ UNSAT
SRO/RO	**MANUALLY ISOLATE PHASE 'B' PENETRATIONS.**	Restore Containment Integrity by closing containment isolation valves such that at least one valve is closed in each Phase – B penetration prior to exiting 0POP05-EO-EO00, Reactor Trip or Safety Injection.	
SRO/RO	**MANUALLY STOP CONTAINMENT SPRAY PUMPS AS REQUIRED.**	Reduce CS Pumps to minimum such that RWST level is conserved during a loss of Emergency Coolant Recirculation.	

TURNOVER INFORMATION

- 100% Power and Stable.
- Train ‘A’ Outage in progress: HHSI & LHSI Pumps 1A, SI-MOV-0016A and AFW Pump 11.
- Rod Control currently in Manual to perform 0PSP02-RC-0410, Delta T and T Average ACOT, on Channel III.
- Cycle Burnup is 150 MWD/MTU. (BOL)
- RCS Boron Concentration is 1362 ppm.
- Boric Acid Tank ‘A’ is at 7315 ppm and ‘B’ is at 7309 ppm.
- No liquid waste discharges are in progress or planned.
- No personnel are in containment.
- FHB Truck Bay doors are closed.
- No ESF DG FOST’s are on recirc