Final Submittal
(Blue Paper)

FINAL JPMS

1. ADMINISTRATIVE JPMs
2. IN-PLANT JPMs
3. SIMULATOR JPMs (CONTROL ROOM)

FARLEY NOV/DEC 2007-301 EXAM

05000348/2007301 AND 05000364/2007301

NOVEMBER 5 - 15, 2007
DECEMBER 21, 2007

A.1.1 Conduct of operations ADMIN G2.1.20 - RO

TITLE: Perform A Quadrant Power Tilt Ratio Calculation

TASK STANDARD: Perform a QPTR calculation per STP-7.0 and identify that the current value does not meet acceptance criteria.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ CLASSROOM

PROJECTED TIME: _20 MIN_ SIMULATOR IC NUMBER: _N/A

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

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

EXAMINER: ______________________

CONDITIONS

When I tell you to begin, you are to PERFORM A QUADRANT POWER TILT RATIO CALCULATION. The conditions under which this task is to be performed are:

a. Reactor power is 70%.
b. N-41, N-42, & N-43 PR NI detectors are operable.
c. N-44 PR NI detector is inoperable.
d. You are directed by Shift Supervisor to perform STP-7.0, using DATA SHEET 2 and curves 71A-D provided, and determine if the acceptance criteria is met.
e. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

_____ START TIME

NOTE: Critical to use the correct 0% AFD values from curves.

*1.	Obtain normalized currents from curves 71A, 71B, & 71C.	Obtains normalized current values (Curve 71) and records them on Attachment 1 of STP-7.0.	S / U
*2.	Record data for power range detector A and detector B from Data sheet 2.	Values from Data sheet 2 for detector A and detector B NI-41, 42, & 43 displays recorded on Attachment 1 of STP-7.0.	S / U
*3.	Calculate upper and lower quadrant power tilt ratios.	Upper ratio calculated at 1.00 to 1.00244. Lower ratio calculated at 1.04 to 1.043.	S / U
*4.	Enter the greater of the upper or lower quadrant power tilt ratio.	Greater of the above two values Lower: between 1.04 to 1.043 entered.	S / U
5.	Records power level.	Current avg power level recorded.	S / U
*6.	Determines acceptance criteria **NOT** met.	Determination made that acceptance criteria was **NOT** met due to Lower Detector higher than acceptable and between 1.04 to 1.043.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
7.	Reports to Shift Supervisor that acceptance criteria is NOT met.	Reports to Shift Supervisor that acceptance criteria is **NOT** met due to lower detector QPTR. (CUE: Shift Supervisor acknowledges).	S / U
8.	Fills out Surveillance Test Review sheet per attached key.	Fills out Surveillance Test Review sheet per attached key. (CUE IF STATED THAT CR WOULD BE WRITTEN: CR # 2007001010 has been written by the Unit Operator).	S / U

_____ **STOP TIME**

Terminate when assessment of acceptance criteria is performed.

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

GENERAL REFERENCES

1. FNP-1-STP-7.0, Version 17.0
2. Core Physics curves 71A-D Rev. 16.0
2. K/As: G2.1.20 RO-4.3 SRO-4.2

GENERAL TOOLS AND EQUIPMENT

Provide:

1. Calculator
2. STP-7.0
3. Core Physics curves 71A-D
4. DATA SHEET 2

COMMENTS

ATTACHMENT 1
QUADRANT POWER TILT RATIO CALCULATION
CALCULATION SHEET

UPPER QUADRANT POWER TILT

Channel	Detector A Indicated Current	÷	* Detector A 100% Current	=	Detector A Calibrated Output	Total Number Operable Upper Detectors	1 / Average Upper Detector Calibrated Output	X	Maximum Detector A Calibrated Output	=	Upper Quadrant Power Tilt Ratio
N41B	104.4	÷	155	=	0.673548						
N42B	107	÷	159.51	=	0.670804						
N42B	114.1	÷	169.95	=	0671374						
N44B	N/A	÷	N/A	=	N/A						
Total Detector A Calibrated Output		=	2.015727	÷	3	=	1 / 0.671909	X	0.673548	=	1.00244 [1.00 to 1.00244] **

*Obtained from Curve 71, 0% AFD Current

LOWER QUADRANT POWER TILT

Channel	Detector B Indicated Current	÷	* Detector B 100% Current	=	Detector B Calibrated Output	Total Number Operable Lower Detectors	1 / Average Lower Detector Calibrated Output	X	Maximum Detector B Calibrated Output	=	Lower Quadrant Power Tilt Ratio
N41B	107	÷	162.46	=	0.658624						
N42B	110	÷	163.29	=	0.673648						
N43B	125	÷	176.06	=	0.709985						
N44B	N/A	÷	N/A	=	N/A						
Total Detector B Calibrated Output		=	2.042257	÷	3	=	1 / 0.680752		0.709985	=	1.042942 [1.04 to 1.044118] **

*Obtained from Curve 71, 0% AFD Current Power 70%

Record Maximum of
Upper or Lower Quadrant Tilt Ratio 1.04 (rounded from all digit calc) to 1.044118 (not rounded: 2 significant digit calc.)

[note: Tolerance determined by using only 2 significant digits in one calculation and another calculation by using all digits in calculator, rounding to 2 significant digits was used and compared to non-rounded numbers. Used max tolerance of either rounding or not rounding.]

ACCEPTANCE CRITERIA: Maximum of Upper or Lower Quadrant Power Tilt Ratio does not exceed 1.02

CONDITIONS

When I tell you to begin, you are to PERFORM A QUADRANT POWER TILT RATIO CALCULATION. The conditions under which this task is to be performed are:

a. Reactor power is 70%.
b. N-41, N-42, & N-43 PR NI detectors are operable.
c. N-44 PR NI detector is inoperable.
d. You are directed by Shift Supervisor to perform STP-7.0, using DATA SHEET 2 and curves 71A-D provided, and determine if the acceptance criteria is met.
e. A pre-job brief is not required.

DATA SHEET 2

	DETECTOR A INDICATED CURRENT
N41	104.4
N42	107.0
N43	114.1
N44	0.0

	DETECTOR B INDICATED CURRENT
N41	107.0
N42	110.0
N43	125.0
N44	0.0

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-7.0

SAFETY RELATED

QUADRANT POWER TILT RATIO CALCULATION

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

Approved:

TODD YOUNGBLOOD
Operations Manager

Date Issued 8-4-03

FARLEY NUCLEAR PLANT
SURVEILLANCE TEST REVIEW SHEET

SURVEILLANCE TEST NO. FNP-1-STP-7.0	TECHNICAL SPECIFICATION REFERENCE SR 3.2.4.1
TITLE QUADRANT POWER TILT RATIO CALCULATION	MODE(S) REQUIRING TEST: 1 (>50% Rated Thermal Power)

TEST RESULTS (TO BE COMPLETED BY TEST PERFORMER)

PERFORMED BY ______________________ DATE/TIME ______________________

COMPONENT OR TRAIN TESTED (if applicable) ______________________

[ ] ENTIRE STP PERFORMED [ ] FOR SURVEILLANCE CREDIT

[ ] PARTIAL STP PERFORMED: [ ] NOT FOR SURVEILLANCE CREDIT

REASON FOR PARTIAL: ______________________

TEST COMPLETED: [ ] Satisfactory [ ] Unsatisfactory

[ ] The following deficiencies occurred:

____

____

[ ] Corrective action taken or initiated:

____

____

____

SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY ______________________ DATE ______________________

[ ] Procedure properly completed and satisfactory

[ ] Comments: ______________________

____

ENGINEERING SUPPORT REACTOR ENG. REVIEW (If applicable)

SCREENED BY ______________________ DATE ______________________

REVIEWED BY ______________________ DATE ______________________

[ ] Satisfactory and Approved

[ ] Comments: ______________________

____

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-7.0

QUADRANT POWER TILT RATIO CALCULATION

1.0 Purpose

To determine the quadrant power tilt ratio using power range nuclear instrumentation.

2.0 Acceptance Criteria

The quadrant power tilt ratio shall be ≤ 1.02.

3.0 Initial Conditions

CJR 3.1 The version of the procedure has been verified to be the current version and correct unit for the task. (OR 1-98-498).

NOTE:	This STP may be performed at less than 50% power for verification of power range instrument indications. In this case, the STP is not for surveillance credit.

CJR 3.2 Above 50% of rated thermal power.

NA 3.3 IF DVM is used to collect data, THEN have I&C obtain a Fluke 45 or equivalent with shielded test leads with NO exposed metal connectors.

DVM Serial No. ________________ Cal. due ______________________

4.0 Precautions and Limitations

4.1 Reactor power, rod position and reactor coolant temperature should be constant while taking data.

4.2 A QPTR calculation should be done prior to rescaling of Power Range Nuclear Instruments, and after completing the rescaling of ALL Power Ranges Nuclear Instruments. A QPTR calculation performed between individual Power Range rescaling may provide erroneous results

4.3 If one Power Range NI is inoperable and thermal power is ≤ 75% RTP, the remaining power range channels can be use for calculating QPTR.(SR 3.2.4.1)

4.4 Above 75% RTP, with one Power Range NI inoperable, QPTR must be determined by SR 3.2.4.2

5.0 Instructions

4NOTE:	**QPTR may be determined using detector current meter data with normalized currents from Curve 71A, 71B, 71C, AND 71D, or by using detector currents read by DVM with normalized currents from Curve 71A,71B,71C, AND 71D, DVM data is obtained using Attachment 2.**

5.1 Obtain normalized currents from Curve 71, and enter on the Calculation Sheet.

NOTE:	**With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR.**

CAUTION:	**DVM readings may be taken in only one drawer at a time.**

5.2 Read detector current meters in NI-41B, 42B, 43B, and 44B POWER RANGE B drawer DETECTOR A and DETECTOR B or have I&C obtain detector currents using Attachment 2 for the desired detectors.

5.3 Enter total number of operable detectors in space provided on the Calculation Sheet.

5.4 Calculate the upper and lower Quadrant Power Tilt Ratios.

5.5 Record the greater of the upper or lower Quadrant Power Tilt Ratio value in the space provided.

ACCEPTANCE CRITERIA:	**Maximum value of upper or lower Quadrant Power Tilt Ratio shall be ≤ 1.02.**

5.6 Record the Power Level (Avg.) in the space provided.

6.0 References

6.1 FSAR - Chapter 4.1.

6.2 Unit 1 Technical Specification 3.2.4

ATTACHMENT 1

QUADRANT POWER TILT RATIO CALCULATION
CALCULATION SHEET

UPPER QUADRANT POWER TILT

Channel	Detector A Indicated Current	÷	* Detector A 100% Current	=	Detector A Calibrated Output
N41B		÷		=	
N42B		÷		=	
N43B		÷		=	
N44B		÷		=	

Total Number Operable Upper Detectors ÷ Total Detector A Calibrated Output = Average Upper Detector Calibrated Output

$\frac{1}{\text{Average Upper Detector Calibrated Output}}$ X Maximum Detector A Calibrated Output = Upper Quadrant Power Tilt Ratio

Total Detector A Calibrated Output = ______ ÷ ______ = $\frac{1}{\_\_\_\_}$ X ______ = ______

*Obtained from Curve 71, 0% AFD Current

LOWER QUADRANT POWER TILT

Channel	Detector B Indicated Current	÷	* Detector B 100% Current	=	Detector B Calibrated Output
N41B		÷		=	
N42B		÷		=	
N43B		÷		=	
N44B		÷		=	

Total Number Operable Lower Detectors ÷ Total Detector B Calibrated Output = Average Lower Detector Calibrated Output

$\frac{1}{\text{Average Lower Detector Calibrated Output}}$ X Maximum Detector B Calibrated Output = Lower Quadrant Power Tilt Ratio

Total Detector B Calibrated Output = ______ ÷ ______ = $\frac{1}{\_\_\_\_}$ X ______ = ______

*Obtained from Curve 71, 0% AFD Current

% Power ____________________

Record Maximum of
Upper or Lower Quadrant Tilt Ratio _______________

ACCEPTANCE CRITERIA:	**Maximum of Upper or Lower Quadrant Power Tilt Ratio does not exceed 1.02**

ATTACHMENT 2

USING A DVM TO OBTAIN DETECTOR CURRENT VALUES

ACCEPTANCE CRITERIA: **Maximum of Upper or Lower Quadrant Power Tilt Ratio shall be ≤ 1.02.USING A DVM TO OBTAIN DETECTOR CURRENT VALUES**

NOTE: Detector current values may be obtained for as many drawers as required. Unused spaces in the Table should be marked NA.

1.0 Obtaining NI Detector Currents using a DVM.

CAUTION: DVM readings may be taken in only one drawer at a time.

1.1 Using a Fluke 45 or equivalent (Do Not use a Fluke 8600) and shielded test leads connect and obtain detector voltage readings as follows:

NOTE: Voltage values should be in the 2 to 3 volt range.

NA
I&C 1.1.1 For Upper Detector connect to TP301 (+) and TP305 (-) and record voltage in appropriate space of table below.

NA
I&C 1.1.2 For Lower Detector connect to TP302 (+) and TP305 (-) and record voltage in appropriate space of table below.

NOTE: To calculate detector currents use the following formula:

$$\frac{\text{Measured Detector Voltage}}{2.083} \times \text{Curve 71 "0\% AFD, 100\% Current" Value} = \text{Calculated Detector Current}$$

NA 1.2 Using the 0% AFD, 100% current value from Curve 71, calculate the detector current value and record in appropriate space of table below.

	N41		N42		N43		N44	
	Upper Detector	Lower Detector	Upper Detector	Lower Detector	Upper Detector	Lower Detector	Upper Detector	Lower Detector
	DVM Voltage	DVM Voltage	DVM Voltage	DVM Voltage	DVM Voltage	DVM Voltage	DVM Voltage	DVM Voltage
Step 1.1								
	Calculated Current	Calculated Current	Calculated Current	Calculated Current	Calculated Current	Calculated Current	Calculated Current	Calculated Current
Step 1.2								

UNIT 1 VOLUME 1 CURVE 71A

PRESENT NIS CHANNEL N41 CURRENT SETTINGS

Rev. 16 04/06/06 WRM

Approved: Ron [illegible] for 4/7/06
Engineering Support Manager Date

Channel	AFD % (Values at 100% Power) Detector Current			K	Computer Constant	Gpot
	30	0	-30			
N41T	179.18	155.00	130.82			
N41B	129.93	162.46	195.00	84.2149	20.206	.6063

Revised Detector Equations

Channel	I Det =	(M)	* AO +	IO
N41T	I Det =	.8059	* AO +	155.0014
N41B	I Det =	-1.0845	* AO +	162.4641

THIS CURVE IS FOR CYCLE 21 STARTUP CURRENTS,

CALCULATED PER FNP-0-ETP-3605

NOTES:
1) At 100% Power AFD% = AO%
2) T refers to the Top or Upper Detector, and B refers to the Bottom or Lower Detector
3) I&C Procedures for N-41 Calibration are FNP-1-IMP-228.8 & FNP-1-STP-228.5
4) This curve is exempted from 50.59 screening per AP-1, Attachment 1, Note 1

Curve Placed in Effect:

_____________________ / _____________________
Shift Supervisor Date / Time
(To be completed following scaling in rack)

PCB-1-VOL1-CRV71B

UNIT 1 VOLUME 1 CURVE 71B

PRESENT NIS CHANNEL N42 CURRENT SETTINGS

Rev. 16 04/06/06 WRM

Approved: Ron Clemm for 4/7/06
Engineering Support Manager Date

Channel	AFD % (Values at 100% Power)			K	Computer Constant	Gpot
	30	0	-30			
	Detector Current					
N42T	185.26	159.51	133.76			
N42B	129.24	163.29	197.33	81.0977	19.463	0.5839

Revised Detector Equations

Channel	I Det =	(M)	* AO +	IO
N42T	I Det =	**.8583**	* AO +	**159.5140**
N42B	I Det =	**-1.1348**	* AO +	**163.2865**

THIS CURVE IS FOR CYCLE 21 STARTUP CURRENTS,

CALCULATED PER FNP-0-ETP-3605

NOTES:
1) At 100% Power AFD% = AO%
2) T refers to the Top or Upper Detector, and B refers to the Bottom or Lower Detector
3) I&C Procedures for N-42 calibration are FNP-1-IMP-228.9 & FNP-1-STP-228.6
4) This curve is exempted from 50.59 screening per Ap-1, Attachment 1, Note 1

Curve Placed in Effect:

_______________________/_______________________
Shift Supervisor Date / Time
(To be completed following scaling in rack)

UNIT 1 VOLUME 1 CURVE 71C

PRESENT NIS CHANNEL N43 CURRENT SETTINGS

Rev. 16 04/06/06 WRM

Approved: [illegible] for 4/7/06
Engineering Support Manager Date

Channel	AFD % (Values at 100% Power) Detector Current			K	Computer Constant	Gpot
	30	**0**	**-30**			
N43T	196.47	169.95	143.43			
N43B	140.38	176.06	211.74	83.6349	20.07	0.6022

Revised Detector Equations

Channel	I Det =	(M)	* AO +	IO
N43T	I Det =	**.8840**	* AO +	**169.9474**
N43B	I Det =	**-1.1893**	* AO +	**176.0636**

THIS CURVE IS FOR CYCLE 21 STARTUP CURRENTS,

CALCULATED PER FNP-0-ETP-3605

NOTES:
1) At 100% Power AFD% = AO%
2) T refers to the Top or Upper Detector, and B refers to the Bottom or Lower Detector
3) I&C Procedures for N-43 calibration are FNP-1-IMP-228.10 and FNP-1-STP-228.7
4) This curve is exempted from 50.59 screening per AP-1, Attachment 1, Note 1

Curve Placed in Effect:

/

Shift Supervisor Date / Time
(To be completed following scaling in rack)

PCB-1-VOL1-CRV71D

UNIT 1 VOLUME 1 CURVE 71D

PRESENT NIS CHANNEL N44 CURRENT SETTINGS

Rev. 16 04/06/06 WRM

Approved: RM Coleman for 4/7/06
Engineering Support Manager Date

Channel	AFD % (Values at 100% Power) 30	0	-30	K	Computer Constant	Gpot
	Detector Current					
N44T	189.88	163.76	137.64			
N44B	131.03	166.86	202.70	80.1607	19.235	N/A

Revised Detector Equations

Channel	I Det =	(M)	* AO +	IO
N44T	I Det =	**.8707**	* AO +	**163.7593**
N44B	I Det =	**-1.1945**	* AO +	**166.8637**

THIS CURVE IS FOR CYCLE 21 STARTUP CURRENTS,

CALCULATED PER FNP-0-ETP-3605

NOTES:
1) At 100% Power AFD% = AO%
2) T refers to the Top or Upper Detector, and B refers to the Bottom or Lower Detector
3) I&C Procedures for N-44 Calibration are FNP-1-IMP-228.11 & FNP-1-STP-228.8
4) This curve is exempted from 50.59 screening per AP-1, Attachment 1, Note 1

Curve Placed in Effect:

_____________________ / _____________________
Shift Supervisor Date / Time
(To be completed following scaling in rack)

KEY

FARLEY NUCLEAR PLANT
SURVEILLANCE TEST REVIEW SHEET

SURVEILLANCE TEST NO. FNP-1-STP-7.0	TECHNICAL SPECIFICATION REFERENCE SR 3.2.4.1
TITLE QUADRANT POWER TILT RATIO CALCULATION	MODE(S) REQUIRING TEST: 1 (>50% Rated Thermal Power)

TEST RESULTS (TO BE COMPLETED BY TEST PERFORMER)

PERFORMED BY applicant's signature, date, time DATE/TIME

COMPONENT OR TRAIN TESTED (if applicable)

[✓] ENTIRE STP PERFORMED [ ] FOR SURVEILLANCE CREDIT

[ ] PARTIAL STP PERFORMED: [ ] NOT FOR SURVEILLANCE CREDIT

REASON FOR PARTIAL:

TEST COMPLETED: [ ] Satisfactory [✓] Unsatisfactory

[✓] The following deficiencies occurred:

Lower quadrant Power tilt ratio >1.02

[✓] Corrective action taken or initiated:

CR# 2007001010 written

SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY DATE

[ ] Procedure properly completed and satisfactory

[ ] Comments:

ENGINEERING SUPPORT
REACTOR ENG. REVIEW
(If applicable)
[ ] Satisfactory and Approved

SCREENED BY DATE

REVIEWED BY DATE

[ ] Comments:

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-7.0

QUADRANT POWER TILT RATIO CALCULATION

1.0 Purpose

To determine the quadrant power tilt ratio using power range nuclear instrumentation.

2.0 Acceptance Criteria

The quadrant power tilt ratio shall be ≤ 1.02.

3.0 Initial Conditions

GKR 3.1 The version of the procedure has been verified to be the current version and correct unit for the task. (OR 1-98-498).

NOTE: This STP may be performed at less than 50% power for verification of power range instrument indications. In this case, the STP is not for surveillance credit.

GKR 3.2 Above 50% of rated thermal power.

NA 3.3 IF DVM is used to collect data, THEN have I&C obtain a Fluke 45 or equivalent with shielded test leads with NO exposed metal connectors.

DVM Serial No. ______________ Cal. due ____________________

4.0 Precautions and Limitations

4.1 Reactor power, rod position and reactor coolant temperature should be constant while taking data.

4.2 A QPTR calculation should be done prior to rescaling of Power Range Nuclear Instruments, and after completing the rescaling of ALL Power Ranges Nuclear Instruments. A QPTR calculation performed between individual Power Range rescaling may provide erroneous results

4.3 If one Power Range NI is inoperable and thermal power is ≤ 75% RTP, the remaining power range channels can be use for calculating QPTR.(SR 3.2.4.1)

4.4 Above 75% RTP, with one Power Range NI inoperable, QPTR must be determined by SR 3.2.4.2

ATTACHMENT 1
QUADRANT POWER TILT RATIO CALCULATION
CALCULATION SHEET

UPPER QUADRANT POWER TILT

Channel	Detector A Indicated Current	÷	* Detector A 100% Current	=	Detector A Calibrated Output	Total Number Operable Upper Detectors	1 / Average Upper Detector Calibrated Output	X	Maximum Detector A Calibrated Output	=	Upper Quadrant Power Tilt Ratio
N41B	104.4	÷	155	=	0.673548						
N42B	107	÷	159.51	=	0.670804						
N42B	114.1	÷	169.95	=	0671374						
N44B	N/A	÷	N/A	=	N/A						
Total Detector A Calibrated Output	=	2.015727	÷	3	=		1 / 0.671909	X	0.673548	=	1.00244 [1.00 to 1.00244] **

*Obtained from Curve 71, 0% AFD Current

LOWER QUADRANT POWER TILT

Channel	Detector B Indicated Current	÷	* Detector B 100% Current	=	Detector B Calibrated Output	Total Number Operable Lower Detectors	1 / Average Lower Detector Calibrated Output	X	Maximum Detector B Calibrated Output	=	Lower Quadrant Power Tilt Ratio
N41B	107	÷	162.46	=	0.658624						
N42B	110	÷	163.29	=	0.673648						
N43B	125	÷	176.06	=	0.709985						
N44B	N/A	÷	N/A	=	N/A						
Total Detector B Calibrated Output	=	2.042257	÷	3	=		1 / 0.680752		0.709985	=	1.042942 [1.04 to 1.044118] **

*Obtained from Curve 71, 0% AFD Current Power 70%

Record Maximum of
Upper or Lower Quadrant Tilt Ratio 1.04 (rounded from all digit calc) to 1.044118 (not rounded: 2 significant digit calc.)

[note: Tolerance determined by using only 2 significant digits in one calculation and another calculation by using all digits in calculator, rounding to 2 significant digits was used and compared to non-rounded numbers. Used max tolerance of either rounding or not rounding.]

ACCEPTANCE CRITERIA: Maximum of Upper or Lower Quadrant Power Tilt Ratio does not exceed 1.02

A.1.1 Conduct of operations ADMIN G2.1.10 - SRO

TITLE: Determine if current conditions allow Mode 4 entry

TASK STANDARD: Determine while completing a mode change checklist that mode 4 entry is prohibited by two unsat STPs, STP-10.4 & STP-15, and an inoperable 1B DG (due to low Fuel Oil Storage tank content).

PROGRAM APPLICABLE: SOT ___ SOCT _____ OLT _X_ LOCT_____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ CLASS ROOM

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

ALTERNATE PATH ___ TIME CRITICAL ___ PRA_____

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to determine if Mode 4 entry is allowed. IF mode 4 entry is prohibited, identify which conditions preclude Mode 4 entry.

a. Unit 1 is in Mode 5.
b. Unit 2 is in Mode 1 at 100% power.
c. You are the Unit 1 Shift Support Supervisor. You are to complete filling out FNP-1-STP-35.1 and determine if Mode 4 entry is allowed. If any conditions preclude Mode 4 entry, then identify all conditions that preclude Mode 4 entry.
d. Shift turnover and shift brief has just been completed.
   1. STP-35.1, step 5.3, is in progress reviewing requirements for Mode 4 entry.
   2. STP-1.0 has been performed 7 hours ago for mode 4.
   3. All STPs have been reviewed per FNP-1-STP-35.1E with exceptions noted on coversheet.
   4. Taggout review is complete sat.
   5. All applicable signatures and initials have been completed in STP-35.1 except on the pages provided.
   6. Review for mode 4 LCOs has been completed except for DG which have parameters listed:

	1/2A	1C	1B
Diesel Fuel Oil storage tank contents	25,500 gals	25,500 gals	20,350 gals
Lube Oil inventory	248 gals	183 gals	255 gals
Starting Air receiver pressures	415 psig	240 psig	425 psig

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ **START TIME**		
*1. Determines that STP-10.4, EMERGENCY BORATION CHECK VALVES INSERVICE TEST, is UNSAT due to step 5.8 (1B BAT pump flow low). This precludes Mode 4 entry.	Determines that STP-10.4, EMERGENCY BORATION CHECK VALVES INSERVICE TEST, is UNSAT due to step 5.8 flow lower than graph of 44 gpm (1B BAT pump flow low). This precludes Mode 4 entry.	S / U
*2. Determines that STP-15.0, CONTAINMENT AIR LOCK DOOR SEAL OPERABILITY TEST, is unsat due to 5.2.20 NOT ≤ 2347 sccm. This precludes Mode 4 entry.	Determines that STP-15.0, CONTAINMENT AIR LOCK DOOR SEAL OPERABILITY TEST, is unsat due to 5.2.20 NOT ≤ 2347 sccm. This precludes Mode 4 entry.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*3. Determines that of the 9 given DG parameters, one makes the 1B DG inoperable due to usable Fuel Level. This TS also requires immediately declaring the 1B DG inoperable. This precludes Mode 4 entry due to two trains of DGs required in Mode 4. (SEE table on next page for KEY) (TS 3.8.3 Cond. E & ts 3.8.1 Cond. B)	Determines that of the 9 given DG parameters, one makes the 1B DG inoperable due to usable Fuel Level. This TS also requires immediately declaring the 1B DG inoperable.	S / U

TS 3.8.3:

	1/2A	1C	1B
Diesel Fuel Oil storage tank contents	25,500 gals	25,500 gals	**20,350 gals Inoperable (TS 3.8.3 Cond F. & TS 3.8.1 Cond B)**
Lube Oil inventory	248 gals	183 gals	255 gals
Starting Air receiver pressures	415 psig	240 psig	425 psig

_____ **STOP TIME**

Terminate when all initial conditions have been evaluated.

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

GENERAL REFERENCES:

1. Technical Specifications, TRM, & Basis

Current Amendment, Revision, or Version Numbers

Last Update: 8-14-07

	Unit 1 / Unit 2
Tech Spec	175 / 168
Tech Spec Bases	39
Environmental Protection Plan	90 / 83
COLR (Cycle-Rev)	21-2 / 19-0
PTLR	2 / 3
Tech Requirements Manual	15
Tech Requirements Manual Bases	5

2. K/A: G2.1.10 SRO 3.9

GENERAL TOOLS AND EQUIPMENT:

Provide:

1. Marked up STP-35.1
2. Marked up STP-10.4
3. Marked up STP-15.0
4. Technical Specifications & Basis for TS 3.8.1 & 3.8.3

COMMENTS:

CONDITIONS

When I tell you to begin, you are to determine if Mode 4 entry is allowed. IF mode 4 entry is prohibited, identify which conditions preclude Mode 4 entry.

a. Unit 1 is in Mode 5.
b. Unit 2 is in Mode 1 at 100% power.
c. You are the Unit 1 Shift Support Supervisor. You are to complete filling out FNP-1-STP-35.1 and determine if Mode 4 entry is allowed. If any conditions preclude Mode 4 entry, then identify all conditions that preclude Mode 4 entry.
d. Shift turnover and shift brief has just been completed.
    1. STP-35.1, step 5.3, is in progress reviewing requirements for Mode 4 entry.
    2. STP-1.0 has been performed 7 hours ago for mode 4.
    3. All STPs have been reviewed per FNP-1-STP-35.1E with exceptions noted on coversheet.
    4. Taggout review is complete sat.
    5. All applicable signatures and initials have been completed in STP-35.1 except on the pages provided.
    6. Review for mode 4 LCOs has been completed except for DG which have parameters listed:

	1/2A	1C	1B
Diesel Fuel Oil storage tank contents	25,500 gals	25,500 gals	20,350 gals
Lube Oil inventory	248 gals	183 gals	255 gals
Starting Air receiver pressures	415 psig	240 psig	425 psig

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-35.1

S
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UNIT STARTUP TECHNICAL SPECIFICATION VERIFICATION

STARTUP NO. ___________________

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

Approved:

Jim Hunter (for)
Operations Manager

Date Issued 9/21/2006

FARLEY NUCLEAR PLANT
SURVEILLANCE TEST REVIEW SHEET

SURVEILLANCE TEST NO. FNP-1-STP-35.1	TECHNICAL SPECIFICATION REFERENCE SR 3.0.4; SR 3.4.2.1
TITLE UNIT STARTUP TECHNICAL SPECIFICATION VERIFICATION	MODE(S) REQUIRING TEST: 1,2,3,4, 5, 6 and Core Alterations

TEST RESULTS (TO BE COMPLETED BY TEST PERFORMER)

PERFORMED BY ______________________ DATE/TIME ______________

COMPONENT OR TRAIN TESTED (if applicable) ______________________

[ ] ENTIRE STP PERFORMED [ ] FOR SURVEILLANCE CREDIT

[ ] PARTIAL STP PERFORMED: [ ] NOT FOR SURVEILLANCE CREDIT

REASON FOR PARTIAL: ______________________

TEST COMPLETED: [ ] Satisfactory [ ] Unsatisfactory

[ ] The following deficiencies occurred:

____

____

[ ] Corrective action taken or initiated:

____

____

____

SHIFT SUPERVISOR / SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY ______________________ DATE ______________

[ ] Procedure properly completed and satisfactory

[ ] Comments: ______________________

____

ENGINEERING SUPPORT GROUP SCREENING (IF APPLICABLE)

SCREENED BY ______________________ DATE ______________

REVIEWED BY ______________________ DATE ______________

[ ] Satisfactory and Approved

[ ] Comments: ______________________

____

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-35.1

UNIT STARTUP TECHNICAL SPECIFICATION VERIFICATION

1.0 Purpose

To ensure the technical specification required during unit startup are completed.

2.0 Acceptance Criteria

2.1 Technical requirements for entering Mode 4 are complete prior to exceeding 200°F Avg. Coolant temp.

2.2 Technical requirements for entering Mode 3 are complete prior to reaching 350°F Avg. Coolant temperature.

2.3 Technical requirements for enabling Rod Control System are complete prior to enabling Rod Control.

2.4 Technical requirements for entering Mode 2 are complete prior to reaching a keff of 0.99.

2.5 Technical requirements for entering Mode 1 are complete prior to exceeding 5% reactor power.

2.6 Reactor Coolant System temperature is ≥ 541°F prior to entry into Mode 2 with $K_{eff} \geq 1.0$

3.0 Initial Conditions

SJJ
Previous/date time 3.1 The version of this procedure has been verified to be the current version. (OR 1-98-498)

SJJ
Previous date time 3.2 The procedure has been verified to be the correct unit for the task (OR 1-98-498)

SJJ
Previous date time 3.3 FNP-1-STP-1.0: OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS is being performed shiftly.

4.0 Precautions and Limitations

4.1 All Surveillance and Tagout reviews should be performed in an environment free from distractions. It is the responsibility of the person performing the review to establish such an environment before commencing the task and ensure he/she is not distracted from the task.

4.2 Units 1/2 TS Amendments 170/163, INCREASING FLEXIBILITY IN MODE RESTRAINTS, issued 02-22-2006, revised LCO 3.0.4 to allow entry into a MODE while relying on the associated ACTIONS, provided that either (a) the ACTIONS to be entered permit continued operation in the MODE for an unlimited period of time, (b) a risk assessment is performed which justifies the use of LCO 3.0.4 (unless there's an exception in the Specification), or (c) an NRC approved allowance is provided in the Specification to be entered.

5.0 Instructions

NOTE: IF plant is in Mode 3 prior to unit startup, THEN steps 5.1 through 5.4 are not required.

SJT
Previous date time
5.1 The following has been performed for Mode 6 or Core Alterations entry:
- A Technical Specification Surveillance verification has been completed, if not completed within the last 24 hours, per checklist FNP-1-STP-35.1F and FNP-1-STP-35.1G OR Appendix A.
- A review for mode 6 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 6.

SJT
Previous date time
5.2 The following has been performed for Mode 5 entry:
- A Technical Specification Surveillance verification has been completed, if not completed within the last 24 hours, per checklist FNP-1-STP-35.1F and FNP-1-STP-35.1G OR Appendix A.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H.
- A review for mode 5 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 5.

_____ 5.3 The following has been performed for Mode 4 entry:
__/__
- A Technical Specification Surveillance verification has been completed, if not completed within the last 24 hours, per checklist FNP-1-STP-35.1E OR Appendix A.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H.
- A review for mode 4 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 4.

_____ 5.4 The following has been performed for Mode 3 entry:
__/__
- A Technical Specification Surveillance verification has been completed, if not completed within the last 24 hours, per checklist FNP-1-STP-35.1D OR Appendix A.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H,
- A review for mode 3 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 3.

NOTE:	**Appendix B may be utilized to expedite the performance of checklist FNP-1-STP-35.1C.**

_____ 5.5 The following has been performed for enabling Rod Control:
__/__
- A Technical Specification Surveillance verification has been completed, if not completed within the last 24 hours, per checklist FNP-1-STP-35.1C.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H.
- A review for LCO's which prohibit Enabling Rod Control has been completed. (IR 2-96-025)

_____ 5.6 The following has been performed for entering Mode 2:
__/__
- A Technical Specification Surveillance verification has been completed, if not completed within last 24 hours, per checklist FNP-1-STP-35.1A OR Appendix A.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H.
- A review for mode 2 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 2.

____ 5.7 Monitor minimum temperature for criticality using each RCS Tavg until low
__/__ low T_{avg} alarm reset and all $T_{avg} > 547°$ F:

5.7.1 IF FNP-1-STP-101, ZERO POWER REACTOR PHYSICS TESTING, is being performed for initial startup, THEN verify the acceptance criteria is met using FNP-1-STP-101, Data Sheet 5.

Actual critical time: ________________

ACCEPTANCE CRITERIA:	• **Reactor Coolant temperature is ≥ 541° F.**
	• **Reactor Coolant temperature is ≥ 531° F during performance of physic testing.**

Section 5.7 is continued on the next page.

5.7.2 IF startup is performed per FNP-1-UOP-1.2, STARTUP OF UNIT FROM HOT STANDBY TO MINIMUM LOAD, Appendix 1, or FNP-1-UOP-1.3, STARTUP OF UNIT FOLLOWING AN AT POWER REACTOR TRIP, Appendix 1, THEN perform the following:

a. Monitor each RCS loop Tavg at least every 15 minutes.
b. Record the lowest RCS loop Tavg on the associated UOP, Appendix 1, Data Table.
c. Transfer the collected data to this procedure when directed by the associated UOP.

TIME	Lowest Tavg		TIME	Lowest Tavg

Actual critical time: ____________

ACCEPTANCE CRITERIA: Reactor Coolant temperature is ≥ 541°F.

____ 5.8 The following have been performed for entering Mode 1:
__/__
- A Technical Specification Surveillance verification has been completed, if not completed within last 24 hours, per checklist FNP-1-STP-35.1B OR Appendix A.
- A Tagout review has been completed per checksheet FNP-1-STP-35.1H.
- A review for mode 1 LCO's has been completed.
- FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, has been performed within 12 hours for Mode 1.

09/24/06 12:45:51

UNIT 1

FNP-1-STP-35.1E
Version 41.0

FARLEY NUCLEAR PLANT
UNIT 1
MODE 4 SURVEILLANCE CHECK LIST

STP Status Reviewed By: Fred James

Date/Time Previous / date & time

STP Status Verified By: Rex Rabbo

Date/Time current / date & time

Startup No.(s) 101

STPs NOT current at time of review (list):

STP	Date/Time Performed for startup:
FNP-1-STP-10.4	/
FNP-1-STP-15.0	/
	/
	/
	/
	/
	/
	/
	/
	/
	/
	/
	/
	/

Based on the above review and performance of STPs listed above surveillance requirements are met for mode 4 entry prior to

/	
Date/Time	Shift Support Supervisor or Shift Supervisor

This check list consists of 16 pages.

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-10.4

EMERGENCY BORATION CHECK VALVES INSERVICE TEST

SAFETY RELATED

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

Approved:

Jim L. Hunter (for)
Operations Manager

Date Issued 12/07/06

FARLEY NUCLEAR PLANT
SURVEILLANCE TEST REVIEW SHEET

SURVEILLANCE TEST NO. FNP-1-STP-10.4	TECHNICAL SPECIFICATION REFERENCE 5.5.8
TITLE EMERGENCY BORATION CHECK VALVES INSERVICE TEST	MODE(S) REQUIRING TEST: 1, 2, 3, 4, 5, 6

TEST RESULTS (TO BE COMPLETED BY TEST PERFORMER)

PERFORMED BY Walt Scott DATE/TIME Current date+time

COMPONENT OR TRAIN TESTED (if applicable) NA

[✓] ENTIRE STP PERFORMED [✓] FOR SURVEILLANCE CREDIT

[ ] PARTIAL STP PERFORMED: [ ] NOT FOR SURVEILLANCE CREDIT

REASON FOR PARTIAL: NA

TEST COMPLETED: [✓] Satisfactory [ ] Unsatisfactory

[ ] The following deficiencies occurred:

None

[ ] Corrective action taken or initiated:

NA

SHIFT SUPERVISOR/SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY ______ DATE ______

[ ] Procedure properly completed and satisfactory

[ ] Comments: ______

ENGINEERING SUPPORT GROUP SCREENING (IF APPLICABLE)
SCREENED BY ______ DATE ______
REVIEWED BY ______ DATE ______
[ ] Satisfactory and Approved
[ ] Comments: ______

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-10.4

EMERGENCY BORATION CHECK VALVES INSERVICE TEST

1.0 Purpose

1.1 To verify operability of the boric acid filter to charging pump suction check valve 1-CVC-V-8442 (Q1E21V210).

1.2 To verify operability of the 1A BATP discharge check valve 1-CVC-V-8314A (Q1E21V220A) to pass full forward flow as described in valve inservice test plan.

1.3 To verify operability of the 1B BATP discharge check valve 1-CVC-V-8314B (Q1E21V220B) to pass full forward flow as described in valve inservice test plan.

2.0 Acceptance Criteria

2.1 Flow through the boric acid filter to the charging pump suction check valve is greater than the minimum flow curve of Figure l.

2.2 The BATP discharge check valves allow flow greater than the minimum flow curve of Figure 1.

NOTE: Asterisked steps (*) are those associated with Acceptance Criteria.

3.0 Initial Conditions

3.1 Verify the following: (OR 1-98-498)

WS 3.1.1 The version of this procedure is the current version.

WS 3.1.2 This procedure is the correct procedure and unit for the task.

WS 3.2 Normal or alternate charging is in operation per FNP-1-SOP-2.1, CHEMICAL AND VOLUME CONTROL SYSTEM PLANT STARTUP AND OPERATION.

WS 3.3 The Boric Acid System is aligned for operation per FNP-1-SOP-2.6, CHEMICAL AND VOLUME CONTROL SYSTEM BORIC ACID SYSTEM.

WS 3.4 Verify the on-service boric acid tank boron concentration is within TRM limits. (circle tank used)

(1A / 1B) BAT concentration 7286 ppm

WS 3.5 Verify that the Boric Acid system is aligned per FNP-1-SOP-2.6, CHEMICAL AND VOLUME CONTROL SYSTEM BORIC ACID SYSTEM, Section 4.1 OR 4.3.

4.0 Precautions and Limitations

4.1 Only the steps for the applicable valve(s) or pump being tested need to be signed off. The other steps can be marked N/A with Shift Supervisor's review and approval as designated by his initials next to the steps that are marked N/A.

4.2 During the conduct of this procedure Boron will be added to the RCS. Unless borating to CSD during the performance of this procedure, minimize the amount of time that a boric acid pump is run with emergency borate valve open.

5.0 Instructions

WS 5.1 Verify closed BORIC ACID TO BLENDER Q1E21FCV113A.

WS 5.2 Open the EMERG BORATE TO CHG PUMP SUCT Q1E21MOV8104

WS 5.3 Record VCT pressure, as indicated on VCT PRESS PI 117.

Pressure 35 psig.

WS 5.4 Start the on service BORIC ACID TRANSFER PUMP (1A or 1B) that is aligned to CVCS. (Circle pump started.)

WS *5.5 Record Emergency Boration flow as indicated on BORIC ACID EMERG BORATE FI-110. Verify the flow is greater than the minimum flow curve of Figure 1.

Flow 45 gpm

ACCEPTANCE CRITERIA:	**Flow is greater than the minimum flow curve for the existing VCT pressure. (See Figure 1.)**

WS 5.6 Stop the BORIC ACID TRANSFER PUMP started in step 5.4.

WS 5.7 Start the standby BORIC ACID TRANSFER PUMP.

Pump started 1A or 1B (circle pump started)

WS *5.8 Record emergency boration flow as indicated on BORIC ACID EMERG BORATE FI-110. Verify the flow is greater than the minimum flow curve of Figure 1.

Flow 43 gpm.

ACCEPTANCE CRITERIA:	Flow is greater than the minimum flow curve for the existing VCT pressure. (See Figure 1.)

WS 5.9 Stop the BORIC ACID TRANSFER PUMP started in step 5.7.

WS 5.10 Close EMERG BORATE TO CHG PUMP SUCT VALVE Q1E21MOV8104.

NOTE:
- **The manual emergency boration flow path is being tested to verify boric acid flow can be delivered at greater than 30 gpm as required by FNP-1-AOP-27.0 EMERGENCY BORATION. This test addresses question CVCS-SSSA-043 dated 8/22/94 of the CVCS SSSA.**
- **Steps 5.11 thru 5.16 are not part of STP Acceptance criteria; however, IF the remainder of this STP is completed satisfactory, THEN the STP should be considered performed entirely for surveillance purposes.**
- **It is desirable to perform steps 5.11 thru 5.16 during each refueling shutdown while performing the initial shutdown boration.**

WS 5.11 Start the on service BORIC ACID TRANSFER PUMP (1A or 1B) that is aligned to CVCS. (Circle pump started.)

5.12 Align the manual emergency boration flow path as follows.

WS 5.12.1 Open BORIC ACID TO BLENDER Q1E21FCV113A

WS 5.12.2 Open MANUAL EMERGENCY BORATION Valve Q1E21V185 (1-CVC-V-8439).

WB 5.13 Record Emergency Boration flow as indicated on MKUP FLOW TO BORIC ACID BLENDER FI-113.

Flow 33 gpm

WB 5.14 Stop the on service BORIC ACID TRANSFER PUMP (1A or 1B) started in step 5.11.

5.15 Align the manual emergency boration flow path as follows.

WB 5.15.1 Close BORIC ACID TO BLENDER Q1E21FCV113A

WB 5.15.2 Close MANUAL EMERGENCY BORATION Valve Q1E21V185 (1-CVC-V-8439).

NA 5.16 IF manual emergency boration flow rate is less than or equal to 30 gpm, THEN evaluate the probable cause of any flow restriction and submit a CR to investigate the problem.

NA 5.17 IF a flow acceptance criteria is NOT met, THEN evaluate the probable cause of any flow restriction, submit a CR to investigate the problem and refer to the appropriate Technical Requirements Manual requirement.

6.0 References

6.1 FNP-1-SOP-2.1, CVCS PLANT STARTUP AND OPERATION

6.2 FNP-1-SOP-2.6, CVCS BORIC ACID SYSTEM

6.3 FNP-1-M-095, Inservice Testing Plan

6.4 D-175039, Sh 2.

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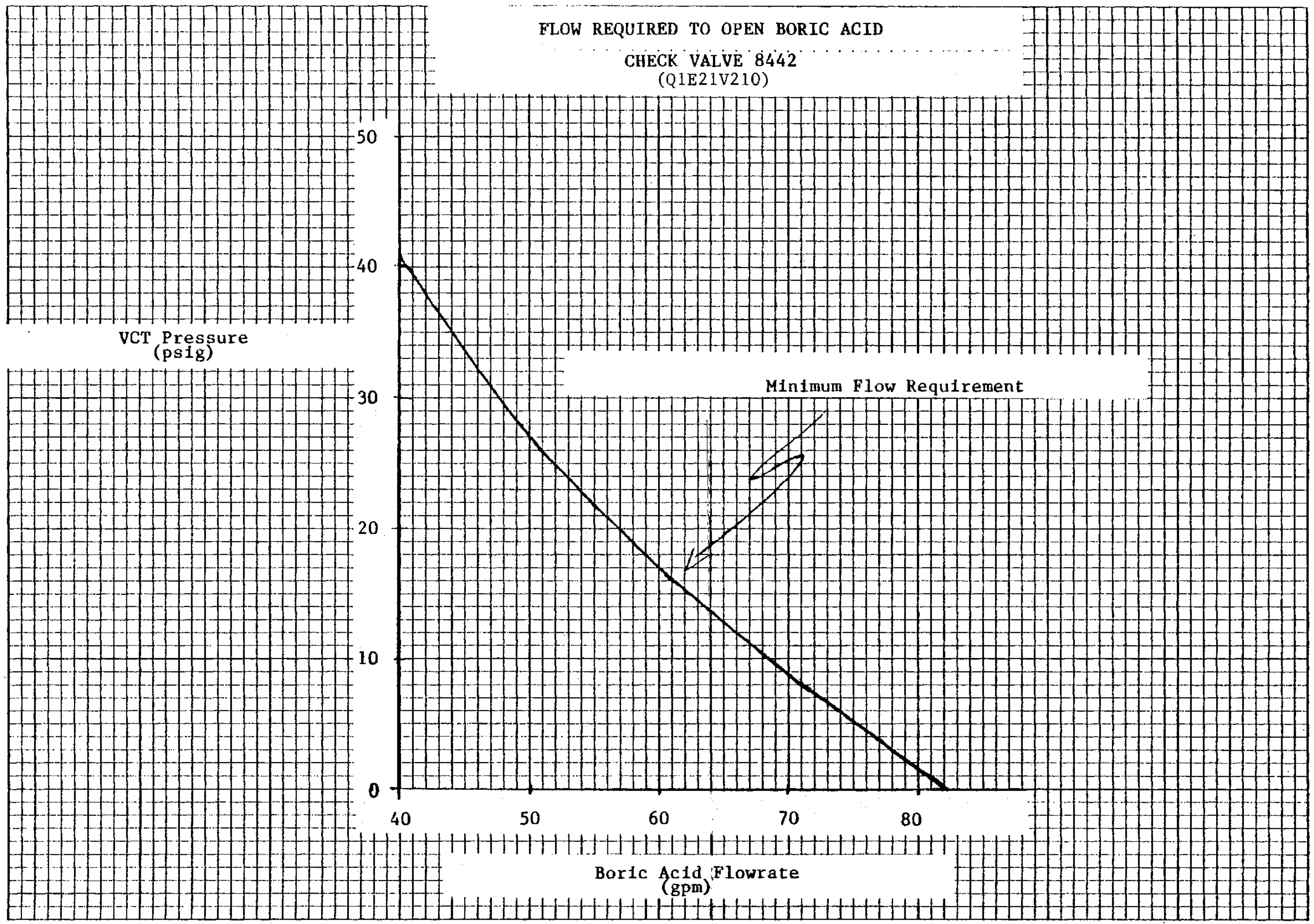


FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-15.0

SAFETY RELATED

CONTAINMENT AIR LOCK DOOR SEAL OPERABILITY TEST

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

Approved:

Richard Wells
Operations Manager

Date Issued 07/06/06

FARLEY NUCLEAR PLANT
SURVEILLANCE TEST REVIEW SHEET

SURVEILLANCE TEST NO. FNP-1-STP-15.0	TECHNICAL SPECIFICATION REFERENCE SR 3.6.2.1; 5.5.17
TITLE CONTAINMENT AIR LOCK DOOR SEAL OPERABILITY TEST	MODE(S) REQUIRING TEST: 1, 2, 3, 4

TEST RESULTS (TO BE COMPLETED BY TEST PERFORMER)

PERFORMED BY Walt Scott / Brad Locke DATE/TIME Current date + time

COMPONENT OR TRAIN TESTED (if applicable) NA

[✓] ENTIRE STP PERFORMED [✓] FOR SURVEILLANCE CREDIT

[ ] PARTIAL STP PERFORMED: [ ] NOT FOR SURVEILLANCE CREDIT

REASON FOR PARTIAL: NA

TEST COMPLETED: [✓] Satisfactory [ ] Unsatisfactory

[ ] The following deficiencies occurred:
None

[ ] Corrective action taken or initiated:
NA

SHIFT SUPERVISOR/ SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY ____________ DATE ____________

[ ] Procedure properly completed and satisfactory

[ ] Comments: ____________

ENGINEERING SUPPORT GROUP SCREENING (IF APPLICABLE)
SCREENED BY ____________ DATE ____________
REVIEWED BY ____________ DATE ____________
[ ] Satisfactory and Approved
[ ] Comments: ____________

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-15.0

CONTAINMENT AIR LOCK DOOR SEAL OPERABILITY TEST

1.0 Purpose

To determine the operability of the containment air lock seals.

2.0 Acceptance Criteria

The leak rate shall be ≤ 2347 sccm per the formula below with the seals pressurized to ≥ 10 psig for at least 15 minutes.

NOTE: Formula for calculation

$$\text{Leakage (sccm)} = \frac{[\text{Initial pressure - final pressure (psi)}] \times \text{Total Test Volume}}{\text{Duration of Test (min)} \times 14.7\text{ psi}}$$

Total Test Volume Personnel hatch = 6000 cc
Total Test Volume Aux hatch = 4000 cc

NOTE: Asterisk (*) steps are those associated with Acceptance Criteria.

3.0 Initial Conditions

WS 3.1 The version of this procedure has been verified to be the current version. (OR 1-98-498)

WS 3.2 This procedure has been verified to be the correct unit for the task. (OR 1-98-498)

NOTE: Door seals are to be tested within 7 days of opening, and once per 30 days during periods of frequent opening.

WS 3.3 The air lock door has been opened.

WS 3.4 A test manifold is available including a 0-30 psig gauge with .5 psig increments and calibrated within 2% accuracy.

WS 3.5 Record Test Gauge Instrument Number FNP-HPG-3802.

Cal. Due Date 8-19-2008.

WS 3.6 The HP Foreman has been contacted. IF necessary, THEN their presence has been requested at the containment access hatch to be tested.

WS 3.7 Snoop or other appropriate leak test solution is available.

WS 3.8 Containment hatch has been energized by closing breaker 10 in receptacle panel N1V51L004E-N.

WS 3.9 Admin LCO established to track performance of FNP-1-STP-15.0 per SR 3.6.2.1

WS 3.10 A flow restrictor is in place on service air connection.

4.0 Precautions and Limitations

4.1 DO NOT pressurize the gap between the exterior door seals > 15 psig.

4.2 Inform any personnel inside containment on which access hatch the test is being conducted and the time required to complete the test.

4.3 IF only one of the hatches has been used for entry into containment, THEN it is only necessary to perform the applicable section of this procedure and steps 5.3 and 5.4.

4.4 The pressure on the door seals shall be ≥ 10 psig for at least 15 minutes for the test to be valid.

4.5 The total test volume assumes ≤ 50 feet of 3/8" O.D. test tubing and ≤ 2 feet of 1" I.D. test tree. IF dimensions exceed these values, THEN test volumes used in above calculation must be revised.

5.0 Instructions

NOTE: IF the outer door is locked, THEN HP will be required to unlock the outer door.

5.1 Personnel Access Hatch.

5.1.1 Inspect and clean the outer door seal as follows:

WS 5.1.1.1 Verify the inner door CLOSED and latched.

WS 5.1.1.2 Inspect the door seal (gasket surface) and the movable door seating surface for evidence of physical deformities or deterioration.

WS 5.1.1.3 Ensure the door seal (gasket) is properly seated in its grooves.

JLS MM 5.1.1.4 IF required, THEN have maintenance clean the door seal (gasket surface) and the movable door seating surface with an alcohol soaked rag. (Ref. OR 96-368)

WS 5.1.2 Remove pipe cap from exterior door test connection.

WS 5.1.3 Verify that all valves on test manifold are closed.

NOTE:	**Use as short a length of hose/Polyflo tubing as possible between door test connection and test rig. Do Not use Chicago type fittings in the section pressurized for the test between door test connection and the test rig.**

WS 5.1.4 Connect air supply line and gauge to exterior door seal test manifold and connect manifold to door test connection via a short length of poly flow tubing (see Figure 1 for typical arrangement).

WS 5.1.4.1 Slowly open the service air connection valve.

5.1.5 Leak check the test manifold as follows:

WS 5.1.5.1 Verify closed isolation valve #2.

WS 5.1.5.2 Slowly pressurize the test manifold to 15 psig by opening the isolation valve #1 and adjusting the regulator as needed.

WS 5.1.5.3 Test each pressurized fitting/connection for air leakage and verify no leakage evident.

WS 5.1.5.4 Isolate the service air connection.

WS 5.1.5.5 Slowly depressurize the test manifold by opening vent valve #2 and then reclosing it.

WS 5.1.5.6 Open isolation valve #2.

WS 5.1.5.7 Slowly open the service air connection valve to verify that the air supply tubing from the door test connection to the area between the seals is free from blockage, evident by air coming out of pin hole between door seals, **THEN** close service air connection valve (see Figure 2).

WS 5.1.6 Verify the exterior door is closed and latched.

CAUTION: Slowly open service air connection to keep from overpressurizing the seals.

WS 5.1.7 Reopen the service air connection valve and then adjust the test manifold regulator to SLOWLY pressurize the door seal between ≥ 10 psig and < 15 psig.

WS 5.1.7.1 Test each fitting/connection between the test connection and the isolation valve #2 for air leakage and verify no leakage evident. (the section not previously tested)

WS 5.1.8 Close the isolation valve #1 to isolate the air supply at the test manifold.

WS 5.1.9 Close the service air connection valve to isolate the air supply line.

WS 5.1.10 IF vent valve #1 is plugged, THEN remove the plug.

WS 5.1.11 Slowly open vent valve #1 to depressurize the air supply line.

WS 5.1.12 Disconnect the air supply line from the test rig.

WS *5.1.13 After 10 minutes, record initial pressure and start time.

Initial Pressure 14.2 psig

Start Time 1042

ACCEPTANCE CRITERIA: Pressure ≥ 10 psig and <15 psig.

WS *5.1.14 WHEN at least 15 minutes has elapsed since the time recorded in step 5.1.13, THEN record final pressure and stop time.

Final Pressure 13.6 psig

Stop Time 1101

NOTE: IF test pressure does not remain greater than 10 psig, THEN the test is invalid and a volumetric test may be performed using Attachment A with results documented in step 5.1.20.

WS *5.1.15 Calculate personnel hatch air seal leakage rate per the formula below:

Leakage Rate (sccm) 12.9 = [14.2 Initial Pressure - 13.6 Final Pressure (psi)] × 6000 cc / Duration of Test 19 min × 14.7 psi

ACCEPTANCE CRITERIA: Leakage Rate ≤ 2347 sccm.

NA 5.1.16 IF the acceptance criteria is not met and the inner air lock door is locked per Tech Spec. LCO 3.6.2 Condition A, THEN initiate a tagout for the locked chain on the inner door. (Ref IR 1-92-112)

NOTE: The test gauge may remain attached to test manifold.

WS 5.1.17 Slowly vent pressure from door seal by opening vent valve #2, and then remove air supply line and gauge from test manifold.

WS 5.1.18 IF plug from vent valve #1 was removed, THEN reinstall plug.

WS 5.1.19 Close all valves on test manifold and then remove test manifold.

NA *5.1.20 IF volumetrics test was performed, THEN record leakage rate below.

Personnel Hatch leakage rate _______________ (sccm)

ACCEPTANCE CRITERIA: Leakage Rate ≤ 2347 sccm.

WS 5.1.21 Reinstall pipe cap securely on exterior door seal test connection.

NA 5.1.22 IF the acceptance criteria was not met and the inner air lock door is locked per Tech Spec. LCO 3.6.2 Condition A, THEN initiate a tagout for the locked chain on the inner door. (Ref IR 1-92-112)

NA 5.1.23 IF containment access is still required THEN track the status of breaker 10 in receptacle panel N1V51L004E-N per Admin LCO.

WS 5.1.24 De-energize personnel access hatch by opening breaker 10 in receptacle panel N1V51L004E-N (located by new fuel door).

5.2 Auxiliary Access Hatch.

WS 5.2.1 Visually inspect door seal and movable door seal seating surface for evidence of physical deformities or deterioration and verify the inner door CLOSED and latched.

WS 5.2.2 Remove pipe cap from exterior test connection.

NOTE:	**Use as short a length of hose/Polyflo tubing as possible between door test connection and test rig. <u>Do Not</u> use Chicago type fittings in the section pressurized for the test between door test connection and the test rig.**

WS 5.2.3 Connect air supply line and test gauge to exterior door seal test manifold and connect manifold to door test connection via short run of poly flow tubing (see Figure 1 for typical arrangement).

WS 5.2.4 Verify all valves on the test manifold are closed.

WS 5.2.4.1 Slowly open the service air connection valve.

5.2.5 Leak check the test manifold as follows:

WS 5.2.5.1 Verify closed isolation valve #2.

WS 5.2.5.2 Slowly pressurize the test manifold to 15 psig by opening isolation valve #1 and adjusting regulator as needed.

WS 5.2.5.3 Test each pressurized fitting/connection for air leakage and verify no leakage evident.

WS 5.2.5.4 Isolate the service air connection.

WS 5.2.5.5 Slowly depressurize the test manifold by opening vent valve #2 and then close it.

WS 5.2.5.6 Open isolation valve #2 to align the test manifold to the door test connection.

WS 5.2.5.7 Slowly open the service air connection to verify that the air supply tubing from the door test connection to the area between the seals is free from blockage, evident by air coming out of pin hole between door seals, **<u>THEN</u>** close service air connection valve (see Figure 2).

WS 5.2.6 Close exterior door, ensuring the door seats firmly against the seal.

CAUTION: Slowly open service air connection to keep from overpressurizing the seals.

WS 5.2.7 Reopen the service air connection valve and then adjust the test manifold regulator to SLOWLY pressurize the door seal between ≥ 10 psig and < 15 psig.

WS 5.2.7.1 Test each fitting/connection between the test connection and the isolation valve #2 for air leakage and verify no leakage evident. (the section not previously tested)

WS 5.2.8 Close isolation valve #1 to isolate the air supply at the test manifold.

WS 5.2.9 Close the service air connection valve to isolate the air supply line.

WS 5.2.10 IF vent valve #1 is plugged, THEN remove the plug.

WS 5.2.11 Slowly open vent valve #1 to depressurize the air supply line.

WS 5.2.12 Disconnect the air supply line from the test rig.

WS *5.2.13 After 10 minutes, record initial pressure and start time.

Initial pressure 14.9 psig

Start time 1304

ACCEPTANCE CRITERIA: Pressure ≥ 10 psig and ≤ 15 psig.

WS *5.2.14 WHEN at least 15 minutes has elapsed since the time recorded in step 5.2.13, THEN record final pressure and stop time.

Final Pressure 0.12 psig

Stop Time 1320

NOTE:	**IF test pressure does not remain greater than 10 psig, THEN the test is invalid and a volumetric test may be performed by using Attachment A with results documented in step 5.2.20**

WS *5.2.15 Calculate Aux Hatch Air Seal leakage rate per the formula below.

Leakage Rate (sccm) 251.4 = [14.9 Initial Pressure - 0.12 Final Pressure (psi)]× 4000 cc / 16 min Duration of Test × 14.7 psi

ACCEPTANCE CRITERIA:	**Leakage Rate ≤ 2347 sccm.**

NA 5.2.16 IF the acceptance criteria is not met and the inner air lock door is locked per Tech Spec LCO 3.6.2 Condition A, THEN initiate a tagout for the locked chain on the inner door.
(Ref IR 1-92-112)

NOTE:	**The test gauge may remain attached to the test manifold.**

WS 5.2.17 Slowly vent pressure from door seal, remove air supply line and gauge from test manifold, and close all valves on test manifold.

WS 5.2.18 IF plug from vent valve #1 was removed, THEN reinstall plug.

WS 5.2.19 Remove test manifold, and then reinstall pipe cap on exterior door test connection.

WS *5.2.20 IF volumetrics test was performed, THEN record leakage rate below.

Auxiliary Hatch leakage rate 2532 (sccm)

ACCEPTANCE CRITERIA:	**Leakage Rate ≤ 2347 sccm.**

NA 5.2.21 IF the acceptance criteria was not met and the inner air lock door is locked per Tech Spec. LCO 3.6.2 Condition A, THEN initiate a tagout for the locked chain on the inner door.
(Ref IR 1-92-112)

WS 5.3 Return tools to storage toolbox and return toolbox and test manifold to Operations storage cage on 130' elevation.

WS 5.4 Verify leakage rate data is forwarded to Engineering Support department for determination of new adjusted leakage which will be used to ensure sum of all leakage is less than or equal to 0.60 La.

5.5 Independently verify the following:

IV 5.5.1 Verify pipe cap securely on exterior door seal test connection which was installed at step 5.1.21.

IV 5.5.2 Verify breaker 10 in receptacle panel N1V51L004E-N is open (located by new fuel door).

IV 5.5.3 Verify pipe cap securely on exterior door test connection which was installed at step 5.2.19.

6.0 References

6.1 U202993 - Instruction manual for air locks and closures

6.2 Eng. Support letter dated 1/22/96 (Rtype A4.51)

6.3 FNP-0-M-93: 10CFR50 Appendix J Option B Containment Leakage Rate Testing Program

6.4 Tech Spec 5.5.17: Containment Leakage Rate Testing Program

ATTACHMENT A

Infinite Supply Method Using Leak Rate Monitor

1.0 Setting Up the Volumetric Machine

1.1 Obtain volumetric machine FNP-VLM-18040, 18041, or 18042 from calibration lab.

1.2 Using the equipment in maintenance purge gang box (located in the Hot Machine Shop), connect the test equipment per Attachment C, Figure 2.

2.0 Connect the Leak Rate Monitor to a power source by one of the following:

- Insert the battery in the front panel.

  OR

- Connect to the optional 12 VDC auxiliary transformer.

3.0 Adjust the N_2 bottle regulator to supply nitrogen between 100 psig minimum and 150 psig maximum to the volumetric machine.

4.0 Turn the machine on and allow for 10 minute warm-up period.

5.0 Set Pressure Zero

5.1 Set the "REGULATOR" valve to the "OFF" position (full counter-clockwise).

5.2 Set the "RANGE SELECT" valve to the "HIGH" position.

5.3 Set the "DECAY" valve to the "FLOW" position.

5.4 Insure TEST port is open to atmosphere by performing the following on the test tree (REF Attachment C):

5.4.1 Open the inlet valve.

5.4.2 Open the vent valve.

5.5 Depress the "PRESS ZERO" button for a minimum of three (3) seconds until a beep is heard, and zero psig is indicated in the display window. Toggle zero to remove the asterisk (*) if shown in display window.

6.0 Set Flow Zero

6.1 Set the "REGULATOR" valve to the "OFF" position (full counter-clockwise).

6.2 Set the "RANGE SELECT" valve to the "HIGH" position.

6.3 Set the "DECAY" valve to the "FLOW" position.

6.4 Insure the TEST port is not open to atmosphere by closing the inlet valve on the test tree (REF Attachment C).

6.5 Adjust the "regulator" to 13 psig, the desired test pressure.

6.6 Select Channel 1 (2 – 200 SCCM) by pushing the "RANGE" button.

6.7 Press the "FLOW ZERO" button.

6.8 Select Channel 2 (200 – 20,000 SCCM) by again pushing the "RANGE" button.

6.9 Depress the "FLOW ZERO" button for a minimum of three (3) seconds until a beep is heard, and zero is indicated in the display window. Toggle zero to remove the asterisk (*) if shown in display window.

7.0 On the test tree, perform the following:

7.1 Close the outlet valve.

7.2 Close the vent.

7.3 Open the inlet valve.

NOTE: The equipment should be pressurized to the outlet valve on the test tree.

8.0 Snoop the machine connections and the test tree connections for leaks, and repair as necessary.

9.0 Attach the poly tubing as shown in Attachment C, Figure 2, to the test connection.

CAUTION: DO NOT EXCEED 15.0 psig in the system.

NOTE: The system should be under direct observation by test personnel while being filled to test pressure.

10.0 Pressurize the test section by opening the outlet valve on the test tree.

11.0 Allow a ten (10) minute temperature stabilization period before starting the test.

NOTE:	**Leakage rate may not reach a descending or stable mode and may not be within the acceptance criteria after a sufficient amount of time. This is indicative of a failed door seal.**

12.0 Observe the digital leak rate display on the Volumetrics machine until leakage is in a descending or stable mode.

13.0 IF leakage exceeds the high range (>20,000 sccm), THEN perform the following:

13.1 Quantify the leakage, using FNP-VLM-18044 (20 – 400 SLM) (located in the cal lab), per attachment B.

13.2 Record the value in step 5.1.20 or step 5.2.20.

13.3 Write CR to have door seal(s) replaced or repaired.

14.0 Measure leakage on high range channel 2. IF leakage falls in range of channel 1 (2 – 200 SCCM), THEN perform the following:

14.1 Move "RANGE SELECTOR" valve to the "LOW" position.

14.2 Select channel 1 by pressing the "RANGE" button.

15.0 Take reading of the digital leak rate display on the Volumetrics machine and record on step 5.1.20 or step 5.2.20

ACCEPTANCE CRITERIA:	**Leakage Rate ≤ 2347 sccm.**

16.0 IF the acceptance criteria was not met and the inner air lock door is locked per Tech Spec LCO 3.6.2 Condition A, THEN initiate a tagout for the locked chain on the inner door.

17.0 Upon completion of test, move "DECAY" valve to DECAY position.

18.0 Close the test tree inlet valve.

19.0 Vent the poly tubing via the test tree by opening the vent valve.

20.0 Remove the poly from the test connection.

21.0 Isolate the nitrogen to volumetric machine.

22.0 Secure test equipment by performing the following on test tree:

22.1 Close the outlet valve.

22.2 Close the inlet valve.

23.0 Vent the volumetric machine by rotating the "REGULATOR" valve counter-clockwise until zero pressure is obtained.

24.0 IF test is complete, THEN perform the following:

24.1 Return leak rate monitor to the cal lab.

24.2 Return the maintenance purge box to the Hot Machine Shop.

ATTACHMENT B

Infinite Supply Method Using High Range Leak Rate Monitor

1.0 Setting Up the Volumetric Machine

1.1 Obtain volumetric machine FNP-VLM-18044 from calibration lab.

1.2 Connect the test equipment per Attachment C, Figure 2.

2.0 Connect the Leak Rate Monitor to a power source by performing one of the following:

- Insert the battery in the front panel.

  OR

- Connect to the optional 12 VDC auxiliary transformer.

3.0 Adjust the N_2 bottle regulator to supply nitrogen between 100 psig minimum and 150 psig maximum to the volumetric machine.

4.0 Turn the machine on and allow for 10 minute warm-up period.

5.0 Set Pressure Zero

5.1 Set the "REGULATOR" valve to the "OFF" position (full counter-clockwise).

5.2 Set the "DECAY" valve to the "TEST" position.

5.3 Set the "FLOW" valve to the "FLOW" position.

5.4 Insure TEST port is open to atmosphere by performing the following on the test tree:

5.4.1 Open the inlet valve.

5.4.2 Open the vent valve.

5.5 Depress the "PRESS ZERO" button until zero psig is indicated in the display window.

6.0 Set Flow Zero

6.1 Set the "REGULATOR" valve to the "OFF" position (full counter-clockwise).

6.2 Set the "DECAY" valve to the "TEST" position.

6.3 Set the "FLOW" valve to the "FLOW" position.

6.4 Insure the TEST port is not open to atmosphere by closing the inlet valve on the test tree.

6.5 Adjust the "regulator" to 13 psig, the desired test pressure.

6.6 Allow readings to stabilize.

6.7 Depress the "FLOW ZERO" button until zero is indicated in the display window.

7.0 On the test tree, perform the following:

7.1 Close the outlet valve.

7.2 Close the vent.

7.3 Open the inlet valve.

NOTE: The equipment should be pressurized to the downstream valve on the test tree.

8.0 Snoop the machine connections and the test tree connections for leaks, and repair as necessary.

9.0 Attach the poly tubing as shown in Attachment C, Figure 2, to the test connection.

CAUTION: DO NOT EXCEED 15.0 psig in the system.

NOTE: The system should be under direct observation by test personnel while being filled to test pressure.

10.0 Pressurize the test section by opening the outlet valve on the test tree.

11.0 Allow a ten (10) minute temperature stabilization period before starting the test.

12.0 Observe the digital leak rate display on the Volumetrics machine until leakage is in a descending or stable mode.

13.0 Take reading of the digital leak rate display on the Volumetrics machine, and record in step 5.1.20 or 5.2.20.

14.0 Close inlet valve on test tree.

NOTE:	**Do not vent test volume through Leak Rate Machine**

15.0 Vent the poly tubing via the test tree by opening the vent valve.

16.0 Remove the poly from the test connection.

17.0 Isolate the nitrogen to volumetric machine.

18.0 Secure test equipment by performing the following on test tree:

18.1 Close the outlet valve.

18.2 Close the inlet valve.

19.0 Vent the volumetric machine by rotating the "REGULATOR" valve counter-clockwise until zero pressure is obtained.

20.0 IF test is complete, THEN perform the following:

20.1 Return leak rate monitor to the cal lab.

20.2 Return the maintenance purge box to the Hot Machine Shop.

ATTACHMENT C

FIGURE 1

NOTE:	THE FILL/VENT CONNECTION CAN BE USED TO FILL WITH NITROGEN OR INSTRUMENT AIR

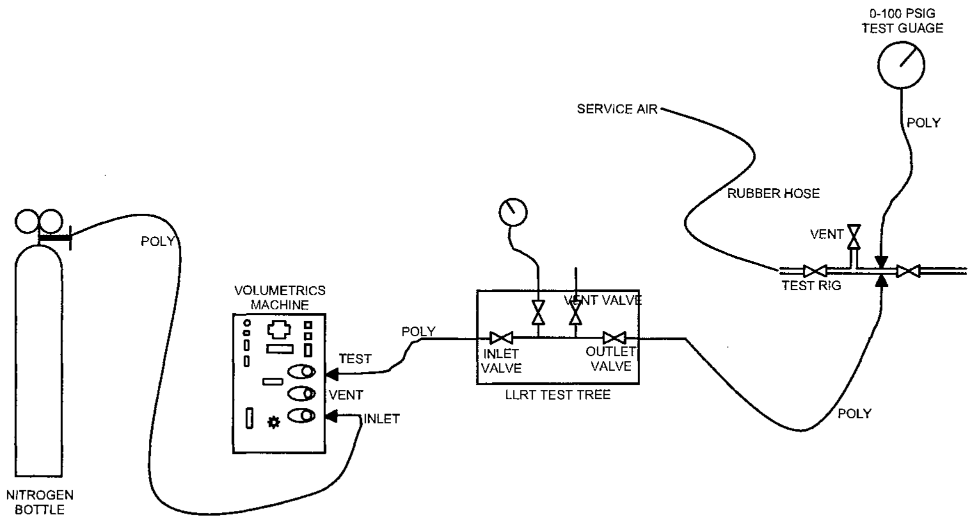


FIGURE 2

NOTE:	THE FILL/VENT CONNECTION CAN BE USED TO FILL WITH NITROGEN OR INSTRUMENT AIR

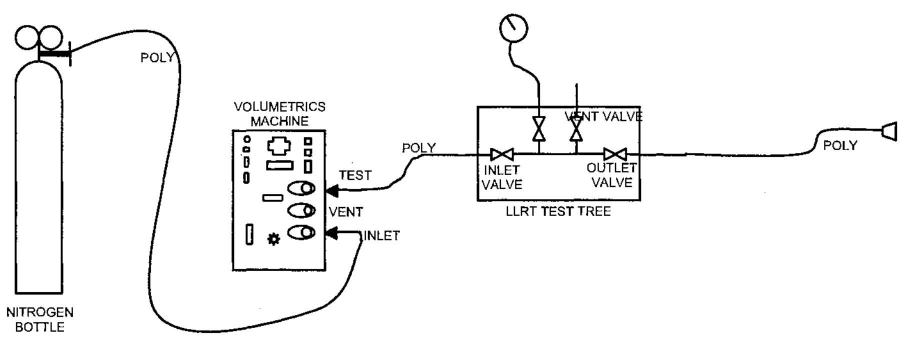


FIGURE 1

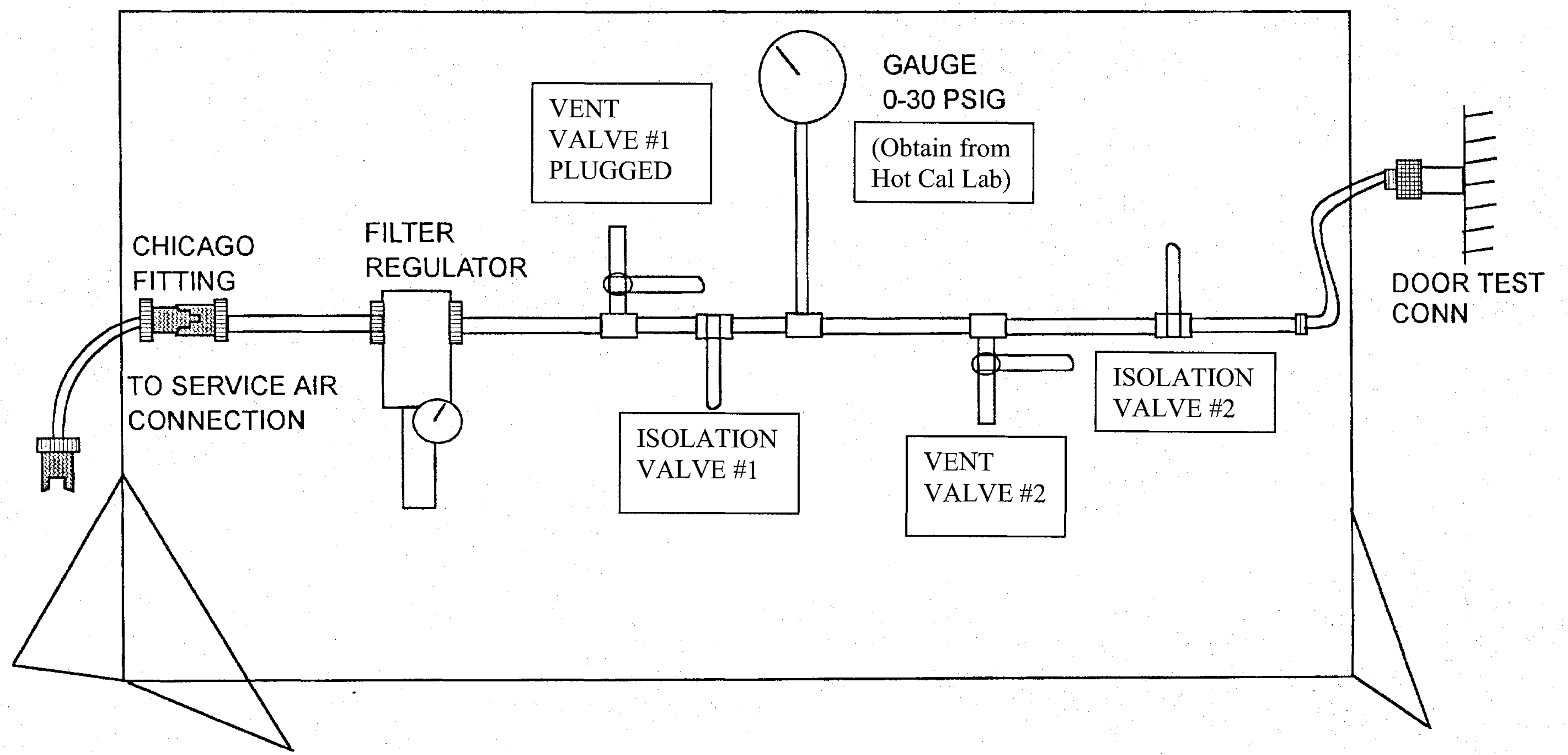
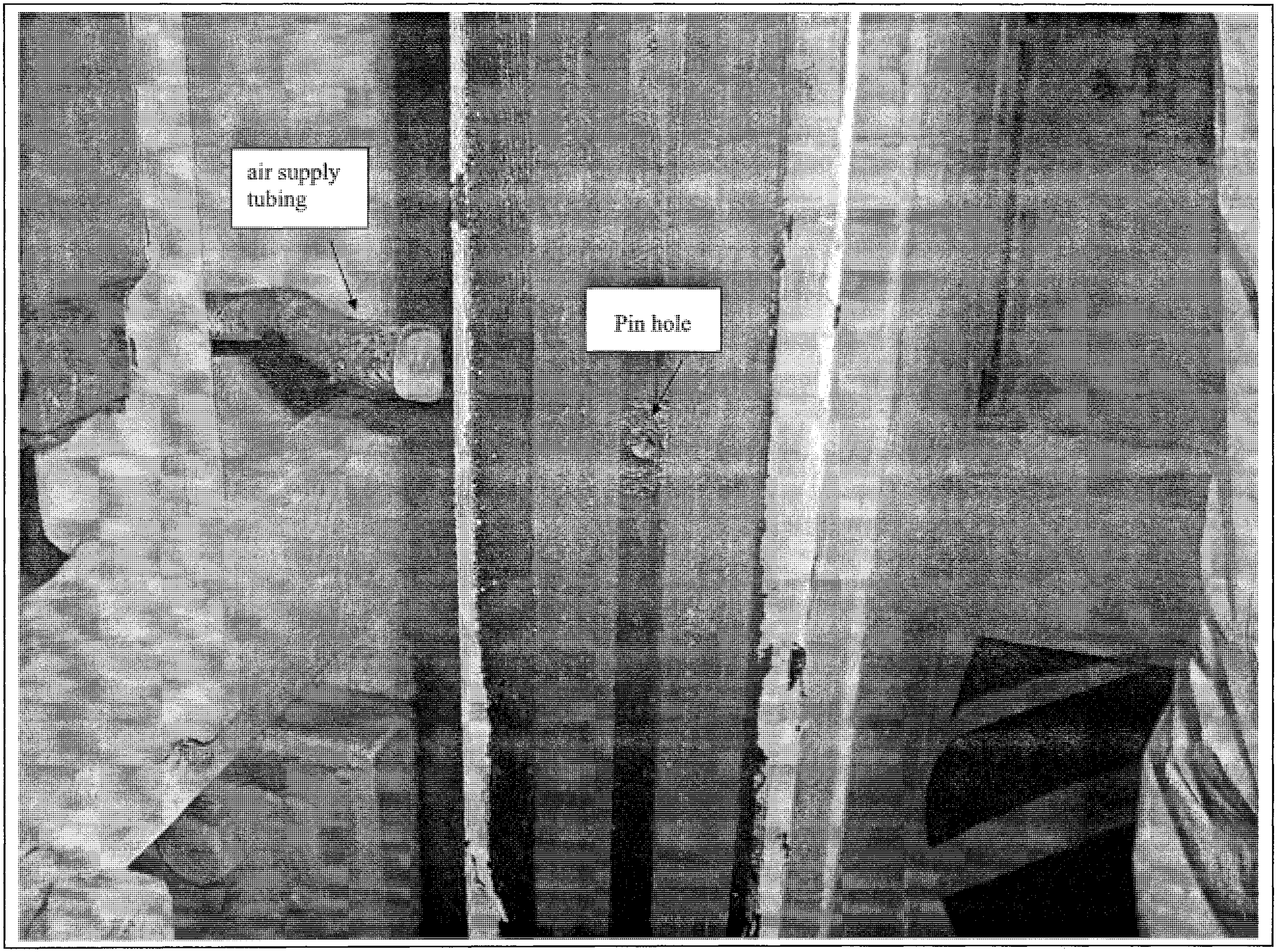

VENT
VALVE #1
PLUGGED
GAUGE
0-30 PSIG
(Obtain from
Hot Cal Lab)
CHICAGO
FITTING
FILTER
REGULATOR
DOOR TEST
CONN
TO SERVICE AIR
CONNECTION
ISOLATION
VALVE #1
VENT
VALVE #2
ISOLATION
VALVE #2

FIGURE 2



3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources — Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and

b. Two diesel generator (DG) sets capable of supplying the onsite Class 1E power distribution subsystem(s); and

c. Automatic load sequencers for Train A and Train B.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---NOTE---
LCO 3.0.4b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.	2 hours <u>AND</u> Once per 8 hours thereafter
	<u>AND</u>	
	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore required offsite circuit to OPERABLE status.	72 hours AND 13 days from discovery of failure to meet LCO
B. One DG set inoperable.	------------------NOTE------------------ LCO 3.0.4c is applicable when only one of the three DGs is inoperable. ---	
	B.1 Perform SR 3.8.1.1 for the required offsite circuit(s).	2 hours AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s) supported by the inoperable DG set inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	
	B.3.1 Determine OPERABLE DG set is not inoperable due to common cause failure. OR	24 hours
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.3.2	Perform SR 3.8.1.6 for OPERABLE DG set.	24 hours
	AND		
	B.4	Restore DG set to OPERABLE status.	10 days AND 13 days from discovery of failure to meet LCO
C. Two required offsite circuits inoperable.	C.1	Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND		
	C.2	Restore one required offsite circuit to OPERABLE status.	24 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One required offsite circuit inoperable. AND One DG set inoperable.	----------------NOTE----------------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems — Operating," when Condition D is entered with no AC power source to any train. ---	
	D.1 Restore required offsite circuit to OPERABLE status.	24 hours
	OR	
	D.2 Restore DG set to OPERABLE status.	24 hours
E. Two DG sets inoperable.	E.1 Restore one DG set to OPERABLE status.	2 hours if all three DGs are inoperable OR 8 hours if DG 1-2A and DG 1(2)B are inoperable OR 24 hours if DG 1C and DG 1(2)B are inoperable
F. Required Action and associated Completion Time of Condition C or E not met.	F.1 Be in MODE 3.	6 hours

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. One automatic load sequencer inoperable.	G.1	Restore automatic load sequencer to OPERABLE status.	12 hours
H. Required Action and associated Completion Time of Condition A, B, D, or G not met.	H.1	Be in MODE 3.	6 hours
	AND		
	H.2	Be in MODE 5.	36 hours
I. Three or more required AC sources inoperable.	I.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite circuit.	7 days
SR 3.8.1.2	-----------------------------NOTES------------------------------ 1. Performance of SR 3.8.1.6 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.6 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, and frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz.	31 days

SURVEILLANCE REQUREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.3	-------------------------------NOTES---------------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.6. --- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2700 kW and ≤ 2850 kW for the 2850 kW DG and ≥ 3875 kW and ≤ 4075 kW for the 4075 kW DGs.	31 days
SR 3.8.1.4	Verify each day tank contains ≥ 900 gal of fuel oil for the 4075 kW DGs and 700 gal of fuel oil for the 2850 kW DG.	31 days
SR 3.8.1.5	Verify the fuel oil transfer system operates to transfer fuel oil from storage tank to the day tank.	31 days
SR 3.8.1.6	-----------------------------NOTE------------------------------- All DG starts may be preceded by an engine prelube period. --- Verify each DG starts from standby condition and achieves in ≤ 12 seconds, voltage ≥ 3952 V and frequency ≥ 60 Hz.	184 days

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.7	-----NOTE----- This Surveillance shall not be performed in MODE 1 or 2. ----- Verify manual transfer of AC power sources from the normal offsite circuit to the alternate required offsite circuit.	18 months
SR 3.8.1.8	Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the speed is ≤ 75% of the difference between nominal speed and the overspeed trip setpoint; and b. Following load rejection, the voltage is ≥ 3740 V and ≤ 4580 V.	18 months

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.9	-------------------------------NOTES------------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in $\leq$ 12 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, 4. maintains steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for $\geq$ 5 minutes.	18 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.10	-------------------------------NOTE------------------------------- All DG starts may be preceded by prelube period. --- Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In $\leq$ 12 seconds after auto-start and during tests, achieves voltage $\geq$ 3952 V; b. In $\leq$ 12 seconds after auto-start and during tests, achieves frequency $\geq$ 60 Hz; c. Operates for $\geq$ 5 minutes and maintains a steady state generator voltage and frequency of $\geq$ 3740 V and $\leq$ 4580 V and $\geq$ 58.8 Hz and $\leq$ 61.2 Hz; -------------------------------NOTE------------------------------- SR 3.8.1.10.d and e shall not be performed in MODE 1 or 2. --- d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized from the offsite power system.	18 months

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.11	Verify each DG's automatic trips are bypassed on actual or simulated loss of voltage signal on the emergency bus and/or an actual or simulated ESF actuation signal except: a. Engine overspeed; b. Generator differential current; and c. Low lube oil pressure.	18 months
SR 3.8.1.12	------------------------------NOTE------------------------------ Momentary transients below the minimum load specified do not invalidate this test. --- Verify each DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4353 for the 4075 kW DGs and ≥ 3100 kW for the 2850 kW DG; and b. For the remaining hours of the test loaded ≥ 4075 kW for the 4075 kW DGs and ≥ 2850 kW for the 2850 kW DG.	18 months

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.13	-------------------------------NOTES----------------------------- 1. This Surveillance shall be performed within 10 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 4075 kW for the 4075 kW DGs and ≥ 2850 kW for the 2850 kW DG. Momentary transients below the minimum load specified do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. --- Verify each DG starts and achieves, in ≤ 12 seconds, voltage ≥ 3952 V and frequency ≥ 60 Hz.	18 months
SR 3.8.1.14	------------------------------NOTE----------------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	18 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by returning DG to ready-to-load operation.	18 months
SR 3.8.1.16	Verify interval between each sequenced load block is within ± 10% of design interval or 0.5 seconds, whichever is greater, for each emergency load sequencer.	18 months
SR 3.8.1.17	-----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in $\leq$ 12 seconds,	18 months (continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.17 (continued)	2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage $\geq$ 3740 V and $\leq$ 4580 V, 4. achieves steady state frequency $\geq$ 58.8 Hz and $\leq$ 61.2 Hz, and 5. supplies permanently connected and auto-connected emergency loads for $\geq$ 5 minutes.	
SR 3.8.1.18	-----------------------------NOTE----------------------------- Testing of the shared Emergency Diesel Generator (EDG) set (EDG 1-2A or EDG 1C) on either unit may be used to satisfy this surveillance requirement for these EDGs for both units. --- Verify each DG does not trip and voltage is maintained $\leq$ 4990 V and $\geq$ 3330 V during and following a load rejection of $\geq$ 1200 kW and $\leq$ 2400 kW.	5 years
SR 3.8.1.19	-----------------------------NOTE----------------------------- All DG starts may be preceded by an engine prelube period. --- Verify when started simultaneously from standby condition, each DG achieves, in $\leq$ 12 seconds, voltage $\geq$ 3952 V and frequency $\geq$ 60 Hz.	10 years

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources — Operating

BASES

BACKGROUND

The unit Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single DG set. DG set A consists of the 1-2A and 1C DGs. DG set B consists of the 1B DG (Unit 1) and the 2B DG (Unit 2).

Offsite power is supplied to the 230 kV and 500 kV switchyard(s) from the transmission network by six transmission lines. From the 230 kV switchyard, two electrically and physically separated circuits provide AC power, through startup auxiliary transformers, to the 4.16 kV ESF buses. A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in the FSAR, Chapter 8 (Ref. 2).

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus(es).

In addition to providing a pre-determined sequence of loading the DGs, the train A and train B automatic load sequencers also function to actuate the required ESF loads on the offsite circuits. When offsite power is available, the automatic load sequencers function to simultaneously start the required ESF loads upon receipt of an SI actuation signal.

The onsite standby power source is provided from 4 DGs (1-2A, 1B, 2B, and 1C). The DGs are of two different sizes. The 1B, 2B, and

(continued)

BASES

BACKGROUND (continued)

1-2A DGs are rated at 4075 kW and the 1C DG is rated at 2850 kW. DG 1-2A and 1-C are assigned to the redundant load group train A. The train A load group is supplied from 4160V emergency Buses, F, H, and K. The 4160V H bus does not supply any design basis required loads by itself but is required to support the operation of DG 1C to supply the emergency Buses F and K which in turn supply design basis required loads. DGs 1B and 2B are assigned to the redundant load group train B. The train B load group is supplied from 4160V emergency Buses G, J, and L. The 4160V bus J does not supply any design basis required loads and is only required for the response to a station blackout which is not a design basis accident.

DGs 1B and 2B are dedicated to train B of Unit 1 and Unit 2, respectively, and each DG comprises a required DG set for its associated unit. DGs 1-2A and 1C are dedicated to train A but are shared between both units and together comprise a required DG set for both units. However, there are no design basis events in which DG 1-2A or 1C are required to supply power to the safety loads of both units simultaneously. In all events, DG 1-2A and 1C are assigned to only one of the two units depending on the event.

The 4.16 kV emergency busses required to supply equipment essential for safe shutdown of the plant at F, G, H, J, K, and L for each unit. These are supplied by two startup transformers on each unit connected to the offsite source during normal and emergency operating conditions. In the event one startup transformer on a unit fails, three of the emergency busses on that unit will be de-energized with their loss annunciated in the Main Control Room. The respective busses Diesel Generators will start and LOSP loads will be sequenced on to those busses. In the event Diesels fail, manual action will be required to re-energize the affected busses from the other startup transformer for that unit.

A DG starts automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on an ESF bus degraded voltage or undervoltage signal (refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation"). After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an SI signal alone. Following the trip of offsite power, a sequencer strips nonpermanent loads from the ESF

(continued)

BASES

BACKGROUND (continued)	bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application. In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA). Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service. Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 2850 kW for DG 1C and 4075 kW for DGs 1-2A, 1B, and 2B. DG 1C has a 2000 hour rating of 3100 kW and overload permissible up to 3250 kW for 300 hours per year. DGs 1-2A, 1B, and 2B have a 2000 hour rating of 4353 kW and overload permissible up to 4474 kW for 2 hours in any 24 hour period with a maximum of 300 hours cumulative per year. The ESF loads that are powered from the 4.16 kV ESF buses are listed in Reference 2.
APPLICABLE SAFETY ANALYSES	The initial conditions of DBA and transient analyses in the FSAR, Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

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BASES

APPLICABLE SAFETY ANALYSES (continued)

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the unit. This results in maintaining at least one train of the onsite or offsite AC sources OPERABLE during Accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC power; and

b. A worst case single failure.

The AC sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two qualified circuits (i.e., consistent with the requirements of GDC 17) consisting of two physically independent transmission lines from the offsite transmission network to the switchyard and two independent circuits between the switchyard and the onsite Class 1E Electrical Power System along with separate and independent DG sets for each train ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an anticipated operational occurrence (AOO) or a postulated DBA.

Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit.

In addition, one automatic load sequencer per train must be OPERABLE (B1F, B2F, B1G, and B2G).

Each offsite circuit must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the ESF buses.

Two physically independent circuits between the transmission network and the onsite system may consist of any combination that includes two of the six transmission lines normally supplying the 230 and 500 kV switchyards and both independent circuits from the 230 kV switchyard to the Class 1E buses via Startup Auxiliary Transformers 1A (2A) and 1B (2B). The two of six combination of transmission lines may be shared between Unit 1 and 2. If either of the transmission lines are 500 kV, one 500/230 kV Autotransformer connecting the 500 and 230 kV switchyards is available. If both of the transmission lines are 500 kV, both 500/230 kV Autotransformers

(continued)

BASES

LCO (continued)

connecting the 500 and 230 kV switchyards are available. Any combination of 500 and 230 kV circuit breakers required to complete the independent circuits is permissible.

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within 12 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. For DG 1C this capability requires the support of the 4160 V H bus to enable DG 1C to supply the 4160 V buses F and K. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillance, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

The AC sources in one train must be separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

For the offsite AC sources, separation and independence are to the extent practical. All ESF buses, with two power sources available, have their supply breakers interlocked such that the buses can receive power from only one source at a time.

APPLICABILITY

The AC sources and sequencers are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

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BASES

APPLICABILITY (continued)

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources — Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition C, for two offsite circuits inoperable, is entered.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. The redundant required features referred to in this Required Action include the motor driven auxiliary feedwater pump as well as the turbine driven auxiliary feedwater pump. One motor driven auxiliary feedwater pump does not provide 100% of the auxiliary feedwater flow assumed in the safety analyses. Therefore, in order to ensure the auxiliary feedwater safety function, the turbine driven auxiliary feedwater pump must be considered a redundant required feature addressed by this Required Action.

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BASES

ACTIONS

A.2 (continued)

The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The train has no offsite power supplying it loads; and

b. A required feature on the other train is inoperable.

If at any time during the existence of Condition A (one offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

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BASES

ACTIONS

A.3 (continued)

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 10 days. This could lead to a total of 13 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 10 days (for a total of 23 days) allowed prior to complete restoration of the LCO. The 13 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 13 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition A was entered.

B.1

The Condition B Required Actions are modified by a Note that is applicable when only one of the three individual DGs is inoperable. The note permits the use of the provisions of LCO 3.0.4c. The allowance provided by this note, to enter the MODE of applicability with a single inoperable DG, takes into account the capacity and capability of the remaining AC sources and the fact that operation is ultimately limited by the Condition B Completion Time for the inoperable DG set.

To ensure a highly reliable power source remains with an inoperable DG set, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result

(continued)

BASES

ACTIONS

B.1 (continued)

in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG set is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. The redundant required features referred to in this Required Action include the motor driven auxiliary feedwater pump as well as the turbine driven auxiliary feedwater pump. One motor driven auxiliary feedwater pump does not provide 100% of the auxiliary feedwater flow assumed in the safety analyses. Therefore, in order to ensure the auxiliary feedwater safety function, the turbine driven auxiliary feedwater pump must be considered a redundant required feature addressed by this Required Action. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG set.

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG set exists; and

b. A required feature on the other train (Train A or Train B) is inoperable.

If at any time during the existence of this Condition (one DG set inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin to be tracked.

Discovering one required DG set inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the OPERABLE DG set, results in starting the Completion Time for the Required Action. Four hours from the

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BASES

ACTIONS

B.2 (continued)

discovery of these events existing concurrently is Acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DG set and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of the inoperable DG set does not exist on the OPERABLE DG set, SR 3.8.1.6 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG set would be declared inoperable upon discovery and Condition E of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.3.1 is satisfied. If the cause of the initial inoperable DG set cannot be confirmed not to exist on the remaining DG set, performance of SR 3.8.1.6 suffices to provide assurance of continued OPERABILITY of that DG set.

In the event the inoperable DG set is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE DG set is not affected by the same problem as the inoperable DG set.

B.4

Operation may continue in Condition B for a period that should not exceed 10 days.

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BASES

ACTIONS

B.4 (continued)

In Condition B, the remaining OPERABLE DG set and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The 10 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.4 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 13 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 16 days) allowed prior to complete restoration of the LCO. The 13 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 10 day and 13 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

C.1 and C.2

Required Action C.1, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. The redundant required features referred to in this Required Action include the motor driven auxiliary feedwater pump as well as the turbine driven auxiliary feedwater pump. One motor driven auxiliary feedwater pump does not provide 100% of the auxiliary feedwater flow assumed in the safety analyses. Therefore, in order to ensure the auxiliary feedwater safety function, the turbine driven auxiliary feedwater pump must be considered a redundant required feature addressed by this Required Action.

The Completion Time for Required Action C.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable; and

b. A required feature is inoperable.

If at any time during the existence of Condition C (two offsite circuits inoperable) a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

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BASES

ACTIONS

C.1 and C.2 (continued)

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and

b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

D.1 and D.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition D are modified by a Note to indicate that when Condition D is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems — Operating," must be immediately entered. This allows Condition D to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

Operation may continue in Condition D for a period that should not exceed 24 hours.

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

In Condition D, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition C (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

E.1

With all or part of Train A DG set and Train B DG set inoperable, the capacity of the remaining standby AC sources is reduced depending on which combination of individual DGs is affected. Thus, with an assumed loss of offsite electrical power, standby AC sources may be insufficient to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

With all or part of each train of DG sets inoperable, operation may continue for a given unit for different periods of time depending on the combination of individual DGs that are inoperable. The length of time allowed increases with decreasing severity in the combinations of inoperable DGs. One set must be restored to operable status in 2 hours if DGs 1-2A, 1C, and 1B on Unit 1 or DGs 1-2A, 1C, and 2B on Unit 2 are inoperable. Operability of one set must be restored in 8 hours if DGs 1-2A and 1B on Unit 1 or DGs 1-2A and 2B on Unit 2 are inoperable. Operability of one set must be restored in 24 hours if DGs 1C and 1B on Unit 1 or DGs 1C and 2B on Unit 2 are inoperable.

(continued)

BASES

ACTIONS (continued)

F.1

Condition F provides the default Required Actions for the Conditions which address two inoperable offsite circuits or two inoperable DG sets. If the inoperable AC Sources cannot be restored to OPERABLE status within the applicable Completion Time, Required Action F.1 specifies that the unit be placed in MODE 3 within 6 hours. Once shut down, the unit is in a more stable condition and the time allowed to remain in MODE 3 is ultimately limited by the Required Actions and Completion Times applicable to a single inoperable AC Source based on the time that an AC Source initially became inoperable. In addition, the Required Actions applicable to one inoperable DG set or offsite circuit would remain applicable until both inoperable DG sets or offsite circuits are restored to OPERABLE status or the unit is placed in a MODE in which the LCO does not apply (MODE 5). The allowed Completion Times are reasonable to reach the required unit conditions from full power in an orderly manner and without challenging plant systems.

G.1

The sequencer(s) B1F, B2F, B1G, and B2G are an essential support system to both the offsite circuit and the DG associated with a given ESF bus. Furthermore, the sequencer is on the primary success path for most major AC electrically powered safety systems powered from the associated ESF bus. Therefore, loss of an ESF bus sequencer affects every major ESF system in the train. The 12 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.

H.1 and H.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

I.1

Condition I corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. This condition exists when any combination of sources from the categories in LCO 3.8.1 totaling three or more are not OPERABLE. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.108 (Ref. 9), as addressed in the FSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3740 V is 90% of the nominal 4160 V output voltage. This value, which is specified in NEMA MG1 (Ref. 12), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 4580 V limits bus voltage to 110% of the nominal 4160 V. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1 (continued)

appropriate independence of offsite circuits is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

SR 3.8.1.2 and SR 3.8.1.6

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

For the purposes of SR 3.8.1.2 and SR 3.8.1.6 testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, some manufacturers recommend a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer. During a modified start, a DG will not respond to a ESF or LOSP signal automatically. Therefore, the DG is considered inoperable with respect to response to ESF or LOSP signals during the brief duration of modified starts. If necessary, Operator action is required to place the speed control in automatic and reset the excitation system. This will immediately allow the DG to achieve normal voltage and frequency.

The DG shall be verified to accelerate to at least a synchronous speed of 900 rpm for the 2850 kW generator and 514 rpm for the 4075 kW generators.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.6 (continued)

SR 3.8.1.6 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 12 seconds. The permissive for closing the generator output breaker requires frequency to be greater than 57 Hz and voltage greater than 3952 V. The 12 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR, Chapter 15 (Ref. 5).

The 12 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 12 second start requirement of SR 3.8.1.6 applies.

Since SR 3.8.1.6 requires a 12 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

The normal 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.108 (Ref. 9). The 184 day Frequency for SR 3.8.1.6 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads in a range comparable to the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.3 (continued)

The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.108 (Ref. 9).

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients, because of changing bus loads, do not invalidate this test. Note 3 indicates that this Surveillance should be conducted on only one DG per unit at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 3 is intended to be applied on a per unit basis and is not intended to preclude testing DGs on different units at the same time. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above a level which ensures sufficient time for manual transfer of fuel oil from the DG storage tank if the automatic transfer fails. The level is expressed as an equivalent volume in gallons, and ensures adequate fuel oil for a minimum of 3 hours of DG operation at the continuous rating.

The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and facility operators would be aware of any large uses of fuel oil during this period.

SR 3.8.1.5

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for fuel transfer systems are OPERABLE.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.5 (continued)

The design of fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate.

SR 3.8.1.6

See SR 3.8.1.2.

SR 3.8.1.7

Transfer of the unit power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.

SR 3.8.1.8

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and while maintaining a specified margin to the overspeed trip. The single load for each DG is approximately 1000 kW. This Surveillance may be accomplished by:

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by Regulatory Guide 1.9 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint.

The voltage tolerance specified in this SR is derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence interval. The voltage specified is consistent with the design range of the equipment powered by the DG. SR 3.8.1.8.b is the steady state voltage value to which the system must recover following load rejection. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9).

SR 3.8.1.9

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 12 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

SR 3.8.1.10

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (12 seconds) from the design basis actuation signal (LOCA signal) and operates for $\geq$ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.10.d and SR 3.8.1.10.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power. Emergency loads are started simultaneously by logic in the load sequencers sensing the availability of offsite power.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for the second Note (which only applies to SR 3.8.1.10.d and e) is that during operation with the reactor critical, performance of SR 3.8.1.10.d and e could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems.

SR 3.8.1.11

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal and/or an ESF actuation test signal, i.e., are bypassed during accident conditions.

(continued)

BASES

SURVEILLLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

The 18 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.1.12

This surveillance requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, $\geq$ 2 hours of which is at a load equivalent to the 2000 hour load rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR. The steady-state generator voltage and frequency shall be maintained between 4160 $\pm$ 420 volts and 60 $\pm$ 1.2 Hz during this test.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by a Note. The Note states that momentary transients due to changing bus loads do not invalidate this test.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 12 seconds. The 12 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(5).

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is consistent with the manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.14

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to ready to load status when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready to load status when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), and takes into consideration unit conditions required to perform the Surveillance.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.15

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to ready to load operation if a LOCA actuation signal is received during operation in the test mode. Ready to load operation is defined as the DG running at rated speed and voltage with the DG output breaker open.

This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(8).

SR 3.8.1.16

Under accident conditions, loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The 10% (or 0.5 seconds, whichever is greater) load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of 18 months is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

SR 3.8.1.17

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.9, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 18 months.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

SR 3.8.1.18

This Surveillance demonstrates the DG capability to reject a load of 1200-2400 kW without overspeed tripping or exceeding the predetermined voltage limits. The DG load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a 1200-2400 kW load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated. The DG output breaker(s) must remain closed such that the DG is connected to at least one ESF bus. All fuses and breakers on the energized ESF bus(es) must be verified not to trip.

This surveillance is modified by a note which states that testing of the shared Emergency Diesel Generator (EDG) set (EDG 1-2A or EDG 1C) on either unit may be used to satisfy this surveillance requirement

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.18 (continued)

for these EDGs for both units. The surveillance requirement consists of sufficient testing to demonstrate that each DG, the DG output breaker, and bus fuses and breakers can successfully withstand a 1200-2400 kW load rejection on each unit. This does not require, however, that each shared DG be aligned to each unit and a load rejection be performed in a redundant fashion. This surveillance is intended to assure the correct performance of the DG voltage regulators and governors.

The 5 year Frequency is adequate and has been shown to be acceptable by operating experience.

SR 3.8.1.19

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9). This surveillance would also be applicable after any modifications which could affect DG interdependence.

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter 8.
3. Regulatory Guide 1.9, Rev. 1, 1971.
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.

(continued)

BASES

REFERENCES (continued)

6. Regulatory Guide 1.93, Rev. 0, December 1974.

7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.

8. 10 CFR 50, Appendix A, GDC 18.

9. Regulatory Guide 1.108, Rev. 1, August 1977.

10. ASME, Boiler and Pressure Vessel Code, Section XI.

11. IEEE Standard 308-1971.

12. NEMA MG1-1967.

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

LCO 3.8.3 The stored diesel fuel oil, lube oil, and starting air subsystem shall be within limits for each required diesel generator (DG).

APPLICABILITY: When associated DG is required to be OPERABLE.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each DG.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more DGs with a useable fuel level < 25,000 gal and > 21,000 gal in the storage tank.	A.1 Restore fuel oil level to within limits.	48 hours
B. One or more DGs with lube oil inventory < 238 gal and > 204 gal (for DG 1-2A, 1B, and 2B) or < 167 gal and > 143 gal (for DG 1C).	B.1 Restore lube oil inventory to within limits.	48 hours
C. One or more DGs with stored fuel oil total particulates not within limit.	C.1 Restore fuel oil total particulates within limit.	7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more DGs with new fuel oil properties not within limits.	D.1 Restore stored fuel oil properties to within limits.	30 days
E. One or more DGs with the required starting air receiver pressure < 350 psig and ≥ 150 psig (for DG 1-2A, 1B, and 2B), or < 200 psig and ≥ 90 psig (for DG 1C).	E.1 Restore at least one starting air receiver pressure per affected DG to ≥ 350 psig (for DG 1-2A, 1B, and 2B) or ≥ 200 psig (for DG 1C).	48 hours
F. Required Action and associated Completion Time not met. <u>OR</u> One or more DGs diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E.	F.1 Declare associated DG inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ 25,000 gal of useable fuel.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.2	Verify lubricating oil inventory is ≥ 238 gal (for DG 1-2A, 1B, and 2B) or ≥ 167 gal (for DG 1C).	31 days
SR 3.8.3.3	Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4	Verify each DG has at least one air start receiver with a pressure ≥ 350 psig (for DG 1-2A, 1B, and 2B) and ≥ 200 psig (for DG 1C).	31 days

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

BACKGROUND

Each diesel generator (DG) is connected to a shared fuel oil storage and transfer system. The shared fuel oil storage system consists of 5 underground storage tanks interconnected with piping, valves and redundant capacity fuel transfer pumps. This configuration allows for pumping diesel fuel to the DG day tanks or from any storage tank to any other storage tank. The deliverable capacity of 4 tanks is sufficient to operate the required DGs for a period of 7 days while the DGs are supplying maximum post loss of coolant accident load demand discussed in the FSAR, Section 8.3.1.1.7 (Ref. 1). The maximum load demand is calculated using the assumption that a minimum of any two DGs are available. This onsite fuel oil capacity is sufficient to operate the DGs for longer than the time to replenish the onsite supply from outside sources.

Fuel oil is transferred from a storage tank by either of two transfer pumps associated with each storage tank. The automatically controlled transfer pump, normally aligned to its DG day tank, is powered from a MCC supplied by the associated diesel, while the manually operated pump is powered from a MCC associated with another diesel. With the exception of transfer pumps for the tank associated with the station blackout diesel (2C), the pumps are powered from opposite trains. The opposite train power supplies ensure fuel in the associated storage tank can be transferred considering a design basis single failure. The transfer pumps for the station blackout diesel storage tank are supplied by train B power only. The automatic transfer pump can be fed from buses supplied by either DG 1B or 2B (in addition to DG 2C) and the manual transfer pump is fed from buses supplied by DG 2B. Therefore, the 2C fuel oil storage tank and associated transfer pumps may be available during design basis events to be used and credited as a manual supply to either B train design basis diesel (1B or 2B) when all applicable Technical Specification requirements are met. Operator actions are required to transfer fuel between storage tanks and day tank using the manually operated fuel transfer pumps.

(continued)

BASES

BACKGROUND (continued)

The usable fuel in a storage tank is the amount above the transfer pump suction nozzles that is available for transfer from a storage tank to a day tank. The amount of usable fuel is determined by correlating control room percent level indication to the applicable tank curve. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any day tank transfer pipe, valve or day tank to result in the loss of more than one DG. All outside tanks, pumps, and piping are located underground.

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. ASTM-D270-65 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ASTM-D975-74 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, and specific gravity (or API gravity).

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG under all loading conditions. The system is required to circulate the lube oil to the diesel engine working surfaces and to remove excess heat generated by friction during operation. The onsite storage in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation. This supply is sufficient to allow the operator to replenish lube oil from outside sources.

Each DG has an air start system with adequate capacity for five successive start attempts on the DG without recharging the air start receiver(s). Each air start system consists of redundant air receivers. Each receiver has sufficient capacity to perform the required number of DG starts.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter 6 (Ref. 4), and in the FSAR, Chapter 15 (Ref. 5), assume Engineered Safety Feature (ESF) systems are OPERABLE. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that fuel, Reactor Coolant System and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	Since diesel fuel oil, lube oil, and the air start subsystem support the operation of the standby AC power sources, they satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	Stored diesel fuel oil is required to have sufficient useable supply for 7 days operation of the required DGs supplying the required loads. It is also required to meet specific standards for quality. Additionally, sufficient lubricating oil supply must be available to ensure the capability to operate at full load for 7 days. This requirement, in conjunction with an ability to obtain replacement supplies within 7 days, supports the availability of DGs required to shut down the reactor and to maintain it in a safe condition for an anticipated operational occurrence (AOO) or a postulated DBA with loss of offsite power. DG day tank fuel requirements, as well as transfer capability from the storage tank to the day tank, are addressed in LCO 3.8.1, "AC Sources - Operating," and LCO 3.8.2, "AC Sources - Shutdown." The starting air system is required to have a minimum capacity for five successive DG start attempts without recharging the air start receivers. A single air receiver on each DG is sufficient to meet this operability requirement.
APPLICABILITY	The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Since stored diesel fuel oil, lube oil, and the starting air subsystem support LCO 3.8.1 and LCO 3.8.2, stored diesel fuel oil, lube oil, and starting air are required to be within limits when the associated DG is required to be OPERABLE.

BASES

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each DG. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable DG subsystem. Complying with the Required Actions for one inoperable DG subsystem may allow for continued operation, and subsequent inoperable DG subsystem(s) are governed by separate Condition entry and application of associated Required Actions.

A.1

In this Condition, the 7 day fuel oil supply for the required DG(s) is not available. However, the Condition is restricted to fuel oil level reductions that maintain at least a 6 day supply. These circumstances may be caused by events, such as full load operation required after an inadvertent start while at minimum required level, or feed and bleed operations, which may be necessitated by increasing particulate levels or any number of other oil quality degradations. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

B.1

With lube oil inventory < 238 gallons for a large DG or < 167 gallons for a small DG, sufficient lubricating oil to support 7 days of continuous DG operation at full load conditions may not be available. However, the Condition is restricted to lube oil volume reductions that maintain at least a 6 day supply (204 gallons for a large DG and 143 gallons for a small DG). This restriction allows sufficient time to obtain the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the low rate of usage, the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

(continued)

BASES

ACTIONS (continued)

C.1

This Condition is entered as a result of a failure to meet the acceptance criterion of SR 3.8.3.3. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine, and particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling and re-analysis of the DG fuel oil.

D.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.3 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

E.1

With both starting air receiver pressures on a DG < 350 psig for the 4075 kW DGs or < 200 psig for DG 1C, sufficient capacity for five successive DG start attempts does not exist. However, as long as at least one receiver pressure per DG is > 150 psig for the 4075 kW DGs or 90 psig for DG 1C, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air

(continued)

BASES

ACTIONS

E.1 (continued)

receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

F.1

With a Required Action and associated Completion Time not met, or one or more DG's fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through D, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of useable fuel oil in the shared storage tanks (25,000 gallons each) to support the operation of the required DG(s) for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG. The inventory may consist of a combination of lube oil in storage and the useable sump volume above the manufacturer recommended minimum sump level or a total volume of lube oil in storage that is in addition to the lube oil normally maintained in each DG sump. The 238 gal requirement for the 4075 kW DGs and the 167 gal requirement for DG 1C are based on the DG manufacturer consumption values for 7 days of operation at full rated load. Implicit in this SR is the requirement to verify the capability

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.2 (continued)

to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

SR 3.8.3.3

A sample from each fuel oil storage tank is analyzed for water and sediment in accordance with ASTM-D270-65 (Ref. 2). The sample is also used to ensure the oil is within the specifications of Table 1 of ASTM-D975-74 (Ref. 3) when checked for viscosity, water, and sediment. The frequency of this testing is in accordance with the DG Fuel Oil Testing Program and takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals. New fuel oil must meet the requirements of ASTM-D975-78 (Ref. 6) when delivered. New fuel is tested to verify acceptability.

SR 3.8.3.4

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. A single air receiver per DG has the capacity to meet the starting requirements. Therefore, only one receiver must be verified within the pressure limit per DG. The system design requirements provide for a minimum of five engine start cycles without recharging. A start cycle is defined by the DG vendor, but usually is measured in terms of time (seconds of cranking) or engine cranking speed. The pressure specified in this SR is intended to reflect the lowest value at which the five starts can be accomplished.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.

REFERENCES

1. FSAR, Section 8.3.1.1.7.
2. ASTM-D270-65.
3. ASTM-D975-74.
4. FSAR, Chapter 6.
5. FSAR, Chapter 15.
6. ASTM-D975-78.

A.1.2 Conduct of operations ADMIN G2.1.7 - SRO + RO

TITLE: Determine The Minimum Amount And Duration Required For RCS Boration

TASK STANDARD: Determine the minimum emergency boration and duration required by AOP-27 for an inadvertent cooldown.

PROGRAM APPLICABLE: SOT ___ SOCT _____ OLT _X_ LOCT_____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ CLASS ROOM

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

ALTERNATE PATH ___ TIME CRITICAL ___ PRA_____

Examinee:

Overall JPM Performance: Satisfactory ☐ Unsatisfactory ☐

Evaluator Comments (attach additional sheets if necessary)

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to DETERMINE THE MINIMUM AMOUNT AND DURATION REQUIRED FOR RCS BORATION. The conditions under which this task is to be performed are:

1. Unit 1 is in Mode 3, 13,500 MWD/MTU, On-service BAT 7350 ppm.
2. All RCPs are secured.
3. The RCS is at the Critical Boron Concentration of 600 ppm.
4. While warming up main steam lines in preparation for opening MSIV's, an inadvertent uncontrolled RCS cooldown occurred.
5. Tavg is 530 °F on TI-412D, TI-422D, & 432D and stable.
6. Tcold is 501°F on TR-410 Loop A, B, & C and stable.
7. AOP-27.0 step 7 has been completed.
8. Emergency boration flow is 95 gpm.
9. You have been directed by the Shift Supervisor to determine the minimum amount and duration of emergency boration required by the plant conditions per AOP-27, Step 8.

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____	START TIME		
1.	Determines reactor is not critical.	Determines reactor is not critical.	S / U

NOTE: Tavg meters bottom of scale is 530°F. Initial conditions show Tavg as 530°F due bottom limit of scale. AOP-27 states use Tc indication with RCPs Secured.

*2.	Determines Tavg is less than 525°F.	Determines Tavg is less than 525°F.	S / U
*3.	Determines from table that 55gals/°F<525°F is the amount of boration for the existing Boron concentration per AOP-27 Table.	Determines minimum gal per °F for the existing Boron concentration: 55gals/°F<525°F. **No tolerance allowed on table value**	S / U
*4.	Determines number of degrees Tavg is below 525°F. $525-501=24^\circ F$	Determines Tavg is 24°F below 525°F. **No tolerance allowed on calculation**	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*5.	Determines total boration required for RCS Tavg 24°<525° .	Determines total boration required for RCS Tavg 24°<525° is 1,320 gals.	S / U
	$$(24^\circ F)\frac{55gals}{^\circ F} = 1{,}320gals$$	**No tolerance allowed on calculation**	
*6.	Determines duration of emergency boration at current flowrate.	Determines duration of emergency boration at current flowrate.	S / U
	$$\frac{1320gals}{\frac{95gals}{\min}} = 13.895\min$$	**Tolerance 13.8-14.0 minutes due to potential differences in rounding & significant digits.** **This converts to the tolerance of 13.8 – 14 minutes 00 secs. (13 min 48 sec-14 min)**	

____ **STOP TIME**

Terminate when minimum amount and duration of emergency boration have been determined.

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

GENERAL REFERENCES:

1. FNP-1-AOP-27.0 Rev. 10
2. Core Phyics Curves 61 Rev. 33, 61A Pgs 1 & 2 Rev. 21
3. K/A: G2.1.7 RO 3.7 SRO 4.4

GENERAL TOOLS AND EQUIPMENT:

Provide: FNP-1-AOP-27.0
Calculator

COMMENTS:

CONDITIONS

When I tell you to begin, you are to DETERMINE THE MINIMUM AMOUNT AND DURATION REQUIRED FOR RCS BORATION. The conditions under which this task is to be performed are:

1. Unit 1 is in Mode 3, 13,500 MWD/MTU, On-service BAT 7350 ppm.
2. All RCPs are secured.
3. The RCS is at the Critical Boron Concentration of 600 ppm.
4. While warming up main steam lines in preparation for opening MSIV's, an inadvertent uncontrolled RCS cooldown occurred.
5. Tavg is 530 °F on TI-412D, TI-422D, & 432D and stable.
6. Tcold is 501°F on TR-410 Loop A, B, & C and stable.
7. AOP-27.0 step 7 has been completed.
8. Emergency boration flow is 95 gpm.
9. You have been directed by the Shift Supervisor to determine the minimum amount and duration of emergency boration required by the plant conditions per AOP-27, Step 8.

FARLEY NUCLEAR PLANT

ABNORMAL OPERATING PROCEDURE

FNP-1-AOP-27.0

EMERGENCY BORATION

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

SAFETY RELATED

Approved:

Jim Hunter (for)
Operations Manager

Date Issued: **9/13/2006**

TABLE OF CONTENTS

A. Purpose

This procedure provides actions to emergency borate the RCS when a reactor trip is not required.

This procedure is applicable in Modes 1, 2, 3, 4, 5 and 6.

B. Symptoms or Entry Conditions

I. This procedure is entered when emergency boration is required by any of the following:

a. Shutdown margin is determined to be less than required by Technical Specifications (or the TRM)

b. Unexplained or uncontrolled reactivity insertion

c. Actuation of CONT ROD BANK POSITION LO-LO annunciator FE2

d. Inadvertent cooldown below 525°F with critical boron concentration established

Step	Action/Expected Response	Response NOT Obtained
✓ 1	**Start a boric acid transfer pump.** BATP [✓] 1A [] 1B	1 Perform the following. 1.1 Align charging pump suction to RWST. RWST TO CHG PUMP [] Q1E21LCV115B open [] Q1E21LCV115D open VCT OUTLET ISO [] Q1E21LCV115C closed [] Q1E21LCV115E closed 1.2 Proceed to step 3.

NOTE: IF emergency boration is being aligned to the manual emergency boration flow path, THEN consideration should be given to starting a boration through the blender via FCV113A & B in accordance with FNP-1-SOP-2.3, CHEMICAL AND VOLUME CONTROL SYSTEM REACTOR MAKEUP CONTROL SYSTEM, while personnel are being dispatched to locally open Q1E21V185.

Step	Action/Expected Response	Response NOT Obtained
✓ 2	**Align normal emergency boration flow path.** EMERG BORATE TO CHG PUMP SUCT [–] Q1E21MOV8104 open	2 Align manual emergency boration flow path. BORIC ACID TO BLENDER [] Q1E21FCV113A open MAN EMERG BORATION [] Q1E21V185 open (100 ft, AUX BLDG rad-side chemical mixing tank area)
✓ 3	**Verify at least one CHG PUMP - STARTED.**	

✓ Page Completed

Step	Action/Expected Response	Response NOT Obtained

4 **Establish adequate letdown.**

4.1 Verify 45 gpm letdown orifice - IN SERVICE.

LTDN ORIF ISO
45 GPM
[] Q1E21HV8149A open

4.2 Verify at least one 60 gpm letdown orifice - IN SERVICE.

LTDN ORIF ISO
60 GPM
[] Q1E21HV8149B open
[] Q1E21HV8149C open

5 **Establish adequate charging flow.**

- IF boration is from boric acid storage tank, THEN verify charging flow - GREATER THAN 40 gpm.

OR

- IF boration is from the RWST, THEN verify charging flow - GREATER THAN 92 gpm.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
6	**Verify emergency boration flow adequate.**	6 Verify boration flow path using ATTACHMENT 1.

- IF normal emergency boration flow path aligned, THEN check emergency boration flow greater than 30 gpm.

  BORIC ACID
  EMERG BORATE
  [] FI 110

  OR

- IF manual emergency boration flow path aligned, THEN check boric acid flow greater than 30 gpm.

  MAKEUP FLOW
  TO CHG/VCT
  [] BA
  FI 113

  OR

- IF boration is from the RWST, THEN verify charging flow - GREATER THAN 92 gpm.

7 **Direct Chemistry to secure the zinc addition system (ZAS).**

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
___ 8	**Check emergency boration complete.**	
8.1	Check reactor - NOT CRITICAL.	8.1 Perform the following. 8.1.1 <u>IF</u> control rod insertion below rod insertion limit, <u>THEN</u> continue emergency boration and return to step 5. <u>IF NOT</u>, proceed to RNO step 8.1.2. 8.1.2 <u>IF</u> emergency borating as a result of inoperable {untrippable} control rods per Tech. Spec. 3.1.3.1 {3.1.4.A}, <u>THEN</u> verify shutdown margin greater than Technical Specification requirement using FNP-1-STP-29.5, SHUTDOWN MARGIN CALCULATION IN MODES 1 AND 2 (TAVG ≥ 547°F) WITH INOPERABLE OR IMMOVABLE CONTROL RODS(S) {WITH UNTRIPPABLE CONTROL ROD(S)}. <u>IF NOT</u>, proceed to step 9. 8.1.3 <u>WHEN</u> shutdown margin greater than Technical Specification requirement, <u>THEN</u> proceed to step 9. 8.1.4 Continue emergency boration and return to step 5.

Step 8 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

NOTE: In response to an uncontrolled cooldown below 525°F, the cold shutdown boron concentration is the maximum boron concentration required regardless of the extent of the cooldown.

8.2 Check RCS TAVG - LESS THAN 525°F.

8.2.1 IF RCP's are running, THEN use the Tavg indication,

TAVG
1A,(1B,1C) RCS LOOP
[] TI 412D
[] TI 422D
[] TI 432D

8.2.2 IF RCP's are not running, THEN use RCS cold leg temperature indication.

RCS COLD LEG TEMP RECORDER
[] TR 410

8.2 Perform the following.

a) Verify shutdown margin greater than Technical Specification requirement using FNP-1-STP-29.1, SHUTDOWN MARGIN CALCULATION (TAVG 547°F) or FNP-1-STP-29.2, SHUTDOWN MARGIN CALCULATION (TAVG < 547°F OR BEFORE THE INITIAL CRITICALITY FOLLOWING REFUELING).

b) WHEN shutdown margin greater than Technical Specification requirement, THEN proceed to step 9.

c) Continue emergency boration and return to step 5.

8.3 Continue emergency boration based on initial boron concentration and RCS TAVG.

Approximate Boration (4 wt% boric acid)	
Initial RCS Boron Concentration	Each °F TAVG Is Less Than 525°F
0 ppm	50 gal
300 ppm	52 gal
600 ppm	55 gal
1200 ppm	60 gal
1500 ppm	64 gal
1800 ppm	68 gal

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

NOTE: The intent of the following step is to optimize the effectiveness of an emergency boration when no RCP is running and RHR is in operation.

___ 9 **IF no RCP is running AND RHR is aligned for cooldown operation, THEN perform the following.**

9.1 Verify alternate charging path in service.

RCS ALT
CHG LINE
[] Q1E21HV8147 open

RCS NORMAL
CHG LINE
[] Q1E21HV8146 closed

NOTE: Step 8 must be complete before continuing with this procedure.

Step	Action/Expected Response	Response NOT Obtained
___10	**Stop running boric acid transfer pump.** BATP [] 1A [] 1B	10 Perform the following. 10.1 Align charging pump suction to VCT. VCT OUTLET ISO [] Q1E21LCV115C open [] Q1E21LCV115E open RWST TO CHG PUMP [] Q1E21LCV115B closed [] Q1E21LCV115D closed 10.2 Proceed to step 12.

___Page Completed

Step	Action/Expected Response		Response NOT Obtained
___11	**IF normal emergency boration flow path aligned, THEN secure normal emergency boration flow path.** EMERG BORATE TO CHG PUMP SUCT [] Q1E21MOV8104 closed	11	Secure manual emergency boration flow path. BORIC ACID TO BLENDER [] Q1E21FCV113A closed MAN EMERG BORATION [] Q1E21V185 closed (100 ft, AUX BLDG rad-side chemical mixing tank area)
___12	**Direct Chemistry to sample RCS for boron concentration using FNP-1-CCP-651, SAMPLING THE REACTOR COOLANT SYSTEM.**		
___13	**Align reactor makeup system.** 13.1 Adjust BORIC ACID MKUP FLOW FK 113 to deliver greater than new RCS boron concentration. 13.2 Verify reactor makeup system - IN AUTOMATIC MODE. MKUP MODE SEL SWITCH [] N1E21HS2100Q in AUTO MKUP MODE CONT SWITCH [] N1E21HS2100P to START	13	Manually control reactor makeup system using FNP-1-SOP-2.3, CHEMICAL AND VOLUME CONTROL SYSTEM REACTOR MAKEUP CONTROL SYSTEM.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
___14	**Check Shutdown Margin verified greater than Technical Specification requirement by Step 8.2, RNO**	14 Verify shutdown margin greater than Technical Specification requirement using applicable procedure: • FNP-1-STP-29.1, SHUTDOWN MARGIN CALCULATION (TAVG 547°F) OR • FNP-1-STP-29.2, SHUTDOWN MARGIN CALCULATION (TAVG < 547°F OR BEFORE THE INITIAL CRITICALITY FOLLOWING REFUELING) OR • FNP-1-STP-29.5, SHUTDOWN MARGIN CALCULATION IN MODES 1 AND 2 (TAVG ≥ 547°F) WITH INOPERABLE OR IMMOVABLE CONTROL RODS(S) {WITH UNTRIPPABLE CONTROL ROD(S)}

NOTE: After a completion of any fast ramp or emergency boration, the suction piping of any idle charging pump could have a significantly higher boron concentration than the existing RCS. (OE-17609 & AI 2004200233)

Step	Action/Expected Response	Response NOT Obtained
___15	**Go to procedure and step in effect.**	

-END-

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 1

___ 1 **IF normal emergency boration flow path aligned, THEN verify running charging pump header valves open.**

Running CHG PUMP	1A	1B	1C
CHG PUMP SUCTION HDR ISO Q1E21MOV	[]8130A []8130B []8131A []8131B	[]8131A []8131B	
CHG PUMP DISCH HDR ISO Q1E21MOV		[]8132A []8132B	[]8132A []8132B []8133A []8133B

RNO 1 IF manual emergency boration flow path aligned, THEN verify running charging pump header valves open.

Running CHG PUMP	1A	1B	1C
CHG PUMP SUCTION HDR ISO Q1E21MOV		[]8130A []8130B	[]8130A []8130B []8131A []8131B
CHG PUMP DISCH HDR ISO Q1E21MOV		[]8132A []8132B	[]8132A []8132B []8133A []8133B

___ 2 **Check boration flow adequate.**

2.1 IF normal emergency boration flow path aligned, THEN check emergency boration flow greater than 30 gpm.

BORIC ACID
EMERG BORATE
[] FI 110

2.2 IF manual emergency boration flow path aligned, THEN check boric acid flow greater than 30 gpm.

MAKEUP FLOW
TO CHG/VCT
[] BA
FI 113

RNO 2 Align charging pump suction to RWST.

RWST
TO CHG PUMP
[] Q1E21LCV115B open
[] Q1E21LCV115D open

VCT
OUTLET ISO
[] Q1E21LCV115C closed
[] Q1E21LCV115E closed

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 1

___ 3 **Verify charging flow path aligned.**

3.1 Verify charging pump discharge flow path - ALIGNED.

CHG PUMPS TO
REGENERATIVE HX
[] Q1E21MOV8107 open
[] Q1E21MOV8108 open

3.2 Verify only one charging line valve - OPEN.

RCS NORM
CHG LINE
[] Q1E21HV8146

RCS ALT
CHG LINE
[] Q1E21HV8147

3.3 IF boration is from the boric acid storage tank, THEN verify charging flow - GREATER THAN 40 gpm.

CHG FLOW
[] FK 122 manually adjusted

RESPONSE NOT OBTAINED: 3.3 IF boration is from the RWST, THEN verify charging flow - GREATER THAN 92 gpm.

CHG FLOW
[] FK 122 manually adjusted

___ 4 **Notify control room of boration status.**

___ 5 **Return to step 7.**

-END-

A.2 Equipment Control ADMIN G2.1.12 - RO

TITLE: Complete selected sections of STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS.

TASK STANDARD: Complete selected sections of STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, Appendix 1, and identify conditions that do not meet acceptance criteria.

PROGRAM APPLICABLE: SOT ___ SOCT _____ OLT _X_ LOCT_____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ CLASSROOM

PROJECTED TIME: 20 MIN SIMULATOR IC NUMBER: N/A

ALTERNATE PATH ___ TIME CRITICAL ___ PRA_____

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to complete pages 3-5 & 15 of FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, Appendix 1. The conditions under which this task is to be performed are:

a. Unit 1 is at 39% power and stable.
b. The UO has completed taking the data for STP-1.0, Appendix 1, with the exception of pages 3-5 & 15.
c. You are the extra plant operator and have been directed by the Shift Supervisor to:
    1. Complete pages 3-5 & 15 of FNP-1-STP-1.0, Appendix 1 using the pictures provided.
    2. Identify any condition that does not meet acceptance criteria.

<u>EVALUATION CHECKLIST</u>

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
____ START TIME		

NOTE: • This is a classroom setting ADMIN JPM task.
• Meters must be read accurately enough to ensure the proper identification of "out of tolerance" instruments and properly identify "in tolerance" instruments.

ELEMENTS:	STANDARDS:	RESULTS:
1. Records all data not previously recorded.	Records all data on pages 3-5 & 15 not previously recorded.	S / U
*2. Determines #4. LI-496 for C SG is out of tolerance low & inoperable.	Determines #4. LI-496 for C SG is out of tolerance low & inop.	S / U
(NOT CRITICAL: May record in the comments section of the STRS).	(May record in the comments section of the STRS).	
3. Informs SS that LI-496 for C SG is inoperable, writes CR, and records CR number in the comments section.	Informs SS that LI-496 for C SG is inoperable, writes CR, & records CR number in the comments section. (CUE: SS acknowledges & CR 2007108522 has been written).	S / U
*4. Determines #5. FI-497 for C SG, is out of tolerance high & inop.	Determines #5. FI-497 for C SG, is out of tolerance high & inop.	S / U
(NOT CRITICAL: May record in the comments section of the STRS).	(NOT CRITICAL: May record in the comments section of the STRS).	

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
5. Informs SS that FI-497 for C SG, is inoperable, writes CR, & records CR number in the comments section.	Informs SS that FI-497 for C SG, is inoperable, writes CR, & records CR number in the comments section. (CUE: SS acknowledges & CR 2007108523 has been written).	S / U
*6. Determines #25. CH A RVLIS, has less than 4 sensors operable per channel & inop. (NOT CRITICAL: May record in the comments section of the STRS).	Determines #25. CH A RVLIS, has less than 4 sensors operable per channel. (NOT CRITICAL: May record in the comments section of the STRS).	S / U
7. Informs SS that CH A RVLIS, is inoperable, writes CR, & records CR number in the comments section.	Informs SS that CH A RVLIS, is inoperable, writes CR, & records CR number in the comments section. (CUE: SS acknowledges & CR 2007108524 has been written).	S / U

_____ **STOP TIME**

Terminate when all elements of the task have been completed.

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

GENERAL REFERENCES:
1. FNP-1-STP-1.0 Version 91.0
2. K/A: G2.2.12 RO 3.0 SRO 3.4

GENERAL TOOLS AND EQUIPMENT:

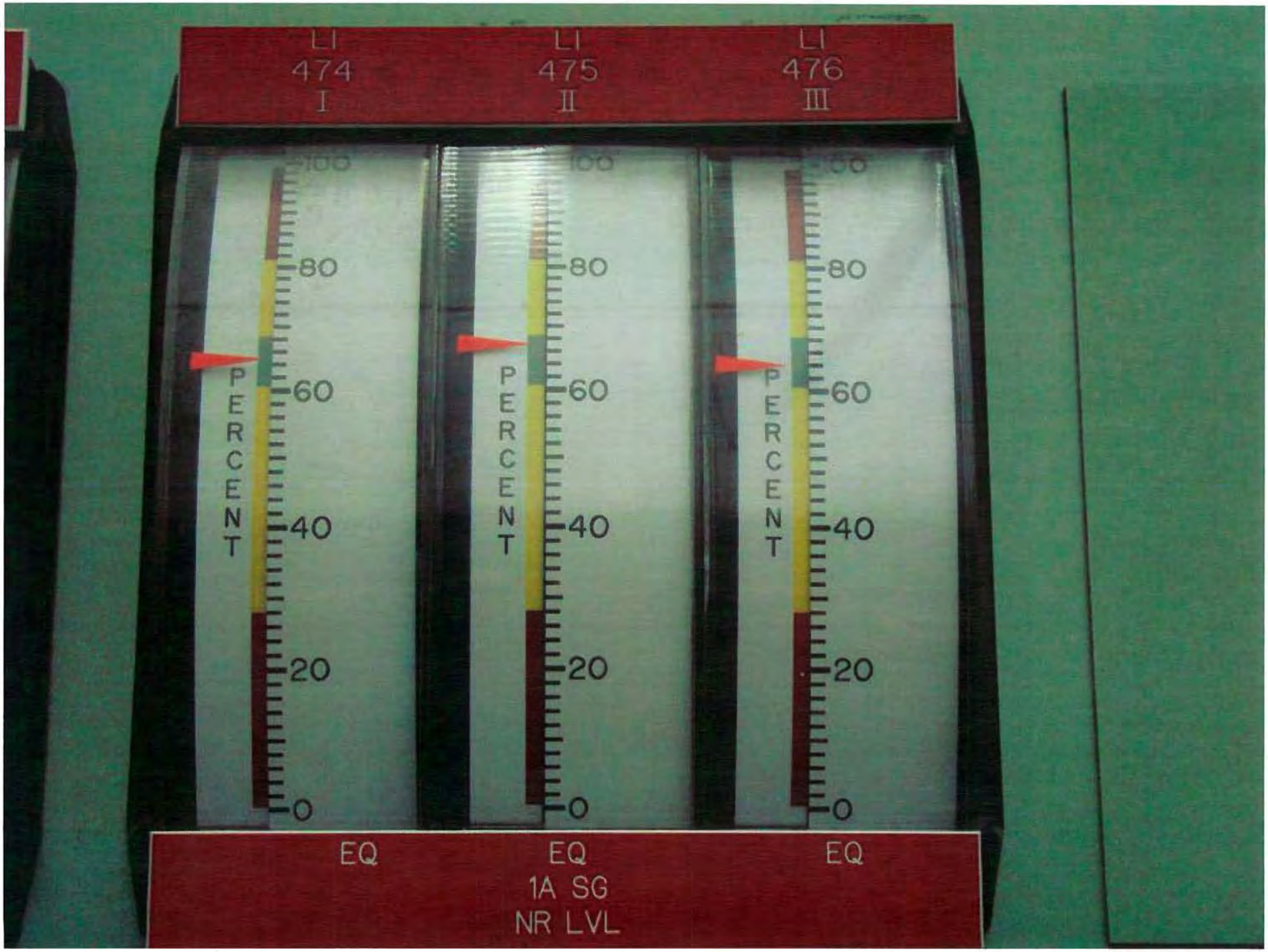
Provide:
1. partially signed off copy of FNP-1-STP-1.0, attachment 1.
2. Pictures of parts of MCB.

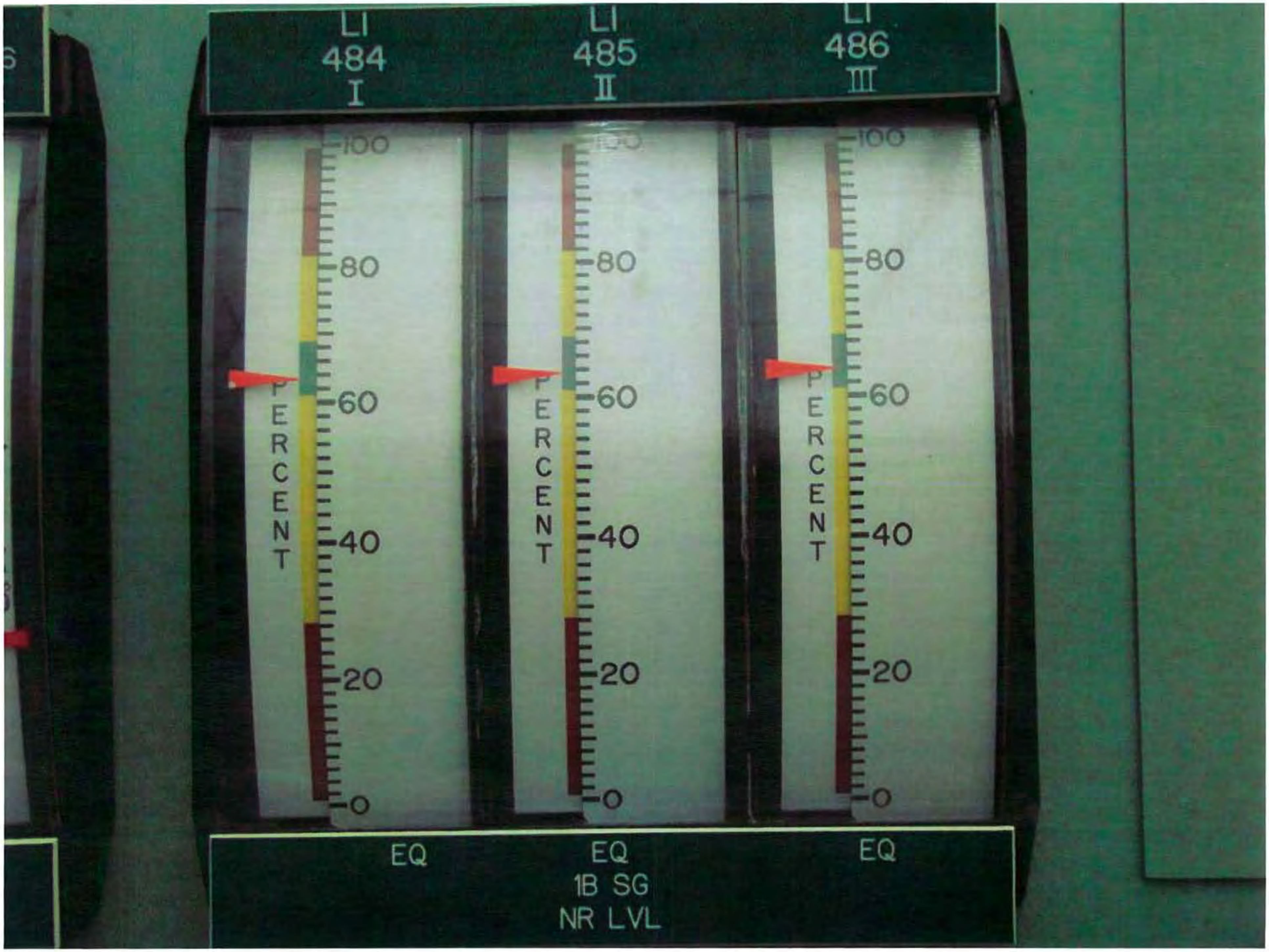
COMMENTS:

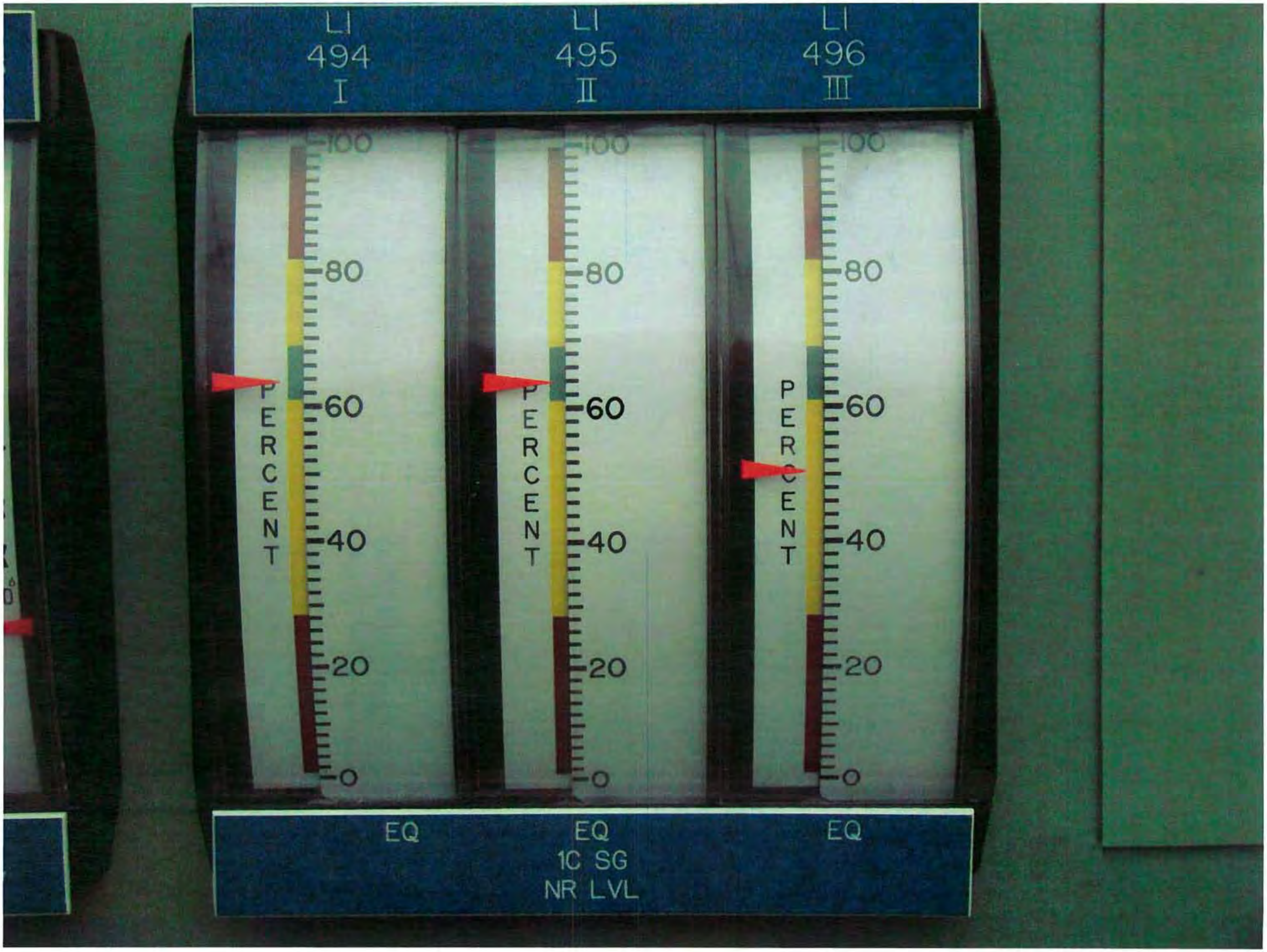
CONDITIONS

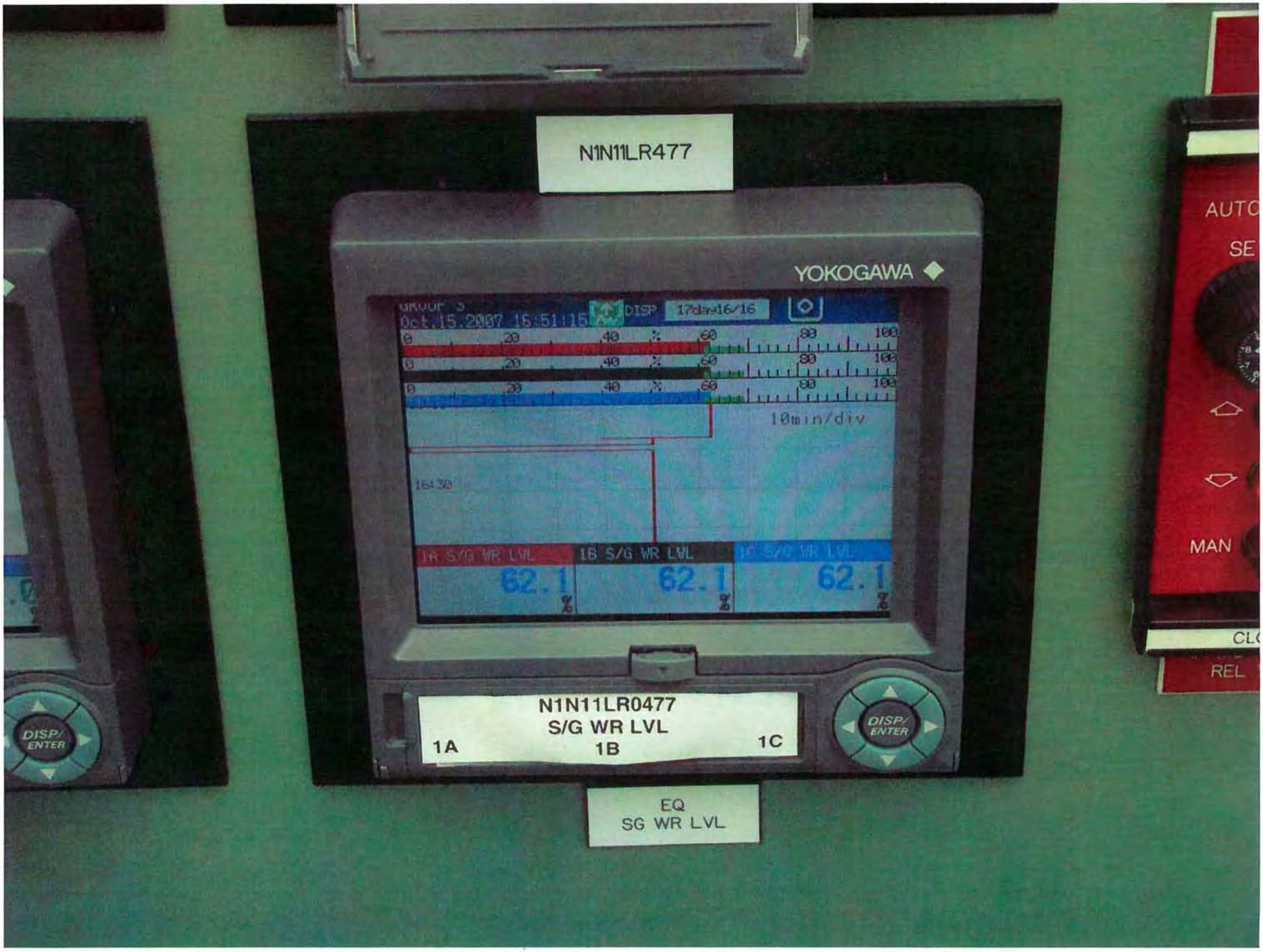
When I tell you to begin, you are to complete pages 3-5 & 15 of FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, Appendix 1. The conditions under which this task is to be performed are:

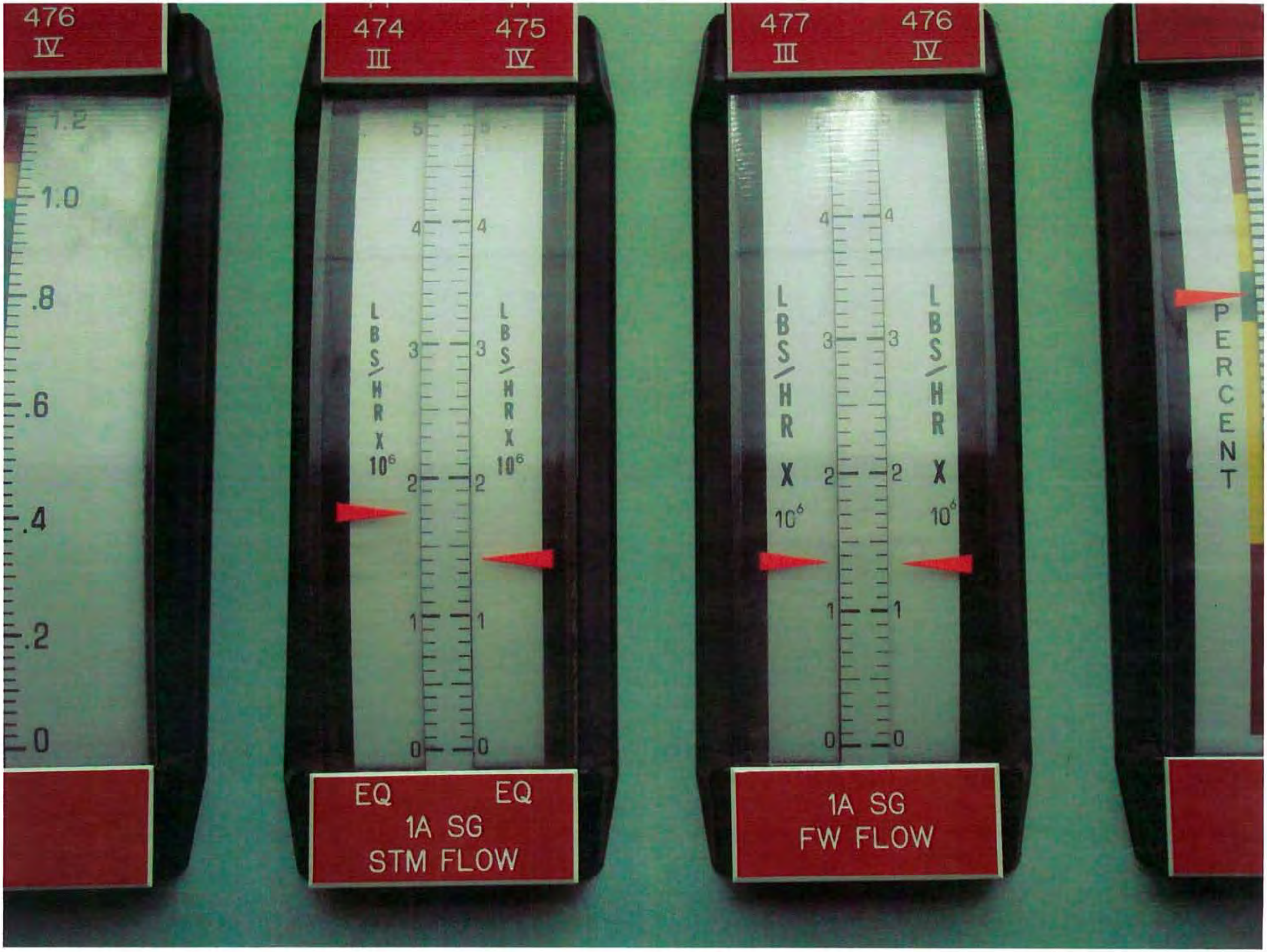
a. Unit 1 is at 39% power and stable.
b. The UO has completed taking the data for STP-1.0, Appendix 1, with the exception of pages 3-5 & 15.
c. You are the extra plant operator and have been directed by the Shift Supervisor to:
    1. Complete pages 3-5 & 15 of FNP-1-STP-1.0, Appendix 1 using the pictures provided.
    2. Identify any condition that does not meet acceptance criteria.

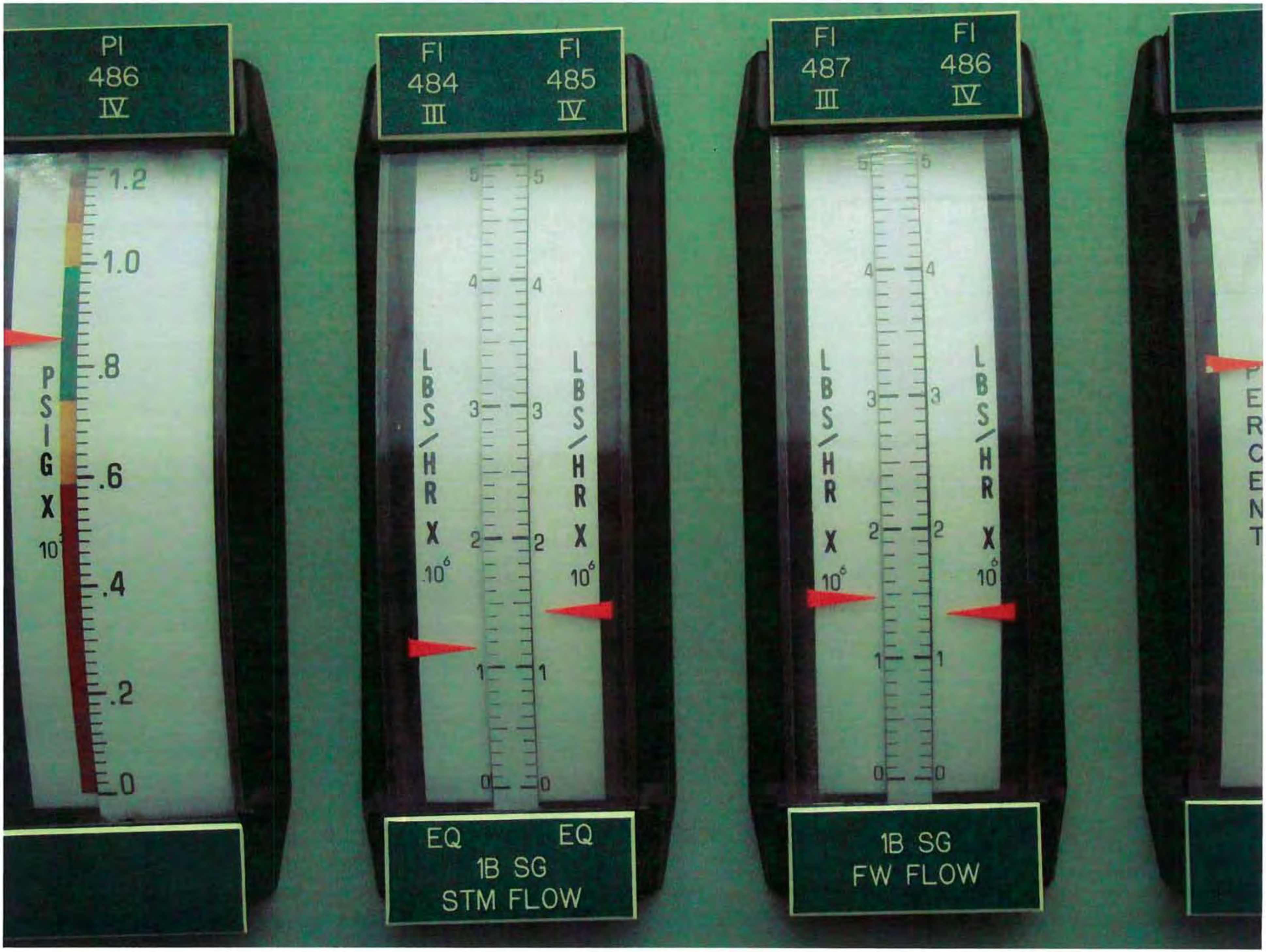

LI
474
I
LI
475
II
LI
476
III
100
80
60
40
20
0
PERCENT
EQ
EQ
1A SG
NR LVL
EQ

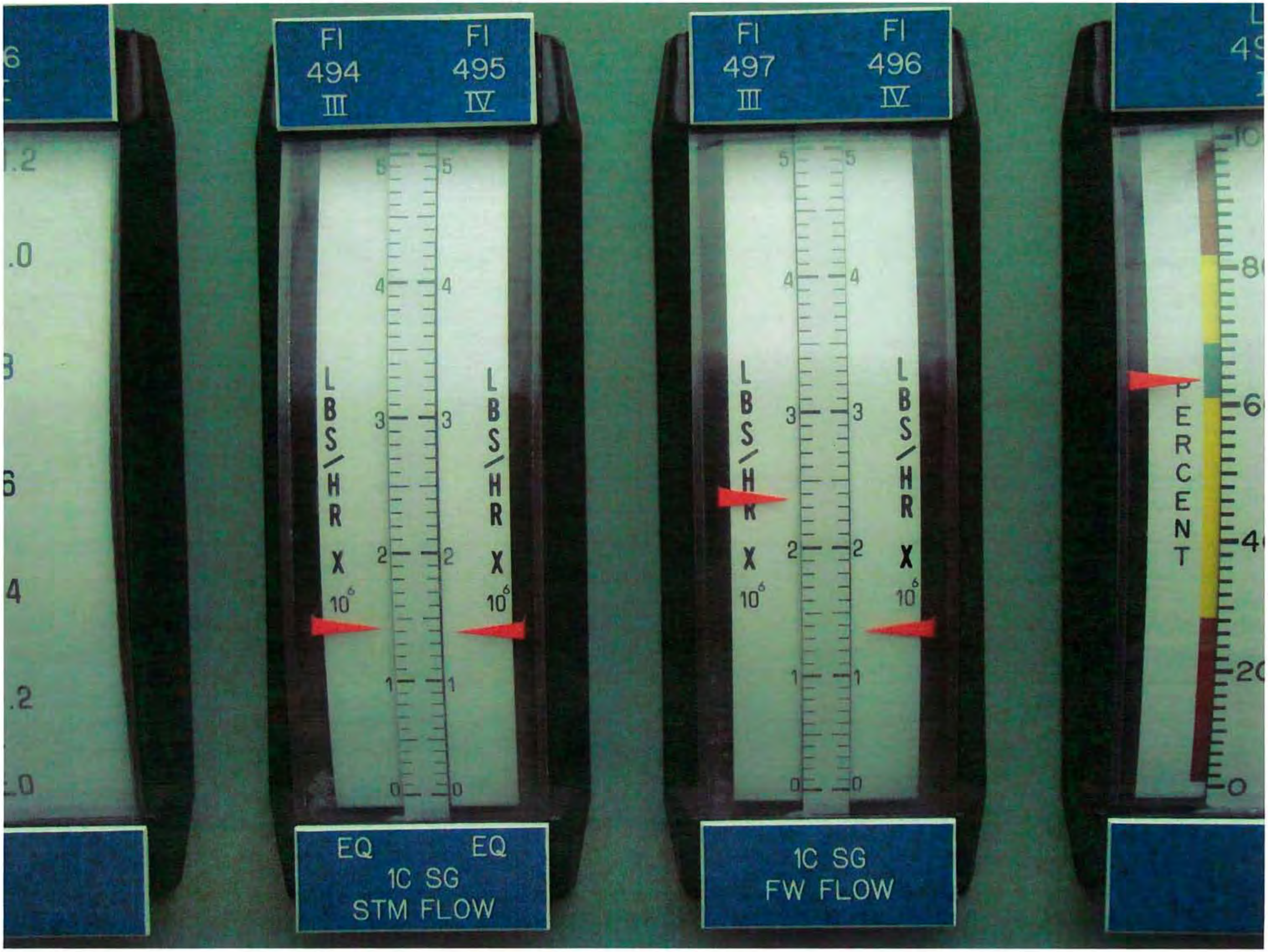

LI 484 I
LI 485 II
LI 486 III
PERCENT
PERCENT
PERCENT
EQ
EQ 1B SG NR LVL
EQ


LI
494
I
LI
495
II
LI
496
III
PERCENT
PERCENT
PERCENT
EQ
EQ
1C SG
NR LVL
EQ


N1N11LR477
YOKOGAWA
Oct.15.2007 15:51:15
DISP
10min/div
1A S/G WR LVL
1B S/G WR LVL
1C S/G WR LVL
62.1
62.1
62.1
N1N11LR0477
S/G WR LVL
1A
1B
1C
DISP/ ENTER
EQ
SG WR LVL
MAN
REL


476 IV
474 III
475 IV
477 III
476 IV
LBS/HR X 10^6
LBS/HR X 10^6
LBS/HR X 10^6
LBS/HR X 10^6
PERCENT
EQ
EQ
1A SG
STM FLOW
1A SG
FW FLOW


PI
486
IV
PSIG X 10
FI
484
III
FI
485
IV
LBS/HR X 10⁶
EQ
EQ
1B SG
STM FLOW
FI
487
III
FI
486
IV
1B SG
FW FLOW
PERCENT

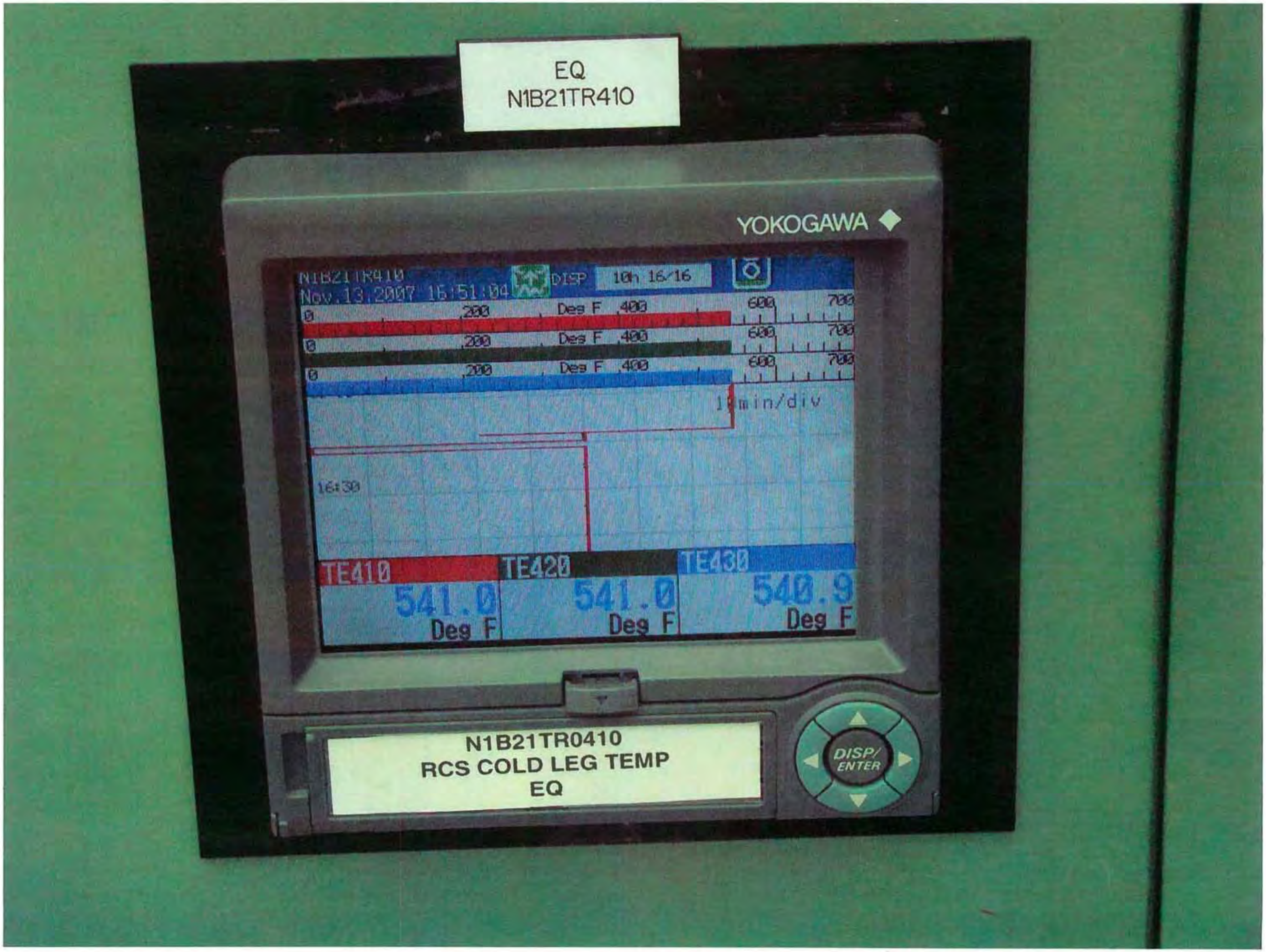

FI 494 III
FI 495 IV
LBS/HR X 10^6
EQ EQ
1C SG
STM FLOW
FI 497 III
FI 496 IV
1C SG
FW FLOW
PERCENT

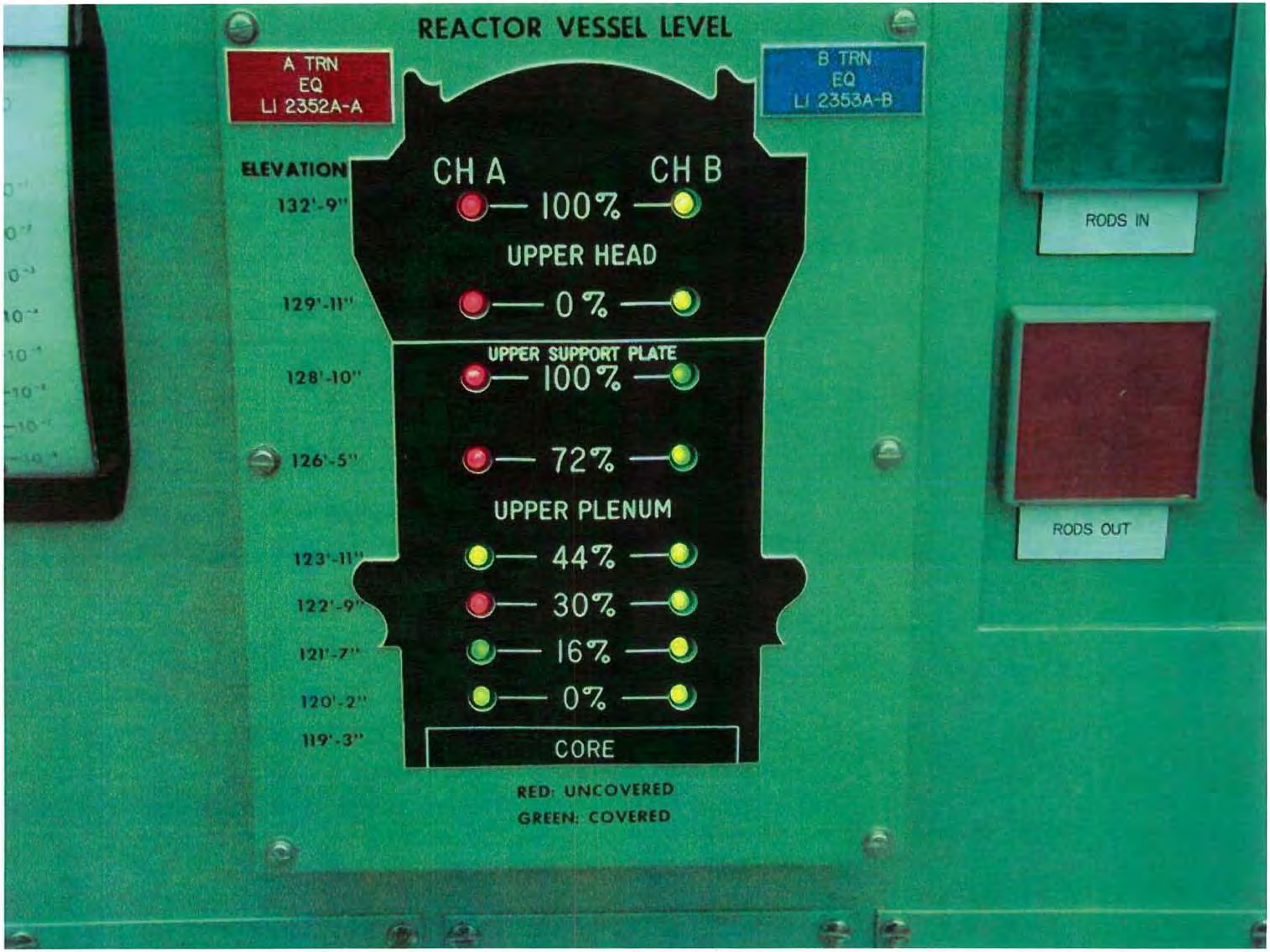

PI
474
II
PI
475
III
PI
476
IV
FI
474
III
PSIG X 10
LBS/HR X 10
1A SG PRESS
EQ


PI
484
II
PI
485
III
PI
486
IV
FI
484
III
PSIG X 10
LBS/HR X 10
1B SG PRESS


PI 494 II
PI 495 III
PI 496 IV
PSIG X 10
1.2
1.0
.8
.6
.4
.2
0
1C SG PRESS
FI 494 III
LBS/HR X 10
EQ
1C SG
STM FLOW


EQ
N1B21TR413
YOKOGAWA
GROUP 2
Nov.13.2007 16:52:09
DISP
17day16/16
TE413
568.3
Deg F
TE423
568.5
Deg F
TE433
568.3
Deg F
N1B21TR0413
RCS HOT LEG TEMP
EQ
DISP/
ENTER


EQ
N1B21TR410
YOKOGAWA
N1B21TR410
Nov.13.2007 16:51:04
DISP
10h 16/16
0
200
Deg F
400
600
700
min/div
16:30
TE410
541.0
Deg F
TE420
541.0
Deg F
TE430
540.9
Deg F
N1B21TR0410
RCS COLD LEG TEMP
EQ
DISP/
ENTER



REACTOR VESSEL LEVEL
A TRN
EQ
LI 2352A-A
B TRN
EQ
LI 2353A-B
ELEVATION
132'-9"
129'-11"
128'-10"
126'-5"
123'-11"
122'-9"
121'-7"
120'-2"
119'-3"
CH A
CH B
100%
UPPER HEAD
0%
UPPER SUPPORT PLATE
100%
72%
UPPER PLENUM
44%
30%
16%
0%
CORE
RED: UNCOVERED
GREEN: COVERED
RODS IN
RODS OUT

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-1.0

SAFETY RELATED

OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS

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

Approved:

Jim L. Hunter (for)
Operations Manager

Date Issued 08/07/2007

UNIT 1

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-1.0

OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS

1.0 Purpose

This procedure provides a means for recording data required on a shift and daily basis.

2.0 Acceptance Criteria

Logged data must be within the acceptance criteria listed in the appropriate Appendix.

3.0 Initial Conditions

None

4.0 Precautions

Each parameter should be logged as accurately as possible.

5.0 Instructions

5.1 The operator completing the daily surveillance logs shall enter the mode, time, and his name in the appropriate space.

5.2 The operators completing the shift surveillance logs shall enter the mode, time and his name in the appropriate space on the review sheet.

5.3 The appropriate Appendix shall be used for shift and daily logging.

5.4 Log the data for each item in the column provided.

5.5 List shift data under the appropriate shift column.

5.6 A Shift and Daily Log for applicable modes shall be completed every day.

5.7 The modes for which surveillance on an item is required are listed in the Acceptance Criteria column.

5.8 The acceptance criteria for the logged data is also listed in the Acceptance Criteria column.

5.9 The technical specification reference is listed for each item in the Tech. Spec. column.

5.10 IF data can NOT be logged because the plant is in a mode, (OR the channel is in test), OR condition that makes logging impractical, THEN enter "NA" or "N/A" in the appropriate space, (OR "IN TEST" as applicable).

NOTE: The Shift or Daily Logs shall be considered complete when all items have been completed, with the following exceptions: (1) items that have been designated as being performed anytime during the shift, and (2) 1600 SFP readings. These items shall be completed prior to the final review.

5.11 Shift or Daily Logs shall be completed between 1100 and 1230 on Day Shift OR 2300 and 0030 on Night Shift. The Shift or Daily Logs shall be submitted to the Shift Supervisor for his/her review by 1300 for Day Shift OR 0100 for Night Shift.

NOTE: The following step does not apply to the MIMS channel check which is normally performed once per shift during Shift Supervisor turnover.

5.12 The data for each shift should be logged during the times specified per step 5.11 to ensure that 12 hour surveillance requirements are met.

5.12.1 Some data has been assigned an eight hour commitment and will be logged in the appropriate time slot.

5.13 The operator shall inform the Shift Supervisor promptly of any new discrepancies in the Shift or Daily Logs.

5.14 Upon notification of a new discrepancy, and during review of existing discrepancies, the Shift Supervisor is responsible for evaluating the discrepancy and ensuring that all appropriate actions are initiated including any that are required to meet any applicable Technical Specification action statements.

5.15 Comments regarding all discrepancies shall be included in the Comments section of the Surveillance Test Review Sheet.

5.16 Surveillance required due to special or abnormal plant conditions which is not normally taken on a shift or daily basis shall be entered in the miscellaneous section of the appropriate Appendix. Entries in this section are not required unless plant conditions warrant.

5.17 The operator completing the miscellaneous section shall enter the title, time, value, acceptance criteria, comments, and technical specification requirement in the appropriate columns.

5.18 The Shift Supervisor or Shift Support Supervisor shall enter any discrepancies and/or comments in the review section of the appropriate Appendix.

5.19 IF a daily OR shift surveillance item can NOT be taken from the listed indicator, BUT is available by some other indication, THEN that value will be listed in the appropriate space and the indicator actually used for the surveillance noted.

5.20 Compare data taken to the expected variations between instrumentation channels. This information, where applicable, along with the maximum allowable deviation is provided in Appendix 1 at the step where data is being taken and in Table 1 and Figure 1. IF the variance is greater than expected, THEN submit a CR to the Shift Supervisor to correct the out of tolerance instrument.

5.21 WHEN a channel check is performed on an instrument that has a numerical readout, THEN the actual value will be recorded, unless otherwise noted. Initials must be used to document performance of other channel checks and verifications.

5.22 Where no value is required to be logged for an item, the operator will initial the appropriate space.

5.23 Data need not be recorded in sequence.

5.24 Marking the STRS as "Acceptable" means that all data points are within their applicable tolerances, meeting the acceptance criteria, or identified and justified by a reason in the comments section (or Appendix).

6.0 References

6.1 Technical Specifications

6.2 FNP-0-M-011 Offsite Dose Calculation Manual

6.3 FSAR Chapter 16

6.4 Technical Requirements Manual

APPENDIX 1

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-1.0

OPERATIONS DAILY AND SHIFT
SURVEILLANCE REQUIREMENTS
MODES 1, 2, 3, 4

This appendix consists of 38 pages.

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST REVIEW SHEET

Date ____________________

SURVEILLANCE TEST NO.	TECHNICAL SPECIFICATION REFERENCE
FNP-1-STP-1.0	Various
TITLE: Operations Daily and Shift Surveillance Requirements	MODE(S) REQUIRING TEST: 1, 2, 3, 4

	OPERATOR	TIME	MODE	ACCEPTABLE Yes	ACCEPTABLE No	SHIFT SUPERVISOR Review
Night Shift	______	______	______	______	______	______
Day Shift	______	______	______	______	______	______

Comments:

____

____

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____

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FINAL SHIFT SUPERVISOR / SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY______________________DATE______________

☐ Procedure Properly completed and satisfactory

☐ 0800 and 1600 SFP readings have been reviewed.

☐ Comments:______________________________________

ENGINEERING SUPPORT GROUP REVIEW

REVIEWED BY______________________DATE______________

☐ Satisfactory and Approved

☐ Comments:______________________________________

TITLE			NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
4.	SG Level (%)					
	SG 1A	LI 474			Channel Check	
		LI 475			Mode 1, 2 Mode 1, 2 Mode 1, 2, 3 Mode 1, 2, 3	3.3.1-1(14): SR 3.3.1.1 3.3.2-1(5.b): SR 3.3.2.1 3.3.2-1(6.b): SR 3.3.2.1 3.3.3-1(4): SR 3.3.3.1
		LI 476				
		LR 477 (WR) Pen 1			Mode 3; NR Level ≥ 30% for at least 2 required SG's	SR 3.4.5.2
	SG 1B	LI 484				
		LI 485			Mode 4; WR level ≥ 75% for required SG(s)	SR 3.4.6.2
		LI 486				
		LR 477 (WR) Pen 2				
	SG 1C	LI 494			Expected variation: ± 4%	
		LI 495			Maximum deviation between channels : 8%	
		LI 496				
		LR 477 (WR) Pen 3				

TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
5. SG Feed Flow (1bm/hr)				Mode 1, 2; Channel Check	N/A
SG 1A	FI 477	$x 10^6$	$x 10^6$		
	FI 476	$x 10^6$	$x 10^6$		
SG 1B	FI 487	$x 10^6$	$x 10^6$	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 lbm/hr	
	FI 486	$x 10^6$	$x 10^6$		
SG 1C	FI 497	$x 10^6$	$x 10^6$	For other power levels, see Figure 1. <u>If</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
	FI 496	$x 10^6$	$x 10^6$		
6. SG Steam Flow (1bm/hr)				Channel Check	
SG 1A	FI 474 (FE0474B)	$x 10^6$	$x 10^6$	Mode 1,2^d,3^d (d) Except when one MSIV is closed in each steam line.	3.3.2-1(4.e): SR 3.3.2.1
	FI 475 (FE0475B)	$x 10^6$	$x 10^6$		
SG 1B	FI 484 (FE0484B)	$x 10^6$	$x 10^6$	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 1bm/hr	
	FI 485 (FE0485B)	$x 10^6$	$x 10^6$		
SG 1C	FI 494 (FE0494B)	$x 10^6$	$x 10^6$	For other power levels, see Figure 1. <u>IF</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
	FI 495 (FE0495B)	$x 10^6$	$x 10^6$		

NOTE: <u>IF</u> any channel III or IV pressure transmitter is out of service for surveillance testing or otherwise inoperable, <u>THEN</u> the corresponding steam flows may be channel checked using the appropriate points off the plant computer (in units of KBH), or by I&C direct readout. Since the MCB FIs are compensated for steam pressure but the computer points are <u>not</u>, compare only FI data to FI data, or computer point to computer point. Note on the Surveillance Test Review Sheet comments section whenever the alternate method of channel check is used.

	TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
7.	SG Pressure (psig)					
	SG 1A	PI 474			Channel Check Mode 1,2,3[b]	3.3.2-1(1.e.1): SR 3.3.2.1
		PI 475			Mode 1,2,3	3.3.2-1(1.e.2): SR 3.3.2.1
		PI 476			Mode 1,2[d],3[b,d]	3.3.2-1(4.d): SR 3.3.2.1
	SG 1B	PI 484			Mode 1, 2, 3	3.3.3-1(8): SR 3.3.3.1
		PI 485				
		PI 486				
	SG 1C	PI 494			Expected variation: ± 40 psi	
		PI 495			Maximum deviation between channels: 50 psi	
		PI 496			(b) Above the P-12 interlock (d) Except when one MSIV is closed in each steam line	
8.	RCS Temperature (°F)				Channel Check	3.3.3-1(1):SR 3.3.3.1
	T_{HOT} (TR 413)				Mode 1, 2, 3	3.3.3-1(2):SR 3.3.3.1
		Loop 1				
		Loop 2				
		Loop 3				
	T_{cold} (TR 410)					
		Loop 1				
		Loop 2			Expected variation: ± 17°F	
		Loop 3			Maximum deviation between channels: 23°F	

TITLE	NIGHT SHIFT		DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
23. Axial Flux Difference (%)				Mode 1, Power ≥ 50% RTP; within limits of the COLR	SR 3.2.3.1
N-41	-1				
N-42	-1.5				
N-43	-1.5				
N-44	-1				
AFD Target Point for Present Power Level (Curve 64)	-0.8				
24. Sub Cooled Margin Monitor (F°)	RTD	CETC		Record subcooling margin and TMAX Modes 1, 2, 3; Channel Check	3.3.3-1(10): SR 3.3.3.1
Q1B14TI2354-A	84.7	70.6			
Q1B14TI2355-B	84.1	66.8			
	TMAX				
Q1B14TI2301-A	583				
Q1B14TI2302-B	587				
25. Reactor Vessel Level Indicating System (MCB Mimic)	Initial			Modes, 1, 2, 3; Perform Channel Check; verify at least 4 sensors operable per channel by comparing each valid sensor with the corresponding sensor in the opposite train to verify they display the same state. IF one train is inoperable, THEN verify that at least 4 sensors indicate properly in the operable train.	3.3.3-1(16):SR 3.3.3.1
Channel A					
Channel B					

OPERATIONS SHIFT OR DAILY
MISCELLANEOUS REQUIREMENTS
MODES 1, 2, 3, 4

TITLE	TIME	VALUE	ACCEPTANCE CRITERIA/COMMENTS	TECH SPEC

TABLE 1

Expected Variations Between Instrumentation Channels During Normal Operation

Parameter	Expected Variation	Maximum Deviation Between Channels
Reactor coolant average temperature indicators	± 3°F	6°F
Delta-T indicators	± 3.7%	7.4%
Reactor coolant flow indicators	± 5%	9%
Feedwater flow indicators	See Fig. 1	
Steam flow indicators	See Fig. 1	
Pressurizer pressure indicators	± 30 psi	48 psi
Pressurizer level indicators	± 4%	8%
Steam generator level indicators (narrow range)	± 4%	8%
Steam line pressure indicators	± 40 psi	50 psi
Turbine impulse chamber pressure indicators	± 20 psi	40 psi
The overpower ΔT reactor trip setpoints	± 3.5%	6%
The overtemperature ΔT reactor trip setpoint	± 7.5%	18.8%
Top nuclear flux indicators	± 2%	3.6%
Bottom nuclear flux indicators	± 2%	3.6%
RCS temperature recorders	± 17°F	23°F

NOTE: IF recorded data is greater than the expected variation, THEN submit a CR to correct the out of tolerance instrument and so note in the deficiency section of the Surveillance Test Review Sheet.

FIGURE 1

Allowable error between SF or FF channels in each set. Loop A, B and C.

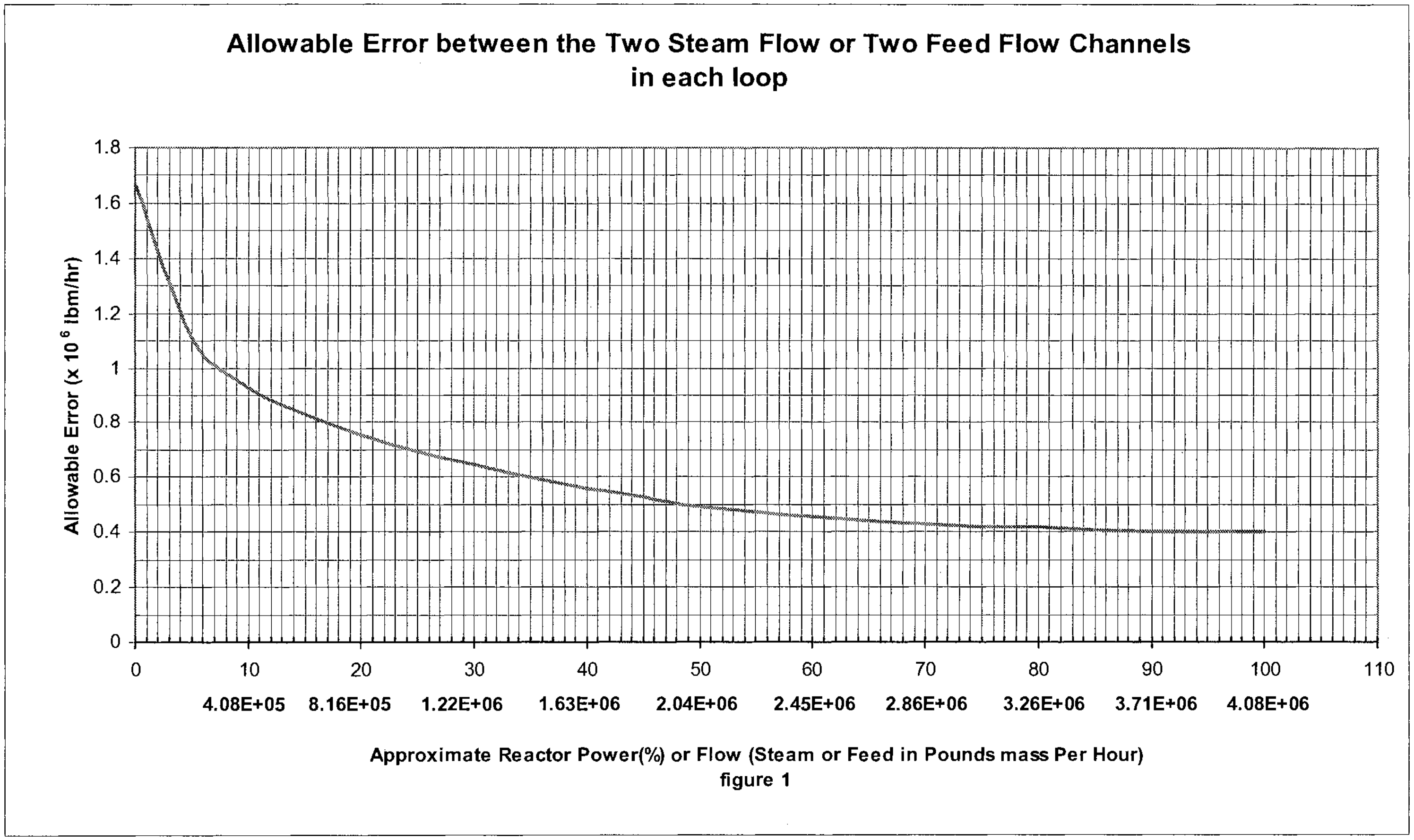


figure 1

Instructions: Determine current reactor power and find corresponding power on horizontal axis of above graph. Follow vertical line from power level to where it intersects curve. Read value for allowable error between each feed flow channel per set and each steam flow channel per set in each loop. IF one set is out of the allowable tolerance, THEN find expected STEAM/FEED flow corresponding to current power level to determine inoperable channel.

KEY

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST REVIEW SHEET

Date ____________

SURVEILLANCE TEST NO.	TECHNICAL SPECIFICATION REFERENCE
FNP-1-STP-1.0	Various
TITLE: Operations Daily and Shift Surveillance Requirements	MODE(S) REQUIRING TEST: 1, 2, 3, 4

	OPERATOR	TIME	MODE	ACCEPTABLE Yes	ACCEPTABLE No	SHIFT SUPERVISOR Review
Night Shift						
Day Shift						

Comments:

#4 LI-496 CSG inop. CR#2007108522 written

#5 FI-497 CSG inop. CR#2007108523 written

#25 RVLIS CHA inop CR#2007108524 written

FINAL SHIFT SUPERVISOR / SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY____________ DATE____________

☐ Procedure Properly completed and satisfactory

☐ 0800 and 1600 SFP readings have been reviewed.

☐ Comments:____________

ENGINEERING SUPPORT GROUP REVIEW

REVIEWED BY____________ DATE____________

☐ Satisfactory and Approved

☐ Comments:____________

TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
4. SG Level (%)					
SG 1A	LI 474	65		Channel Check	
	LI 475	67		Mode 1, 2	3.3.1-1(14): SR 3.3.1.1
	LI 476	64		Mode 1, 2	3.3.2-1(5.b): SR 3.3.2.1
				Mode 1, 2, 3	3.3.2-1(6.b): SR 3.3.2.1
				Mode 1, 2, 3	3.3.3-1(4): SR 3.3.3.1
	LR 477 (WR) Pen 1	62.1		Mode 3; NR Level ≥ 30% for at least 2 required SG's	SR 3.4.5.2
SG 1B	LI 484	63			
	LI 485	63		Mode 4; WR level ≥ 75% for required SG(s)	SR 3.4.6.2
	LI 486	64			
	LR 477 (WR) Pen 2	62.1			
SG 1C	LI 494	64		Expected variation: ± 4%	
	LI 495	64		Maximum deviation between channels : 8%	
	LI 496	① 51			
	LR 477 (WR) Pen 3	62.1			

① See Comments

TITLE			NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
5.	SG Feed Flow (1bm/hr)				Mode 1, 2; Channel Check	N/A
	SG 1A	FI 477	1.35 x 10^6	x 10^6		
		FI 476	1.35 x 10^6	x 10^6		
	SG 1B	FI 487	1.5 x 10^6	x 10^6	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 lbm/hr	
		FI 486	1.35 x 10^6	x 10^6		
	SG 1C	FI 497	1 2.35 x 10^6	x 10^6	For other power levels, see Figure 1. <u>If</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
		FI 496	1.35 x 10^6	x 10^6		
6.	SG Steam Flow (1bm/hr)				Channel Check	
	SG 1A	FI 474 (FE0474B)	1.7 x 10^6	x 10^6	Mode 1,2^d,3^d (d) Except when one MSIV is closed in each steam line.	3.3.2-1(4.e): SR 3.3.2.1
		FI 475 (FE0475B)	1.4 x 10^6	x 10^6		
	SG 1B	FI 484 (FE0484B)	1.15 x 10^6	x 10^6	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 1bm/hr	
		FI 485 (FE0485B)	1.45 x 10^6	x 10^6		
	SG 1C	FI 494 (FE0494B)	1.4 x 10^6	x 10^6	For other power levels, see Figure 1. <u>IF</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
		FI 495 (FE0495B)	1.4 x 10^6	x 10^6		

NOTE: **<u>IF</u> any channel III or IV pressure transmitter is out of service for surveillance testing or otherwise inoperable, <u>THEN</u> the corresponding steam flows may be channel checked using the appropriate points off the plant computer (in units of KBH), or by I&C direct readout. Since the MCB FIs are compensated for steam pressure but the computer points are <u>not</u>, compare only FI data to FI data, or computer point to computer point. Note on the Surveillance Test Review Sheet comments section whenever the alternate method of channel check is used.**

1 See Comments

	TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
7.	SG Pressure (psig)					
	SG 1A	PI 474	890		Channel Check Mode 1,2,3[b]	3.3.2-1(1.e.1): SR 3.3.2.1
		PI 475	880		Mode 1,2,3	3.3.2-1(1.e.2): SR 3.3.2.1
		PI 476	870		Mode 1,2[d],3[b,d]	3.3.2-1(4.d): SR 3.3.2.1
	SG 1B	PI 484	890		Mode 1, 2, 3	3.3.3-1(8): SR 3.3.3.1
		PI 485	880			
		PI 486	850			
	SG 1C	PI 494	880		Expected variation: ± 40 psi	
		PI 495	880		Maximum deviation between channels: 50 psi	
		PI 496	870		(b) Above the P-12 interlock (d) Except when one MSIV is closed in each steam line	
8.	RCS Temperature (°F)				Channel Check Mode 1, 2, 3	3.3.3-1(1):SR 3.3.3.1 3.3.3-1(2):SR 3.3.3.1
	T_{HOT} (TR 413)	Loop 1	568.3			
		Loop 2	568.5			
		Loop 3	568.3			
	T_{cold} (TR 410)	Loop 1	541.0			
		Loop 2	541.0		Expected variation: ± 17°F	
		Loop 3	540.9		Maximum deviation between channels: 23°F	

TITLE		NIGHT SHIFT		DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
23. Axial Flux Difference (%)						
N-41		-1			Mode 1, Power ≥ 50% RTP; within limits of the COLR	SR 3.2.3.1
N-42		-1.5				
N-43		-1.5				
N-44		-1				
AFD Target Point for Present Power Level (Curve 64)		-0.8				
24. Sub Cooled Margin Monitor (F°)		RTD	CETC		Record subcooling margin and TMAX Modes 1, 2, 3; Channel Check	3.3.3-1(10): SR 3.3.3.1
Q1B14TI2354-A		84.4	70.6			
Q1B14TI2355-B		84.1	66.8			
		TMAX				
Q1B14TI2301-A		583				
Q1B14TI2302-B		587				
25. Reactor Vessel Level Indicating System (MCB Mimic)		Initial			Modes, 1, 2, 3; Perform Channel Check; verify at least 4 sensors operable per channel by comparing each valid sensor with the corresponding sensor in the opposite train to verify they display the same state. IF one train is inoperable, THEN verify that at least 4 sensors indicate properly in the operable train.	3.3.3-1(16):SR 3.3.3.1
Channel A		inop	①			
Channel B		aw				

applicant's initials ① see comments

A.2 Equipment Control ADMIN G2.1.12 - SRO

TITLE: Review selected sections of STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS & identify any required actions.

TASK STANDARD: Review selected sections of STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS & identify any Tech Spec actions required due to inoperable components which do not meet acceptance criteria.

PROGRAM APPLICABLE: SOT ___ SOCT _____ OLT _X_ LOCT_____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ CLASSROOM

PROJECTED TIME: _20 MIN_ SIMULATOR IC NUMBER: _N/A_

ALTERNATE PATH ___ TIME CRITICAL ___ PRA_____

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to review pages 2-5 & 15 of FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS. The conditions under which this task is to be performed are:

a. Unit 1 is at 39% power.
b. You are the Shift Supervisor and must:
   1. Review pages 2-5 & 15 of FNP-1-STP-1.0.
   2. IF any component is inoperable, THEN identify ALL required actions for ALL inoperable components.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

_____ START TIME

NOTE: This is a classroom setting ADMIN JPM task.

1.	Reviews all readings on pages 1-5 & 15 and determines that they are in spec with the exception of the elements below:	Records all readings per attached key and determines that they are in spec with the exception of the following:	S / U
2.	Determines #4. LI-496 for C SG is out of tolerance low & inoperable.	Determines #4. LI-496 for C SG is out of tolerance low & inop.	S / U
*3	Determines from Tech Specs that with LI-496 for C SG inoperable,: the level channel must be placed in trip in 6 hours, or be in MODE 3 in 12 hours, & mode 4 in 18 (CRITICAL: most limiting action).	Determines from Tech Specs with LI-496 channel inoperable, the level channel must be:	

3.3.1-1(14): SR 3.3.1.1, Cond E

3.3.2-1(5.b): SR 3.3.2.1, Cond. I

3.3.2-1(6.b): SR 3.3.2.1, Cond. D (and be in Mode 4 in 18 hours)

3.3.3-1(4): SR 3.3.3-1, Cond. E. N/A due to only 2 of 3 required.

- placed in trip in 6 hours, or be in MODE 3 in 12 hours per — S / U

3.3.1-1(14): SR 3.3.1.1, Cond E and 3.3.2-1(5.b): SR 3.3.2.1, Cond. I,

- placed in trip in 6 hours, OR be in MODE 3 in 12 hours AND be in Mode 4 in 18 hours per — S / U

3.3.2-1(6.b): SR 3.3.2.1, Cond. D

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
4. Determines #8. TR-410 Tcold for Loop 1 & 2 are greater than Maximum deviation between channels & inop., and Loop 3 Tcold is out of commission.	Determines #8. TR-410 Tcold for Loop 1 & 2 are greater than Maximum deviation between channels & at least one of the two are inop., and Loop 3 Tcold is out of commission.	S / U
*5. Determines from Tech Specs, with TR-410 Tcold less than 2 operable, 3.3.3-1(2):SR 3.3.3.1 Condition A, Restore required channel to OPERABLE status in 30 days, and if not met apply 5.6.8 immediately.	Determines from Tech Specs, with less than 2 operable Tcold channels, Condition A is entered: Restore required channel to OPERABLE status in 30 days. If Condition A is not met, Condition B requires initiating action in accordance with Specification 5.6.8 immediately (PAM Report is required to be submitted within 14 days).	S / U
6. Determines #25. CH A RVLIS, has only 3 (<4) sensors operable & Channel A is inop.	Determines #25. CH A RVLIS, has less than 4 sensors operable & is inop.	S / U
*7. Determines from Tech Specs, with CH A RVLIS inoperable, entry must be made into Condition A. 3.3.3-1(16): SR 3.3.3.1, Cond A, Restore to operable in 30 days and if not met apply 5.6.8 immediately.	Determines from Tech Specs 3.3.3-1 (16) Condition A requires Restore CH A RVLIS to OPERABLE status in 30 days. If Condition A not met, Condition B requires initiate action in accordance with Specification 5.6.8 immediately (PAM Report is required to be submitted within 14 days).	S / U

_____ **STOP TIME**

Terminate when all actions have been identified.

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

GENERAL REFERENCES:

1. FNP-1-STP-1.0 Version 91.0
2. Technical Specifications & Basis for the following:
   - 3.3.1
   - 3.3.2
   - 3.3.3
   - 5.6.8

Current Amendment, Revision, or Version Numbers

Last Update: 8-14-07

	Unit 1 / Unit 2
Tech Spec	175 / 168
Tech Spec Bases	39
Environmental Protection Plan	90 / 83
COLR (Cycle-Rev)	21-2 / 19-0
PTLR	2 / 3
Tech Requirements Manual	15
Tech Requirements Manual Bases	5

3. K/A: G2.2.12 RO 3.0 SRO 3.4

GENERAL TOOLS AND EQUIPMENT:

Provide:

1. Partially marked up version of STP-1.0
2. Technical Specifications & Basis for the following:
   a. 3.3.1
   b. 3.3.2
   c. 3.3.3
   d. 5.6.8

COMMENTS:

CONDITIONS

When I tell you to begin, you are to review pages 2-5 & 15 of FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS. The conditions under which this task is to be performed are:

a. Unit 1 is at 39% power.
b. You are the Shift Supervisor and must:
    1. Review pages 2-5 & 15 of FNP-1-STP-1.0.
    2. IF any component is inoperable, THEN identify ALL required actions for ALL inoperable components.

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-1.0

SAFETY RELATED

OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS

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

Approved:

Jim L. Hunter (for)
Operations Manager

Date Issued 08/07/2007

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SURVEILLANCE TEST PROCEDURE STP-1.0

OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS

1.0 Purpose

This procedure provides a means for recording data required on a shift and daily basis.

2.0 Acceptance Criteria

Logged data must be within the acceptance criteria listed in the appropriate Appendix.

3.0 Initial Conditions

None

4.0 Precautions

Each parameter should be logged as accurately as possible.

5.0 Instructions

5.1 The operator completing the daily surveillance logs shall enter the mode, time, and his name in the appropriate space.

5.2 The operators completing the shift surveillance logs shall enter the mode, time and his name in the appropriate space on the review sheet.

5.3 The appropriate Appendix shall be used for shift and daily logging.

5.4 Log the data for each item in the column provided.

5.5 List shift data under the appropriate shift column.

5.6 A Shift and Daily Log for applicable modes shall be completed every day.

5.7 The modes for which surveillance on an item is required are listed in the Acceptance Criteria column.

5.8 The acceptance criteria for the logged data is also listed in the Acceptance Criteria column.

5.9 The technical specification reference is listed for each item in the Tech. Spec. column.

5.10 IF data can NOT be logged because the plant is in a mode, (OR the channel is in test), OR condition that makes logging impractical, THEN enter "NA" or "N/A" in the appropriate space, (OR "IN TEST" as applicable).

NOTE: The Shift or Daily Logs shall be considered complete when all items have been completed, with the following exceptions: (1) items that have been designated as being performed anytime during the shift, and (2) 1600 SFP readings. These items shall be completed prior to the final review.

5.11 Shift or Daily Logs shall be completed between 1100 and 1230 on Day Shift OR 2300 and 0030 on Night Shift. The Shift or Daily Logs shall be submitted to the Shift Supervisor for his/her review by 1300 for Day Shift OR 0100 for Night Shift.

NOTE: The following step does not apply to the MIMS channel check which is normally performed once per shift during Shift Supervisor turnover.

5.12 The data for each shift should be logged during the times specified per step 5.11 to ensure that 12 hour surveillance requirements are met.

5.12.1 Some data has been assigned an eight hour commitment and will be logged in the appropriate time slot.

5.13 The operator shall inform the Shift Supervisor promptly of any new discrepancies in the Shift or Daily Logs.

5.14 Upon notification of a new discrepancy, and during review of existing discrepancies, the Shift Supervisor is responsible for evaluating the discrepancy and ensuring that all appropriate actions are initiated including any that are required to meet any applicable Technical Specification action statements.

5.15 Comments regarding all discrepancies shall be included in the Comments section of the Surveillance Test Review Sheet.

5.16 Surveillance required due to special or abnormal plant conditions which is not normally taken on a shift or daily basis shall be entered in the miscellaneous section of the appropriate Appendix. Entries in this section are not required unless plant conditions warrant.

5.17 The operator completing the miscellaneous section shall enter the title, time, value, acceptance criteria, comments, and technical specification requirement in the appropriate columns.

5.18 The Shift Supervisor or Shift Support Supervisor shall enter any discrepancies and/or comments in the review section of the appropriate Appendix.

5.19 IF a daily OR shift surveillance item can NOT be taken from the listed indicator, BUT is available by some other indication, THEN that value will be listed in the appropriate space and the indicator actually used for the surveillance noted.

5.20 Compare data taken to the expected variations between instrumentation channels. This information, where applicable, along with the maximum allowable deviation is provided in Appendix 1 at the step where data is being taken and in Table 1 and Figure 1. IF the variance is greater than expected, THEN submit a CR to the Shift Supervisor to correct the out of tolerance instrument.

5.21 WHEN a channel check is performed on an instrument that has a numerical readout, THEN the actual value will be recorded, unless otherwise noted. Initials must be used to document performance of other channel checks and verifications.

5.22 Where no value is required to be logged for an item, the operator will initial the appropriate space.

5.23 Data need not be recorded in sequence.

5.24 Marking the STRS as "Acceptable" means that all data points are within their applicable tolerances, meeting the acceptance criteria, or identified and justified by a reason in the comments section (or Appendix).

6.0 References

6.1 Technical Specifications

6.2 FNP-0-M-011 Offsite Dose Calculation Manual

6.3 FSAR Chapter 16

6.4 Technical Requirements Manual

APPENDIX 1

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST PROCEDURE

FNP-1-STP-1.0

OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS MODES 1, 2, 3, 4

This appendix consists of 38 pages.

FARLEY NUCLEAR PLANT

SURVEILLANCE TEST REVIEW SHEET

Date ____________________

SURVEILLANCE TEST NO. FNP-1-STP-1.0	TECHNICAL SPECIFICATION REFERENCE Various
TITLE: Operations Daily and Shift Surveillance Requirements	MODE(S) REQUIRING TEST: 1, 2, 3, 4

	OPERATOR	TIME	MODE	ACCEPTABLE Yes	ACCEPTABLE No	SHIFT SUPERVISOR Review
Night Shift	________	______	______	______	______	____________
Day Shift	________	______	______	______	______	____________

Comments:

____

____

____

____

____

____

____

FINAL SHIFT SUPERVISOR / SHIFT SUPPORT SUPERVISOR REVIEW

REVIEWED BY______________________________DATE____________________

☐ Procedure Properly completed and satisfactory

☐ 0800 and 1600 SFP readings have been reviewed.

☐ Comments:____

ENGINEERING SUPPORT GROUP REVIEW

REVIEWED BY______________________________DATE____________________

☐ Satisfactory and Approved

☐ Comments:____

OPERATIONS DAILY
SURVEILLANCE REQUIREMENTS
MODES 1, 2, 3, & 4

TITLE	NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
1. Condensate Storage Tank (ft.)			Mode 1, 2, 3; ≥150,000 gallons (12.5 ft)	SR 3.7.6.1
*LI 4005B	37			

*IF LI 4005B is out of service, THEN adequate level (12.5 ft) may be checked using Auxiliary Feedwater Pump suction pressure indicator PI-3211A, and verifying indicated pressure is ≥ 32 psig (Ref. FP 98-0553, dated September 30, 1998; NEL-98-0387). The use of this alternative means of verifying level should be documented in the miscellaneous requirements section.

TITLE	NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
2. Auxiliary Feedwater Flow Rate (gpm)			Mode 1, 2, 3; Channel Check	3.3.3-1(9): SR 3.3.3.1
FI 3229A	0			
FI 3229B	0			
FI 3229C	0			
3. Turbine Impulse Pressure (psig)			Mode 1 Channel Check	3.3.1-1(17.f): SR 3.3.1.1
PT 446	185		Expected variation: ± 20 psi	
PT 447	195		Maximum deviation between channels: 40 psi	

TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
4. SG Level (%)					
SG 1A	LI 474	65		Channel Check	
	LI 475	67		Mode 1, 2	3.3.1-1(14): SR 3.3.1.1
				Mode 1, 2	3.3.2-1(5.b): SR 3.3.2.1
	LI 476	64		Mode 1, 2, 3	3.3.2-1(6.b): SR 3.3.2.1
				Mode 1, 2, 3	3.3.3-1(4): SR 3.3.3.1
	LR 477 (WR) Pen 1	62.1		Mode 3; NR Level ≥ 30% for at least 2 required SG's	SR 3.4.5.2
SG 1B	LI 484	64			
	LI 485	64		Mode 4; WR level ≥ 75% for required SG(s)	SR 3.4.6.2
	LI 486	64			
	LR 477 (WR) Pen 2	62.1			
SG 1C	LI 494	64		Expected variation: ± 4%	
	LI 495	64		Maximum deviation between channels : 8%	
	LI 496	51			
	LR 477 (WR) Pen 3	62.1			

TITLE			NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
5.	SG Feed Flow (1bm/hr)				Mode 1, 2; Channel Check	N/A
	SG 1A	FI 477	1.1 x 10^6	x 10^6		
		FI 476	1.35 x 10^6	x 10^6		
	SG 1B	FI 487	1.5 x 10^6	x 10^6	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 lbm/hr	
		FI 486	1.35 x 10^6	x 10^6		
	SG 1C	FI 497	1.6 x 10^6	x 10^6	For other power levels, see Figure 1. <u>If</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
		FI 496	1.35 x 10^6	x 10^6		
6.	SG Steam Flow (1bm/hr)				Channel Check	
	SG 1A	FI 474 (FE0474B)	1.4 x 10^6	x 10^6	Mode 1,2[d],3[d] (d) Except when one MSIV is closed in each steam line.	3.3.2-1(4.e): SR 3.3.2.1
		FI 475 (FE0475B)	1.7 x 10^6	x 10^6		
	SG 1B	FI 484 (FE0484B)	1.8 x 10^6	x 10^6	Allowable error between channels in each set at ≥ 95% reactor power: ± 0.4 x 10^6 1bm/hr	
		FI 485 (FE0485B)	1.4 x 10^6	x 10^6		
	SG 1C	FI 494 (FE0494B)	1.1 x 10^6	x 10^6	For other power levels, see Figure 1. <u>IF</u> one set is out of tolerance, <u>THEN</u> see Figure 1 to determine inoperable channel.	
		FI 495 (FE0495B)	1.45 x 10^6	x 10^6		

NOTE: **<u>IF</u> any channel III or IV pressure transmitter is out of service for surveillance testing or otherwise inoperable, <u>THEN</u> the corresponding steam flows may be channel checked using the appropriate points off the plant computer (in units of KBH), or by I&C direct readout. Since the MCB FIs are compensated for steam pressure but the computer points are <u>not</u>, compare only FI data to FI data, or computer point to computer point. Note on the Surveillance Test Review Sheet comments section whenever the alternate method of channel check is used.**

	TITLE		NIGHT SHIFT	DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
7.	SG Pressure (psig)					
	SG 1A	PI 474	890		Channel Check Mode 1,2,3[b]	3.3.2-1(1.e.1): SR 3.3.2.1
		PI 475	880		Mode 1,2,3	3.3.2-1(1.e.2): SR 3.3.2.1
		PI 476	870		Mode 1,2[d],3[b,d]	3.3.2-1(4.d): SR 3.3.2.1
	SG 1B	PI 484	890		Mode 1, 2, 3	3.3.3-1(8): SR 3.3.3.1
		PI 485	880			
		PI 486	850			
	SG 1C	PI 494	880		Expected variation: ± 40 psi	
		PI 495	880		Maximum deviation between channels: 50 psi	
		PI 496	870		(b) Above the P-12 interlock (d) Except when one MSIV is closed in each steam line	
8.	RCS Temperature (°F)				Channel Check	3.3.3-1(1):SR 3.3.3.1
	T_{HOT} (TR 413)				Mode 1, 2, 3	3.3.3-1(2):SR 3.3.3.1
		Loop 1	577.1			
		Loop 2	568.5			
		Loop 3	562.4			
	T_{cold} (TR 410)					
		Loop 1	541.0			
		Loop 2	516.2		Expected variation: ± 17°F	
		Loop 3	out of commission		Maximum deviation between channels: 23°F	

	TITLE	NIGHT SHIFT		DAY SHIFT	ACCEPTANCE CRITERIA	TECH SPEC
23.	Axial Flux Difference (%)				Mode 1, Power ≥ 50% RTP; within limits of the COLR	SR 3.2.3.1
	N-41	-1				
	N-42	-1.5				
	N-43	-1.5				
	N-44	-1				
	AFD Target Point for Present Power Level (Curve 64)	-0.8				
24.	Sub Cooled Margin Monitor (F°)	RTD	CETC		Record subcooling margin and TMAX Modes 1, 2, 3; Channel Check	3.3.3-1(10): SR 3.3.3.1
	Q1B14TI2354-A	84.4	70.6			
	Q1B14TI2355-B	84.1	66.8			
		TMAX				
	Q1B14TI2301-A	583				
	Q1B14TI2302-B	587				
25.	Reactor Vessel Level Indicating System (MCB Mimic)	Initial			Modes, 1, 2, 3; Perform Channel Check; verify at least 4 sensors operable per channel by comparing each valid sensor with the corresponding sensor in the opposite train to verify they display the same state. IF one train is inoperable, THEN verify that at least 4 sensors indicate properly in the operable train.	3.3.3-1(16):SR 3.3.3.1
	Channel A	①				
	Channel B	as				

Note ①: 3 of 8 sensors on 'A' Train operable.
5 of 8 sensors inoperable - CR 2007100092

OPERATIONS SHIFT OR DAILY
MISCELLANEOUS REQUIREMENTS
MODES 1, 2, 3, 4

TITLE	TIME	VALUE	ACCEPTANCE CRITERIA/COMMENTS	TECH SPEC

TABLE 1

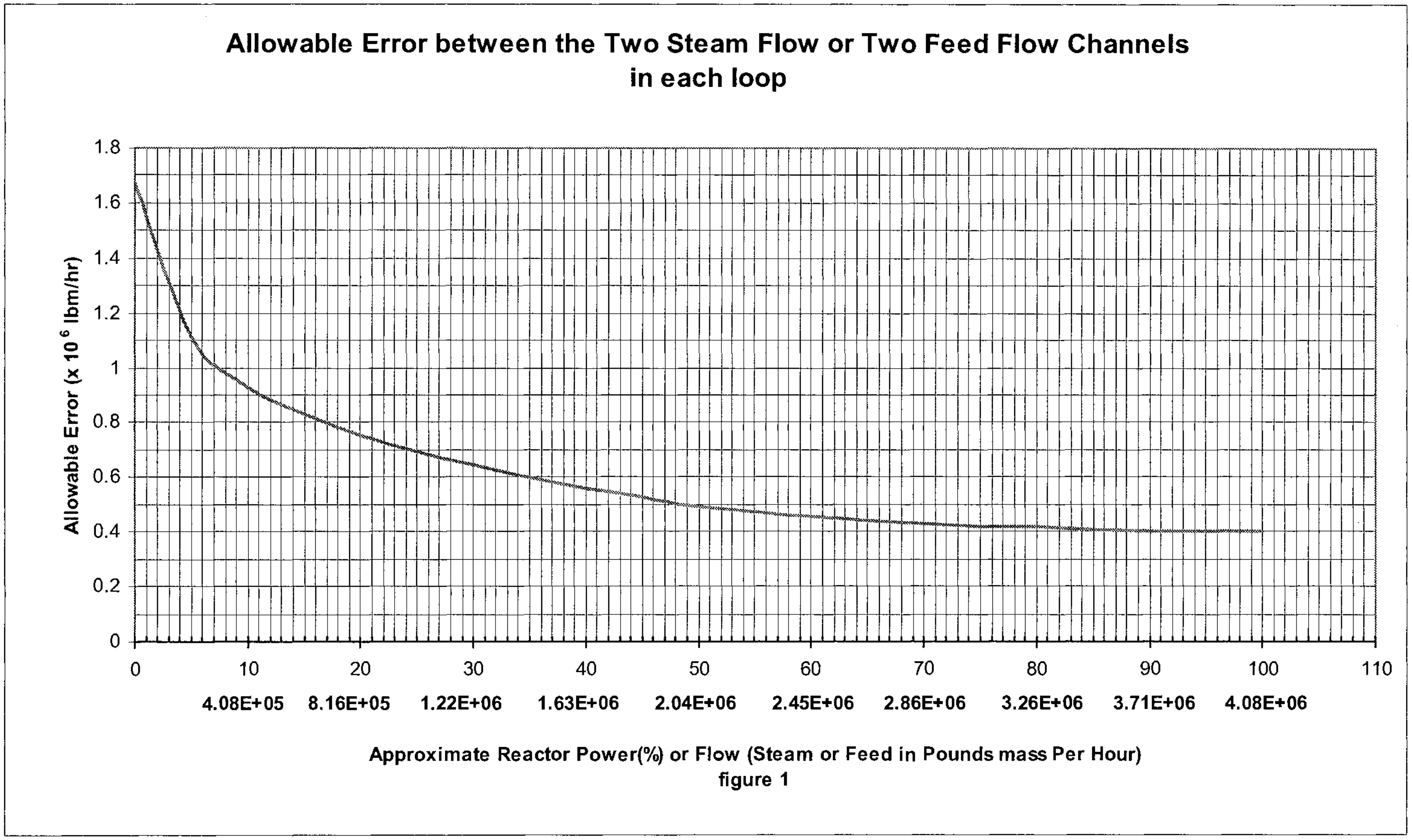
Expected Variations Between Instrumentation Channels During Normal Operation

Parameter	Expected Variation	Maximum Deviation Between Channels
Reactor coolant average temperature indicators	± 3°F	6°F
Delta-T indicators	± 3.7%	7.4%
Reactor coolant flow indicators	± 5%	9%
Feedwater flow indicators	See Fig. 1	
Steam flow indicators	See Fig. 1	
Pressurizer pressure indicators	± 30 psi	48 psi
Pressurizer level indicators	± 4%	8%
Steam generator level indicators (narrow range)	± 4%	8%
Steam line pressure indicators	± 40 psi	50 psi
Turbine impulse chamber pressure indicators	± 20 psi	40 psi
The overpower ΔT reactor trip setpoints	± 3.5%	6%
The overtemperature ΔT reactor trip setpoint	± 7.5%	18.8%
Top nuclear flux indicators	± 2%	3.6%
Bottom nuclear flux indicators	± 2%	3.6%
RCS temperature recorders	± 17°F	23°F

NOTE: IF recorded data is greater than the expected variation, THEN submit a CR to correct the out of tolerance instrument and so note in the deficiency section of the Surveillance Test Review Sheet.

FIGURE 1

Allowable error between SF or FF channels in each set. Loop A, B and C.



Instructions: Determine current reactor power and find corresponding power on horizontal axis of above graph. Follow vertical line from power level to where it intersects curve. Read value for allowable error between each feed flow channel per set and each steam flow channel per set in each loop. IF one set is out of the allowable tolerance, THEN find expected STEAM/FEED flow corresponding to current power level to determine inoperable channel.

A.3 Radiation Control ADMIN G2.3.11 - RO

TITLE: Perform control room test of R-18 for liquid waste release

TASK STANDARD: Perform Control Room portion of liquid waste release and set R-18 alarm setpoint greater than background but less than max allowed for a liquid waste release.

PROGRAM APPLICABLE: SOT ___ SOCT ______ OLT _X_ LOCT__________

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _73*_____

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA____

BOOTH OPERATOR NOTE:

- Run text file per setup sheet

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to PERFORM CONTROL ROOM OPERATIONS FOR A LIQUID WASTE RELEASE. The conditions under which this task is to be performed are:

a. A liquid waste release permit has been issued for the release of #1 WMT.
b. The Radside SO is standing by in the field, with a current copy of SOP-50.1.
c. The System Operator has requested that you verify proper operation of Liquid Waste Discharge R-18 beginning at SOP-50.1, Appendix 1, step 2.5.4.6, and continue with control room actions required for a liquid waste release using Attachment 1.
d. The System Operator prejob brief has been done.
e. A prejob brief is required for only the Control Room portion of this task.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ **START TIME**		
1. Attempts to reset R-18 trip. Att. 1 step 1.0	OPERATION SELECTOR Switch taken to RESET.	S / U
CUE IF REQUESTED: Normal setting is 7900 cpm, or 5.51 POT SETTING.		
*2. Raises pot setting to greater than normal 7900 cpm setting (>5.51) and resets R-18 alarm and informs SO. Att. 1 step 1.1	Raises pot setting to greater than normal 7900 cpm setting (>5.51) and resets R-18 alarm and informs SO. (CUE from BOOTH: SO acknowledges.)	S / U
3. Open waste monitor tank discharge valve RCV-18 (N1G21V113). Att. 1 step 2.0	Direct SO to open RCV-18. (CUE from BOOTH: SO reports RCV-18 is open.).	S / U
*4. Lower potentiometer setting of R-18 until alarm actuates. Att. 1 step 3.0	Potentiometer adjusted counter-clockwise to alarm.	S / U
5. Verify RCV-18 (N1G21V113) closes. Att. 1 step 4.0	Direct SO to check RCV-18 closed per step 4.3.6 of SOP-50.1. (CUE from BOOTH: SO reports RCV-18 closed.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
6. Operate control switch for RCV-18 (N1G21V113) from LWPP to verify that valve cannot be opened from the panel. Att. 1 step 5.0	Direct SO to attempt to open RCV-18 per step 4.3.7 of SOP-50.1. (CUE from BOOTH: SO reports that RCV-18 did NOT open when control switch was placed in OPEN.)	S / U
7. Adjusts the pot setting clockwise to normal value & attempts to reset alarm. Att. 1 step 6.0	Adjusts the pot setting clockwise to normal value & attempts to reset alarm.	S / U
*8. Raises pot setting to greater than normal 7900 cpm setting (5.51) but less than max allowed 10,000 cpm setting per release permit (5.7) and resets R-18 alarm to allow release and informs SO. Att. 1 step 6.1& 7.0	Raises pot setting to greater than normal 7900 cpm setting (5.51) but less than max allowed 10,000 cpm setting per release permit (5.7) and resets R-18 alarm to allow release and informs SO. (CUE from BOOTH: SO acknowledges.)	S / U

____ **STOP TIME**
Terminate when R-18 is reset.

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

GENERAL REFERENCES:

1. FNP-1-SOP-50.1, Version 58.0
2. K/As: G2.3.11 RO-2.7 SRO-3.2

GENERAL TOOLS AND EQUIPMENT:

Provide:
1. Partially filled out LIQUID WASTE RELEASE PERMIT
2. Marked up FNP-1-SOP-50.1

COMMENTS:

CONDITIONS

When I tell you to begin, you are to PERFORM CONTROL ROOM OPERATIONS FOR A LIQUID WASTE RELEASE. The conditions under which this task is to be performed are:

a. A liquid waste release permit has been issued for the release of #1 WMT.
b. The Radside SO is standing by in the field, with a current copy of SOP-50.1.
c. The System Operator has requested that you verify proper operation of Liquid Waste Discharge R-18 beginning at SOP-50.1, Appendix 1, step 2.5.4.6, and continue with control room actions required for a liquid waste release using Attachment 1.
d. The System Operator prejob brief has been done.
e. A prejob brief is required for only the Control Room portion of this task.

LIQUID WASTE RELEASE PERMIT
FARLEY NUCLEAR PLANT

Unit 1 LWRP# 71103.011.113.L

PART I: ANALYSIS REQUEST

DISCHARGE SOURCE TANK #1 WMT

Date 11/ today/ 2007 a. Tank Content 4500 (gal) d. Recirc start 0700
Time NOW b. Recirc Rate 37.5 (gpm) e. Sample After 1100
Initials SRC c. Recirc Time Minimum (2xa/b) 240 (min)
f. Reviewed by: SS
SOP 50.1 OTC # 09/13/07 06:40:10

PART II: PRE-RELEASE CALCULATIONS (CHM)

Unit# 1 Tank# 1 Sampled @ 1800 Recirc Duration 660 (min)
RE-18 Background 1800 cpm (must exceed PART I c. Limit)

Maximum Permissible Release Rate 45 GPM

Possible Release Conditions and Dose Projections - SEE ATTACHMENTS

SPECIAL CONDITIONS: Set RE-18 to ≤ 10,000 cpm prior to release. Reset RE-18 to ≤7900 cpm after release. Use ≥ 20,000 gpm dilution flow

Composite Stored By SRC

ID of Sample, Prerelease & LWRP Verified and Release Approved By SRC foreman
Shift Radiochemist

Date/Time 11 / today /2007 now

PART III: ACTUAL RELEASE DATA (OPS)

Dilution Flow Rate ______ gpm Monitor Trip Setpoint ______ cpm
Tank Flow Rate ______ gpm

	Date	Time	Tank Level (gal)	Totalizer Dilut	Totalizer WMT
Start					
Finish					
Net					

Monitor Reading 10 minutes into Discharge ______ cpm
Post Monitor Reading ______ cpm

Discharge Completed By ______ Data Reviewed By ______

Date/Time / /

PART IV: Release Records Update (CHM)

Actual Release Conditions and Dose Calculations - SEE ATTACHMENTS
Data Updated & Checked By ______ Date/Time / /

FARLEY NUCLEAR PLANT

UNIT 1

APPENDIX 1

WASTE MONITOR TANK 1

RELEASE TO THE ENVIRONMENT

1.0 Initial Conditions

1.1 This copy of the procedure has been verified for the following: (OR 1-98-498)

ko 1.1.1 The correct version of the procedure.

ko 1.1.2 The correct unit for the task.

2.0 Instructions

CAUTION:	**DO NOT enter the "TEST/CALIB" or the "PARAM SET" modes of the WMT totalizer processor. Any changes in these modes will affect the channel calibration.**

NOTE:

- **Either WMT FLOW TOTALIZER, (N1G21FQI1085) OR #1 WMT LI, (N1G21LIS1082) should be operable to discharge a WMT. IF both instruments are inoperable, THEN the Shift Support Supervisor should be notified.**
- **IF the WMT FLOW TOTALIZER, (N1G21FQI1085) is out of service, THEN the totalizer's reading may be derived from the #1 WMT LI, (N1G21LIS1082). One gallon discharged from the WMT equals one gallon on the WMT totalizer. (Either the WMT totalizer or the WMT level indication should be operable)**
- **IF the #1 WMT LI (N1G21LIS1082) is out of service, THEN the volume released (Net Tank Level) may be derived from the net "INVENT" totalizer reading or the "TOTAL" totalizer reading.**
- **IF the SERVICE WATER DILUTION FLOW TOTALIZER, (N1P16FR4107) is out of service, THEN the dilution totalizer reading may be derived by taking the average dilution flowrate during the release, multiplying this by the release duration (net time), and dividing by 10,000. Each totalizer integration equals 10,000 gal of water.**
- **Either the SERVICE WATER DILUTION FLOW TOTALIZER, (N1P16FR4107) OR the SW DILUTION FLOW RECORDER, (N1P16FR4107) should be operable to discharge a WMT. IF both instruments are inoperable, THEN the Shift Support Supervisor should be notified.**
- **Technical Specification 5.5.1 and Chapter 2 of FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL, are applicable to the WASTE MONITOR PUMP DISC, (N1G21FI1085B) AND the SW DILUTION FLOW RECORDER, (N1P16FR4107).**

NOTE: • Initial each step as completed. Instructions for completion of liquid waste release permit are specified in FNP-0-CCP-212, LIQUID WASTE RELEASE PROGRAM.

Ro 2.1 Waste monitor tank 1 is aligned per system check list FNP-1-SOP-50.1A, LIQUID WASTE PROCESSING SYSTEM LIQUID WASTE RELEASE FROM WASTE MONITOR TANK.

2.2 Determine recirculation flowpath.

N/A 2.2.1 IF waste monitor tank 1 is to be recirculated through the Demineralizer, THEN proceed to step 2.3.

Ro 2.2.2 IF normal recirculation is to be used, THEN proceed to step 2.4.

CAUTION:
- **Only one tank may be recirculated through the demineralizer at a time.**
- **IF WMT is aligned for recirc through the demin while WCT is being pumped to the Disposable Demineralizer System, THEN the two tanks will be cross-connected.**

NOTE: Recirculation time through the demineralizers does not count towards recirculation time necessary to obtain a representative sample. Section 2.4 must be performed. (Ref. FNP-1-CCP-212)

2.3 Recirculate through Demineralizer as follows:

N/A 2.3.1 Verify closed FDT STRAINER DISCH, N1G21V118 (1-LWP-V-7421)

2.3.2 Start #1 WMT PUMP, N1G21P006B.

2.3.3 Close FDT DISCH TO WASTE EVAP, Q1G21V267 (1-LWP-V-7427).

2.3.4 Close #2 WMT DEMIN BYP, Q1G21V125 (1-LWP-V-7428).

2.3.5 Open FDT FILTER OUTLET, Q1G21V189 (1-LWP-V-7456).

2.3.6 Open FDT TO WMT DEMIN, Q1G21V091B (1-LWP-V-7452B).

2.3.7 Verify closed WMT DEMIN DISCH TO #2 WMT, Q1G21V093B (1-LWP-V-7438B).

2.3.8 Open WMT DEMIN DISCH TO #1 WMT, Q1G21V093A (1-LWP-V-7438A).

N/A

2.3.9 Open WMT DEMIN OUTLET, Q1G21V094 (1-LWP-V-7434).

2.3.10 Verify open WMT #1 INLET ISO Q1G21V090 (1-LWP-V-7413).

2.3.11 Open WMT #1 DISCHARGE TO FDT, Q1G21V115 (1-LWP-V-7454).

2.3.12 Throttle open #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

2.3.13 Recirculate tank contents for a minimum of two (2) tank volumes based on the flow rate from either FI1085B, totalizer processor "RATE" display or the release flow rate corresponding to the discharge pressure obtained using Table 1, and the tank volume.

Disch Press ______ psig Flow Rate ______ gpm

Recirculation Time ___________ hr. _________ min.

N/A

2.3.14 Verify WMT filter $\Delta P < 20$ psid.

Inlet Press __________ (N1G21PI2907) - Outlet Press __________ (N1G21PI1089) = __________ psid

2.3.15 IF WMT filter $\Delta P \geq 20$ psid, THEN contact control room and submit a CR to change the filter.

2.3.16 WHEN recirculation is completed, THEN close #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

2.3.17 Close #1 WMT DISCH TO FDT, Q1G21V115 (1-LWP-V-7454).

2.3.18 Close #1 WMT INLET ISO, Q1G21V090 (1-LWP-V-7413).

2.3.19 Close WMT DEMIN OUTLET, Q1G21V094 (1-LWP-V-7434).

2.3.20 Close WMT DEMIN DISCH TO #1 WMT, Q1G21V093A (1-LWP-V-7438A).

2.3.21 Close FDT TO WMT DEMIN, Q1G21V091B (1-LWP-V-7452B).

2.3.22 Open FDT DISCH TO WASTE EVAP, Q1G21V267 (1-LWP-V-7427).

2.3.23 Open #2 WMT DEMIN BYP, Q1G21V125 (1-LWP-V-7428).

2.3.24 Close FDT FILTER OUTLET, Q1G21V189 (1-LWP-V-7456).

2.3.25 Proceed to step 2.4 for recirculation to obtain sample.

2.4 Align normal recirc to #1 WMT as follows:

DD 2.4.1 Close #1 WMT INLET ISO, Q1G21V090 (1-LWP-V-7413).

DW 2.4.2 Verify closed #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

DW 2.4.3 Start #1 WMT PUMP, N1G21P006B.

DW 2.4.4 Record #1 WMT pump discharge pressure from WASTE MONITOR PUMP DISCHARGE PRESSURE INDICATOR, N1G21PI1084A.

110 psig

DW 2.4.5 IF pressure recorded in step 2.4.4 ≥ 108 psig and ≤112 psig, THEN continue with 2.4.6, IF NOT, the flow value specified in step 2.4.6 is not conservative and will have to be re-determined using Appendix 3 prior to proceeding with this release.

DW 2.4.6 Recirculate tank contents for a minimum of two (2) tank volumes based on the following flow rate and the volume of liquid in the tank.

Flow Rate 37.5 gpm

Recirculation Time 4 hr. 0 min.

RF CHEM 2.4.7 Sample has been drawn and analyzed after required recirculation time.

DW 2.4.8 Proceed to step 2.5.

2.5 Liquid Waste Release

DW 2.5.1 Liquid waste release permit number 1-2006-178298 has been issued.

DW 2.5.2 Calculate time that tank low level and pump shutoff will occur by using the following formula.

$$\text{Time (minutes)} = \frac{A - 750\ (\text{gal})}{B}$$

A = Quantity of liquid to be released from permit, gal.

B = Expected Release rate, gal/min.

750 gal = pump lo lo level trip setpoint

CP
SSS 2.5.3 Shift Support Supervisor has performed a review of the release permit and has verified that #1 WMT is the tank to be released.

NOTE:	**With R-18 out of service, FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL Chapter 2 should be referred to for release limitations.**

2.5.4 IF LIQ WASTE DISCH R-18 is operable, THEN perform test on LIQ WASTE DISCH R-18 per the following:

cWR 2.5.4.1 IF operable, THEN verify RR-0200 (point RR-18) recorder in operation.

cWR 2.5.4.2 Verify meter responds in the top scale direction on channel R-18 by inserting check source. IF check source is NOT sufficient, THEN have Health Physics source check with a portable source.

cWR 2.5.4.3 IF RR-0200 (point RR-18) recorder is operable, THEN verify source check caused on upscale on point RR-18.

cWR 2.5.4.4 Document R-18 source check in FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS.

nW 2.5.4.5 Verify the following valves are locked closed.

#1 WMT DISCH, Q1G21V111 (1-LWP-V-7446) (KEY #Z-22)
#2 WMT DISCH, Q1G21V114 (1-LWP-V-7448) (KEY #Z-19)

____ 2.5.4.6 Coordinate with the Control Room to perform test on LIQ WASTE DISCH R-18 per section 4.3 (Attachment 1).

/
P.O.
CV 2.5.5 IF R-18 is operable, THEN adjust the monitor setpoint for RE-18 to the value obtained from the discharge permit and the pot setting in Unit 1 Volume III Curve R18.

NOTE:	**IF the Service Water dilution flow recorder is out of service, THEN the limitations of FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL Chapter 2 apply.**

____ 2.5.6 Verify the dilution flow rate is greater than or equal to the minimum, as stated in Part II of the liquid waste release permit. (Utilize the largest dilution flow which can practically be attained.)

ATTACHMENT 1

PRE-RELEASE RE-18 TEST

NOTE:	**This attachment may be used by the Control Room Operator in conjunction with section 4.3 which is maintained by the Radside Systems Operator.**

1.0 IF LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018 drawer is in alarm, THEN reset the alarm. (Section 4.3, step 4.3.3)

1.1 IF background radiation levels prevent resetting LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, THEN raise the pot setting to a value above background AND reset the alarm.

2.0 Open WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113). (Section 4.3, step 4.3.4)

3.0 Lower the trip setting of LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, drawer until a high radiation alarm actuates. (Section 4.3, step 4.3.5)

4.0 Verify WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113), closes. (Section 4.3, step 4.3.6)

5.0 Operate the control switch for WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113), from the LWPP to verify that the valve cannot be opened from the panel. (Section 4.3, step 4.3.7)

6.0 Adjust the pot setting of LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, to normal value. (Section 4.3, step 4.3.8)

6.1 IF background radiation levels prevent resetting LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, to normal value, THEN raise the pot setting to a value sufficiently above background to prevent spurious trips while maintaining the setpoint less than allowed by the release permit.

7.0 Reset the high radiation alarm on LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018. (Section 4.3, step 4.3.9)

A.3 Radiation Control ADMIN G2.3.11 - SRO

TITLE: Perform control room test of R-18 for liquid waste release

TASK STANDARD: Perform Control Room portion of liquid waste release and identify that R-18 automatic function is inoperable. Identify the ODCM actions that will allow a release with R-18 automatic isolation function inoperable.

PROGRAM APPLICABLE: SOT ___ SOCT ______ OLT _X_ LOCT__________

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _73 *_____

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA____

- No batch files associated with this JPM

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to PERFORM CONTROL ROOM OPERATIONS FOR A LIQUID WASTE RELEASE. The conditions under which this task is to be performed are:

a. A liquid waste release permit has been issued for the release of #1 WMT.
b. The Radside SO is standing by in the field, with a current copy of SOP-50.1.
c. The System Operator has requested that you verify proper operation of Liquid Waste Discharge R-18 beginning at SOP-50.1, Appendix 1, step 2.5.4.6, and continue with control room actions required for a liquid waste release using Attachment 1.
d. The System Operator prejob brief has been done.
e. A prejob brief is required for only the Control Room portion of this task.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ **START TIME**		
1. Resets R-18 trip. Att. 1 step 1.0	OPERATION SELECTOR Switch taken to RESET.	S / U
2. Open waste monitor tank discharge valve RCV-18 (N1G21V113). Att. 1 step 2.0	Direct SO to open RCV-18. (CUE from BOOTH: SO reports RCV-18 is open.)	S / U
*3. Lower potentiometer setting of R-18 until alarm actuates. Att. 1 step 3.0	Potentiometer adjusted counter-clockwise to alarm. [Indications expected: Red HIGH ALARM light is on. MCB annunciator FH1 alarms. RMS panel alarm sounds.]	S / U
4. Verify RCV-18 (N1G21V113) closes. Att. 1 step 4.0	Direct SO to check RCV-18 closed per step 4.3.6 of SOP-50.1. (CUE from BOOTH: SO reports RCV-18 closed.)	S / U
5. Operate control switch for RCV-18 (N1G21V113) from LWPP to verify that valve cannot be opened from the panel. Att. 1 step 5.0	Direct SO to attempt to open RCV-18 per step 4.3.7 of SOP-50.1. (CUE from BOOTH: SO reports that RCV-18 DID open when control switch was placed in OPEN.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*6.	Determines that the release must not occur (May inform the Rad side System operator to close RCV-18 due to valve reopens with alarm in. This is not a critical part of this step).	Determines that the release must not occur (May inform the Rad side System operator to close RCV-18 due to valve reopens with alarm in). (CUE from BOOTH: SO Reports RCV-18 has been closed.).	S / U
7.	Informs the SS that R-18 Auto isolation of RCV-18 function is inoperable, and the WMT release cannot occur.	Informs the SS that R-18 Auto isolation of RCV-18 function is inoperable, and the WMT release cannot occur. **(CUE from EXAMINER: SS acknowledges, and requests that you determine if release can occur, and if so under what conditions?)**	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*8. Determines from the ODCM that a release may occur but only if prior to initiating a release compensatory actions are taken for action 28.	Determines from the ODCM that a release may occur but only if the following conditions are met prior to initiating a release: a. At least two independent samples are analyzed in accordance with Section 2.1.2.3, and b. At least two technically qualified members of the Facility Staff independently verify the discharge line valving and (1) Verify the manual portion of the computer input for the release rate calculations performed on the computer, or (2) Verify the entire release rate calculations if such calculations are performed manually.	S / U

____ **STOP TIME**

Terminate when actions which allow release are determined.

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

GENERAL REFERENCES:

1. FNP-1-SOP-50.1, Version 58.0
2. ODCM, Version 22
3. K/As: G2.3.11 RO-2.7 SRO-3.2

GENERAL TOOLS AND EQUIPMENT:

Provide:

1. Partially filled out LIQUID WASTE RELEASE PERMIT
2. Marked up FNP-1-SOP-50.1
3. ODCM

COMMENTS:

CONDITIONS

When I tell you to begin, you are to PERFORM CONTROL ROOM OPERATIONS FOR A LIQUID WASTE RELEASE. The conditions under which this task is to be performed are:

a. A liquid waste release permit has been issued for the release of #1 WMT.
b. The Radside SO is standing by in the field, with a current copy of SOP-50.1.
c. The System Operator has requested that you verify proper operation of Liquid Waste Discharge R-18 beginning at SOP-50.1, Appendix 1, step 2.5.4.6, and continue with control room actions required for a liquid waste release using Attachment 1.
d. The System Operator prejob brief has been done.
e. A prejob brief is required for only the Control Room portion of this task.

RType G02.036

LIQUID WASTE RELEASE PERMIT
FARLEY NUCLEAR PLANT

Unit 1 LWRP# 71103.011.113.L

PART I: ANALYSIS REQUEST

DISCHARGE SOURCE TANK #1 WMT

Date 11/ today/ 2007 a. Tank Content 4500 (gal) d. Recirc start 0700
Time NOW b. Recirc Rate 37.5 (gpm) e. Sample After 1100
Initials SRC c. Recirc Time Minimum (2xa/b) 240 (min)
f. Reviewed by: SS
SOP 50.1 OTC # 09/13/07 06:40:10

PART II: PRE-RELEASE CALCULATIONS (CHM)

Unit# 1 Tank# 1 Sampled @ 1800 Recirc Duration 660 (min)
RE-18 Background 1800 cpm (must exceed PART I c. Limit)

Maximum Permissible Release Rate 45 GPM

Possible Release Conditions and Dose Projections - SEE ATTACHMENTS

SPECIAL CONDITIONS: Set RE-18 to ≤ 10,000 cpm prior to release. Reset RE-18 to ≤7900 cpm after release. Use ≥ 20,000 gpm dilution flow

Composite Stored By SRC

ID of Sample, Prerelease & LWRP Verified and Release Approved By SRC foreman
Shift Radiochemist
Date/Time 11 / today /2007 now

PART III: ACTUAL RELEASE DATA (OPS)

Dilution Flow Rate ______ gpm Monitor Trip Setpoint ______ cpm
Tank Flow Rate ______ gpm

	Date	Time	Tank Level (gal)	Totalizer	
				Dilut	WMT
Start					
Finish					
Net					

Monitor Reading 10 minutes into Discharge ______cpm
Post Monitor Reading ______cpm

Discharge Completed By ______ Data Reviewed By ______

Date/Time / /

PART IV: Release Records Update (CHM)

Actual Release Conditions and Dose Calculations - SEE ATTACHMENTS
Data Updated & Checked By ______ Date/Time / /

CHM Form 1700.1

FARLEY NUCLEAR PLANT

UNIT 1

APPENDIX 1

WASTE MONITOR TANK 1

RELEASE TO THE ENVIRONMENT

1.0 Initial Conditions

1.1 This copy of the procedure has been verified for the following: (OR 1-98-498)

RO 1.1.1 The correct version of the procedure.

RO 1.1.2 The correct unit for the task.

2.0 Instructions

CAUTION:	**DO NOT enter the "TEST/CALIB" or the "PARAM SET" modes of the WMT totalizer processor. Any changes in these modes will affect the channel calibration.**

NOTE:
- **Either WMT FLOW TOTALIZER, (N1G21FQI1085) OR #1 WMT LI, (N1G21LIS1082) should be operable to discharge a WMT. IF both instruments are inoperable, THEN the Shift Support Supervisor should be notified.**
- **IF the WMT FLOW TOTALIZER, (N1G21FQI1085) is out of service, THEN the totalizer's reading may be derived from the #1 WMT LI, (N1G21LIS1082). One gallon discharged from the WMT equals one gallon on the WMT totalizer. (Either the WMT totalizer or the WMT level indication should be operable)**
- **IF the #1 WMT LI (N1G21LIS1082) is out of service, THEN the volume released (Net Tank Level) may be derived from the net "INVENT" totalizer reading or the "TOTAL" totalizer reading.**
- **IF the SERVICE WATER DILUTION FLOW TOTALIZER, (N1P16FR4107) is out of service, THEN the dilution totalizer reading may be derived by taking the average dilution flowrate during the release, multiplying this by the release duration (net time), and dividing by 10,000. Each totalizer integration equals 10,000 gal of water.**
- **Either the SERVICE WATER DILUTION FLOW TOTALIZER, (N1P16FR4107) OR the SW DILUTION FLOW RECORDER, (N1P16FR4107) should be operable to discharge a WMT. IF both instruments are inoperable, THEN the Shift Support Supervisor should be notified.**
- **Technical Specification 5.5.1 and Chapter 2 of FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL, are applicable to the WASTE MONITOR PUMP DISC, (N1G21FI1085B) AND the SW DILUTION FLOW RECORDER, (N1P16FR4107).**

NOTE: • Initial each step as completed. Instructions for completion of liquid waste release permit are specified in FNP-0-CCP-212, LIQUID WASTE RELEASE PROGRAM.

ko 2.1 Waste monitor tank 1 is aligned per system check list FNP-1-SOP-50.1A, LIQUID WASTE PROCESSING SYSTEM LIQUID WASTE RELEASE FROM WASTE MONITOR TANK.

2.2 Determine recirculation flowpath.

N/A 2.2.1 IF waste monitor tank 1 is to be recirculated through the Demineralizer, THEN proceed to step 2.3.

Mo 2.2.2 IF normal recirculation is to be used, THEN proceed to step 2.4.

CAUTION:
- **Only one tank may be recirculated through the demineralizer at a time.**
- **IF WMT is aligned for recirc through the demin while WCT is being pumped to the Disposable Demineralizer System, THEN the two tanks will be cross-connected.**

NOTE: Recirculation time through the demineralizers does not count towards recirculation time necessary to obtain a representative sample. Section 2.4 must be performed. (Ref. FNP-1-CCP-212)

2.3 Recirculate through Demineralizer as follows:

N/A 2.3.1 Verify closed FDT STRAINER DISCH, N1G21V118 (1-LWP-V-7421)

2.3.2 Start #1 WMT PUMP, N1G21P006B.

2.3.3 Close FDT DISCH TO WASTE EVAP, Q1G21V267 (1-LWP-V-7427).

2.3.4 Close #2 WMT DEMIN BYP, Q1G21V125 (1-LWP-V-7428).

2.3.5 Open FDT FILTER OUTLET, Q1G21V189 (1-LWP-V-7456).

2.3.6 Open FDT TO WMT DEMIN, Q1G21V091B (1-LWP-V-7452B).

2.3.7 Verify closed WMT DEMIN DISCH TO #2 WMT, Q1G21V093B (1-LWP-V-7438B).

2.3.8 Open WMT DEMIN DISCH TO #1 WMT, Q1G21V093A (1-LWP-V-7438A).

N/A

2.3.9 Open WMT DEMIN OUTLET, Q1G21V094 (1-LWP-V-7434).

2.3.10 Verify open WMT #1 INLET ISO Q1G21V090 (1-LWP-V-7413).

2.3.11 Open WMT #1 DISCHARGE TO FDT, Q1G21V115 (1-LWP-V-7454).

2.3.12 Throttle open #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

2.3.13 Recirculate tank contents for a minimum of two (2) tank volumes based on the flow rate from either FI1085B, totalizer processor "RATE" display or the release flow rate corresponding to the discharge pressure obtained using Table 1, and the tank volume.

Disch Press ______ psig Flow Rate ______ gpm

Recirculation Time ___________ hr. _________ min.

N/A

2.3.14 Verify WMT filter $\Delta P < 20$ psid.

Inlet Press __________ (N1G21PI2907) - Outlet Press __________ (N1G21PI1089) = __________ psid

2.3.15 IF WMT filter $\Delta P \geq 20$ psid, THEN contact control room and submit a CR to change the filter.

2.3.16 WHEN recirculation is completed, THEN close #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

2.3.17 Close #1 WMT DISCH TO FDT, Q1G21V115 (1-LWP-V-7454).

2.3.18 Close #1 WMT INLET ISO, Q1G21V090 (1-LWP-V-7413).

2.3.19 Close WMT DEMIN OUTLET, Q1G21V094 (1-LWP-V-7434).

2.3.20 Close WMT DEMIN DISCH TO #1 WMT, Q1G21V093A (1-LWP-V-7438A).

2.3.21 Close FDT TO WMT DEMIN, Q1G21V091B (1-LWP-V-7452B).

2.3.22 Open FDT DISCH TO WASTE EVAP, Q1G21V267 (1-LWP-V-7427).

2.3.23 Open #2 WMT DEMIN BYP, Q1G21V125 (1-LWP-V-7428).

2.3.24 Close FDT FILTER OUTLET, Q1G21V189 (1-LWP-V-7456).

2.3.25 Proceed to step 2.4 for recirculation to obtain sample.

2.4 Align normal recirc to #1 WMT as follows:

DD 2.4.1 Close #1 WMT INLET ISO, Q1G21V090 (1-LWP-V-7413).

DW 2.4.2 Verify closed #1 WMT PUMP DISCH, N1G21V108B (1-LWP-V-7443B).

DW 2.4.3 Start #1 WMT PUMP, N1G21P006B.

DW 2.4.4 Record #1 WMT pump discharge pressure from WASTE MONITOR PUMP DISCHARGE PRESSURE INDICATOR, N1G21PI1084A.

110 psig

2.4.5 IF pressure recorded in step 2.4.4 ≥ 108 psig and ≤112 psig, THEN continue with 2.4.6, IF NOT, the flow value specified in step 2.4.6 is not conservative and will have to be re-determined using Appendix 3 prior to proceeding with this release.

2.4.6 Recirculate tank contents for a minimum of two (2) tank volumes based on the following flow rate and the volume of liquid in the tank.

Flow Rate 37.5 gpm

Recirculation Time 4 hr. 0 min.

RF
CHEM 2.4.7 Sample has been drawn and analyzed after required recirculation time.

2.4.8 Proceed to step 2.5.

2.5 Liquid Waste Release

2.5.1 Liquid waste release permit number 1-2006-178298 has been issued.

2.5.2 Calculate time that tank low level and pump shutoff will occur by using the following formula.

$$\text{Time (minutes)} = \frac{A - 750\ (gal)}{B}$$

A = Quantity of liquid to be released from permit, gal.

B = Expected Release rate, gal/min.

750 gal = pump lo lo level trip setpoint

CP
SSS 2.5.3 Shift Support Supervisor has performed a review of the release permit and has verified that #1 WMT is the tank to be released.

NOTE:	**With R-18 out of service, FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL Chapter 2 should be referred to for release limitations.**

2.5.4 IF LIQ WASTE DISCH R-18 is operable, THEN perform test on LIQ WASTE DISCH R-18 per the following:

___ 2.5.4.1 IF operable, THEN verify RR-0200 (point RR-18) recorder in operation.

___ 2.5.4.2 Verify meter responds in the top scale direction on channel R-18 by inserting check source. IF check source is NOT sufficient, THEN have Health Physics source check with a portable source.

___ 2.5.4.3 IF RR-0200 (point RR-18) recorder is operable, THEN verify source check caused on upscale on point RR-18.

___ 2.5.4.4 Document R-18 source check in FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS.

___ 2.5.4.5 Verify the following valves are locked closed.

#1 WMT DISCH, Q1G21V111 (1-LWP-V-7446) (KEY #Z-22)
#2 WMT DISCH, Q1G21V114 (1-LWP-V-7448) (KEY #Z-19)

___ 2.5.4.6 Coordinate with the Control Room to perform test on LIQ WASTE DISCH R-18 per section 4.3 (Attachment 1).

__/__
P.O.
CV 2.5.5 IF R-18 is operable, THEN adjust the monitor setpoint for RE-18 to the value obtained from the discharge permit and the pot setting in Unit 1 Volume III Curve R18.

NOTE:	**IF the Service Water dilution flow recorder is out of service, THEN the limitations of FNP-0-M-011, OFFSITE DOSE CALCULATION MANUAL Chapter 2 apply.**

___ 2.5.6 Verify the dilution flow rate is greater than or equal to the minimum, as stated in Part II of the liquid waste release permit. (Utilize the largest dilution flow which can practically be attained.)

ATTACHMENT 1

PRE-RELEASE RE-18 TEST

NOTE:	**This attachment may be used by the Control Room Operator in conjunction with section 4.3 which is maintained by the Radside Systems Operator.**

1.0 IF LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018 drawer is in alarm, THEN reset the alarm. (Section 4.3, step 4.3.3)

1.1 IF background radiation levels prevent resetting LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, THEN raise the pot setting to a value above background AND reset the alarm.

2.0 Open WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113). (Section 4.3, step 4.3.4)

3.0 Lower the trip setting of LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, drawer until a high radiation alarm actuates. (Section 4.3, step 4.3.5)

4.0 Verify WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113), closes. (Section 4.3, step 4.3.6)

5.0 Operate the control switch for WMT DISCH TO ENVIRONMENT, N1G21RCV18 (N1G21V113), from the LWPP to verify that the valve cannot be opened from the panel. (Section 4.3, step 4.3.7)

6.0 Adjust the pot setting of LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, to normal value. (Section 4.3, step 4.3.8)

6.1 IF background radiation levels prevent resetting LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018, to normal value, THEN raise the pot setting to a value sufficiently above background to prevent spurious trips while maintaining the setpoint less than allowed by the release permit.

7.0 Reset the high radiation alarm on LIQUID WASTE DISCHARGE RADIATION MONITOR, N1D11RE0018. (Section 4.3, step 4.3.9)

Table 2-1 Radioactive Liquid Effluent Monitoring Instrumentation

Instrument	OPERABILITY Requirements[a]	
	Minimum Channels OPERABLE	ACTION
1. Gross Radioactivity Monitors Providing Automatic Termination of Release		
a. Liquid Radwaste Effluent Line (RE-18)	1	28
b. Steam Generator Blowdown Effluent Line (RE-23B)	1	29
2. Flowrate Measurement Devices		
a. Liquid Radwaste Effluent Line 1) Waste Monitor Tank No. 1	1	30
2) Waste Monitor Tank No. 2	1	30
b. Discharge Canal Dilution Line (Service Water)	1	30
c. Steam Generator Blowdown Effluent Line	1	30

a. All requirements in this table apply to each unit.

Key

Table 2-1 (contd) Notation for Table 2-1 - ACTION Statements

ACTION 28 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases may continue provided that prior to initiating a release:

a. At least two independent samples are analyzed in accordance with Section 2.1.2.3, and

b. At least two technically qualified members of the Facility Staff independently verify the discharge line valving and

(1) Verify the manual portion of the computer input for the release rate calculations performed on the computer, or

(2) Verify the entire release rate calculations if such calculations are performed manually.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 29 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided grab samples are analyzed for gross radioactivity (beta or gamma) at a MINIMUM DETECTABLE CONCENTRATION no higher than 1×10^{-7} μCi/mL.

a. At least once per 8 hours when the specific activity of the secondary coolant is greater than 0.01 μCi/gram DOSE EQUIVALENT I-131.

b. At least once per 24 hours when the specific activity of the secondary coolant is less than or equal to 0.01 μCi/gram DOSE EQUIVALENT I-131.

ACTION 30 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided that the flowrate is estimated at least once per 4 hours during actual releases. Pump curves may be used to estimate flow.

Key

Table 2-2 Radioactive Liquid Effluent Monitoring Instrumentation Surveillance Requirements

INSTRUMENT	Surveillance Requirements[d]			
	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL OPERATIONAL TEST
1. Gross Radioactivity Monitors Providing Automatic Termination of Release				
a. Liquid Radwaste Effluent Line (RE-18)	D[b]	P	R[b]	Q[a]
b. Steam Generator Blowdown Effluent Line (RE-23B)	D	M	R[b]	Q[a]
2. Flowrate Measurement Devices				
a. Liquid Radwaste Effluent Line				
1) Waste Monitor Tank No. 1	D[c]	NA	R	NA
2) Waste Monitor Tank No. 2	D[c]	NA	R	NA
b. Discharge Canal Dilution Line (Service Water)	D[c]	NA	R	Q
c. Steam Generator Blowdown Effluent Line	D[c]	NA	R	NA

a. In addition to the basic functions of a CHANNEL OPERATIONAL TEST (Section 10.2):

(1) The CHANNEL OPERATIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occur if any of the following conditions exists:

(a) Instrument indicates measured levels above the alarm/trip setpoint;

(b) Loss of control power; or

(c) Instrument controls loss of instrument power.

(2) The CHANNEL OPERATIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:

(a) Instrument indicates a downscale failure; or

(b) Instrument controls not set in operate mode.

A.4 EMERGENCY PLAN ADMIN - SRO ONLY G2.4.41

TITLE: Classify An Emergency Event and Complete the Initial Notification Form

TASK STANDARD: Classify an emergency event and fill out forms for emergency notification within the time allowed.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT_____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM _X_ CLASSROOM

PROJECTED TIME: _20 MIN_ SIMULATOR IC NUMBER: _N/A

ALTERNATE PATH ____ TIME CRITICAL _X_ PRA

THIS JPM IS TIME CRITICAL

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to CLASSIFY AN EMERGENCY EVENT AND COMPLETE THE INITIAL NOTIFICATION FORM. This task is to be performed under the following conditions:

a. A rampdown was started 30 minutes ago on Unit 2 due to high RCS activity (GFFD increased by >1e5 CPM above normal.
b. R-4 is in alarm.
c. R-11, R-2 and R-7 went into alarm 5 minutes ago.
d. The plant initiated a manual SI 5 minutes ago based on excessive RCS leakage.
e. Pressurizer pressure is stable at 1900 psig and Pressurizer level is stable with 200 gpm HHSI flow.
f. R-27A and R27B are reading 3.0 rem/hr with containment pressure 3 psig and slowly increasing.
g. No other radiation monitors have changed.
h. RCS Tavg is 539°F & decreasing slowly.
i. Another SRO is standing by to make any requested announcements, callouts, or notifications.
j. Meteorological data:
   - WIND SPEED IS 2.5 MPH
   - WIND DIRECTION IS FROM 355 DEGREES
   - DELTA T IS -0.1 DEGREES F
   - NO PRECIPITATION.
k. A pre-job brief is not required.
l. Parts of this JPM are Time critical.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
_____	**TIME CRITICAL START TIME**		

NOTE: THE TIME IT TAKES TO CLASSIFY THE EVENT IS TIME CRITICAL AND MUST BE COMPLETED IN 15 MINUTES.

1.	Contact counting room to initiate offsite dose assessment.	Shift radiochemist contacted to initiate offsite dose assessment. (CUE: Shift radiochemist acknowledges.)	S / U

NOTE:
- **SEE COMMENTS SECTION BELOW FOR COMPLETE PROCEDURE FLOWPATH**
- **IF EXAMINEE ASKS FOR TIME OF SHUTDOWN, SUBTRACT 5 MINUTES FROM THE START OF THIS TASK AND PROVIDE THAT TIME.**

*2.	Classify the event.	Event classified as a Site Area Emergency per EIP-9.0.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

_____ TIME CRITICAL STOP / START TIME

NOTE: THE TIME IT TAKES TO COMPLETE AND APPROVE THE DECLARATION FORM PER THE FOLLOWING ELEMENTS IS TIME CRITICAL AND MUST BE COMPLETED IN 15 MINUTES.

3.	Signs, times & dates Data sheet 1 or 2 of EIP-9.2.	Signs, times & dates Data sheet 1 or 2 of EIP-9.2 recording time of classification.	S / U
4.	Announces the classification over plant public address system.	Announces over plant public address system something similar to: "A Site Area Emergency has been declared due to an RCS leak on Unit Two". This may be DELGATED to other SRO. (CUE: SRO acknowledges.)	S / U

NOTE: IF Emergency Response Organization (ERO) callout is made, message number 3 (this is a drill) is normally used for exam purposes.

5.	Directs callout of Emergency Response Organization.	DELEGATES callout to shift Clerk or Shift Communicator (Unit Operator of either unit) EIP-8.3, Table 2 Message 3 (drill) used for complete callout of TSC & EOF. (CUE: Shift Communicator acknowledges.)	S / U

NOTE: ACCURATE COMPLETION OF CERTAIN STEPS EIP-9.0, SAE NOTIFICATION FORM, ARE ESSENTIAL TO ENSURE ADEQUATE NOTIFICATION OF STATE AND LOCAL AGENCIES. THESE STEPS ARE SHOWN AS THE STANDARDS FOR ELEMENT NUMBER 6.

ELEMENT 6, FOR THE REQUIREMENTS OF THIS JPM, MUST BE COMPLETED IN 15 MINUTES AND IS THEREFORE TIME CRITICAL. THE ACTUAL 15 MINUTE CRITICAL TIME PERIOD ALSO INCLUDES THE NOTIFICATION OF AT LEAST ONE AGENCY IN EACH STATE.

*6.	Complete EIP-9.0, SAE Notification Form.	Identifies Site Area Emergency	S / U
		Completes declaration time date	S / U
		No Release in progress	S / U
		IF release is identified completes met tower data correctly	S / U
		Approves the declaration form	S / U

_______ TIME CRITICAL STOP TIME

Terminate JPM when initial notification form is completed

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

GENERAL REFERENCES:

1. FNP-0-EIP-8.3, Rev. 11
2. FNP-0-EIP-9.0 Rev. 59
3. FNP-0-EIP-9.2 Rev. 7
4. KA: G2.4.41 RO-2.3 SRO-4.1

GENERAL TOOLS AND EQUIPMENT:

Provide:

1. FNP-0-EIP-9.0
2. FNP-0-EIP-9.2

COMMENTS:

EIPs 9.0 & 9.2 Procedure flowpath:

- EIP-9 step 4.1, to
- EIP-9.2 step 6.0,
- step 6.1 (Using Data sheet 1) OR 6.2 (Using Data sheet 2 and plant drawings 1, 2, & 3),
- evaluates STATUS OF FISSION PRODUCT BARRIERS, (Loss of Fuel barrier per DEI Concentration estimated by EIP-9.2 Figure 4 curve (5 minutes after leak started with R-27A & B reading 3 R/hr, Potential loss of RCS barrier due to 2 & 5 RCS leak (HHSI flow at 200 gpm with RCS Pressure stable, with no loss or potential loss of ctmt)
- evaluates HOT INITIATING CONDITION and Threshold values for event to determine EAL,
- signs and dates fig. 1 & 2 with time of classification of event,
- EIP-9.0 Guide Line 4 for SAE,
- Checklist which will include
    - announcing classification,
    - evacuate affected areas,
    - callout ERO staff as appropriate (staff fully using EIP-8.3 Table 2 Message #3 for drill due to FNP Policy for examinations.
    - filling out SAE initial notification form (No PARS recommended for SAE)

CONDITIONS

When I tell you to begin, you are to CLASSIFY AN EMERGENCY EVENT AND COMPLETE THE INITIAL NOTIFICATION FORM. This task is to be performed under the following conditions:

a. A rampdown was started 30 minutes ago on Unit 2 due to high RCS activity (GFFD increased by >1e5 CPM above normal.
b. R-4 is in alarm.
c. R-11, R-2 and R-7 went into alarm 5 minutes ago.
d. The plant initiated a manual SI 5 minutes ago based on excessive RCS leakage.
e. Pressurizer pressure is stable at 1900 psig and Pressurizer level is stable with 200 gpm HHSI flow.
f. R-27A and R27B are reading 3.0 rem/hr with containment pressure 3 psig and slowly increasing.
g. No other radiation monitors have changed.
h. RCS Tavg is 539°F & decreasing slowly.
i. Another SRO is standing by to make any requested announcements, callouts, or notifications.
j. Meteorological data:
   - WIND SPEED IS 2.5 MPH
   - WIND DIRECTION IS FROM 355 DEGREES
   - DELTA T IS -0.1 DEGREES F
   - NO PRECIPITATION.
k. A pre-job brief is not required.
l. Parts of this JPM are Time critical.

KEY

DATA SHEET 1
CLASSIFICATION DETERMINATION

1. ✓ Have the On Shift Dose Analyst (Shift Radio Chemist) commence performing the calculations for dose assessment per EIP-9.0 step 4.2.
2. ✓ IF the affected Unit is in Modes 1, 2, 3, or 4, go to step 4.
3. N/A IF the affected Unit is in Modes 5, 6, or Defueled, go to step 6.
4. ✓ Evaluate the status of the fission product barriers using Figure 1 or the "Fission Product Barrier Matrix" linked document.
   a. ✓ Fuel Cladding Integrity ☑ LOSS ☐ POTENTIAL LOSS ☐ INTACT
   (See Figure 1 or "Fission Product Barrier Matrix" linked document.)
   b. ✓ Reactor Coolant System ☐ LOSS ☑ POTENTIAL LOSS ☐ INTACT
   Integrity (See Figure 1 or "Fission Product Barrier Matrix" linked document.)
   c. ✓ Containment Integrity ☐ LOSS ☐ POTENTIAL LOSS ☑ INTACT
   (See Figure 1 or "Fission Product Barrier Matrix" linked document.)
5. ✓ Use Figure 2 or the "Emergency Classification Hot Matrix" linked document .to evaluate and determine the Hot Initiating Condition based on events which are in progress, considering past events, and their impact on current plant conditions. When using Figure 2 refer to the Threshold Value page associated with the Initiating Condition chosen to ensure that the Threshold is met. When using the "Emergency Classification Hot Matrix" linked document refer to the Threshold Value page for the IC if desired to evaluate the basis. Proceed to step 7.
6. N/A Use Figure 3 or the "Emergency Classification Cold Matrix" linked document to evaluate and determine the Cold Initiating Condition based on events which are in progress, considering past events, and their impact on current plant conditions. When using Figure 3 refer to the Threshold Value page associated with the Initiating Condition chosen to ensure that the Threshold is met. When using the "Emergency Classification Cold Matrix" linked document refer to the Threshold Value page for the IC if desired to evaluate the basis.
7. ✓ Check ☑ One:
   - ☐ General Emergency (EIP-9.0 Guideline 1)
   - ☑ Site Area Emergency (EIP-9.0 Guideline 2)
   - ☐ Alert (EIP-9.0 Guideline 3)
   - ☐ Notification Of Unusual Event (EIP-9.0 Guideline 4)

   Comments: FS1

8. ✓ Assume the position of Emergency Director, sign this form and indicate the date and time of classification below.

Signature: Applicant's Date: Current → Time: ______
Emergency Director

9. ✓ Go to the FNP-0-EIP-9.0 Guideline indicated in step 7 to perform appropriate actions for the declared emergency. Classification time is the time indicated in step 8.

KEY

GUIDELINE 2

SITE AREA EMERGENCY

I. Purpose of Classification

The classification of Site Area Emergency applies to those events which are in progress or have occurred involving actual or likely major failures of plant functions needed for protection of the public from radiation or contamination 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. The potential for release of radioactive material for the Site Area Emergency classification is up to 1000 Ci of I-131 equivalent, or 10^4 to 10^6 Ci of Xe-133 equivalent. The purpose of the declaration of a Site Area Emergency is to:

(a) Assure that response centers are manned,

(b) Assure that monitoring teams are dispatched,

(c) Assure that personnel involved in an evacuation effort of near site areas are at their duty stations if the situation worsens, and,

(d) Provide current information for and consultation with offsite authorities and the public.

(e) A Site Area Emergency would be declared for plant conditions that warrant activation of emergency centers and monitoring teams.

A Site Area Emergency would be declared Based on FNP-0-EIP-9.2

II. Emergency Director Actions

NOTE: THE SHIFT MANAGER SHALL PERFORM THE DUTIES OF THE EMERGENCY DIRECTOR UNTIL HIS ARRIVAL AND ASSUMPTION OF DUTIES.

Initials

A ✓ Notify personnel on site — APPlicant's initials

ad 1. If the plant emergency alarm has not already been activated, then announce over the public address system, "All plant personnel report to designated assembly areas", activate the PEA for 30 seconds, then repeat announcement.

ad 2. Announce the condition, request setup of the TSC and OSC, and give needed evacuation instructions over plant public address system.

GUIDELINE 2

SITE AREA EMERGENCY

B. Callout the ERO staff

ad 1. Activate the ERO callout system per FNP-0-EIP-8.3, Table 2. (located in the Unit 2 SS desk)

C Complete Notification form

ad 1.. Fill in the SITE AREA Emergency Initial Notification Form (last pages of this guideline).

NOTE:	**INITIAL NOTIFICATIONS WILL NORMALLY BE MADE BY THE OPERATIONS SHIFT COMMUNICATOR, BUT MAY BE MADE BY OPERATIONS STAFF, TSC STAFF OR OTHER QUALIFIED PERSON USING THE INITIAL NOTIFICATION FORM (LAST PAGES OF THIS GUIDELINE).**
NOTE:	**INITIAL AND UPGRADE CLASSIFICATIONS AND NOTIFICATIONS SHOULD BE DONE FROM THE CONTROL ROOM OR THE TSC, WITH THE EOF INFORMED AS SOON AS POSSIBLE.**

D. Initial Notifications

______1. Within 15 minutes of declaration verbally notify the state agencies using the Site Area Emergency Initial Notification Form (last pages of this guideline).

______2. Verify notifications complete and documented on the Site Area Emergency Initial Notification Form (last pages of this guideline).

______3. Complete Figure 6, follow-up message. Instructions for completing the form are available as part of the Figure.

______4. Within one hour of the Site Area Emergency Initial Notification Form (Verbal Notification) transmittal, fax Figure 6, follow-up message to state and local agencies. The goal should be within 30 minutes of the verbal notification.

______5. Complete Figure 5, NRC notification message. Instructions for completing the form are available in Figure 5.

______6. Provide the information on Figure 5, to the NRC as soon as possible, but within one hour of the declaration per the instructions on Figure 5.

E. Emergency Organization Notifications

_____ 1. On-call Emergency Director

GUIDELINE 2

SITE AREA EMERGENCY

_____ 2. On-call EOF Manager

_____ 3. SNC Duty Manager

_____ 4. Notify Security of Emergency, incoming personnel and access restrictions (4611).

F. Other Notifications

_____ 1. Have Regulatory ERDS activated to transmit data to the NRC within one hour of the declaration of the emergency (EIP 8.3, step 10).

_____ 2. If personnel injury or fire is involved, refer to FNP-0-EIP-11.0 and 13.0 respectively for additional actions and EIP-8.0 steps 5.0 and 6.0 for additional notifications.

_____ 3. U.S. Army EOD group at Fort Benning, GA, if necessary.

_____ 4. Savannah River Operations Office, if necessary.

_____ 5. If there is a security event involved, ensure appropriate notifications and actions of FNP-0-AOP-49 and FNP-0-SP 37.0 are performed.

_____ 6. If there is a security event involved and access to the plant from off site is restricted by local law enforcement (LLE) and it is desired to bring a plant employee to the site or additional off site resources such as fire departments or law enforcement then perform the following:
- Contact the Houston County EMA to arrange a route and provide the names of individuals or resources that require access to the plant for relay to LLE.
- In conjunction with Houston County EMA determine on site and off site staging areas for off-site resources using Appendix 1
- Inform the individuals and resources that are coming to the site of the required route to the site. Individuals must have a company picture ID to get through the roadblocks

G. In Plant Protective Actions

_____ 1. Ensure personnel accountability per EIP-10.0.

_____ 2. Plan and initiate reentries per EIP-14.0.

_____ 3. Ensure proper Control Room response.

_____ 4. Assign an individual to provide periodic plant status updates.

GUIDELINE 2

SITE AREA EMERGENCY

_____ 5. Assign an individual to maintain a log of important Emergency Director activities.

_____ 6. Assign an individual to keep a record of all off site communications.

_____ 7. Determine what should be done with a unit that is not affected by the declared emergency. Consider the effect on the emergency unit, manpower utilization, plant and grid stability and other relevant factors.

_______8. In the event of mass casualties refer to FNP-0-EIP-11.0 step 15 to arrange for triage and additional ambulances.

H. Off Site Support

_____ 1. Ensure Field Monitoring teams have been dispatched per EIP-4.0.

_____ 2. Provide information to the EOF Manager for use in press releases and recovery planning.

I. Information to Off Site Authorities

_____ 1. Provide periodic plant status updates, meteorological and dose estimates and release projections based on plant conditions and foreseeable contingencies.

J. Re-Assess plant conditions

_____ 1. Continue to assess plant and radiological conditions to ensure the correct emergency classification is declared.

_____ 2. If a higher emergency classification is required immediately go to the appropriate guideline.

_____ 3. If plant and radiological conditions no longer require the current emergency classification terminate the emergency class using FNP-0-EIP-28.0.

K. Long term concerns

_____ 1. Within 8 hours, provide for full TSC and OSC reliefs.

_____ 2. Within 16 hours, provide for 24 hour TSC and OSC coverage.

_____ 3. If an LOSP has occurred evaluate the event to ensure that an adequate supply of fuel oil is available for the Diesel Generators for 7 days. Refer to REA 00-2337 and FNP-0-SOP-42.0 Figure 1.

GUIDELINE 2

SITE AREA EMERGENCY

L. Protective action recommendation guidance

a. Protective Action Recommendations other than NONE should not be made for a Site Area Emergency..

b. If it is determined that PARs are required, then the emergency classification should be upgraded to a General Emergency

Left Blank-filled in Later

SHARED

GUIDELINE 2
* SITE AREA EMERGENCY
ORANGE VERBAL NOTIFICATION FORM

1. [A] DRILL [B] ACTUAL EVENT MESSAGE # 01

2. (A) INITIAL NOTIFICATION: TIME ______ DATE __/__/__ AUTHENTICATION # **N/A**

3. SITE: **FARLEY NUCLEAR PLANT** ~~(334) 814-4662, 814-4663~~
Confirmation Phone # (334) 794-0800, 899-5156 (ext 4662, 4663)

4. EMERGENCY CLASSIFICATION: (C) SITE AREA EMERGENCY
BASED ON EAL # FS1

5. PROTECTIVE ACTION RECOMMENDATIONS: (A) NONE

6. EMERGENCY RELEASE: * [A] None [B] Is Occurring [C] Has Occurred

7. RELEASE SIGNIFICANCE: [A] Not applicable [B] Within normal operating limits [C] Above normal operating limits [D] Under evaluation

8. EVENT PROGNOSIS: [A] Improving [B] Stable [C] Degrading

9. METEOROLOGICAL DATA: Wind Direction from 355 degrees Wind Speed 2.5 mph
35 foot elevation preferred Precipitation None Stability Class [A] [B] [C] [D] [E] [F] [G]

10. (A) DECLARATION Time ______ Date __/__/__

11. AFFECTED UNIT(S): [1] [2] [All]

12. UNIT STATUS: [A] U1 ____% Power Shutdown at Time ______ Date __/__/__
(Unaffected Unit(s) Status Not Required for Initial Notifications) [B] U2 0 % Power Shutdown at Time 10 mins ago Date current

13. REMARKS: [✓] No additional remarks [ ] read additional remarks on separate page

17. APPROVED BY: * applicant Title Emergency Director *current Time ____ Date __/__/__

NOTE: The information that is highlighted on this form must be correct for the notification to be considered correct.

A.✓ Line 1 check box A or B. Select B only if it is an actual event in the plant

B.✓ Line 1 Number each verbal initial and follow-up messages sequentially starting at 001 for the first verbal message.

C.✓ Line 2 Notification time to be completed by ENN communicator just prior to making the ENN notification

D.✓ Line 4 Enter the EAL number as listed in the EIP-9.2. Example RA1, FS1 etc.

E.✓ Line 5 There are no Protective Action Recommendations (PARS) for a Site Area Emergency and box A, NONE is marked.

F.✓ Line 6 An emergency release is occurring if an effluent monitor has increased by a factor of 10 over and above normal operating levels OR is in alarm. The effluent monitors are R-18, R-23B, R-15, R-14, R-22 R-60 (A,B,C,D)and R-29B(NG)

- Mark box A if no emergency release is in progress or has occurred
- Mark box B if an emergency release is in progress
- Mark box C if an emergency release has occurred, but is currently stopped

G.✓ Line 7 Release Significance. Mark box A, B, C or D. Normal limits are being exceeded if an effluent monitor listed in step F above is in alarm

- Mark box A if 6A is marked
- Mark box B if 6B or 6C is marked and **NO** effluent monitor is or has been in alarm.
- Mark box C if 6B or 6C is marked and **ANY** effluent monitor is or has been in alarm.
- Mark box D if 6B or 6C is marked and it can not be determined if an effluent monitor is or has been in alarm.

H.✓ Line 8 Event Prognoses. Mark box A, B or C.

- A should be marked if mitigation efforts appear successful, progressing toward termination/recovery.
- B should be marked if escalation to a higher classification is unlikely based on current conditions.
- C should be marked if escalation to a higher emergency classification or PAR change is likely.

*Critical

GUIDELINE 2
SITE AREA EMERGENCY
ORANGE VERBAL NOTIFICATION FORM

I. Line 9 Meteorological Data
- Fill in the meteorological data required (35 foot elevation preferred).
- When possible use 15 minute average data, available from the EP_WEATHER.
- If stability class is not available it can be calculated from delta temperature from the below table

ΔT (200' elev. temp, °F - 35' elev. temp, °F)	Stability Class
<-1.74	A
-1.74 to <-1.56	B
-1.56 to <-1.38	C
-1.38 to <-0.46	D
-0.46 to < 1.38	E
1.38 to 3.60	F
>3.60	G

J.___Line 10 Time is for the declaration checked in line 4
K.___Line 11 Mark the unit that is involved with the emergency declaration, or all if both units are affected.
L.___Line 12 Fill in the per cent power or the time of shutdown for units involved with the event
M.___Line 13 If additional remarks are required mark the box for additional remarks and write them on a separate paper and have them read over the ENN, or mark the box for no additional remarks
N.___The Emergency Director must sign the form with time and date.
0. Within 15 minutes of declaration time, using the ENN contact the state and local agencies listed below.
P.______Verify the Southern LINC ENN Radio being used is turned on
Q.______If the Southern LINC display does not show "WIDE AREA, FEP ENN" when group is pressed in step R, THEN perform the following:
- Press the button with the square until the top line is indicated, then press the arrow buttons until "WIDE AREA" is displayed, then press the button under OK. Press the button with the square until the second line is indicated then press the arrow buttons until "FEP ENN" is displayed, and then press the button under OK.

R______Press group pushbutton, verify display shows WIDE AREA, FEP ENN. Correct per above step if necessary. Pickup handset or leave in cradle, press to talk (PTT), wait for the chirp and announce "This is name/title at Farley Nuclear Plant. Please obtain a SITE AREA EMERGENCY ORANGE initial notification form and monitor the ENN." Release the PTT.

S.______Contact one state agency listed in each of the two boxes below.

Indicate the time of initial attempt to contact any Alabama agency. Circle agency actually contacted. Indicate the name of the individual contacted. Underlined phone numbers staffed 24 hours a day

PTT and request one Alabama agency in the order listed below acknowledge manning of the ENN. State agency name and ask if they are on the line. Release the PTT after each request.

ALABAMA State Agencies In preferred order
- Alabama Radiation Control at Montgomery EOC. ENN (1305), OPX (6628), (334-206-5391), (334-324-0076)
- AEMA ENN (1306), OPX(6619), (205-280-2312, 205-280-2310)
- Alabama Radiation Control at Alabama Forward EOC, ENN (1307), OPX 6621), (334-793-1565)
- HOUSTON COUNTY ENN (1307), OPX (6621), (334-794-9720, 793-9655, 677-4807, 4808)

Time________Name____________________________Acknowledged ☐

GUIDELINE 2
SITE AREA EMERGENCY
ORANGE VERBAL NOTIFICATION FORM

Indicate the time of initial attempt to contact any Georgia agency. Circle agency actually contacted. Indicate the name of the individual contacted. Underlined phone numbers staffed 24 hours a day

PTT and request one Georgia agency in the order listed below acknowledge manning of the ENN. State agency name and ask if they are on the line. Release the PTT after each request.

GEORGIA State Agencies In preferred order

- GEMA at Atlanta EOC, ENN (1304), OPX (6629), (404-635-7200)
- GEMA at Georgia Forward EOC, ENN (1308) OPX (6626), (229-723-4826)
- EARLY COUNTY, ENN(1308) OPX (6622),(229-723-3577, 3578, 4826)

Time_________Name____________________________Acknowledged □

T.______Fill in the date and time on line 2 using the time that the first state agency contact ATTEMPT was made

U.______PTT and announce on the ENN "**Please prepare to receive a SITE AREA EMERGENCY, ORANGE initial notification message with acknowledgment**", then slowly read the SAE initial notification form over the ENN. Release the PTT after reading two or three lines to allow individuals to respond.

V.______Have the agencies contacted above, acknowledge receipt of the message and fill in the acknowledge checkbox above when they do.

W.______If any required agency could not be contacted on the ENN, then use numbers listed with each agency or in FNP-0-EIP-8.1 to contact them by any available means as soon as possible.

X______Fax a copy of the previous page SITE AREA EMERGENCY ORANGE VERBAL NOTIFICATION FORM to the State of Florida, EOF using speed dial #10

Y.______Wait for the Fax report indicating the fax was received then verify the state of Florida has received the Fax by calling. (800-320-0519) (850-413- 9911)

HLT-31 exam JPM a.

CRO-033B

TITLE: Perform The Recovery Actions for The Rod Control System In Response to A Misaligned Rod.

TASK STANDARD: Perform Attachment 2 of AOP-19.0, steps 2-11, to recover a misaligned Rod and reset step counter to match rod position.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _IC-212

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to PERFORM THE RECOVERY ACTIONS IN RESPONSE OF THE ROD CONTROL SYSTEM FOR A MISALIGNED ROD. The conditions under which this task is to be performed are:

a. The Plant is in Mode 1, ramping from 100% to 15%.
b. The ramp has been stopped at ≈ 74% power.
c. DRPI indication for rod F-6 indicates 204 steps, DRPI indication for all other Bank D rods indicate 189 steps.
d. Rod F-6 lift coil fuse was blown and has been replaced.
e. All actions of AOP-19.0 for recovery of the misaligned rod have been completed.
f. You are directed by the Shift Supervisor to perform Attachment 2 of AOP-19.0, steps 2-11.

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

______START TIME

> **NOTE: CUE FROM EXAMINER WHEN COUNTER NUMBER IS OBTAINED: "YOU MAY WRITE THE COUNTER NUMBER DOWN TO RECORD IN AUTOLOG LATER".**
>
> **THE FOLLOWING ELEMENT MAY BE SATISFIED BY EXAMINEE STATING THAT THEY WOULD LOG THE MISALIGNED BANK STEP COUNTER INDICATION IN AUTOLOG AND SIMULATING RECORDING CBD1 STEP COUNTER POSITION.**

1.	Record misaligned bank step counter indications in AUTOLOG.	Step counter position for rod group CBD1 recorded.	S / U
*2.	Place lift coil disconnect switches for all non-affected rods in affected bank to DISCONNECTED.	Lift coil disconnect switches for rods H-2, B-8, H-14, P-8, F-10, K-10, K-6 opened.	S / U
3.	Verify the ROD CONTROL BANK SELECTOR SWITCH is selected to the affected bank.	The ROD CONTROL BANK SELECTOR SWITCH is positioned to CBD position.	S / U
*4.	Adjust misaligned rod to agree with associated group DRPI indication at a rate determined in step 1.1.	In-Hold-Out Switch to the IN position.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

NOTE: IF the RO desires to ramp, THEN give the CUE: UO will Ramp as necessary to control Tavg ± 2°F. Ramp was not necessary during validation of this JPM, but may be if xenon is allowed to build over a sufficient time.

5.	IF required, adjusts turbine load to maintain RCS Tavg within 2°F of Tref.	Tavg - Tref checked. (CUE IF TURBINE LOAD IS ADJUSTED: Turbine load will be adjusted as necessary by the UO to maintain Tavg ± 2°F of Tref.	S / U

NOTE: IF the RO inserts rods too far, THEN he should pull them out to the proper position at a rate of no more than 3 steps at a time waiting enough time in between pulls for parameters to stabilize. The SS must be informed if rods were inserted too far for reactivity management expectations.

*** CRITICAL TO NOT GO MORE THAN 25 STEPS IN. ROD MUST NOT BE INSERTED BELOW D164 on D gp 2 step counters (INITIAL Step counter: 189 -20 -5) DUE TO ATT. 2 LIMIT OF <20 STEPS/HR INSERTION.**

*6.	WHEN misaligned rod DRPI indication at same position as non-affected rods, THEN stop rod motion.	In-Hold-Out Switch returned to neutral position and rod movement stopped with DRPI indication for rod F-6 at 189 steps.	S / U
*7.	Place all lift coil disconnect switches to CONNECTED.	Switches for rods H-2, B-8, H-14, P-8, F-10, K-10, K-6 closed.	S / U
*8.	Reset ROD CONTROL URGENT FAILURE ALARM RESET pushbutton and verify ROD CONT SYS URGENT FAILURE annunciator FF1 – NOT LIT.	ROD CONTROL URGENT FAILURE ALARM RESET pushbutton depressed.	S / U
*9.	Adjust control bank D group step counters to position recorded in reactor operator logbook by pushing (+) button.	Control bank D step counter adjusted to position recorded in logbook.	S / U

_____ **STOP TIME**

Terminate when control bank D step counters reset.

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

GENERAL REFERENCES

1. FNP-1-AOP-19.0, Version 22.0

2. Technical Specifications

3. K/As:

001A2.03	RO-3.5	SRO-4.2
001A3.05	RO-3.5	SRO-3.5
001A4.06	RO-2.9	SRO-3.2
001A4.14	RO-3.0	SRO-3.4

GENERAL TOOLS AND EQUIPMENT

Provide:

1. Marked up FNP-1-AOP-19.0, ATTACHMENT 2

COMMENTS

CONDITIONS

When I tell you to begin, you are to PERFORM THE RECOVERY ACTIONS IN RESPONSE OF THE ROD CONTROL SYSTEM FOR A MISALIGNED ROD. The conditions under which this task is to be performed are:

a. The Plant is in Mode 1, ramping from 100% to 15%.
b. The ramp has been stopped at ≈ 74% power.
c. DRPI indication for rod F-6 indicates 204 steps, DRPI indication for all other Bank D rods indicate 189 steps.
d. Rod F-6 lift coil fuse was blown and has been replaced.
e. All actions of AOP-19.0 for recovery of the misaligned rod have been completed.
f. You are directed by the Shift Supervisor to perform Attachment 2 of AOP-19.0, steps 2-11.

ATTACHMENT 2

MISALIGNED ROD RECOVERY or MAINTENANCE TESTING

NOTE: This attachment may be performed as many times as required for multiple misaligned rods, or as required by a maintenance testing plan.

ROL 1.0 **Notify appropriate Plant Management and Engineering Support personnel prior to implementing any realignment plan.**

1.1 Any realignment plan should consider the following:

- [✓] Determination of how long the rod has been misaligned. 30 mins
- [✓] Power level at which recovery will be performed. 70-80%
- [✓] Rate of control rod movement during recovery. <20 steps/hr
- [✓] Movement of other control rods to support recovery NO

___ 2.0 **Record misaligned bank step counter indications in reactor operator's log.**

___ 3.0 **Align lift coil disconnect switches. (BOP)**

3.1 For rod re-alignment, align switches to DISCONNECT position for all non-affected rods.

OR

3.2 For maintenance testing align disconnect switches as required by the test plan.

- [] Affected bank ________
- [] Affected rods ________________
- [] Special considerations: ____

___ 4.0 **Verify the ROD CONTROL BANK SELECTOR SWITCH is selected to the affected bank.**

N/A 5.0 **IF required notify maintenance personnel when rod movement will begin.**

ATTACHMENT 2

NOTE:
- Performing step 6 will cause the ROD CONT SYS URGENT FAILURE annunciator FF1 to actuate. This wll lock out the non-affected group step counter.
- Performance of steps 6, 7 and 8 should be a coordinated action.

___ **6.0 Rod alignment**

6.1 For rod re-aligment, adjust misaligned rod to agree with associated group DRPI indication at a rate determined in step 1.1.

OR

6.2 For maintenance testing align rods as specified by test plan.

[] Affected bank _______
[] Affected rod(s) ____________________
[] Number of steps to move rod(s)__________
[] Direction of rod motion ____________
[] Special conditions:____
____
____

___ **7.0 Adjust turbine load to maintain RCS TAVG within 2°F of TREF.**

___ **8.0 WHEN the appropriate condition is met, THEN stop rod motion.**

[] For rod realignment, When rod DRPI indicates that the affected rod is at the same position as non affected rods,

OR

[] When maintenance testing is complete.

___ **9.0 Place all lift coil disconnect switches to CONNECTED. (BOP)**

___ **10.0 Reset rod control urgent failure alarm.**

10.1 Depress ROD CONTROL URGENT FAILURE ALARM RESET pushbutton.

10.2 Verify ROD CONT SYS URGENT FAILURE annunciator FF1 - NOT LIT.

ATTACHMENT 2

____**11.0 Adjust affected bank group step counters.**

11.1 Depress the recessed pushbutton switches on each step counter located to the right of the digital display.

[] The top switch raises the position value.
[] The middle switch lowers the position value.
[] The bottom switch resets the position value to zero.

11.2 Restore affect bank counter to positon recorded in step 2.0.

____**12.0 IF misaligned rod is in a control bank,**
THEN adjust pulse to analog converter. (121 ft, CRDM SWGR room)

12.1 Unlock and open the rear of the DC HOLD cabinet.(CRDM Cab key)

12.2 Place the DISPLAY switch to affected bank.

12.3 Place the AUTOMATIC/MANUAL switch to MANUAL and hold in position.

12.4 Repeatedly depress the UP or DOWN pushbutton to adjust digital display to position recorded in reactor operator's log.

12.5 Release the AUTOMATIC/MANUAL switch.

12.6 Place the DISPLAY switch to OFF.

____**13.0 Place ROD CONTROL BANK SELECTOR SWITCH to MANUAL.**

____**14.0 Adjust RCS TAVG within 1°F of TREF.**

____**15.0 Notify control room that ATTACHMENT 2 is complete.**

____**16.0 Return to procedure step in affect.**

-END-

UNIT 1

FNP-1-ESP-1.3
4-20-2007
Revision 18

FARLEY NUCLEAR PLANT

EVENT SPECIFIC PROCEDURE

FNP-1-ESP-1.3

TRANSFER TO COLD LEG RECIRCULATION

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

SAFETY RELATED

Approved:

Jim L. Hunter (for)
Operations Manager

Date Issued: 04/23/07

Table of Contents

A. Purpose

This procedure provides the necessary instructions for transferring the safety injection system and containment spray system to the recirculation mode.

B. Symptoms or Entry Conditions

I. This procedure is entered when RWST level is less than 12.5 ft; from the following:

a. FNP-1-EEP-1, LOSS OF REACTOR OR SECONDARY COOLANT, step 16

b. FNP-1-ESP-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, step 1

c. FNP-1-ECP-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, step 13

d. FNP-1-FRP-C.2, RESPONSE TO DEGRADED CORE COOLING, step 1

e. FNP-1-FRP-C.3, RESPONSE TO SATURATED CORE COOLING, step 1

f. FNP-1-FRP-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, step 20

g. A Foldout Page

Step	Action/Expected Response	Response NOT Obtained

****

CAUTION: To ensure that SI recirculation flow is maintained at all times, the following steps should be performed without delay.

****

****

CAUTION: No Function Restoration Procedure should be implemented until step 7 has been completed.

****

****

CAUTION: Switchover to recirculation may cause high radiation levels in the auxiliary building.

****

1 [CA] IF RWST level less than 4.5 ft AND alignment for recirculation NOT imminent, THEN stop any pump taking suction from the RWST.

Page Completed

Step	Action/Expected Response	Response NOT Obtained

NOTE: The intent of Step 2 is to differentiate between a steam line break event (with SI terminated and RWST drain down only from containment spray operation) and a loss of reactor coolant event (RWST drain down from one or more ECCS pumps).

✓ 2 **Check SI in service.**

- Check HHSI flow - GREATER THAN 0 gpm.

  A TRN
  HHSI FLOW
  [] FI 943

  OR

- Check any RHR PUMP - STARTED IN SI MODE.

Started RHR PUMP	1A	1B
RWST TO 1A(1B) RHR PUMP Q1E11MOV	[] 8809A open	[] 8809B open
1C(1A) RCS LOOP TO 1A(1B) RHR PUMP Q2E11MOV	[] 8701A closed [] 8701B closed	[] 8702A closed [] 8702B closed

2 Perform the following.

2.1 Reset containment sump to RHR valve switches.

CTMT SUMP TO RHR
PUMP RESET
[] A TRN
[] B TRN

2.2 Proceed to Step 8.

✓ 3 **Verify SI - RESET.**

[] MLB-1 1-1 not lit (A TRN)
[] MLB-1 11-1 not lit (B TRN)

3 IF any train will NOT reset using the MCB SI RESET pushbuttons, THEN place the affected train S821 RESET switch to RESET. (SSPS TEST CAB.)

✓ 4 **Verify at least one train of PRF in operation using FNP-1-SOP-60.0, PENETRATION ROOM FILTRATION SYSTEM in conjunction with the remaining steps of this procedure.**

✓ Page Completed

Step	Action/Expected Response	Response NOT Obtained
___ 5	**Check CCW to RHR heat exchangers MOVs - OPEN.** CCW TO 1A(1B) RHR HX [] Q1P17MOV3185A open [] Q1P17MOV3185B open	5 Open any closed CCW to RHR heat exchanger valve(s) <u>AND</u> continue with this procedure while valves stroke open. CCW TO 1A(1B) RHR HX [] Q1P17MOV3185A open [] Q1P17MOV3185B open
___ 6	**Establish only one CHG PUMP in each train - RUNNING.** [] A Train (1A or 1B) amps > 0 [] B Train (1C or 1B) amps > 0	

****

<u>CAUTION</u>: Pump damage will occur if a charging pump or RHR pump is started in a train in which a flow path from the containment sump to the RCS cannot be established or maintained.

****

Step	Action/Expected Response	Response NOT Obtained
___ 7	**Align ECCS for cold leg recirculation.**	
	7.1 Check containment sump level - GREATER THAN 2.4 ft{3.0 ft}. CTMT SUMP LVL [] LI 3594A POST ACCIDENT CTMT WTR LVL [] LR 3594B	7.1 <u>IF</u> both containment sump level indications less than 2.4 ft{3.0 ft}, <u>THEN</u> go to FNP-1-ECP-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.
	7.2 Verify recirculation valve disconnects - CLOSED USING ATTACHMENT 1.	
	7.3 Stop both RHR PUMPs.	
	7.4 Close RWST TO 1A RHR PUMP Q1E11MOV8809A.	7.4 Perform the following. 7.4.1 Stop the running A train CHG PUMP. 7.4.2 Proceed to step 7.9.

Step 7 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
7.5	Align CTMT sump to 1A RHR PUMP. CTMT SUMP TO 1A RHR PUMP [] Q1E11MOV8811A open [] Q1E11MOV8812A open	7.5 Perform the following. 7.5.1 Stop the running A train CHG PUMP. 7.5.2 Proceed to step 7.9.
7.6	Close RHR to RCS HOT LEGS XCON Q1E11MOV8887A.	
7.7	Start 1A RHR PUMP. RHR PUMP [] 1A amps > 0	7.7 Perform the following. 7.7.1 Stop the running A train CHG PUMP. 7.7.2 Proceed to step 7.9.
7.8	Verify A Train LHSI flow - STABLE. 1A RHR HDR FLOW [] FI 605A	
7.9	Close RWST TO 1B RHR PUMP Q1E11MOV8809B.	7.9 Perform the following. 7.9.1 Stop the running B train CHG PUMP. 7.9.2 Proceed to step 7.14.
7.10	Align CTMT sump to 1B RHR PUMP. CTMT SUMP TO 1B RHR PUMP [] Q1E11MOV8811B open [] Q1E11MOV8812B open	7.10 Perform the following. 7.10.1 Stop the running B train CHG PUMP. 7.10.2 Proceed to step 7.14.
7.11	Close RHR to RCS HOT LEGS XCON Q1E11MOV8887B.	

Step 7 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
7.12	Start 1B RHR PUMP. RHR PUMP [] 1B amps > 0	7.12 Perform the following. 7.12.1 Stop the running B train CHG PUMP. 7.12.2 Proceed to step 7.14.
7.13	Verify B Train LHSI flow - STABLE. 1B RHR HDR FLOW [] FI 605B	

****

CAUTION: The charging pumps should be stopped if RCS pressure rises to greater than their shutoff head.

****

****

CAUTION: The charging pump miniflows should NOT be reopened to satisfy miniflow criteria while the charging pump suctions are aligned to the RHR pumps.

****

Step	Action/Expected Response	Response NOT Obtained
7.14	Verify charging pump miniflow valves - CLOSED. 1A(1B,1C) CHG PUMP MINIFLOW ISO [] Q1E21MOV8109A [] Q1E21MOV8109B [] Q1E21MOV8109C CHG PUMP MINIFLOW ISO [] Q1E21MOV8106	

Step 7 continued on next page.

____Page Completed

Step	Action/Expected Response	Response NOT Obtained
7.15	Verify seal return flow valves - CLOSED. RCP SEAL WTR RTN ISO [] Q1E21MOV8100 closed [] Q1E21MOV8112 closed	
7.16	IF 1A RHR PUMP started, THEN align charging pump suction header isolation valves based on 1B charging pump status.	7.16 IF 1A RHR PUMP NOT started, THEN perform the following. 7.16.1 Verify the A train CHG PUMP stopped. 7.16.2 Proceed to step 7.20.

1B Charging Pump Status	Aligned As A Train pump	Aligned As B Train pump	Not Available
CHG PUMP SUCTION HDR ISO Q1E21MOV	[] 8130A open [] 8130B open [] 8131A closed [] 8131B closed	[] 8130A closed [] 8130B closed [] 8131A open [] 8131B open	[] 8130A closed [] 8130B closed [] 8131A closed [] 8131B closed

Step	Action/Expected Response	Response NOT Obtained
7.17	Open RHR supply to A train charging pump suction. 1A RHR HX TO CHG PUMP SUCT [] Q1E11MOV8706A	7.17 Perform the following. 7.17.1 Stop the running A train CHG PUMP. 7.17.2 Proceed to step 7.20.
7.18	Verify VCT level - GREATER THAN 5%.	

Step 7 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

7.19 Close A train RWST to charging pump header valve.

RWST
TO CHG PUMP
[] Q1E21LCV115B

7.19 Perform the following.

7.19.1 Stop the running A train CHG PUMP.

7.19.2 Close RHR supply to A train charging pump suction.

1A RHR HX
TO CHG PUMP SUCT
[] Q1E11MOV8706A

7.20 IF 1B RHR PUMP started, THEN align charging pump suction header isolation valves based on 1B charging pump status.

1B Charging Pump Status	Aligned As A Train pump	Aligned As B Train pump	Not Available
CHG PUMP SUCTION HDR ISO Q1E21MOV	[] 8130A open [] 8130B open [] 8131A closed [] 8131B closed	[] 8130A closed [] 8130B closed [] 8131A open [] 8131B open	[] 8130A closed [] 8130B closed [] 8131A closed [] 8131B closed

7.20 IF 1B RHR PUMP NOT started, THEN perform the following.

7.20.1 Verify the B train CHG PUMP stopped.

7.20.2 Proceed to step 7.24.

7.21 Open RHR supply to B train charging pump suction.

1B RHR HX
TO CHG PUMP SUCT
[] Q1E11MOV8706B

7.21 Perform the following.

7.21.1 Stop the running B train CHG PUMP.

7.21.2 Proceed to step 7.24.

7.22 Verify VCT level - GREATER THAN 5%.

Step 7 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
7.23	Close B train RWST to charging pump header valve. RWST TO CHG PUMP [] Q1E21LCV115D	7.23 Perform the following. 7.23.1 Stop the running B train CHG PUMP. 7.23.2 Close RHR supply to B train charging pump suction. 1B RHR HX TO CHG PUMP SUCT [] Q1E11MOV8706B 7.23.3 Proceed to step 7.24.

****

CAUTION: Injecting through 'A' train and 'B' train flowpaths simultaneously with only one charging pump running could result in pump runout conditions. Therefore, in Step 7.24 RNO the HHSI valves should be closed without delay after MOV8885 is opened.

****

Step	Action/Expected Response	Response NOT Obtained
7.24	Check one CHG PUMP in each train - STARTED. [] A train (1A or 1B) amps > 0 [] B train (1C or 1B) amps > 0	7.24 IF an A train CHG PUMP started, THEN proceed to step 7.26 IF NOT establish B train injection per the following. 7.24.1 Open charging pump recirculation to RCS cold legs valve. CHG PUMP RECIRC TO RCS COLD LEGS [] Q1E21MOV8885 7.24.2 Close HHSI isolation valves. HHSI TO RCS CL ISO [] Q1E21MOV8803A [] Q1E21MOV8803B 7.24.3 Proceed to step 7.26.

Step 7 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

7.25 Open charging pump recirculation to RCS cold legs valve.

CHG PUMP RECIRC
TO RCS COLD LEGS
[] Q1E21MOV8885

7.26 Align charging pump discharge header isolation valves based on 1B charging pump status.

1B Charging Pump Status	Aligned As A Train pump	Aligned As B Train pump	Not Available
CHG PUMP DISCH HDR ISO Q1E21MOV	[] 8132A open [] 8132B open [] 8133A closed [] 8133B closed	[] 8132A closed [] 8132B closed [] 8133A open [] 8133B open	[] 8132A closed [] 8132B closed [] 8133A closed [] 8133B closed

7.27 Verify SI flow - STABLE.

A TRN
HHSI FLOW
[] FI 943

HHSI
B TRN RECIRC
FLOW
[] FI 940

1A(1B)
RHR HDR
FLOW
[] FI 605A
[] FI 605B

7.27 IF at least one train of flow from the containment sump to the RCS can NOT be established or maintained, THEN go to FNP-1-ECP-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

****

CAUTION: Any charging pump with suction aligned to an RHR pump should be stopped prior to stopping the RHR pump.

****

****

CAUTION: Charging pump or spray pump damage will occur if suction is lost and the pump is not secured.

****

NOTE:
- Erratic pump parameters (flow, discharge pressure, amps, etc.) are indications of pump cavitation.
- Step 8 is a continuous action step which applies any time ECCS pumps are aligned to the sump.

Step	Action/Expected Response	Response NOT Obtained
___ 8	**Verify ECCS pumps not affected by sump blockage.**	8 IF both trains are affected such that at least one train of SI recirculation flow cannot be maintained, THEN go to FNP-1-ECP-1.3, LOSS OF EMERGENCY COOLANT RECIRCULATION CAUSED BY SUMP BLOCKAGE.
8.1	[CA] Monitor ECCS pump suction conditions - NO INDICATION OF CAVITATION. CHG PUMP [] 1A [] 1B [] 1C RHR PUMP [] 1A [] 1B CS PUMP [] 1A [] 1B	

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
___ 9	**[CA] Check containment spray - IN OPERATION.**	9 Perform the following: 9.1 Makeup to the RWST as necessary. 9.1.1 Makeup to the RWST in accordance with FNP-1-SOP-2.3, CHEMICAL AND VOLUME CONTROL SYSTEM REACTOR MAKEUP CONTROL SYSTEM. <u>OR</u> 9.1.2 Consult TSC staff to determine alternate method of makeup to the RWST. 9.2 Go to procedure and step in effect.
___10	**[CA] <u>WHEN</u> RWST level less than 4.5 ft, <u>THEN</u> align containment spray for recirculation.** 10.1 Reset PHASE B CTMT ISO. [] MLB-3 1-1 not lit [] MLB-3 6-1 not lit 10.2 Open containment spray pump containment sump suction isolation valves. CTMT SUMP TO 1A(1B) CS PUMP [] Q1E13MOV8826A [] Q1E13MOV8827A [] Q1E13MOV8826B [] Q1E13MOV8827B 10.3 Close containment spray pump RWST suction isolation valves. RWST TO 1A(1B) CS PUMP [] Q1E13MOV8817A [] Q1E13MOV8817B	

Step 10 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained
10.4	[CA] WHEN containment spray recirculation flow has been established for at least 8 hours, AND containment pressure is less than 16 psig, THEN stop both CS PUMPs.	
10.5	Makeup to the RWST as necessary.	
10.5.1	Makeup to the RWST in accordance with FNP-1-SOP-2.3, CHEMICAL AND VOLUME CONTROL SYSTEM REACTOR MAKEUP CONTROL SYSTEM. OR	
10.5.2	Consult TSC staff to determine alternate method of makeup to the RWST.	
___11	**[CA] Determine criteria to be used for Transfer to Hot-Leg Recirculation requirements.**	
11.1	Check FNP-1-EEP-1, LOSS OF REACTOR OR SECONDARY COOLANT procedure in effect.	11.1 Consult TSC to determine Transfer to Hot-Leg Recirculation requirements.
___12	**Go to procedure and step in effect.**	

-END-

START	STEP	CONTINUOUS ACTION
☐	1	[CA] IF RWST level less than 4.5 ft AND alignment for recirculation NOT imminent, THEN stop any pump taking suction from the RWST.
☐	8	8.1 [CA] Monitor ECCS pump suction conditions - NO INDICATION OF CAVITATION.
☐	9	[CA] Check containment spray - IN OPERATION.
☐	10	[CA] WHEN RWST level less than 4.5 ft, THEN align containment spray for recirculation. 10.4 [CA] WHEN containment spray recirculation flow has been established for at least 8 hours, AND containment pressure is less than 16 psig, THEN stop both CS PUMPs.
☐	11	[CA] Determine criteria to be used for Transfer to Hot-Leg Recirculation requirements.

Step | Action/Expected Response | Response NOT Obtained

ATTACHMENT 1

___ 1 **Close the following disconnects.**

'B' Train Disconnects				
Disconnect TPNS No.	Description	Position	Key	Location
Q1R18B033-B	Disconnect FV-T2 MOV 8884-B	ON	Z-91	139' hallway across from chemistry sample room
Q1R18B034-B	Disconnect FV-J2 MOV 8132B-B	ON	Z-89	
Q1R18B035-B	Disconnect FV-S2 MOV 8808B-B	ON	Z-86	
Q1R18B036-B	Disconnect FV-B2 MOV 8889-B	ON	Z-88	
Q1R18B041-B	Disc for MOV 8130B-B	ON	Z-408	
Q1R18B042-B	Disc for MOV 8131B-B	ON	Z-412	
Q1R18B043-B	Disc for MOV 8133B-B	ON	Z-416	

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 1

___ 2 **Close the following disconnects.**

'A' Train Disconnects				
Disconnect TPNS No.	Description	Position	Key	Location
Q1R18B030-A	Disconnect FU-J2 MOV 8132A-A	ON	Z-203	139' hallway across from MCC 1A
Q1R18B029-A	Disconnect FU-R2 MOV 8886-A	ON	Z-90	
Q1R18B038-A	Disc for MOV 8130A-A	ON	Z-405	
Q1R18B039-A	Disc for MOV 8131A-A	ON	Z-410	
Q1R18B040-A	Disc for MOV 8133A-A	ON	Z-415	
Q1R18B031-A	Disconnect FU-Z3 MOV 8808C-A	ON	Z-85	
Q1R18B032-A	Disconnect FU-Z2 MOV 8808A-A	ON	Z-84	

3 **Verify recirculation valves MCB indication - POWER AVAILABLE.**

CHG PUMP
SUCTION HDR ISO
[] Q1E21MOV8130A
[] Q1E21MOV8130B
[] Q1E21MOV8131A
[] Q1E21MOV8131B

CHG PUMP
DISCH HDR ISO
[] Q1E21MOV8132A
[] Q1E21MOV8132B
[] Q1E21MOV8133A
[] Q1E21MOV8133B

1A(1B,1C) ACCUM
DISCH ISO
[] Q1E21MOV8808A
[] Q1E21MOV8808B
[] Q1E21MOV8808C

Step 3 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 1

CHG PUMP RECIRC
TO RCS HOT LEGS
[] Q1E21MOV8884
[] Q1E21MOV8886

RHR TO RCS
HOT LEGS ISO
[] Q1E11MOV8889

___ 4 **Notify control room of recirculation valve disconnect status.**

-END-

HLT-31 exam JPM b.

CRO-333D

TITLE: Perform The Required Actions For Cold Leg Recirculation

TASK STANDARD: Align ECCS for cold leg recirc on A train only (B train power is not available) starting at Step 7 of ESP-1.3.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: _15 MIN_ SIMULATOR IC NUMBER: _IC-213 * NOTE BELOW

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA ___

* BOOTH OPERATOR ENSURE 1B D/G IN MODE 3 & HOLD TAGS ON M-3 SWITCH AND OUTPUT BREAKER

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

EXAMINER: ____________________

CONDITIONS

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

a. A Safety Injection is in progress following a LOCA on Unit 1.
b. 1B DG is tagged out for annual maintenance.
c. An electrical fault on the 1G 4160V bus caused the startup xfmr supply bkr to bus 1G to trip open.
d. 1G 4160V bus remains de-energized.
e. ESP-1.3 has been entered and all steps through Step 6 have been completed.
f. 1B Chg pump is aligned to A train.
g. Containment pressure is approximately 7 psig.
h. You have been directed by the Shift Supervisor to align ECCS for cold leg recirc starting at Step 7 of ESP-1.3.
i. A pre-job brief is not required.

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
	______**START TIME**		
1. 7.1	Check containment sump level greater than 3.0 ft.	LI-3594A or LR-3594B checked >3ft.	S / U
2. 7.2	Verify recirculation valve disconnects – closed using Attachment 1.	Per attachment 1 observes White power available light **NOT lit** for MOV-8884 , MOV-8132B, MOV-8808B, MOV-8889, MOV-8130B, MOV-8131B, and MOV-8133B. White power available light **lit** for MOV-8132A, MOV-8886, MOV-8130A, MOV-8131A, MOV-8133A, MOV-8808C, MOV-8808A.	S / U
*3. 7.3	Stop "A" R7.3HR pump.	Hand switch for "A" RHR pump placed to stop & observes Amps indicate zero and pump bkr indicator green light lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

NOTE: NO VALVE POSITION INDICATOR (VPI) OR "B' TRAIN POWER TO MOV'S 8809B, 8811B, 8812B, 8887B.

ELEMENTS	STANDARDS	RESULTS
*4. Align RHR for cold leg recirc. 7.4-7.6	Hand switch for RWST to "A" RHR pump, MOV-8809A, taken to close & observes VPI green light lit/red light out.	S / U
	Hand switches for CTMT sump to "A" RHR pump valves taken to open & observes • MOV-8811A VPI red light lit and • MOV-8812A VPI red light lit.	S / U
	Handswitch for RHR to RCS hot legs XCONN taken to close & observes MOV-8887A VPI green light lit.	S / U
*5. Start "A" RHR pump. 7.7	Hand switch for "A" RHR pump taken to start & observes pump amp meter indicates amps, pump bkr indicator red light lit.	S / U
6. Verify flow stable. 7.8	FI-605A checked & observes FI-605A stable.	S / U
7. Close RWST to "B" RHR PUMP. 7.9, 7.9.2 RNO	Observes 8809B has no power and cannot be closed & per RNO- checks B Train Chg Pumps not running.	S / U

NOTE: NO "B" TRAIN POWER TO MOV'S 8130B, 8131B, 8706B, VPI AVAILABLE.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
8. 7.14	Verify charging pump miniflows closed.	MOV-8109A, B, C checked. MOV-8106 checked closed & observes • MOV-8109A, B, C has no indication (were previous open). • MOV-8106 closed with green indication (in series with all three of the others, so isolation IS accomplished).	S / U
9. 7.15	Verify seal return flow valves – closed.	Observes valve position indication for • MOV-8100 - VPI not lit; • MOV-8112– VPI green light lit.	S / U
10. 7.16	B Chg to A trn suction valves checked open.	Observes position indicator for CHG PMP HDR ISO VLVs • MOV-8130A VPI red light lit and • MOV-8130B has no power available light lit, red light lit.	S / U
*11. 7.16	Isolate B Chg pump suction from B train.	Hand switch for CHG PMP SUCTION HDR ISO VLV MOV-8131A taken to close & observes VPI green light lit. Observes MOV-8131B has no power available light lit, red light lit.	S / U
*12. 7.17	Align RHR supply to charging pump suction.	Hand switch for 1A RHR HX TO CHG PUMP SUCT taken to open & observes MOV-8706A VPI red light lit/green light out.	S / U
13. 7.18	Verify VCT level is > 5%.	LI-112 and LI-115 are checked & observes LI-115 & 112 indicates >5% level.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
NOTE:	**NO VPI OR "B" TRAIN POWER TO MOV'S LCV-115D, 8885, FI-940 INDICATES 0 GPM FLOW.**		
*14 7.19	Close RWST to charging pump header valves.	Hand switch for RWST TO CHG PMP HDR LCV-115B taken to close & observes LCV-115B VPI green light lit/red light out.	S / U
15. 7.20.1 RNO, 7.20.2 RNO	Verify the B train CHG PUMP stopped.	Observes no breaker indication and 0 amps for B train CHG PUMP.	S / U
16. 7.24 RNO	Verify one CHG PUMP in A train – STARTED.	Observes A train CHG PUMP amps indicate 170, B train amps indicate 0.	S / U
NOTE:	**NO "B" TRAIN POWER TO MOV'S 8132B, 8133B, VPI AVAILABLE.**		
17. 7.26	Check Chg pump to A train discharge valves.	Observes • MOV-8132A VPI red light lit and • MOV-8132B has no power available light lit, red light lit.	S / U
*18. 7.26	Isolate B charging pump discharge to B train.	Hand switch for CHG PMP DISCH HDR MOV-8133A taken to close & observes • MOV-8133A VPI green light lit & • MOV-8133B has no power available light lit, red light lit.	S / U
19. 7.27	Verify SI flow stable on A train.	Observes • FI-943 stable at approx. 600 gpm. • FI-940 at zero, • FI-605B at zero. • FI-605A stable at approx. 2600 gpm.	S / U

_____ **STOP TIME**

Terminate when MOV-8133A taken to close & SI flow verified stable.

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

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

GENERAL REFERENCES:

1. FNP-1-ESP-1.3, Rev. 18
2. K/A: 011 EA1.11 RO-4.2 SRO-4.2

GENERAL TOOLS AND EQUIPMENT:

Provide: Marked up ESP-1.3

COMMENTS:

CONDITIONS

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

a. A safety injection is in progress following a LOCA.
b. 1B DG is tagged out for annual maintenance.
c. An electrical fault on the 1G 4160V bus caused the startup xfmr supply bkr to bus 1G to trip open.
d. 1G 4160V bus remains de-energized.
e. ESP-1.3 has been entered and all steps through Step 6 have been completed.
f. 1B Chg pump is aligned to A train.
g. Containment pressure is approximately 7 psig.
h. You have been directed by the Shift Supervisor to align ECCS for cold leg recirc starting at Step 7 of ESP-1.3.
i. A pre-job brief is not required.

HLT-31 exam JPM c.

CRO-NEW for HLT-31

TITLE: Restore Off -Site power to 1F BUS and remove the 1/2A DG from the bus

TASK STANDARD: Restore off-site power to 1F BUS from 1A Startup Transformer & remove the 1/2A Diesel from the bus per FNP-0-SOP-38.0, DIESEL GENERATORS, section 4.5.

PROGRAM APPLICABLE: SOIT ____ SOCT ____ OLT _X_ LOCT _____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ____ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ____ PLANT

PROJECTED TIME: 15 MIN SIMULATOR IC NUMBER: IC-214

ALTERNATE PATH ____ TIME CRITICAL ____ PRA _

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to Restore Off -Site power to 1F BUS and remove the 1/2A DG from the bus. The conditions under which this task is to be performed are:

a. Unit 1 is in Hot Standby per UOP-1.2.
b. Off Site power was previously lost, but has been restored.
c. PCC has reported that the grid is now stable and reliable. Off Site power may be restored.
d. You are the Unit Operator, and are directed to restore off-site power to 1F BUS per FNP-0-SOP-38, DIESEL GENERATORS, section 4.5.
e. A Prejob brief is not required.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
____	**START TIME**		
*1. 4.5.5.1	Depresses DIESEL EMERG START RESET pushbutton.	DIESEL EMERG START RESET depressed.	S / U
2. 4.5.5.2	Checks DG EMERGENCY START light extinguished on EPB.	Check DG EMERGENCY START light extinguished on EPB.	S / U
*3. 4.5.6	Places 1A startup transformer breaker 1-DF01 SYNCH SWITCH in MANUAL position.	Place 1A startup transformer breaker 1-DF01 SYNCH SWITCH in MANUAL position.	S / U
4. 4.5.7	Adjusts generator voltage to match incoming voltage by going to raise OR lower on the VOLTAGE ADJUST VOLTS/MVARS switch.	Adjust generator voltage to match incoming voltage at approximately 4160V.	S / U
5. 4.5.8	Adjusts generator frequency to establish a slow synchroscope speed in the FAST direction by going to raise OR lower on the GOVERNOR MOTOR SPEED/MW switch.	Adjust generator frequency to establish a slow synchroscope speed in the FAST direction.	S / U
* 6. 4.5.9	Holds 1A startup transformer breaker 1-DF01 SYNCH SWITCH in BYPASS position.	Hold 1A startup transformer breaker 1-DF01 SYNCH SWITCH in BYPASS position.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*7. 4.5.10	Just prior to the synchroscope reaching 12:00 position, closes the supply breaker 1-DF01. CRITICAL TASK IS THAT THE BREAKER CLOSES AND DOES NOT TRIP OPEN DUE TO UNMATCHED VOLTAGES OR PARALLELING OUT OF PHASE.	Just prior to the synchroscope reaching 12:00 position, closes the supply breaker 1-DF01 and observes breaker red light is lit, green light is out.	S / U
8. 4.5.11	Returns SYNCH SWITCH to OFF position.	Returns SYNCH SWITCH to OFF position.	S / U

NOTE: IF DG Load is > 2000kW, AND WHEN examinee states the wait time per the Appendix 2 is 15 minutes at 2000kW, THEN time compression may be used to continue task.
CUE FROM EXAMINER: 15 MINUTES HAVE ELAPSED.

IF DG Load is already 2000 kW or less, the following element is not applicable.

9. 4.5.12	IF DG Load is > 2000kW, THEN slowly unloads the diesel to 2,000 kW per Appendix 2 by placing the GOVERNOR MOTOR switch to LOWER AND reduces reactive load by adjusting the generator VOLTAGE ADJUST switch.	IF DG Load is > 2000kW, THEN slowly unloads the diesel to 2,000 kW load per appendix & HOLDS for 15 minutes	S / U
		Goes to lower on VOLTAGE VOLTS/MVARS switch to lower MVAR Load. (CUE FROM EXAMINER AFTER ESTABLISHING 2000 KW LOAD: 15 minutes has elapsed.)	S / U
10.	Slowly unloads the diesel to 100 kW by placing the GOVERNOR MOTOR switch to LOWER AND reduces reactive load by adjusting the generator VOLTAGE ADJUST switch.	Goes to lower on Governor MOTOR SPEED/MW switch to 100 kW load.	S / U
		Goes to lower on VOLTAGE VOLTS/MVARS switch to lower MVAR Load.	S / U
11.	WHEN DG load reaches approximately 100 kW, THEN performs the following:	Places MODE SELECTOR SWITCH in MODE 2	S / U
	Places MODE SELECTOR SWITCH in MODE 2.	& Opens diesel output breaker, 1-DF08.	S / U
4.5.13.1	* Open diesel output breaker.	Observes diesel output breaker green light lit, red light out.	

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)

NOTE: Terminate scenario when 1/2A DG has been removed from 1F 4160V bus. CUE FROM EXAMINER: ANOTHER PLANT OPERATOR WILL SECURE THE 1/2A DG.

_____ STOP TIME

Terminate when 1A SU XFMR supplying 1F 4160V bus, and 1/2A DG output breaker is open.

CRITICAL ELEMENTS:

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

GENERAL REFERENCES:

1. FNP-0-SOP-38.0, Version 94.0

2. K/As: 064A4.01 RO-4.0 SRO-4.3

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

CONDITIONS

When I tell you to begin, you are to Restore Off -Site power to 1F BUS and remove the 1/2A DG from the bus. The conditions under which this task is to be performed are:

a. Unit 1 is in Mode 3 per UOP-1.2
b. Off Site power was previously lost, but has been restored.
c. PCC has reported that the grid is now stable and reliable. Off Site power may be restored.
d. You are the Unit Operator, and are directed to restore off-site power to 1F BUS per FNP-0-SOP-38, DIESEL GENERATORS, section 4.5.
e. A Prejob brief is not required.

HLT-31 exam JPM d.

(Modified from CRO-043A)

TITLE: Start 1A RCP

TASK STANDARD: Startup the 1A RCP per SOP-1.1, starting at Step 4.1.10, recognize indications of a RCP high bearing temp with trip criteria being exceeded and trip the RCP.

PROGRAM APPLICABLE: SOT ____ SOCT ____ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM ___ SIMULATE ____ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ____ PLANT

PROJECTED TIME: _13 MIN_ SIMULATOR IC NUMBER: _IC-215 NOTE BELOW

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA _

BOOTH OPERATOR REMINDER that this will include the SSPS Output mode sel switch in test for IMP-0.7,

- Simview TRCPUL gives IPC temp inputs

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to START 1A RCP. The conditions under which this task is to be performed are:

a. The Plant is in Mode 5 with RCS temperature at 167°F.
b. A bubble is established in the Pressurizer.
c. 1B RCP is running.
d. RCS pressure is 365 psig.
e. UOP-1.1, Startup of Unit from Cold Shutdown to Hot Standby, Step 5.12.21 directs 1A RCP startup IAW SOP-1.1, Reactor Coolant System.
f. SOP-1.1 has been completed through step 4.1.9.
g. You have been directed by the Shift Supervisor to continue the startup of the 1A RCP per SOP-1.1, starting at Step 4.1.10.

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____	START TIME		
*1.	Start the oil lift pump for 1A RCP.	Start oil lift pump for 1A RCP & observes Red indicating light is on.	S / U
2.	Verify 1A RCP SEAL LEAKOFF VALVE Q1E21HV-8141A is open.	Verifies open HV-8141A & observes VPI red light lit.	S / U
3.	Verify 1A RCP No. 1 seal leakoff flow rate is within the limits of Figure 1.	Determines Seal leakoff flow rate within limits.	S / U
4.	Verify that DC4, SEAL WTR INJ FLTR HI D/P is clear.	Checks annunciators DC4 is NOT lit & DD1 IS lit.	S / U
*5.	Observes DD1, RCP SEAL INJ FLOW LO, annunciator is LIT, and adjusts seal injection flow to clear alarm.	Adjusts HIK-186, SEAL WTR INJECTION potentiometer to raise flow > alarm setpoint & observes DD1, RCP SEAL INJ FLOW LO, is clear.	S / U
6.	Verify all RCP No. 1 seal ΔPs are greater than 200 psid.	PI-156A, 155A, and 154A indication verified greater than 200 psid.	S / U
7.	Verify that DC3, RCP #1 SEAL LO D/P annunciator is clear.	Check annunciator DC3, RCP # 1 SEAL LO D/P, is clear.	S / U
8.	Verify oil lift pump for 1A RCP has been running for at least two minutes and is producing adequate pressure.	At least two minutes has elapsed and white indicating light is on.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*9.	Start 1A RCP.	Places Pump hand switch to start & observes pump breaker indicator red light lit, FI-414, 415, and 416 show increasing flow rate & indicators stabilize at ≈ 110%.	S / U
10.	Responds to annunciator DD3, CCW FLOW FROM RCP OIL CLRS LO, & monitors RCP Brng temperatures.	Responds to annunciator DD3, CCW FLOW FROM RCP OIL CLRS LO, & monitors RCP Brng temperatures.	S / U
11.	Verify RCP 1A amperage decreases to normal operating range.	1A RCP AMPMETER checked & observes Amp meter indicates 850 amps.	S / U
12.	Verify EF1, 1A RCS LOOP FLOW LO or 1A RCP BKR OPEN, annunciator is clear.	EF1 Annunciator is verified clear.	S / U
13.	After at least one minute stop oil lift pump for 1A RCP.	After at least one minute has elapsed Oil Lift Pump hand switch taken to stop and observes pump breaker indicator green light lit.	S / U
14.	Observe RCP operating parameters very closely during the initial several minutes after starting. Special attention should be given to indications relating to seal performance.	RCS flow, subcooling, amps, seal injection flow and bearing temperatures checked & observes all parameters are normal.	S / U
15.	Responds to annunciator HH1, RCP 1A BRG UPPER/LOWER OIL RES LO LVL & monitors RCP Brng temperatures.	Responds to annunciator HG1, RCP 1A BRG UPPER/LOWER OIL RES HI LVL & monitors RCP Brng temperatures.	S / U
* 16.	Trips A RCP due to Brng temp either higher than 195°F trip criteria or prior to 195°F based on rising trend approaching 195°F.	Trips A RCP & observes green light lit and red light out.	S / U

_____ **STOP TIME**

Terminate when 1A RCP is secured.

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

GENERAL REFERENCES

1. FNP-1-SOP-1.1 Rev. 39
2. FNP-1-UOP-1.1 Rev. 82
3. FNP-1-ARP-1.5 Rev. 49
4. FNP-1-ARP-1.8 Rev. 31
5. K/As: 003A4.06 RO-2.9 SRO-2.9

GENERAL TOOLS AND EQUIPMENT

Provide: Marked up SOP-1.1

COMMENTS

CONDITIONS

When I tell you to begin, you are to START 1A RCP. The conditions under which this task is to be performed are:

a. The Plant is in Mode 5 with RCS temperature at 167°F.
b. A bubble is established in the Pressurizer.
c. RCS pressure is 365 psig with RCS pressure control in manual.
d. 1B RCP is running.
e. UOP-1.1, Startup of Unit from Cold Shutdown to Hot Standby, Step 5.12.21 directs 1A RCP startup IAW SOP-1.1, Reactor Coolant System.
f. SOP-1.1 has been completed through step 4.1.9.
g. You have been directed by the Shift Supervisor to continue the startup of the 1A RCP per SOP-1.1, starting at Step 4.1.10.

FARLEY NUCLEAR PLANT

SYSTEM OPERATING PROCEDURE

FNP-1-SOP-1.1

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REACTOR COOLANT SYSTEM

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

Approved:

Douglas O. Hobson (for)
Operations Manager

Date Issued 09/24/2007

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SYSTEM OPERATING PROCEDURE SOP-1.1

REACTOR COOLANT SYSTEM

1.0 Purpose

This section provides Initial Conditions, Precautions, and instructions for the operation of the Reactor Coolant System. Instructions are included in the following sections:

4.1 Reactor coolant pump startup.

4.2 Reactor coolant pump shutdown.

4.3 Pressurizer heater operation.

Appendix A Operation of an Uncoupled RCP Motor

Appendix B Rotating a RCP by hand.

2.0 Initial Conditions

2.1 The Reactor Coolant System (RCS) has been filled, vented per FNP-1-SOP-1.3, REACTOR COOLANT SYSTEM FILLING AND VENTING, and is aligned per system check list FNP-1-SOP-1.1A with exceptions noted. Pressurizer spray valves Q1B31PCV444C and Q1B31PCV444D may be in manual or automatic control.

2.2 The electrical distribution system is energized and aligned for normal operation per FNP-1-SOP-36.0, PLANT ELECTRICAL DISTRIBUTION LINE-UP, with exceptions noted.

2.3 The compressed air system is aligned and in service per FNP-1-SOP-31.0, COMPRESSED AIR SYSTEM.

2.4 The Service Water System (SW) is aligned and in service for normal operations per FNP-1-SOP-24.0, SERVICE WATER SYSTEM.

2.5 Component Cooling Water (CCW) is supplying Reactor Coolant Pumps per FNP-1-SOP-23.0, COMPONENT COOLING WATER SYSTEM.

2.6 The reactor coolant pressure relief system and Reactor Coolant Drain Tank (RCDT) are available to receive discharge from the RCS per FNP-1-SOP-1.2, REACTOR COOLANT PRESSURE RELIEF SYSTEM, and FNP-1-SOP-50.0, LIQUID WASTE PROCESSING SYSTEM.

2.7 The Pressurizer (PRZR) heater distribution panels are aligned per system check list FNP-1-SOP-1.1B, with exceptions noted.

2.8 CVCS charging (CHG) and letdown (LTDN) flows have been established and seal water is being supplied to RCP's in accordance with FNP-1-SOP-2.1, CHEMICAL AND VOLUME CONTROL SYSTEM PLANT STARTUP AND OPERATION.

3.0 Precautions and Limitations

3.1 The RCS (except the pressurizer) shall be limited to a maximum heatup of 100°F in any one hour period and a maximum cooldown of 100°F in any one hour period at all times.

3.2 The pressurizer temperature shall be limited to a maximum cooldown of 200°F in any one hour period, a maximum heatup of 100°F in any one hour period, and a maximum spray water temperature differential of 320°F at all times.

3.3 A Residual Heat Removal (RHR) pump or a RCP must be operating to provide reactor coolant recirculation and thorough mixing during boron concentration changes, chemical addition or any time the RCS temperature exceeds 140°F.

3.3.1 Verify the desired boron concentration in the RCS and PRZR has been achieved prior to securing the only running RCP. (SOER 94-02)

3.3.2 At least one RCP must be in operation prior to performing any RCS dilution or boration except as noted in step 3.3.3 below. (SOER 94-02)

3.3.3 IF no RCP is in operation and at least one RHR pump is on service providing 3000 gpm flow, THEN chemicals may be added to the RCS provided an evaluation of the effects of a small volume dilution to the RCS with potentially inadequate mixing has been performed and with Shift Supervisor concurrence. The evaluation should consider shutdown margin for present conditions and the affected volume of RCS. Boron samples should be obtained and analyzed to ensure adequate shutdown margin is maintained.

3.4 RCS pressure and temperature are limited to maximum of 375 psig and 350°F respectively when the RHR system is valved into the RCS.

3.5 RCP's shall not be operated continuously until the RCS has been filled and vented in accordance with FNP-1-SOP-1.3, REACTOR COOLANT SYSTEM FILLING AND VENTING - VACUUM METHOD, or FNP-1-SOP-1.11, REACTOR COOLANT SYSTEM FILLING AND VENTING - DYNAMIC METHOD.

3.6 DO NOT attempt to start a RCP unless its oil lift pump has been delivering oil to the upper thrust shoes for at least two minutes. Observe the oil lift pumps indicating lights to verify correct oil pump motor operation and oil pressure. The oil lift pumps should run at least 1 minute after the RCP's are started. An interlock will prevent starting a RCP until 600 psig oil pressure is established.

3.7 Shift Supervisor's approval must be obtained prior to removing any seal wires or changing the position of any throttle valves.

3.8 RCP seal water injection flow of 6 gpm or CCW to the RCP thermal barrier must be continuously supplied when RCS temperature exceeds 150°F.

3.9 Maintain RCP CCW and seal injection water supply temperature less than 105°F and 130°F respectively.

3.10 IF CCW flow to the RCP motor bearing oil coolers is lost, THEN pump operation may be continued until the motor upper or lower bearing temperature reaches 195°F (approximately 2 minutes after cooling water flow stops).

3.11 For RCP operations, a minimum pressure differential of 200 psid must be maintained across RCP No. 1 seals.

3.12 The following precautions apply in the case of a RCP #1 seal failure.

3.12.1 DO NOT restart an RCP with an indicated No. 1 seal failure.

3.12.2 Refer to FNP-1-ARP-1.4, MAIN CONTROL BOARD ANNUNCIATOR PANEL "D", for guidance if No. 1 seal leakoff flow is abnormally low (Ann. DC1) or abnormally high (Ann. DC2).

3.13 The No. l seal bypass valve should NOT be opened unless either the pump bearing temperature (seal inlet temperature) or the No. l seal leakoff temperature approaches its alarm level. The No. l seal bypass valve should then be opened only if all of the following conditions are met:

3.13.1 Reactor coolant system pressure is greater than l00 PSIG AND less than l000 PSIG.

3.13.2 No. l seal leakoff valve is open.

3.13.3 No. l seal leakoff flowrate is less than one GPM.

3.13.4 Seal injection water flow rate to each pump is greater than six GPM.

3.14 For RCP operations, the required minimum back pressure of 15 psig on the RCP No. 1 seals is ensured by maintaining a pressure of at least 18 psig in the VCT.

3.15 The following precautions apply to the operation of the RCP's:

3.15.1 IF all RCP's have been idle for more than 5 minutes with seal water flow established during solid plant operations, THEN refer to FNP-1-UOP-1.1, STARTUP OF UNIT FROM COLD SHUTDOWN TO HOT STANDBY, Appendix 5, prior to starting an RCP.

3.15.2 At least one RCP should be running when the RCS temperature is greater than 160°F.

3.15.3 The number of operating RCPs is limited to one at RCS temperatures less than 110°F, with the exception that a second pump may be started for the purpose of maintaining continuous flow while taking the operating pump out of service.

3.15.4 Verify open 1C and 1A RCS LOOP TO 1A AND 1B RHR PUMP valves Q1E11MOV8701A and B and Q1E11MOV8702A and B prior to starting an RCP during solid plant operation.

3.15.5 IF one or more of the RCS cold leg temperatures is ≤ 325°F, THEN a RCP shall not be started unless the PRZR water volume is less than 24% wide range cold PRZR level indication OR the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

3.16 After any significant change in charging flow, the RCP seal injection flow should be checked and adjusted, if necessary, to maintain injection flow rates between 6 gpm and 13 gpm to each RCP.

3.17 The RCP's are not designed for "start-stop" operations. Too frequent starting may damage the motor windings. To prevent such damage, the following maximum starting duty should be observed:

3.17.1 Only one RCP is to be started at any one time.

3.17.2 After any running period OR after any attempted start that fails, allow a minimum 30 minute idle period before attempting a restart.

3.17.3 DO NOT exceed three starts or attempted starts in a two hour period. IF three starts OR attempted starts have been made within a two hour period, THEN allow a 60 minute idle period before attempting an additional start.

3.18 Following a change of boron concentration of 50 ppm or greater in the RCS, the PRZR spray must be operated to equalize the concentration throughout the system. Automatic operation of the spray should be initiated by manual operation of the PRZR heaters when there is a bubble in the PRZR.

3.19 Continuous spray line flow is provided by normal leakage past the seat of the spray valves. This minimum flow will prevent the spray and surge lines from cooling below operating temperature and will also aid in maintaining uniform water chemistry and temperature conditions within the PRZR.

3.20 To minimize temperature transients to the PRZR during plant heatup or cooldown operations, the following precautions should be observed when PRZR spray flow is initiated:

3.20.1 IF the temperature difference between the PRZR and the spray fluid is greater than 320°F, THEN spray should not be used .

3.20.2 Auxiliary spray should only be used during plant cooldown. Auxiliary spray flow should be initiated slowly by opening RCS PRZR AUX SPR Q1E21HV8145 (Q1E21V245) and gradually increasing CHG line flow.

3.21 IF CCW will be secured to the RCP motor oil coolers for longer than 2 months, THEN contact Maintenance to have the oil coolers drained and dried per RCP Technical Manual Technical Bulletin 81-02.

3.22 IF an RCP is to be secured for greater than one month, THEN its termination box strip heaters should be energized.

3.23 IF a RCP's Lower Seal Water Bearing temperature reaches 225°F, THEN that RCP must be shutdown immediately.

4.0 Instructions

NOTE:
- **Initial startup of a RCP will be performed in accordance with FNP-1-UOP-1.1, STARTUP OF UNIT FROM COLD SHUTDOWN TO HOT STANDBY, OR FNP-1-SOP-1.3, REACTOR COOLANT SYSTEM FILLING AND VENTING. FNP-1-UOP-1.1, STARTUP OF UNIT FROM COLD SHUTDOWN TO HOT STANDBY, covers the initial startup of a RCP with the reactor coolant system in solid water operation and ensures all pumps are running prior to entry into mode 4. Starting of additional pumps may be performed by this procedure following the start of the first RCP.**
- **Initial startup of a RCP may also be performed during Plant Shutdown per this procedure (FNP-1-SOP-1.1) when sent here from FNP-1-UOP-2.2, SHUTDOWN OF UNIT FROM HOT STANDBY TO COLD SHUTDOWN, Appendix 5. FNP-1-UOP-2.2, Appendix 5 references this procedure (FNP-1-SOP-1.1) to start a RCP during shutdown, either solid plant or with a bubble in the pressurizer.**

4.1 1A(B)(C) RCP Startup.

4.1.1 Verify RCP seal flow established per FNP-1-SOP-2.1, CHEMICAL AND VOLUME CONTROL SYSTEM PLANT STARTUP AND OPERATION.

4.1.2 Verify VCT pressure > 18 psig.

4.1.3 Verify RCS pressure is 325-375 psig if RHR is aligned to the RCS. IF RHR is not aligned to the RCS, THEN verify RCS pressure ≥ 350 psig.

4.1.4 Verify that the 1A (B) (C) RCP STANDPIPE LVL LO annunciator DA1 (A2) (A3) is clear.

4.1.5 Verify that the RCP THRM BARR CCW FLOW HI annunciator DD2 is clear.

4.1.6 Verify that the CCW FLOW FROM RCP OIL CLRS LO annunciator DD3 is clear.

4.1.7 Verify that the RCP 1A (B) (C) BRG UPPER/LOWER OIL RES HI LVL annunciator HG1 (G2) (G3) is clear.

4.1.8 Verify that the RCP 1A (B) (C) BRG UPPER/LOWER OIL RES LO LVL annunciator HH1 (H2) (H3) is clear.

~~4.1.9~~ WHEN one or more of the RCS cold leg temperatures is ≤ 325°F, THEN record Przr level and steam generator ΔT as per FNP-1-UOP-1.1, STARTUP OF UNIT FROM COLD SHUTDOWN TO HOT STANDBY.

NOTE:	**The oil lift pump must be operated for at least two minutes prior to starting the RCP.**

4.1.10 Start the 1A (B) (C) RCP Oil Lift Pump. Adequate oil pressure is indicated by the white light coming ON.

4.1.11 Verify that the 1A (B,C) RCP SEAL LEAKOFF valve Q1E21HV8141A (B) (C) is OPEN.

4.1.12 Verify that 1A (B) (C) RCP No. 1 Seal Leakoff Flow rate is within the limits of Figure 1.

4.1.13 Verify that the SEAL WTR INJ FLTR HI ΔP annunciator DC4 is clear.

4.1.14 Verify that the RCP SEAL INJ FLOW LO annunciator DD1 is clear.

4.1.15 Verify that all RCP No. 1 Seal ΔP's are greater than 200 psid.

4.1.16 Verify that the RCP #1 SEAL LO ΔP annunciator DC3 is clear.

4.1.17 Verify that the Oil Lift Pump for RCP 1A (B) (C) has run for at least two minutes, and is producing adequate pressure (white light ON).

4.1.18 Start 1A (B) (C) RCP. Verify that all loop 1A (B) (C) flow instruments show an increasing flow rate.

4.1.19 Verify that RCP 1A (B) (C) amperage decreases to a normal operating range of 900 amps cold and 700 amps hot.

4.1.20 Verify that the 1A (B) (C) RCS LOOP FLOW LO OR 1A (B) (C) RCP BKR OPEN annunciator EF1 (F2) (F3) is clear.

CAUTION: **The RCP seal water bypass valve Q1E21HV8142, should only be opened IF No. 1 seal leakoff flow rate is less than 1 gpm AND RCS pressure is less than 1000 psig. During RCS heatup/pressurization or cooldown/depressurization, the seal water bypass valve, Q1E21HV8142, may be left closed unless pump bearing temperature or No. 1 seal outlet temperature approach their alarm levels. During normal operation, the seal water bypass valve should remain closed.**

4.1.21 After at least one minute of 1A (B) (C) RCP operation, stop its Oil Lift Pump.

NOTE: # 1 Seal Injection flow should be maintained at ~ 8 gpm to each RCP.

4.1.22 Observe RCP operating parameters very closely during the initial several minutes after starting. Special attention should be given to indications relating to pump seal performance.

4.1.23 Repeat steps 4.1.4 through 4.1.22 for each RCP which is to be started.

4.1.24 Verify 1A (B) (C) RCP termination box strip heaters de-energized by opening the appropriate breaker(s) in 120 V 1G receptacle panel N1T51L002B (129 ft CTMT).

RCP	BKR
1A	11
1B	9
1C	7

4.2 1A (B) (C) RCP shutdown.

NOTE: RCP shutdown should be performed in conjunction with the applicable UOP.

4.2.1 IF plant is in Mode 3, THEN verify that the reactor trip breakers are open or the rod drive MG sets are shutdown to prevent rod withdrawal prior to having more than one RCP secured (refer to Technical Specification 3.4.5).

4.2.2 Verify the desired boron concentration in the RCS and PRZR has been achieved prior to securing the only running RCP. (SOER 94-02)

4.2.3 Stop 1A (B, C) RCP by placing control switch to TRIP position.

4.2.4 Verify the 1A (B) (C) RCP motor current decreases to approximately zero amps.

4.2.5 Verify 1A(B) (C) RCP termination box strip heaters energized for any RCP that is to remain stopped for greater than 1 month by closing the appropriate breaker(s) in 120 V 1G receptacle panel N1T51L002B (129 ft CTMT).

RCP	BKR
1A	11
1B	9
1C	7

4.3 PRZR heater operation.

CAUTION: Maintain RCS pressure in accordance with temperature/pressure limits of Technical Specification.

NOTE: PRZR heaters should be operated in conjunction with unit operating procedures.

4.3.1 Manual PRZR heater operation.

4.3.1.1 Energize 1A (B, D, E) PRZR HTR GROUP BACKUP by placing control switch to the ON position.

4.3.1.2 De-energize 1A (B, D, E) PRZR HTR GROUP BACKUP 1A (B, D, E) by placing control switch to the OFF position.

NOTE: The following step will cause annunciator HD4 PZR HTR CONT TRBL.

4.3.1.3 De-energize 1C PRZR HTR GROUP VARIABLE by placing control switch to OFF (spring return to neutral).

4.3.2 Normal automatic PRZR heater operation.

4.3.2.1 Place 1A, 1B, 1D and 1E PRZR HTR GROUP BACKUP control switches to the AUTO position.

4.3.2.2 Place 1A PRZR HTR GRP BLOCKING BYPASS SWITCH to BLOCK.

4.3.2.3 Place 1C PRZR HTR GROUP VARIABLE control switch to the ON position. (Spring returns to neutral)

4.3.2.4 Monitor PRZR variable heater operation, verify PRZR pressure maintained at approximately 2235 psig.

4.3.3 Pressurizer Heater GRP 1A operation during LOSP or SI/LOSP.

NOTE:	**DCP 88-1-4773 modified the PRZR HTR GROUP 1A supply breaker EA-11 control circuit to block automatic heater energization when offsite power is unavailable. The intent of the BLOCK/BYPASS switch is to regain automatic heater energization of the 1A heaters after appropriate diesel generator load management actions have been completed. (Ref. D-177109)**

4.3.3.1 WHEN required to energize PRZR HTR GROUP 1A during an LOSP, THEN place PRZR HTR GRP 1A BLOCKING BYPASS SW to BYPASS.

4.3.3.2 WHEN offsite power has been restored, THEN return the PRZR HTR GRP 1A BLOCKING BYPASS SW to BLOCK.

5.0 References

5.1 P & ID Drawings:

D-175037, sh. 1, 2, 3 Reactor Coolant System
D-175039, sh. 1, 2 Chemical and Volume Control System
D-175002, sh. 2, Component Cooling Water
D-175003, sh. 2, Service Water
D-176152, 176157, Containment Penetration Schedule

5.2 Technical Manual:

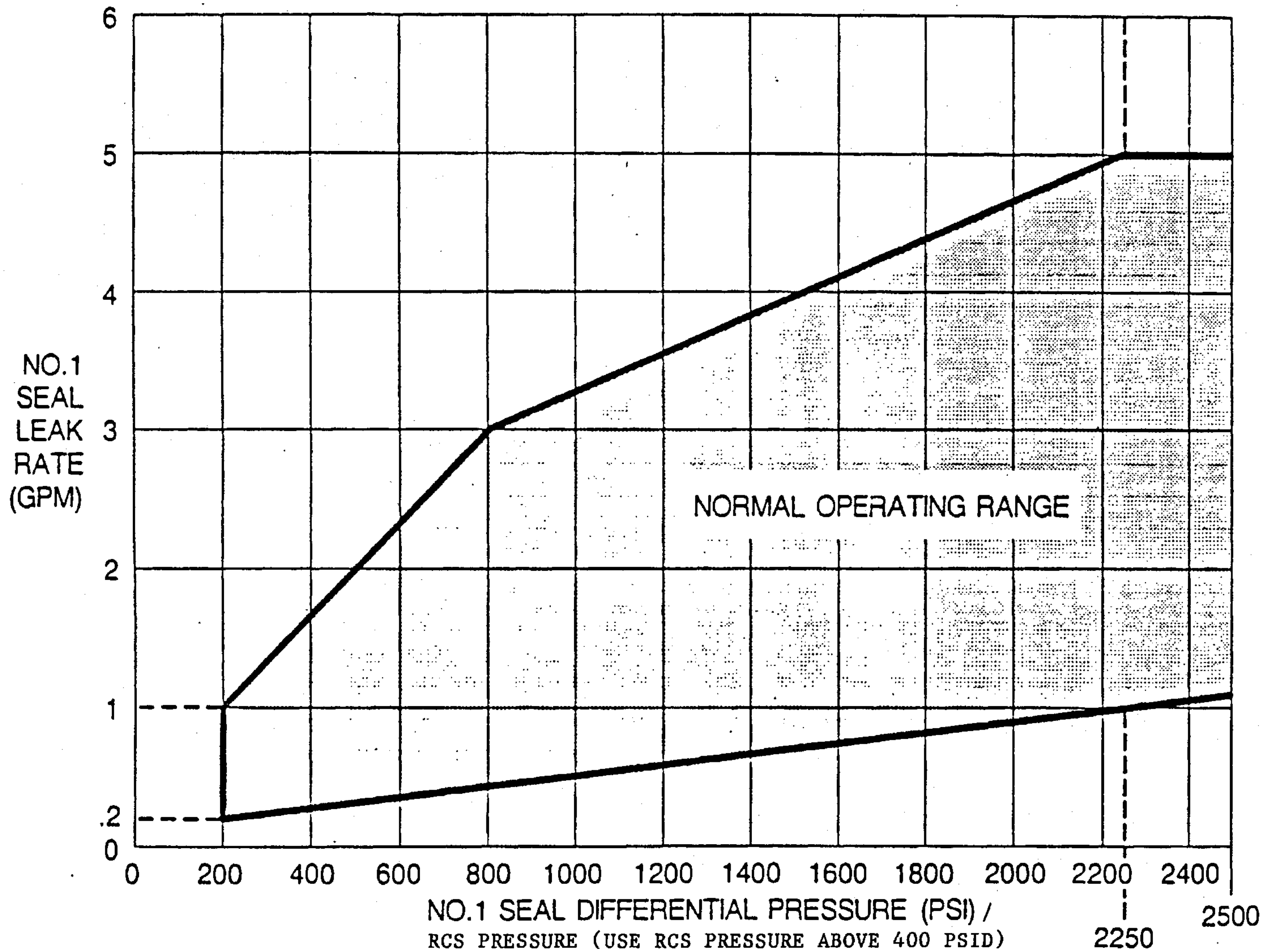
U-258242, Controlled Leakage Seal Reactor Coolant Pump.

5.3 FSAR - Vol. VI - Section 5.5.

5.4 PCNs
B88-1-5259
B88-1-4773

FIGURE 1

NO.1 SEAL NORMAL OPERATING RANGE



OPERATION OF AN UNCOUPLED RCP MOTOR

1.0 Purpose

This appendix provides Initial Conditions, Precautions, and Instructions for the operation of an uncoupled RCP motor

2.0 Initial Conditions

2.1 The electrical distribution system is energized and aligned for normal operation per FNP-1-SOP-36.0, PLANT ELECTRICAL DISTRIBUTION LINE-UP, with exceptions noted.

2.2 The compressed air system is aligned and in service per FNP-1-SOP-31.0, COMPRESSED AIR SYSTEM.

2.3 The Service Water System (SW) is aligned and in service per FNP-1-SOP-24.0, SERVICE WATER SYSTEM.

2.4 Component Cooling Water (CCW) is supplying Reactor Coolant Pump oil coolers per FNP-1-SOP-23.0, COMPONENT COOLING WATER SYSTEM.

3.0 Precautions and Limitations

3.1 DO NOT attempt to start a RCP unless its oil lift pump has been delivering oil to the upper thrust shoes for at least two minutes. Observe the oil lift pumps indicating lights to verify correct oil pump motor operation and oil pressure. The oil lift pumps should run at least 1 minute after the RCPs are started. An interlock will prevent starting a RCP until 600 psig oil pressure is established.

3.2 Maintain RCP CCW supply temperature less than 105°F.

3.3 IF CCW flow to the RCP motor bearing oil coolers is lost, THEN pump operation may be continued until the motor upper or lower bearing temperature reaches 195°F (approximately 2 minutes after cooling water flow stops).

3.4 The RCPs are not designed for "start-stop" operations. Too frequent starting may damage the motor windings. To prevent such damage, the following maximum starting duty should be observed:

3.4.1 Only one RCP is to be started at any one time.

3.4.2 After any running period OR after any attempted start that fails, allow a minimum 30 minute idle period before attempting a restart.

3.4.3 DO NOT exceed three starts or attempted starts in a two hour period. IF three starts OR attempted starts have been made within a two hour period, THEN allow a 60 minute idle period before attempting an additional start.

3.5 IF CCW will be secured to the RCP motor oil coolers for longer than 2 months, THEN contact Maintenance to have the oil coolers drained and dried per RCP Technical Manual Technical Bulletin 81-02.

3.6 IF an RCP is to be secured for greater than one month, THEN its termination box strip heaters should be energized.

4.0 Instructions

4.1 1A(B)(C) RCP Motor Startup (uncoupled)

NOTE:	**Annunciator DD3 may be in alarm due to CCW being isolated to another RCP.**

4.1.1 Check that the CCW FLOW FROM RCP OIL CLRS LO annunciator DD3 is clear.

4.1.2 IF annunciator DD3 is NOT clear, THEN locally verify adequate CCW flow to the RCP motor to be run.

4.1.3 Check that the RCP 1A (B) (C) BRG UPPER/LOWER OIL RES HI LVL annunciator HG1 (G2) (G3) is clear.

4.1.4 Check that the RCP 1A (B) (C) BRG UPPER/LOWER OIL RES LO LVL annunciator HH1 (H2) (H3) is clear.

4.1.5 Locally verify that RCP 1A (B) (C) motor upper and lower oil reservoir level is in the normal operating band.

NOTE:	**The oil lift pump must be operated for at least two minutes prior to starting the RCP.**

4.1.6 Start the 1A (B) (C) RCP Oil Lift Pump. Adequate oil pressure is indicated by the white light coming ON.

4.1.7 Verify that the Oil Lift Pump for RCP 1A (B) (C) has run for at least two minutes, and is producing adequate pressure (white light ON).

4.1.8 Start 1A (B) (C) RCP motor.

4.1.9 Verify that RCP 1A (B) (C) amperage decreases to approximately 200 amps.

4.1.10 After at least one minute of 1A (B) (C) RCP motor operation, stop its Oil Lift Pump.

4.1.11 Observe RCP operating parameters very closely during the initial several minutes after starting and periodically throughout the run. The Plant Computer should be used for trending motor bearing temperatures.

NOTE: Electrical Maintenance should be contacted for guidance on operation of termination box strip heaters based on length of desired uncoupled run, tagging in place, outage length, etc. Reference Appendix A Precaution and Limitation 3.6.

4.1.12 IF desired THEN verify 1A (B) (C) RCP termination box strip heaters de-energized by opening the appropriate breaker(s) in 120 V 1G receptacle panel N1T51L002B (129 ft CTMT).

RCP	BKR
1A	11
1B	9
1C	7

4.2 1A (B) (C) RCP Motor Shutdown (uncoupled)

4.2.1 Stop 1A (B, C) RCP motor by placing control switch to TRIP position.

4.2.2 Verify the 1A (B) (C) RCP motor current decreases to approximately zero amps.

NOTE: Electrical Maintenance should be contacted for guidance on operation of termination box strip heaters based on length of desired uncoupled run, tagging in place, outage length, etc. Reference Appendix A Precaution and Limitation 3.6.

4.2.3 IF desired, THEN verify 1A(B) (C) RCP termination box strip heaters energized for any RCP that is to remain stopped for greater than 1 month by closing the appropriate breaker(s) in 120 V 1G receptacle panel N1T51L002B (129 ft CTMT).

RCP	BKR
1A	11
1B	9
1C	7

ROTATING A RCP BY HAND

1.0 Purpose

This appendix provides Initial Conditions, Precautions, and Instructions for manually rotating a RCP.

2.0 Initial Conditions

2.1 1A (B) (C) RCP tagged out.

2.2 RCP seal flow established per FNP-1-SOP-2.1, CHEMICAL AND VOLUME CONTROL SYSTEM PLANT STARTUP AND OPERATION.

3.0 Precautions and Limitations

3.1 DO NOT use any type of mechanical advantage on the RCP to perform the rotation by hand.

3.2 The Anti-Reverse-Rotation Device will prevent rotation in the clockwise direction (when looking down on the RCP from above).

4.0 Instructions

4.1 Start the 1A (B) (C) RCP Oil Lift Pump. Adequate oil pressure is indicated by the white light coming ON.

4.2 Locally check the RCP upper and lower oil reservoir levels adequate.

NOTE: Body placement must be carefully considered to avoid unnecessary back strain while rotating the RCP manually. It may be practical to use a push/pull method with both hands applied to coupling bolts on either side of the RCP shaft.

The RCP can only be rotated counterclockwise, when viewed from the motor.

4.3 Grasp the coupling bolts and rotate the RCP shaft.

4.4 Rotate the RCP through several rotations.

4.5 Report to the control room any deficiencies noted.

HLT-31 exam JPM e.

CRO-133A

TITLE: Start Up The Containment Cooling System

TASK STANDARD: Start up the containment cooling system per SOP-12.1 section 4.1

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

PROJECTED TIME: 12 MIN SIMULATOR IC NUMBER: IC-216

ALTERNATE PATH ___ TIME CRITICAL ___ PRA _____

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to START UP THE CONTAINMENT COOLING SYSTEM PER SOP 12.1. The conditions under which this task is to be performed are:

a. The unit is in Mode 5.
b. Repairs and modifications to the Containment Air Cooling System have been completed.
c. Testing has been completed satisfactory.
d. All preparations have been completed.
e. The shift supervisor has directed you to start up the containment cooling system per SOP-12.1 section 4.1
    - Start the CTMT CLR FANs in Fast speed
    - Start the CTMT DOME RECIRC FANs in High speed

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____	**START TIME**		
*1.	Open the service water containment cooler inlet valves Q1P16MOV3019A, B, C and D (Q1P16V010A, B, C and D).	Takes handswitch for SW TO CTMT CLR CLR 1A, B, C, and D AND CTMT FPS MOV3019A, B, C, and D to open & observes MOV3019A, B, C, & D red lights are lit.	S / U
*2.	Open the service water containment cooler outlet valves Q1P16MOV3441A, B, C, & D.	Takes handswitch for SW FROM 1A, B, C, and D Q1P16MOV3441A, B, C, and D to open & observes MOV3441A, B, C, and D red lights are lit.	S / U
*3.	Open the service water containment cooler discharge valves Q1P16MOV3023A, B, C, and D (Q1P16V044A, B, C, and D.)	Takes handswitch for 1A, B, C, and D CTMT CLR SW DISCH Q1P16MOV3023A, B, C, and D to open & observes MOV3023A, B, C, and D red lights are lit.	S / U
4.	Verify service water flow through A&B containment coolers ≥ 2000 gpm.	Verifies service water flow through A&B containment coolers ≥2000 gpm on FI-3013A and 3014A.	S / U
5.	Verify service water flow through C&D containment coolers ≥ 2675 gpm.	Verifies service water flow through C&D containment coolers ≥2675 gpm on FI-3013B and FI-3014B.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

NOTE: Fan speed selection is not a critical task. Starting the fans IS a critical task. Normal speed is fast, but the procedure allows either speed and there is no adverse consequence regardless of the speed chosen.

*6.	Start containment coolers 1A, 1B, 1C and 1D in FAST speed. **CRITICAL STEP** IS TO START THE FANS. FAST SPEED IS PREFERED, BUT EITHER FAST OR SLOW IS ACCEPTABLE.	Starts containment coolers 1A, 1B, 1C and 1D in FAST speed by turning switches H001A, B, C, and D to start.	S / U
7.	Verify CTMT CLR 1A, 1B, 1C, 1D DISCH 3186A, B, C, and D and OPEN light illuminated.	Verify CTMT CLR 1A, 1B, 1C, 1D DISCH 3186A, B, C, and D and OPEN.RED OPEN light illuminated.	S / U

NOTE: Fan speed selection is not a critical task. Starting the fans IS a critical task. Normal speed is high, but the procedure allows either speed and there is no adverse consequence regardless of the speed chosen.

*8.	Place containment dome recirculation fans 1A, 1B, 1C, and 1D in HIGH speed. **CRITICAL STEP** IS TO START THE FANS. HIGH SPEED IS PREFERED, BUT EITHER HIGH OR SLOW IS ACCEPTABLE.	Places containment dome recirculation fans 1A, 1B, 1C, and 1D in HIGH speed by turning switches M001A, B, C, and D to HIGH & observes RED running lights lit.	S / U
9.	Operate the containment dome recirculation fans and containment coolers as necessary to maintain CTMT temperature < 120°F.	Operates all of the containment dome recirculation fans to maintain containment temperature < 120°F.	S / U
*10.	Open 1A and 1B RX CAV CLG DMPR Q1E12HV3999A and B (Q1E12V001A and B).	Open HV3999A and B by taking the hand switches to the open position & observes HV3999A and B RED lights lit.	S / U

____STOP TIME

Terminate when 1A and 1B reactor cavity cooling dampers are open.

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

GENERAL REFERENCES:

1. FNP-1-SOP-12.1, Version 32.0

2. KAs:

022A4.01	RO-3.6	SRO-3.6
022A4.03	RO-3.2	SRO-3.2
022A4.04	RO-3.1	SRO-3.2
022A4.05	RO-3.8	SRO-3.8

GENERAL TOOLS AND EQUIPMENT

None

COMMENTS:

CONDITIONS

When I tell you to begin, you are to START UP THE CONTAINMENT COOLING SYSTEM PER SOP 12.1. The conditions under which this task is to be performed are:

a. The unit is in Mode 5.
b. Repairs and modifications to the Containment Air Cooling System have been completed.
c. Testing has been completed satisfactory.
d. All preparations have been completed.
e. The shift supervisor has directed you to start up the containment cooling system per SOP-12.1 section 4.1
   - Start the CTMT CLR FANs in Fast speed
   - Start the CTMT DOME RECIRC FANs in High speed

HLT-31 exam JPM f.

CRO-MOD 406B MOD

TITLE: Verify Phase B Containment Isolation And Containment Spray Initiation

TASK STANDARD: Verify phase 'B' alignment per EEP-0.0 step 6.3.1 RNO and attachment 5.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

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

ALTERNATE PATH ___ TIME CRITICAL ___ PRA _X

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to VERIFY PHASE B CONTAINMENT ISOLATION AND CONTAINMENT SPRAY INITIATION. The conditions under which this task is to be performed are:

a. A safety injection has occurred.
b. Containment pressure has been greater than 30 psig, only 'A' train containment spray actuated.
c. All steps of EEP-0 through step 6.2 RNO have been completed.
d. You are directed to verify phase 'B' alignment per EEP-0.0 step 6.3.1 RNO.
e. A pre-job brief is not required.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

NOTE: HV2228 Closed due to S Signal (6-2 lit), & HV3184 failed closed due to loss of air – HV3611 Closed (8-2 lit).

Convention is column & then row: 1-2 is column 1, row 2.

1.	Check all MLB-3 indicating lights, • tries Phase B handswitches which don't work to actuate B Train Phase B, • goes to attachment 5 to manually align equipment.	Checks MLB-3 lights & observes are lit: 1-1, 1-2, 2-1, 2-2, 2-3 3-1, 3-2, 3-3 4-1, 4-2, 4-3, 4-4 6-2 & 8-2 are NOT lit: 6-1, 7.1, 7.2, 7.3 8.1, 9-1, 9-2, 9.3, 9-4.	S / U

NOTE: The order of performance of the following elements is not critical.

*2.	Start the 'B' CS pump.	'B' CS pump switch taken to start & observes red pump running light lit and MLB-3 7-1 and 7-2 are lit.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*3.	Align ‘B’ train CTMT Spray.	Q1E13MOV8820B handswitch taken to open. FI-958B is checked & observes • MOV-8820B red light lit/green light out, • Spray flow on FI-958B is 2550 gpm, • MLB3 7-3 is lit.	S / U
*4.	Close CCW to RCP MOV-3046.	Handswitch for MOV-3046, CCW from RCP oil coolers taken to close & observes • Red light out/green light lit, & • MLB-3 8-1 is lit.	S / U
*5.	Starts 1B PENE RM EHX FAN.	Handswitch for PENE RM EHX FAN 1B taken to START & observes • Red light lit/green light out, • MLB-3 9-1 is lit	S / U
*6.	Starts 1B PENE RM RECIRC FAN.	Handswitch for PENE RM RECIRC FAN 1B taken to START & observes • Red light lit/green light out, • MLB-3 9-2 is lit	S / U

NOTE: HV3361B WILLOPEN AUTOMATICALLY AFTER FAN IS STARTED.

7.	Open HV3361B, 1B PRF RECIRC FAN RECIRC DMPR.	Handswitch for HV3361B MAY BE taken to open & observes • Red light lit/green light out, • MLB-3 9-3 is lit	S / U
*8.	Open HV3362B, 1B PRF SUCTION DMPR.	Handswitch for HV3362B taken to open & observes • Red light lit/green light out, • MLB-3 9-4 is lit.	S / U

Terminate when HV3362B, 1B PRF SUCTION DMPR is open.

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

GENERAL REFERENCES:

1. FNP-1-EEP-0, Version 34..0

2. PRA/IPE Human Reliability Analysis Notebook operator actions 3.6.10 and 3.6.11

3. K/As:

013A4.01	RO-4.5	SRO-4.8
027A4.01	RO-3.3	SRO-3.2

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

CONDITIONS

When I tell you to begin, you are to VERIFY PHASE B CONTAINMENT ISOLATION AND CONTAINMENT SPRAY INITIATION. The conditions under which this task is to be performed are:

a. A safety injection has occurred.
b. Containment pressure has been greater 30 psig, only 'A' train containment spray actuated.
c. All steps of EEP-0 through step 6.2 RNO have been completed.
d. You are directed to verify phase 'B' alignment per EEP-0.0 step 6.3.1 RNO.
e. A pre-job brief is not required.

HLT-31 exam JPM g.

CRO-NEW

TITLE: Reduce Reactor power to stabilize at 8% per UOP-2.1

TASK STANDARD: Reduce reactor power from 13% to stabilize at 8% per UOP-2.1 step 5.4, with N-35 in LEVEL TRIP BYPASS prior to reducing power less than 10%.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _____

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

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

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA ___

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to reduce reactor power and stabilize at 8% per UOP-2.1. The conditions under which this task is to be performed are:

a. The unit is in Mode 1 at 13% power with B train O/S.
b. A tech spec required shutdown is in progress.
c. The Shift manager has directed a normal shutdown.
d. UOP-2.1, step 5.3 has been completed.
e. The Unit Operator (UO) is in the Control Room to assist with:
   - Responding to MCB alarms unrelated to your task
   - Operating steam dumps as necessary
   - Maintaining SG level as necessary
   - Monitoring the Reactor Controls area if requested
f. You are the Operator at the Controls, and the Shift Supervisor has directed you to reduce reactor power and stabilize at 8% per UOP-2.1 step 5.4.

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____	START TIME		
1.	Checks the status of the intermediate range trip bistable lights TSLB 3-2.1 & 2.2.	Checks the status of the intermediate range trip bistable lights & observes TSLB 3-2.1 is lit, & 2.2 is NOT lit.	S / U
2.	Determines that the reactor will trip if shutdown continues lower than 10% power & reports to Shift Supervisor that shutdown cannot continue.	Determines that the reactor will trip if shutdown continues lower than 10% power & reports to shift supervisor that one IR NI hi-flux trip has not reset. (CUE FROM EXAMINER: SS states that normal shutdown must continue, the IR NI repairs cannot be made prior to shutdown, continue with procedure at step 5.5.1.2.)	S / U
3.	Informs Shift Supervisor to review Technical Specifications 3.0.4 and 3.3.1 for applicability.	Informs Shift Supervisor to review Technical Specifications 3.0.4 and 3.3.1 for applicability. (CUE FROM EXAMINER: Shift Supervisor will review Technical Specifications 3.0.4 and 3.3.1.)	S / U
4.	Verifies control power available to N-35.	Checks CONTROL POWER ON light on drawer LIT, & may check control power fuse holder blown fuse indication NOT LIT.	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)

NOTE: the OATC will not normally go to the NI drawers, but in this case the Simulator Operator can assume the "at the controls" monitoring duties and allow the OATC to complete the actions at the NI drawers.

(CUE FROM EXAMINER WHEN ASKED: THE UO WILL WATCH THE REACTOR PANEL WHILE YOU CONTINUE THE PROCEDURE)

5.	Requests Shift Managers approval place the N-35 in LEVEL TRIP BYPASS.	Requests Shift Managers approval place the N-35 in LEVEL TRIP BYPASS . (CUE FROM EXAMINER: The Shift Manager has given approval to place N-35 in LEVEL TRIP BYPASS.)	S / U

NOTE: The following element will cause an expected alarm: FA4, NI SYS IN TRIP BYP.

*6.	Places N-35 in LEVEL TRIP BYPASS prior to reducing power less than 10%.	Places N-35 in LEVEL TRIP BYPASS prior to reducing power less than 10%, & observes Drawer light for LEVEL TRIP BYPASS is lit & bypass and permissive panel, INTERM RANGE TRIP BYPASS NC-35F is LIT.	S / U

CUE WHEN STEP 5.5 IS SIGNED OFF: UO IS MONITORING SG LEVELS AND WILL SIGN OFF STEP 5.7.1, 5.7.2 & NA STEP 5.7.3

[BOOTH OPERATOR MUST SIGN OFF 5.7.1, 5.7.2, & 'NA' 5.7.3 AFTER EXAMINEE SIGNS OFF 5.5. THIS ALLOWS EXAMINEE TO SIGN OFF 5.8 WHICH MAY BE DONE BUT IS NOT CRITICAL.

5.6 DOES NOT HAVE TO BE SIGNED OFF DUE TO BEING ASTERISKED AND CAN BE DONE IN ANY ORDER].

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
7.	Observes NUCLEAR AT POWER PERMISSIVE P-10 PERMISSIVE status light goes off (3/4 power ranges less than 10%) & checks proper indications per step 5.8 (attached).	Observes NUCLEAR AT POWER PERMISSIVE P-10 PERMISSIVE status light goes off (3/4 power ranges less than 10%) & checks proper indications per step 5.8 (attached).	
*7.	Continues reducing power to 8% by inserting rods.	Inserts rods to reduce power to 8% a few steps at a time, and waiting until the plant is stable each insertion prior to inserting further.	S / U
*8.	Stabilizes power at approximately 8% (± 1%).	Stabilizes power at approximately 8% (± 1%).	S / U

NOTE: The power reduction will be performed in a conservative and controlled manner. Approx. 15 steps total Rod insertion will be required to bring power < 10%, & approx. 20 steps total to get to 8%.

____STOP TIME

Terminate when N-35 is in level trip bypass, and power at 8% and stable with steam dumps controlling temperature.

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

GENERAL REFERENCES:

1. FNP-1-UOP-2.1, Version 58.0
2. KAs: 015A4.03 RO-3.8 SRO-3.9

GENERAL TOOLS AND EQUIPMENT

Provide:

Marked up UOP-2.1 Complete up to step 5.4

COMMENTS:

5.8 WHEN NUCLEAR AT POWER PERMISSIVE P-10 PERMISSIVE status light goes off (3/4 power ranges less than 10%), THEN perform the following:

5.8.1 On the bypass and permissive panel check the following indications.

5.8.1.1 Check that the intermediate range reactor trips and over power rod stops are automatically unblocked by:

5.8.1.1.1 The INTERM RANGE TRAIN A TRIP BLOCKED light not illuminated.

5.8.1.1.2 The INTERM RANGE TRAIN B TRIP BLOCKED light not illuminated.

5.8.1.2 Check that the power range low setting reactor trip is automatically unblocked by:

5.8.1.2.1 The POWER RANGE LOW SETTING TRAIN A TRIP BLOCKED light is not illuminated.

5.8.1.2.2 The POWER RANGE LOW SETTING TRAIN B TRIP BLOCKED light is not illuminated.

5.8.1.3 Check that the LOW POWER TRIP BLOCK P-7 status light is illuminated to ensure automatic block of the following reactor trips:

[] Pressurizer low pressure

[] Pressurizer high water level

[] Loss of flow-two loops

5.8.2 Check that SR LOSS OF DET VOLTAGE annunciator FA3 comes in indicating that this annunciator is no longer disabled.

5.8.3 Monitor NR-45A & B for proper indications.

CONDITIONS

When I tell you to begin, you are to reduce reactor power and stabilize at 8% per UOP-2.1. The conditions under which this task is to be performed are:

a. The unit is in Mode 1 at 13% power with B train O/S.
b. A tech spec required shutdown is in progress.
c. The Shift manager has directed a normal shutdown.
d. UOP-2.1, step 5.3 has been completed.
e. The Unit Operator (UO) is in the Control Room to assist with:
   - Responding to MCB alarms unrelated to your task
   - Operating steam dumps as necessary
   - Maintaining SG level as necessary
   - Monitoring the Reactor Controls area if requested
f. You are the Operator at the Controls, and the Shift Supervisor has directed you to reduce reactor power and stabilize at 8% per UOP-2.1 step 5.4.

09/28/07 13:51:38

UNIT 1

FNP-1-UOP-2.1
September 24, 2007
Version 58.0

FARLEY NUCLEAR PLANT

UNIT OPERATING PROCEDURE

FNP-1-UOP-2.1

SAFETY RELATED

SHUTDOWN OF UNIT FROM MINIMUM LOAD TO HOT STANDBY

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

Approved:

Douglas O. Hobson (for)
Operations Manager

Date Issued: 09/24/2007

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
UNIT OPERATING PROCEDURE UOP-2.1

SHUTDOWN OF UNIT FROM MINIMUM LOAD TO HOT STANDBY

1.0 Purpose

The procedure provides the Initial Conditions, Precautions and Limitations, Technical Specifications, and Instructions for shutdown of unit from Minimum Load to Hot Standby condition.

1.1 Each step should be initialed as it is performed, and dated and timed where provided. The step may be initialed by the individual performing the step or by an individual who knows the specified step is in fact complete. For example: IF an individual based on knowledge and review is aware the condensate and feedwater system has been placed in operation as required by a procedural step, THEN the individual may initial for performance of this action even though he/she did not physically place the system in operation. Example:

Initial

Date/Time

1.2 IF this procedure is required to be used beginning at plant conditions that establish plant operation within the Instruction section, THEN the Shift Supervisor will review all Initial Conditions and all Instructions up to the existing plant conditions. Initial Conditions and Instructions that are not applicable due to plant conditions will be marked N/A and initialed by the Shift Supervisor; all other items will require normal sign-off required by step 1.1.

1.3 Instruction and Initial Conditions steps noted by an asterisk (*) are operations that do not have to be performed in the specified sequence without any further approval. Per FNP-0-AP-6, Unit Operating Procedures have many tasks which may be performed concurrently. The Shift Supervisor may allow procedural steps to be performed out of sequence if it does not result in omission of required work, violate the intent of the procedure, or create an unsafe plant condition.

1.4 The plant is being maintained at minimum load while establishing the initial conditions of section 2.0.

2.0 Initial Conditions

> **NOTE:** **<u>WHEN</u> a rapid load reduction is in progress, <u>THEN</u> entry conditions for the Instructions section of this procedure are satisfied when the double asterisk steps (**) are performed. Perform the non-asterisk steps as conditions permit.**

ajg 2.1 The version of this procedure has been verified to be the current version. (OR 1-98-498)

ajg 2.2 This procedure has been verified to be the correct unit for the task. (OR 1-98-498)

ajg 2.3 The plant is being maintained at the minimum load (15-20%) condition in accordance with one of the following procedures.

- FNP-1-UOP-1.2, STARTUP OF UNIT FROM HOT STANDBY TO MINIMUM LOAD

  <u>OR</u>

- FNP-1-UOP-3.1, POWER OPERATION,

ajg 2.4 Plant control systems should be set up in automatic unless plant conditionsor system malfunctions require the control system be taken to manual.

ajg 2.5 The rod control system is in automatic or manual maintaining TAVG within ± 1.5°F of TREF.

ajg 2.6 RCS pressure is being maintained 2220-2250 psig with pressurizer heaters, spray valves and PORVs in automatic.

ajg 2.7 Pressurizer level is being maintained at the programmed level ± 2% with normal letdown and charging flow in automatic.

ajg 2.8 The steam generators are being maintained at 61-69% with the main feedwater pump(s) and main feed regulating valves in automatic.

ajg **2.9 Reactor makeup is in automatic and set at blended flow equal to or greater than the existing RCS boron concentration, except when specific boration or dilution operations are in progress.

ajg **2.10 The steam dump system is aligned for operation in the desired mode:

- TAVG,

  OR

- STM PRESS mode per one of the following:
  - FNP-1-SOP-18.0, STEAM DUMP SYSTEM.
  - FNP-1-UOP-3.1, POWER OPERATION

ajg **2.11 1D and 1E 4160V busses are aligned to the Startup transformers.

PDL 2.12 The Zinc Addition System has been secured per FNP-1-CCP-335, ZINC ADDITION SYSTEM OPERATION.
Proper date/time
CHEM

> **NOTE:** **Initial Condition step 2.10 should be completed prior to initiation of AFW flow to the SGs.**

ajg 2.13 AFW pump suction piping has been sampled and flushed as required per FNP-1-SOP-22.0 Appendix E, FLUSHING AFW PUMP SUCTION PIPING.

ajg 2.14 The Circulating Water Make-Up Control Valve, Q1P16V560, is in the OPEN position, and canal level is being maintained by use of manual valve, Q1P16V748,

OR

Make-Up Control Valve, Q1P16V560, is in the AUTO position, and canal level is being maintained by Remote Manual operations per FNP-1-SOP-26.0, Appendix 1.

ajg 2.15. Auxiliary Building ventilation is aligned and operating per FNP-1-SOP-58.0, AUXILIARY BUILDING HVAC SYSTEM. (AI 2002201307)

NOTES:	• **The containment to atmosphere differential pressure needs to be minimized prior to defeating the containment personnel hatch interlocks and opening both doors.** • **A zero or small positive ΔP on PDT3317 is needed. (AI2005204697)**

ajg 2.16 IF required to defeat personnel hatch interlocks for an up coming outage, THEN containment to atmosphere differential pressure is being maintained at a ΔP of zero or at a slightly positive ΔP by the following:

2.16.1 Monitor the following computer point:

- PDT-3317 CTMT TO ATMOSPHERE DIFF PRESSURE This is a measure of the pressure differential between containment and aux building as sensed in the 121'piping pentration room. (in psid)

  If computer point PDT-3317 is not reliable compare containment pressure to barometric pressure using any of the following computer points.

- PC1501 NARROW RANGE CTMT AVG PRESS in psig
- PT0951 CTMT PRESSURE CHAN 1 (in psig)
- PT0952 CTMT PRESSURE CHAN 2 (in psig)
- PT0953 CTMT PRESSURE CHAN 3 (in psig)
- PC0700 BAROMETRIC PRESSURE in psia(0 psig ≈ 14.7 psia)
- PT0246 BAROMETRIC PRESSURE inhga.(inhga X .491 ≈ psia)

ajg
Proper date/time

2.16.2 Operate the containment mini-purge supply and exhaust fans as required per FNP-1-SOP-12.2 to maintain, containment differential pressure near zero or slightly positive.

N/A 2.16.3 IF needed to equalize differential pressure due to low negative containment differential pressure being indicated, THEN perform Appendix 2, Pressurization of Containment with Service Air.

NA 2.16.4 IF needed to equalize differential pressure due to high positive containment differential pressure, THEN perform containment venting per Appendix 3, Venting Containment For Differential Pressure Control.

3.0 Precautions and Limitations

3.1 At low power do not conduct any operation that could produce a sudden change in RCS temperature or boron concentration.

3.2 Criticality must be anticipated anytime the control rods are being withdrawn or RCS boron dilution is in progress.

3.3 The shutdown rod banks must be at the fully withdrawn position whenever reactivity is being changed by boron dilution or xenon concentration changes, RCS temperature changes, or control bank rod movement. Except for the following conditions:

- The RCS has been borated to the cold shutdown concentration.
- The RCS has been borated to the hot, xenon-free concentration and is being maintained at no load TAVG.

3.4 The control rod banks must not be below the low-low insertion limits when the reactor is critical.

3.5 The reactor shutdown margin must be maintained ≥ that required by Technical Specification 3.1.1.1. Shutdown Margin is reduced by lowering RCS TAVG and by Xenon decay.

3.6 When the Source Range Nuclear Instruments energize a channel check should be performed. If a channel check cannot be performed, a verification of the shutdown should be performed using FNP-1-STP-29.1, SHUTDOWN MARGIN CALCULATION (TAVG 547°F), or FNP-1-STP-29.2, SHUTDOWN MARGIN CALCULATION (TAVG < 547°F OR BEFORE THE INITIAL CRITICALITY FOLLOWING REFUELING).

3.7 Positive reactivity additions shall be made by only one controlled method when the reactor is in the source range.

3.8 A minimum of one source range channel shall be in operation while the reactor is shutdown with rod control disabled.

3.9 During boron concentration changes if the count rate on either source range channel increases by a factor of two, the evolution will be immediately suspended and core reactivity evaluated by the Shift Supervisor.

3.10 Once the Source Range Nuclear Instruments energize during the shutdown the scaler timer and the audio count rate amplifier are required to be aligned and operating properly

3.11 The high flux at shutdown alarm shall be operable when the reactor is shutdown with fuel in the reactor.

3.12 Smoothed SUR is useful in anticipating the trend in reactor power and RCS TAVG especially when there is a positive moderator temperature coefficient. The expected moderator temperature coefficient can be obtained by referring to Curve 5. It is important to remember that while using smoothed SUR to anticipate trends, the actual parameters to be controlled are reactor power level and RCS average temperature. Appropriate response to control temperature must be taken even if smoothed SUR does not indicate a change is necessary.

3.13 In modes 1 and 2, three RCS loops are required operable. Refer to FNP-1-AOP-4.0, LOSS OF REACTOR COOLANT FLOW.

3.14 The rod control system must be disabled for rod withdrawal when less than 2 reactor coolant pumps are operating in Mode 3. Disabling may be accomplished by MG set shutdown or reactor trip breakers OPEN.

3.15 At least one RCP must be running prior to changing the boron concentration in the RCS. (SOER 94-2)

3.16 Operation of SG atmospheric relief valve with known primary to secondary leakage requires implementation of FNP-0-CCP-645, MAIN STEAM ABNORMAL ENVIRONMENTAL RELEASE. Chemistry should be contacted in advance to allow them to generate a release permit if required and to calculate projected dose rates.

3.17 Notify Chemistry each time a primary or secondary relief or safety valve relieves to the atmosphere.

3.18 When conditions warrant a ramp rate of greater than 2 MW/min, the Shift Manager is to be notified as soon as conditions permit. Additionally, for ramp rates greater than 5 MW/min, FNP-1-AOP-17.0, RAPID LOAD REDUCTION, is to be used in conjunction with this procedure. During rapid load reductions, circumstances may dictate that the unit be ramped down in an urgent manner prior to signing off initial conditions, or with some initial conditions not satisfied. Under these circumstances, attempts to meet the initial conditions should continue, but this should not cause undue delay in ramping down the unit. When initial conditions are not originally satisfied, they should be signed off when circumstances allow.

3.19 WHEN the turbine is operating at ≥ 30% load, THEN the maximum permissible condenser pressure is 5.5 in Hg (2.7 psia). WHEN the turbine is operating at < 30% load, THEN the maximum permissible condenser pressure is 3.5 in Hg (1.7 psia). Refer to FNP-1-AOP-8.0, PARTIAL LOSS OF CONDENSER VACUUM for remedial actions.

3.20 During mode changes while reducing reactor power there will be a review of LCOs required to verify that all conditions are met for entry into a lower mode. The hold points for this is ~ 7% for going into Mode 2 and ~ 1% for going into Mode 3. It is recommended that these reviews are made in advance to anticipate any problems that would hinder mode change and allow smoother control of the reactor shutdown.

3.21 Chemistry should be notified of any significant changes in plant load and to sample RCS per STP-746 if Rx Power changes by > 15% of rated thermal power within a 1 hr. period (Tech Spec SR 3.4.16.2).

3.22 Correct operation of the SGFP speed control system is very important for proper steam generator water level control system operation. Ensure feed header to steam header ΔP is being maintained at the correct program value

4.0 Technical Specification Requirements

4.1 The flow rate through the reactor coolant system shall be determined to be greater than 3000 gpm prior to the start and at least once per hour during a reduction in RCS boron concentration by recording the required data per FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS, miscellaneous section.

4.2 Within 4 hours of reducing reactor power below 10%, one of the following must be performed to meet TS 3.3.1.8:

- Verify the low power interlocks/trips tested within the previous 92 days, OR
- Test the low power interlocks/trips, OR
- Place the unit in Mode 3

4.3 Within 1 hour of reducing reactor power below P-6, a satisfactory channel check of the Source Range Instrumentation must be performed and documented in FNP-1-STP-1.0, OPERATIONS DAILY AND SHIFT SURVEILLANCE REQUIREMENTS. (SR 3.3.1.1)

4.4 A CHANNEL OPERATIONAL TEST of the source range instrumentation is required within four hours of entering mode 3 from mode 2 if the rod control system is not disabled. (SR 3.3.1.7)

5.0 Instructions

ajB 5.1 IF a reactor trip is to be performed, THEN proceed to Appendix 1. The remainder of Section 5.0 will be N/A.

Proper date+time

ajB 5.2 Ensure 1A, 1B and 1C 4160V busses aligned to the startup transformers per FNP-1-SOP-36.2, 4160 V AC ELECTRICAL DISTRIBUTION SYSTEM.

5.3 IF the main generator is tied to the grid, THEN perform the following:

NA 5.3.1 Notify ACC the generator is ready for unloading.

NA 5.3.2 WHEN ACC gives permission to remove the generator from the grid, THEN begin ramping generator load down to approximately 40 MW per FNP-1-SOP-28.1, TURBINE GENERATOR OPERATION, steps 4.12.1 through 4.12.7.

____ 5.4 Prior to decreasing reactor power below 13%, check the status of the intermediate range trip bistable lights TSLB 3-2.1(2.2).

TSLB 3-2.1 ☐ OFF ☐ ILLUMINATED

TSLB 3-2.2 ☐ OFF ☐ ILLUMINATED

CAUTION: **Failure to perform the following step will result in a reactor trip when Nuclear at Power Permissive P-10 permissive resets (3/4 power ranges less than 10%).**

5.5 IF either TSLB 3-2.1(2.2) is(are) illuminated and will not clear prior to 13%, THEN perform one of the following as plant conditions permit.

____ 5.5.1 Stabilize reactor power above 13% to repair the intermediate range channel(s).

____ 5.5.1.1 WHEN repairs are complete, THEN verify the following indications:

☐ TSLB 3-2.1, IR HI Q NC-35F is OFF

☐ TSLB 3-2.2, IR HI Q NC-36F is OFF

5.5.1.2 IF only ONE Intermediate range NI Bistable is illuminated and it cannot be repaired, THEN place the affected channel for TSLB 3-2.1(2.2) in LEVEL TRIP BYPASS as follows:

____ / 5.5.1.2.1 Review Technical Specifications 3.0.4 and 3.3.1 for applicability.

____ / 5.5.1.2.2 Verify control power available to affected channel.

____ / 5.5.1.2.3 With Shift Managers approval place the affected channel in LEVEL TRIP BYPASS.

____ / 5.5.1.2.4 Verify the affected intermediate range channel is bypassed by one of the following indications:

[] On the bypass and permissive panel, INTERM RANGE TRIP BYPASS NC-35F is illuminated.

[] On the bypass and permissive panel, INTERM RANGE TRIP BYPASS NC-36F is illuminated.

____ / 5.5.2 IF any intermediate range channel cannot be repaired or bypassed, AND the reactor power reduction must proceed, THEN trip the reactor and enter FNP-1-EEP-0.0, REACTOR TRIP AND SAFETY INJECTION.

* 5.6 WHEN the LOW TURBINE IMPULSE PRESSURE AUTO ROD WITHDRAWAL BLOCKED C-5 permissive light goes off (turbine impulse less than 15%), THEN perform the following:

____ 5.6.1 Place rod control in MANUAL and maintain TAVG within ±1.5°F of program.

5.6.2 Maintain reactor power at approximately 8% until after the main turbine has been removed from service by operating the steam dumps as follows:

____ 5.6.2.1 Place the steam dumps in steam pressure mode using FNP-1-SOP-18.0, STEAM DUMP SYSTEM.

____ 5.6.2.2 Using Table 1 in the Curve Book, determine STM HDR PRESS PK-464 potentiometer setting for the present steam generator pressure.

____ 5.6.2.3 Slowly adjust the potentiometer to the setpoint for the present S/G pressure or until the steam dumps start to open.

____ 5.6.2.4 Verify proper operation of the steam dumps.

_____ 5.6.3 Maintain desired reactor power level by:

5.6.3.1 Manual adjustment of control rods.

5.6.3.2 Control steam dumps in the steam pressure mode per FNP-1-SOP-18, STEAM DUMP SYSTEM.

OR

5.6.3.3 IF the main condenser or steam dumps are not available, THEN perform the following:

_____ 5.6.3.3.1 IF required due to known primary to secondary leakage, THEN contact Chemistry to perform FNP-0-CCP-645 MAIN STEAM ABNORMAL ENVIRONMENTAL RELEASE.

_____ 5.6.3.3.2 Utilize the atmospheric relief valves as follows:

[] PC 3371A, 1A MS ATMOS REL VLV, placed in AUTO and set for desired SG pressure.

[] PC 3371B, 1B MS ATMOS REL VLV, placed in AUTO and set for desired SG pressure.

[] PC 3371C, 1C MS ATMOS REL VLV, placed in AUTO and set for desired SG pressure

5.7 Maintain steam generator level at 61-69% narrow range as follows:

_____ 5.7.1 Maintain the feedwater control system in AUTO as long as possible during the load reduction.

_____ 5.7.2 IF required, THEN operate the main feed regulating bypass valves in AUTO or MANUAL.

_____ 5.7.3 IF it is required to isolate air to the feed regulating valves or the feed regulating bypass valves due to valve leak by, THEN refer to FNP-1-SOP-21.0, CONDENSATE AND FEEDWATER SYSTEM

5.8 WHEN NUCLEAR AT POWER PERMISSIVE P-10 PERMISSIVE status light goes off (3/4 power ranges less than 10%), THEN perform the following:

5.8.1 On the bypass and permissive panel check the following indications.

5.8.1.1 Check that the intermediate range reactor trips and over power rod stops are automatically unblocked by:

____ 5.8.1.1.1 The INTERM RANGE TRAIN A TRIP BLOCKED light not illuminated.

____ 5.8.1.1.2 The INTERM RANGE TRAIN B TRIP BLOCKED light not illuminated.

5.8.1.2 Check that the power range low setting reactor trip is automatically unblocked by:

____ 5.8.1.2.1 The POWER RANGE LOW SETTING TRAIN A TRIP BLOCKED light is not illuminated.

____ 5.8.1.2.2 The POWER RANGE LOW SETTING TRAIN B TRIP BLOCKED light is not illuminated.

____ 5.8.1.3 Check that the LOW POWER TRIP BLOCK P-7 status light is illuminated to ensure automatic block of the following reactor trips:

[] Pressurizer low pressure

[] Pressurizer high water level

[] Loss of flow-two loops

____ 5.8.2 Check that SR LOSS OF DET VOLTAGE annunciator FA3 comes in indicating that this annunciator is no longer disabled.

____ 5.8.3 Monitor NR-45A & B for proper indications.

HLT-31 exam JPM h.

CRO-328B

TITLE: Restore Instrument Air To Containment

TASK STANDARD: Restore instrument air with 1A instrument air compressor and ctmt valves open using ESP-1.2, Attachment 1 starting at Step 1.11.

PROGRAM APPLICABLE: SOT ___ SOCT ___ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: _X_ SIMULATOR _X_ CONTROL ROOM ___ PLANT

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

ALTERNATE PATH _X_ TIME CRITICAL ___ PRA

NOTE TO BOOTH OPERATOR: WHEN REQUESTED, Reset B1F Sequencer locally by the command:

Remote / R43 / LOA-DSQ001 [Delta Sierra Quebec Zero Zero One]

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

EXAMINER: ______________________

CONDITIONS

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

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

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
	____ START TIME		

NOTE: IN THIS SCENARIO, AS SOON AS DH01 IS CLOSED THE A AIR COMPRESSOR WILL START.

1.	Verify the 1C air compressor handswitch in RUN/START.	Observes 1C air compressor indication, green indicating light lit, & places 1C air compressor handswitch in RUN/START.	S / U
2.	Attempts to verify 1C air compressor started.	Attempts to verify 1C air compressor started, but observes 1C air compressor indication did <u>NOT</u> change (Green light still lit).	S / U

NOTE: IF EXAMINEE DIRECTS THE SO TO CHECK 1C AIR COMPRESSOR THEN CUE FROM BOOTH: S.O. REPORTS 1C AIR COMPRESSOR MOTOR VERY WARM TO THE TOUCH.

3.	Verify 1C air compressor handswitch in OFF.	Verifies 1C air compressor handswitch placed in OFF position.	S / U
4.	Verify SI is reset.	Checks MLB1 1-1 and 11-1 not lit.	S / U
5.	Direct resetting B1F sequencer.	Direct sequencer to be reset, & observes SEQ B1F or B2F SIAS annunciator (WE5) goes from a solid condition to a flashing condition. (CUE from SO: I reset the B1F Sequencer).	S / U

*6.	Place Breaker DF13 Sync Switch in manual.	SYNC SWITCH in MANUAL POSITION & observes Red light under the 'A' train synchroscope is lit.	S / U
*7.	Close Breaker DF13.	Breaker DF13 handswitch taken to closed & observes Breaker position indicator red light lit. & 1H 4160 bus AC potential lights illuminated.	S / U
*8.	Close breaker DH01.	Breaker DH01 handswitch taken to close & observes breaker position indicator red light lit.	S / U
9.	Verify breaker EG02-1 closed.	Observes breaker EG02-1 position indicator red light lit.	S / U
10.	Verify start of 1A air compressor.	1A air compressor observed running by breaker position indicator red light lit.	S / U
11.	Check IA pressure > 85 psig.	INST AIR PI-4004B indication checked & observes PI-4004B indicates > 85 psig.	S / U
12.	Check instrument air to containment.	Attempts to check MLB-3 1-2 <u>NOT</u> lit and Annunciator KD1 clear, & observes MLB-3 1-2 IS lit and Annunciator KD1 is in alarm.	S / U
*13.	Open IA to PENE RM valve HV-3825.	Handswitch for HV-3825 taken to open & observes red light lit and green light out.	S / U
*14	Open IA to PENE RM valve HV-3885.	Handswitch for HV-3885 taken to open & observes red light lit and green light out.	S / U

NOTE: HV-3611 WILL NOT STAY OPEN UNTIL BOTH HV-3885 & HV-3825 ARE OPEN.

*15	Open instrument air supply to CTMT HV-3611.	Handswitch for HV-3611 taken to open & observes red light lit and green light out.	S / U

16.	Inform Shift Supervisor that instrument air is aligned to containment.	Shift supervisor informed air is aligned to containment. (CUE FROM EXAMINER: Shift supervisor acknowledges.)	S / U

____ STOP TIME

TASK STANDARD: (Terminate when) CTMT HV-3611 is open & SS informed.

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

GENERAL REFERENCES:

1. FNP-1-ESP-1.2, Version 23.0
2. K/A: 065AA-1.03 RO-2.9 SRO-3.1

GENERAL TOOLS AND EQUIPMENT:

None

COMMENTS:

CONDITIONS

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

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

HLT-31 exam JPM i.

SO-052

TITLE: Perform Lineups For Filling The Accumulators

TASK STANDARD: Fill 'C' accumulator in accordance with SOP-8.0, section 4.1.

PROGRAM APPLICABLE: SOT _X_ SOCT ___ OLT _X_ LOCT

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE

EVALUATION LOCATION: ___ SIMULATOR ___ CONTROL ROOM _X_ PLANT

PROJECTED TIME: 10 MIN SIMULATOR IC NUMBER: N/A

ALTERNATE PATH ___ TIME CRITICAL ___ PRA

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to PERFORM LINEUPS FOR FILLING THE ACCUMULATORS. The conditions under which this task is to be performed are:

a. The Plant is in Mode 1.
b. 'C' accumulator has a low level.
c. RWST boron concentration is suitable for makeup.
d. You are directed by the Control Room Operator to fill 'C' accumulator in accordance with SOP-8.0, section 4.1, steps 4.1.2 through 4.1.10.

NOTE: THIS JPM MAY BE PERFORMED ON EITHER UNIT. (IF UNIT 2 VALVES ARE DIFFERENT THE NUMBERS ARE IN PARENTHESES.)

EVALUATION CHECKLIST

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
	_____ START TIME		

NOTE: KEYS MAY BE OBTAINED PRIOR TO STARTING OR MAY BE OBTAINED AT STEP WHEN NEEDED. EITHER OBTAINING THE KEY FOR THE VALVE, OR MASTER KEY IS ACCEPTABLE.

	ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
1.	Obtain key Z-60 [V-33] or master Z [V] from Shift Support Supervisor's office.	Key Z-60 [V-33] obtained. (CUE: Key Z-60 [V-33] or master Z [V] obtained.)	S / U
2.	Verify open hydro test pump seal overflow valve Q1[2]E21V083 (V-8979).	Valve Q1[2]E21V083 verified open. (CUE: V083 is fully counterclockwise.)	S / U
*3.	Open hydro test pump suction valve Q1[2]E21V028 (V-8932).	Valve Q1[2]E21V028 open. (CUE: Valve V028 is fully counterclockwise.)	S / U
4.	Requests Control Room Operator: • Set HYDRO TEST PUMP DISCH CONT VLV HIK 947 to open. • Verifies closed ACCUM N2 SUPP ISO, Q1E21HV8880.	Control Room Operator informed. (CUE: CRO acknowledges and sets HIK 947 to open and verifies Accumulator N2 supply isolation HV8880 closed).	S / U
*5.	Unlock and open hydro test pump discharge valve N1[2]E21V085 (V-8967). Key #Z60 [V33].	Unlocks valve N1[2]E21V085 and turned counterclockwise to open. (CUE: Valve V085 is fully counterclockwise.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*6.	Start hydro test pump N1[2]E21P003.	Hydro test pump start button pushed. (CUE: The Hydro test pump red light is lit).	S / U
7.	Report to Control Room Operator that hydro test pump is running and Q1[2]E21V085 (V-8967) is open.	Control Room Operator informed. (CUE: CRO acknowledges and continues with opening HV8860 and HV8878C & adjusts HIK- 947 to commence filling 'C' accumulator. CRO request that the hydro test pump discharge pressure be monitored.)	S / U
8.	Monitor hydro test pump discharge pressure.	PI-947 checked. (CUE: PI-947 indicates 665 psig).	S / U
9.	Report to Control Room Operator that hydro test pump discharge pressure is 665 psig.	Report to Control Room Operator that hydro test pump discharge pressure is 665 psig . (CUE: CRO acknowledges Hydro Test Pump discharge pressure is 665 psig.)	S / U

_____ **STOP TIME**

Terminate when Control Room Operator is notified that hydro test pump discharge pressure is 665 psig.

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

GENERAL REFERENCES:

1. FNP-1-SOP-8.0, Version 28.0
2. FNP-2-SOP-8.0, Version 24.0
3. KAs: 006A1.13 RO 3.5 SRO 3.7

GENERAL TOOLS AND EQUIPMENT:

1. Locked valve key

Provide either:

FNP-1-SOP-8.0, section 4.1, Version 28.0
FNP-2-SOP-8.0, section 4.1, Version 24.0

COMMENTS:

CONDITIONS

When I tell you to begin, you are to PERFORM LINEUPS FOR FILLING THE ACCUMULATORS. The conditions under which this task is to be performed are:

a. The Plant is in Mode 1.
b. 'C' accumulator has a low level.
c. RWST boron concentration is suitable for makeup.
d. You are directed by the Control Room Operator to fill 'C' accumulator in accordance with SOP-8.0, section 4.1, steps 4.1.2 through 4.1.10.

FARLEY NUCLEAR PLANT

SYSTEM OPERATING PROCEDURE

FNP-1-SOP-8.0

SAFETY RELATED

SAFETY INJECTION SYSTEM - ACCUMULATORS

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

Approved:

Jim Hunter (for)
Operations Manager

Date Issued 6/26/06

TABLE OF CONTENTS

FARLEY NUCLEAR PLANT
UNIT 1
SYSTEM OPERATING PROCEDURE SOP-8.0

SAFETY INJECTION SYSTEM - ACCUMULATORS

1.0 Purpose

This procedure provides the Initial Conditions, Precautions, Limitations, and Instructions for the operation of the Safety Injection System-Accumulators. Instructions are included in the following sections:

4.1 Filling Accumulator 1A (B, C)

4.2 Draining Accumulator 1A (B, C) with RCS Pressure Greater Than 1000 psig

4.3 Draining Accumulator 1A (B, C) with RCS Pressure Less Than 1000 psig

4.4 Establishing a Nitrogen Atmosphere in Accumulator 1A (B, C) by Pumping to an RHT

4.5 Establishing a Nitrogen Atmosphere in Accumulator 1A (B, C) by Pumping to the RWST

4.6 Increasing Accumulator 1A (B, C) Nitrogen Pressure

4.7 Venting Accumulator 1A (B, C)

4.8 Pumping Accumulator 1A (B, C) to RWST with RCS Pressure Less Than 1000 psig

4.9 Complete Depressurization of Accumulator 1A (B, C) to Support Outage Activities.

NOTE: Indicate completion of applicable (*) steps by initialing on procedure Sign-Off List Appendix 1.

Appendix 1 Sign-Off List: Safety Injection System - Accumulators

Appendix 2 Feed and Bleed of Accumulator 1A (1B, 1C) to Raise Boron Concentration > 2300 ppm

2.0 Initial Conditions

2.1 The Electrical Distribution System is energized and aligned for normal operation per FNP-1-SOP-36.0, PLANT ELECTRICAL DISTRIBUTION LINE-UP, with exceptions noted.

2.2 The accumulator valves and electrical distribution system are aligned per System Check List FNP-1-SOP-8.0A, SAFETY INJECTION SYSTEM - ACCUMULATORS, with exceptions noted.

2.3 The refueling water storage tank contains primary grade water borated to greater than 2300 ppm.

2.4 The Nitrogen System is in service and aligned for normal operation per FNP-0-SOP-33.0, NITROGEN SYSTEM.

3.0 Precautions and Limitations

3.1 Accumulator pressure should be maintained between 605 and 645 psig in Modes 1, 2, and 3. DO NOT exceed the accumulator design pressure of 700 psig.

3.2 DO NOT allow accumulator level to exceed a high level of 55% or a low level of 35% in Modes 1, 2, and 3.

3.3 Alert personnel in containment prior to venting accumulators.

3.4 1A, B, and C ACCUM DISCH ISO Q1E21MOV8808A, B, and C (Q1E21V038A, B, and C) should be closed when RCS pressure is less than 1000 psig and open when RCS pressure is greater than 1000 psig.

3.5 The temperature of the accumulators must be kept above 70°F (the minimum temperature for pressurization) whenever the accumulators are pressurized.

3.6 IF accumulator 1A (B, C) level rises significantly (approx. 5%) due to inleakage from RCS, THEN sample accumulator 1A (B, C) to verify boron concentration > 2300 ppm.

3.7 Cross-connection of accumulators via N2 or Fill lines is prohibited in Modes 1, 2, or 3 (with RCS pressure greater than 1000 psig). This is because in the event of a LOCA, all cross-connected accumulators would depressurize through the faulted RCS loop.

3.8 IF increasing accumulator nitrogen pressure per section 4.6 after establishing nitrogen atmosphere per sections 4.4 OR 4.5, THEN ensure the high pressure nitrogen banks are greater than 2000 psig prior to performing section 4.6.

4.0 Instructions

4.1 Filling Accumulator 1A (B, C)

CAUTION:	**Accumulator levels must be maintained between 35% and 55% while in operational modes 1, 2, and 3 (with RCS pressure greater than 1000 psig).**

CAUTION:	**The accumulator boron concentration must be maintained between 2200 and 2500 ppm while in operational modes 1, 2, and 3 (with RCS pressure greater than 1000 psig).**

4.1.1 Verify RWST boron concentration is suitable for makeup to the accumulator.

4.1.2 Verify open HYDRO TEST PUMP SEAL OVERFLOW ISO, Q1E21V083 (1-CVC-V-8979).

4.1.3 Open HYDRO TEST PUMP SUCT, Q1E21V028 (1-CVC-V-8932).

4.1.4 Set HYDRO TEST PUMP DISCH CONT VLV HIK 947 to open.

4.1.5 Verify closed ACCUM N2 SUPP ISO, Q1E21HV8880.

4.1.6 Unlock AND open HYDRO TEST PUMP DISCH TO ACCUM, N1E21V085 (1-CVC-V-8967). [Key # Z-60]

4.1.7 Start the hydro test pump.

NOTE:	**IF depressurized per section 4.9, THEN step 4.1.8 has been performed.**

4.1.8 IF the accumulator is being filled from the empty condition, THEN open the following valves:

- 1A (B, C) ACCUM N2 SUPP/VT ISO, Q1E21HV8875A (B, C).
- ACCUM N2 VENT HIK-936.

CAUTION:	**Cross-connection of accumulators via N2 or Fill lines is prohibited in Modes 1, 2, or 3 (with RCS pressure greater than 1000 psig). This is because in the event of a LOCA, all cross-connected accumulators would depressurize through the faulted RCS loop.**

4.1.9 Perform the following:

4.1.9.1 Open ACCUM FILL LINE ISO, Q1E21HV8860.

4.1.9.2 Open 1A (B, C) ACCUM FILL LINE ISO, Q1E21HV8878A (B, C).

4.1.10 Adjust HYDRO TEST PUMP DISCH CONT VLV HIK 947 to maintain 665 psig.

CAUTION: DO NOT fill accumulators to greater than 55%.

4.1.11 Monitor accumulator water level indicators.

4.1.11.1 Verify the water level in accumulator 1A (B, C) is the only accumulator which shows an increase in water level.

NOTE: IF accumulator pressure increases to greater than 640 psig, THEN the hydro test pump must be stopped AND the accumulator vented per section 4.7.

4.1.12 Monitor accumulator pressure indicators while filling.

4.1.13 WHEN the accumulator is filled to approximately 45% level, THEN:

- Adjust HYDRO TEST PMP DISCH CONT VLV full open using HIK 947
- Close 1A (B, C) ACCUM FILL LINE ISO, Q1E21HV8878A (B, C).

4.1.14 IF additional accumulators are required to be filled, THEN return to step 4.1.9.2.

4.1.15 IF no additional accumulators require filling, THEN perform the following:

4.1.15.1 Close ACCUM FILL LINE ISO, Q1E21HV8860.

4.1.15.2 Stop the hydro test pump.

4.1.16 Verify closed the following valves:

- 1A (B, C) ACCUM N2 SUPP/VT ISO, Q1E21HV8875A (B, C).
- ACCUM N2 VENT HIK 936.

4.1.17 Verify HYDRO TEST PMP DISCH CONT VLV full open using HIK 947.

4.1.18 Close the following valves:

- HYDRO TEST PUMP DISCH TO ACCUM, N1E21V085 (1-CVC-V-8967) LOCKED CLOSED [Key # Z-60]
- HYDRO TEST PUMP SUCT, Q1E21V028 (1-CVC-V-8932)

HLT-31 exam JPM j.

SO-607A

TITLE: Perform the Required Actions to Minimize DC Loads

TASK STANDARD: De-energize non-essential DC loads in the non-rad side of the auxiliary building using Attachment 4 of ECP-0.0.

PROGRAM APPLICABLE: SOT _X_ SOCT _X_ OLT _X_ LOCT _X

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ____ CONTROL ROOM _X_ PLANT

PROJECTED TIME: _12 MIN._ SIMULATOR IC NUMBER: _N/A_

ALTERNATE PATH ___ TIME CRITICAL ___ PRA ____

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

EXAMINER: ______________________

CONDITIONS

When I tell you to begin, you are to PERFORM THE REQUIRED ACTIONS TO MINIMIZE DC LOADS. The conditions under which this task is to be performed are:

a. A loss of all AC power has occurred.
b. ECP-0.0 is in progress.
c. You are directed by the control room to de-energize non-essential DC loads in the non-rad side of the auxiliary building using Attachment 4 of ECP-0.0.
d. A pre-job brief is not required.

NOTE: THIS JPM REQUIRES SHIFT SUPERVISOR'S APPROVAL PRIOR TO OPENING BREAKER PANEL DOORS.

NOTE: THIS JPM MAY BE PERFORMED ON EITHER UNIT. USE THE [BRACKETED] NUMBERS FOR UNIT TWO (2).

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
_____ START TIME		
*1. Open DC breakers at DC distribution panel 1A [2B]. Breaker 25: 25 Load Control Remote Unit Control Power To Fuse Block NSH11NGLCR2507I-N [Breakers 9 and 16: 9 CRDM MG SET 2A CONTROL POWER TO STARTER BKR & GEN FIELD FLASH & 16 RX TRIP SWGR CONTROL PWR TO "A" BYPASS BKR & "A" RX TRIP BKR]	Breaker 25 [Breakers 9 and 16] taken to the OFF position. (CUE: For each breaker operated the breaker indicates OFF.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	**STANDARDS:**	**RESULTS: (CIRCLE)**
*2. Open DC breakers at DC distribution panel 1B [2H]. Breakers 9 and 16: 9 CRDM MG "1A" Control Cab Power to Starter Bkr., Field Flash & output CT & 16 Rx Trip SWGR Control Power to Unit 1 "A" Bypass Bkr & "A" Rx Trip Bkr [Breakers 13, 16, and 20: 13 Waste Evaporator Control Panel N2G21NDWE2609-N & 16 Recycle Evaporator Control Panel N2G21NDRE2608-N & 20 STEAM GENERATOR BLDN PROCESS PANEL N2G24NDSG2611-N]	Breakers 9 and 16 [Breakers 13, 16, and 20] taken to the OFF position. (CUE: For each breaker operated the breaker indicates OFF.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*3. Open DC breakers at DC distribution panel 1H [2G]. Breakers 7, 10, 13, 16, and 20: 7 Solenoid Valve 600 Volt Load Center Dampers LCS & 10 Radioactive Lab Exh Fan SV/JB NSV46V3860-N/JB & 13 Waste Evaporator Control Panel N1G21NDWE2609-N & 16 Recycle Evaporator Control Panel N1G21NDRE2608-N & 20 Steam Generator Blowdown Processing Panel N1G24NDSGB2611-N [Breakers 15, 16 and 17: 15 Waste Encapsulation Panel N2G24NGWBP2614-N & 16 Containment Cooler Vibration switches Lower equipment rm HVAC local control station N2V47L003-N & 17 Lower equipment rm HVAC local control station N2V47L003-N]	Breakers 7, 10, 13, 16, and 20 . [Breakers 15, 16 and 17] taken to the OFF position. (CUE: For each breaker operated the breaker indicates OFF.)	S / U

EVALUATION CHECKLIST

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*4. Open DC breakers at DC distribution panel 1G [2E]. Breakers 15, 16, and 17 15 Waste Encap. Panel N1G24NGWBP2614-N & 16 Containment Cooler Vibration Switches & 17 Lower Equip Room HVAC Local Control Station N1V47L003-N [Breakers 9 and 16: 9 2B CRDM MG CONTROL CAB C/P TO BKR CONTROL CIRCUIT FOR STARTER CIRCUIT & BKR CONTROL & 16 RX TRIP SWGR CONTROL POWER TO "B" BYPASS BKR & "B" RX TRIP BKR]	Breakers 15, 16, and 17 [Breakers 9 and 16] taken to the OFF position. (CUE: For each breaker operated the breaker indicates OFF.)	S / U

_____ **UNIT 2 STOP TIME**

ELEMENTS:	STANDARDS:	RESULTS: (CIRCLE)
*5. Open DC breakers at DC distribution panel 1E. Breakers 9 and 16: 9 CRDM MG Set 1B control cabinet & 16 Rx Trip SWGR Cabinet Unit 1 Q1C11E004A-AB	**[APPLICABLE ONLY ON UNIT ONE]** Breakers 9 and 16 taken to the OFF position. (CUE: For each breaker operated the breaker indicates OFF.)	S / U

_____ **UNIT 1 STOP TIME**

Terminate when DC breakers at distribution panel 1E [2E] are opened.

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

GENERAL REFERENCES:

1. FNP-1-ECP-0.0, Attachment 4, Rev. 22
   FNP-2-ECP-0.0, Attachment 4, Rev. 21
2. K/As: 055EA1.04 RO-3.5 SRO-3.9

GENERAL TOOLS AND EQUIPMENT:

Provide either:

FNP-1-ECP-0.0, Attachment 4, Rev. 22
FNP-2-ECP-0.0, Attachment 4, Rev. 21

COMMENTS:

CONDITIONS

When I tell you to begin, you are to PERFORM THE REQUIRED ACTIONS TO MINIMIZE DC LOADS. The conditions under which this task is to be performed are:

a. A loss of all AC power has occurred.
b. ECP-0.0 is in progress.
c. You are directed by the control room to de-energize non-essential DC loads in the non-rad side of the auxiliary building using Attachment 4 of ECP-0.0.
d. A pre-job brief is not required.

ATTACHMENT 4

NOTE: Steps 1 and 2 may be performed in any order.

1 **Deenergize non-essential DC loads in the NON-RAD AUX BLDG.**

1.1 Open breaker for non-essential load on 1A 125 V DC distribution panel. (155 ft, AUX BLDG main control room)

Load Control Remote
Unit Control Power
To Fuse Block
NSH11NGLCR2507I-N
[] BKR 25

1.2 Open breakers for non-essential loads on 1B 125 V DC distribution panel. (139 ft, AUX BLDG A train SWGR room)

CRDM MG "1A" Control
Cab Power to Starter
Bkr., Field Flash &
output CT
[] BKR 9

Rx Trip SWGR Control
Power to Unit 1
"A" Bypass Bkr &
"A" Rx Trip Bkr
[] BKR 16

Step 1 continued on next page.

___Page Completed

ATTACHMENT 4

1.3 Open breakers for non-essential loads on 1H 125 V DC distribution panel. (139 ft, AUX BLDG CRDM MG set room)

Solenoid Valve 600 Volt
Load Center Dampers LCS
[] BKR 7

Radioactive Lab
Exh Fan SV/JB
NSV46V3860-N/JB
[] BKR 10

Waste Evaporator
Control Panel
N1G21NDWE2609-N
[] BKR 13

Recycle Evaporator
Control Panel
N1G21NDRE2608-N
[] BKR 16

Steam Generator Blowdown
Processing Panel
N1G24NDSGB2611-N
[] BKR 20

Step 1 continued on next page.

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 4

1.4 Open breakers for non-essential loads on 1G 125 V DC distribution panel. (139 ft, AUX BLDG CRDM SWGR room)

Waste Encap.
Panel
N1G24NGWBP2614-N
[] BKR 15

Containment Cooler Vibration
Switches
[] BKR 16

Lower Equip Room
HVAC Local Control Station
N1V47L003-N
[] BKR 17

1.5 Open breakers for non-essential loads on 1E 125 V DC distribution panel. (121 ft, AUX BLDG B train SWGR room)

CRDM MG Set 1B
control cabinet
[] BKR 9

Rx Trip SWGR Cabinet
Unit 1 Q1C11E004A-AB
[] BKR 16

___Page Completed

Step	Action/Expected Response	Response NOT Obtained

ATTACHMENT 4

2 Deenergize non-essential DC loads in the RAD-SIDE AUX BLDG.

2.1 Open breakers for non-essential loads on 1C 125 V DC distribution panel Q1R41L001C-A. (139 ft, AUX BLDG rad side hallway)

Boron Recycle
Evap Package
Control Panel
Control Power
[] BKR 1

Liquid Waste Processing
Panel Control Power
[] BKR 3

Junction Box AITB004
Control Power For
MSVR Flooding Sensor
Control Circuit
[] BKR 4

"1-A" Catalytic
Hydrogen Recombiner
Control Panel D.C.
Control Power
[] BKR 5

Sample Control Panel
Q1P15NFSS2607A-A
Panel "A" Train
Fuse Compartments
[] BKR 6

Step 2 continued on next page.

___Page Completed

ATTACHMENT 4

2.2 Open breakers for non-essential loads on 1F 125 V DC distribution panel Q1R41L001F-B. (121 ft, AUX BLDG rad side hallway)

Waste Gas Panel
N1G22NBWPP2603C-N
Control Power to
Fuse Blocks
[] BKR 1

Catalytic Hydrogen
Recombiner 1B Control Panel
D.C. Breaker Panel
[] BKR 5

Waste Encapsulation System
Control Panel
Control Power to Fuse Blocks
[] BKR 6

Terminal Box B1TB004
Control Power to
Main Steam Room
Flooding Sensors Train B
[] BKR 7

Sample Control Panel
Q1P15NFSS2607B-B
To Sample Line Iso
Vlvs Solenoids
[] BKR 10

___ 3 **Notify control room that ATTACHMENT 4 is complete.**

-END-

HLT-31 exam JPM k.

SO-368A

TITLE: Align RCDT Discharge To WHT

TASK STANDARD: Pump the Unit 1 RCDT to the Unit 1 WHT per FNP-1-SOP-50.0, step 4.1.4, to decrease RCDT level to approximately 10% and complete 4.1.4.

PROGRAM APPLICABLE: SOT _X_ SOCT ___ OLT _X_ LOCT ______

ACCEPTABLE EVALUATION METHOD: _X_ PERFORM _X_ SIMULATE ___ DISCUSS

EVALUATION LOCATION: ____ SIMULATOR ___ CONTROL ROOM _X_ PLANT

PROJECTED TIME: _20 MIN_ SIMULATOR IC NUMBER: _N/A_

ALTERNATE PATH ___ TIME CRITICAL ___ PRA _____

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

EXAMINER: ____________________

CONDITIONS

When I tell you to begin, you are to ALIGN THE RCDT DISCHARGE TO THE WHT PER SOP-50.0. The conditions under which this task is to be performed are:

a. The RCDT is aligned per SOP-50.0A.
b. #1 RHT is on service per SOP-2.4.
c. The liquid waste system is aligned per SOP-50.0.
d. Both RCDT pumps are off and aligned for normal operation per SOP-50.0.
e. RCDT level / pressure, and WHT level has been checked.
   - RCDT level is 50%,
   - RCDT pressure is 8#,
   - WHT level is 20%.
f. You have been instructed by the control room to pump the RCDT to the WHT per FNP-1(2)-SOP-50.0, step 4.1.4, to decrease RCDT level to approximately 10%.

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
_____ START TIME			
*1.	Open RCDT discharge to WHT.	Q1(2)G21V009 is turned counter-clockwise. (CUE: V009 is fully counter clockwise.)	S / U
*2.	Close RCDT pump discharge to RHT iso.	Q1(2)E21V315 is turned clockwise. (CUE: V315 is fully clockwise.)	S / U

NOTE FOR CUE IF ASKED:
RCDT ANNUNCIATORS initial conditions:

Window 11 REACTOR COOLANT DRAIN TANK HI-LO LEVEL *NOT LIT* (75%, 5% stpts)
Window 12 REACTOR COOLANT DRAIN TANK HI TEMP *NOT LIT* (170 degrees stpt)
Window 13 REACTOR COOLANT DRAIN TANK HI PRESS *LIT* (8 psig stpt)
Window 37 REACTOR COOLANT DRAIN TK RECIRC LO FLOW *LIT* (85 gpm stpt)

3.	Verify open: RCDT recirc iso RCDT outlet iso	N1(2)G21HV7144 and N1(2)G21HV7127 position lights checked on LWPP. (CUE: Red lights are lit for both valves.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
4.	Monitor RCDT pressure during pump-down. If required to maintain RCDT pressure, align the RCDT H2 supply.	Monitor RCDT pressure on N1(2)G21PI1004 to ensure pressure doesn't fall below 3# (Step 4.1.4.13). Aligning H2 should not be necessary for normal pump down. (CUE: RCDT pressure is 8#. If asked after pumping is commenced, the RCDT pressure will slowly fall, reaching 3.5# at 10% RCDT level.)	S / U
5.	Verify that RCDT LCV1003 is in manual and closed.	Q1(2)G21LCV1003 M/A station on LWPP checked to ensure in manual and closed. (CUE: LCV1003 M/A station display indications are as follows: • "M" is lit on display • the far right bargraph is at minimum • A blue dot is lit above the far right bargraph • the display above the 3 bargraphs displays "0.0".)	S / U
*6.	Request Control Room take RCDT LCV1003 handswitch on MCB to OPEN and then spring return to AUTO.	Control Room contacted to take Q1(2)G21LCV1003 switch to OPEN and returned to AUTO. (CUE: Control Room acknowledges, and LCV1003 switch has been taken to OPEN and has been returned to AUTO.)	S / U
*7.	Request Control Room take RCDT pumps disch line iso HV7136 handswitch switch on MCB to OPEN and then spring return to AUTO.	Control Room contacted to take Q1(2)G21HV7136 switch to OPEN and returned to AUTO. (CUE: Control Room acknowledges instruction, and HV7136 switch has been taken to OPEN and has been returned to AUTO.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
*8.	Open the RCDT level control valve, LCV1003, 20%-50% in manual.	Q1(2)G21LCV1003 M/A station demand raised to 20-50% by pressing up arrow until desired demand is reached. (CUE: • the far right bargraph is at approximately 40% • "39.1" is displayed above the 3 bargraphs)	S / U

NOTE FOR CUE IF ASKED:
RCDT ANNUNCIATORS initial conditions:

Window 11 REACTOR COOLANT DRAIN TANK HI-LO LEVEL *NOT LIT* (75%, 5% stpts)
Window 12 REACTOR COOLANT DRAIN TANK HI TEMP *NOT LIT* (170 degrees stpt)
Window 13 REACTOR COOLANT DRAIN TANK HI PRESS *LIT* (8 psig stpt)
Window 37 REACTOR COOLANT DRAIN TK RECIRC LO FLOW *LIT* (85 gpm stpt)

*9.	Start RCDT pump and verify flow through FI-1008.	Either RCDT pump handswitch taken to start. N1G21FI1008 checked to verify flow. (CUE: • RCDT pump red "running" light lit for pump started. • N1(2)G21FI1008 indicates ~100 gpm • Alarm clears: 37 REACTOR COOLANT DRAIN TK RECIRC LO FLOW)	S / U
10.	Monitor tank transfer.	RCDT level, pressure and flow are monitored. WHT level is monitored. (CUE: • RCDT level and pressure are falling. • Alarm clears < 8 psig: 13 REACTOR COOLANT DRAIN TANK HI PRESS • RCDT flow is stable at ~ 100 gpm. • WHT level is rising slightly.)	S / U

EVALUATION CHECKLIST

ELEMENTS:		STANDARDS:	RESULTS: (CIRCLE)
(CUE: RCDT LEVEL IS 10% AND PRESSURE IS 3.5 PSIG.)			
*11.	Secure RCDT pump.	RCDT pump handswitch is taken to off. (CUE: • Green "stopped" light is lit. • Alarm comes in: 37 REACTOR COOLANT DRAIN TK RECIRC LO FLOW)	S / U
*12.	Close RCDT LCV-1003.	Q1(2)G21LCV1003 M/A station demand lowered to 0% by depressing the down arrow. (CUE: the far right bargraph is at minimum and the display above the bargraphs indicates 0.0)	S / U
*13.	Open RCDT discharge to RHT.	Q1(2)E21V315 is turned counter-clockwise. (CUE: V315 is fully counter clockwise.)	S / U
*14.	Close RCDT discharge to the WHT.	Q1(2)G21V009 is turned clockwise. (CUE: V009 is fully clockwise.)	S / U
15.	Verify RCDT pressure PI 1004 (LWPP) between 3 and 8 psig.	PI 1004 checked. (CUE: PI 1004 indicates 3.5 psig)	
16.	Reports to CR that the RCDT pump-down is complete.	Reports to CR that the RCDT pump-down is complete, and states the RCDT must be restored to normal operation. (CUE: CR acknowledges RCDT pump-down)	S / U

_____ **STOP TIME**

Terminate when Pump Down is complete.

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

GENERAL REFERENCES:

1. FNP-1-SOP-50.0, Version 56.0
2. FNP-2-SOP-50.0, Version 54.0
3. K/As: 068K1.07 RO-2.7 SRO-2.9

GENERAL TOOLS AND EQUIPMENT:

Provide:

1. FNP-1-SOP-50.0, section 4.1.4

Or

2. FNP-1-SOP-50.0, section 4.1.4

COMMENTS:

CONDITIONS

When I tell you to begin, you are to ALIGN THE RCDT DISCHARGE TO THE WHT PER SOP-50.0. The conditions under which this task is to be performed are:

a. The RCDT is aligned per SOP-50.0A.
b. #1 RHT is on service per SOP-2.4.
c. The liquid waste system is aligned per SOP-50.0.
d. Both RCDT pumps are off and aligned for normal operation per SOP-50.0.
e. RCDT level / pressure, and WHT level has been checked.
   - RCDT level is 50%,
   - RCDT pressure is 8#,
   - WHT level is 20%.
f. You have been instructed by the control room to pump the RCDT to the WHT per FNP-1(2)-SOP-50.0, step 4.1.4, to decrease RCDT level to approximately 10%.

09/28/07 13:34:53

UNIT 1

FNP-1-SOP-50.0
July 17, 2007
Version 56.0

FARLEY NUCLEAR PLANT

SYSTEM OPERATING PROCEDURE

FNP-1-SOP-50.0

SAFETY RELATED

LIQUID WASTE PROCESSING SYSTEM

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

Approved:

Jim L. Hunter (for)
Operations Manager

Date Issued: 08/02/07

TABLE OF CONTENTS

Procedure Contains	Number of Pages

FARLEY NUCLEAR PLANT
UNIT 1
SYSTEM OPERATING PROCEDURE SOP-50.0

LIQUID WASTE PROCESSING SYSTEM

1.0 Purpose

This procedure provides the Initial Conditions, Precautions and Limitations, and Instructions for Operation of the Liquid Waste Processing System. Included are the following instructions.

4.1 Reactor Coolant Drain Tank (RCDT) Operation
- 4.1.1 RCDT system startup and recirculation
- 4.1.2 RCDT normal operation
- 4.1.3 Manual Pump Down of RCDT to RHT
- 4.1.4 RCDT Discharge to WHT
- 4.1.5 Draining refueling canal with the RCDT System to the RWST.
- 4.1.6 Filling the RCDT from the PRT
- 4.1.7 Draining Refueling Cavity Using the RCDT System and Pumping to the RHT or WHT
- 4.1.8 Processing Nozzle Dam Leakage to RHT.
- 4.1.9 Draining the RCS Loops for Maintenance Via the Reactor Coolant Drain System.
- 4.1.10 Establishing a Hydrogen Atmosphere in the RCDT.
- 4.1.11 Establishing a Nitrogen Atmosphere in the RCDT

4.2 Waste Holdup Tank (WHT) Operation

4.3 Waste Evap Condensate Tank (WECT) Operation

4.4 Chemical Drain Tank (CDT) Operation

4.5 Floor Drain Tank (FDT) System Operation

4.6 #1(2) Waste Monitor Tank (WMT) Operation

4.7 #1(2) Waste Monitor Tank (WMT) Recirculation

4.8 Educting Diaphragm on WECT

4.9 Laundry and Hot Shower Tank (LHST) Operation

4.10 Manually Draining Refueling Cavity to CTMT Sump

4.11 Alternate Processing of the FDT to the WHT

4.12 Draining the Cask Wash area to the FDT

Appendix 1	Measurement of Floor Drain Tank Pump Recirc Line Flow.
Appendix 2	Floor Drain Tank Filter Isolation for Filter Replacement.
Appendix 3	Floor Drain Tank Strainer Isolation for Basket Cleaning or Replacement.
Appendix 4	LHST Strainer Isolation for Basket Cleaning or Replacement.
Appendix 5	Processing FDT Using Temporary Demin Liner
Appendix 6	Use of the RCDT LCV-1003 Controller

2.0 Initial Conditions

2.1 The electrical distribution system is energized and aligned for normal operation per system checklist FNP-1-SOP-36.0, PLANT ELECTRICAL DISTRIBUTION LINE-UP, with exceptions noted.

2.2 The compressed air system is in service and aligned for normal operation per FNP-1-SOP-31.0, COMPRESSED AIR SYSTEM, with exceptions noted.

2.3 The liquid waste processing system valves are aligned per system checklist FNP-1-SOP-50.0A-E, LIQUID WASTE PROCESSING SYSTEM, with exceptions noted.

2.4 Component cooling water system is aligned per FNP-1-SOP-23.0, COMPONENT COOLING WATER SYSTEM, to supply water to the waste evaporator condenser, distillate cooler, vent condenser, and RCDT heat exchanger. This initial condition may be waived by the Shift Supervisor if not required to support the activity being performed.

2.5 A hydrogen blanket has been established in the RCDT and is being maintained at a pressure between three and eight psig per Section 4.1.10. This initial condition may be waived by the Shift Supervisor if not required to support the activity being performed.

2.6 Solid Waste Processing System aligned per FNP-1-SOP-49.0A, SOLID WASTE PROCESSING SYSTEM, and FNP-1-SOP-49.0B, STEAM GENERATOR BLOWDOWN SPENT RESIN STORAGE SYSTEM.

2.7 The WHT to Recycle Evap. Spoolpiece and the R.E.C. Filter to WECT Spoolpiece are both removed and blind flanges are installed.

3.0 Precautions and Limitations

3.1 Due to the presence of radioactive or potentially radioactive materials within the confines of the liquid waste processing system, constant vigilance must be exercised over system piping, valves, tanks, and other components whether in operation or shutdown. Pre-operational checks and normal routine operations and surveillance should include visual checks for system deterioration, component leakage, and correct system line-up which if not detected and corrected could subsequently result in the release of radioactive liquid to the immediate area, the environment, or other parts of this system.

3.2 Radiation monitor R-18 must be operable and in service during liquid waste discharge to the river except as permitted by technical specifications.

3.3 IF R-18 becomes inoperable while discharging liquid waste to the river, THEN the discharge must be stopped immediately.

3.4 The Shift Supervisor or Shift Support Supervisor shall be notified any time R-18 is taken out of service or becomes inoperable.

3.5 A Radioactive Liquid Release Permit must be completed and approved prior to discharging radioactive liquid to the river.

3.6 Verify that tanks aligned to receive liquid waste discharge have sufficient capacity to receive the liquid.

3.7 Tank levels shall be monitored periodically during processing, discharge or transfer of liquid waste. For processing or transfers, the levels of the source tank and the destination tank should be determined. The approximate flow rate should be considered and used to determine an approximate completion time. Tank levels shall be checked prior to the estimated completion of the processing or transfer such that sufficient margin exists to prevent tank overflow. At no time should the High Level Alarm be relied upon for securing the processing or transfer of a tank. To preclude overflow, waste tanks should not be filled to greater than 95%.

3.8 A deficiency report should be written to replace liquid waste system filters when the ΔP increases to greater than 20 psid.

3.9 Caution should be exercised when pumping liquids to ascertain that affected pumps do not lose suction.

3.10 Once a WMT has been placed on recirculation for sampling purposes, prior to discharging to the environment, the tank shall remain in an isolated condition to prevent the introduction of any liquids which could alter the concentrations of the tanks contained volume.

3.11 WECT should not be drained less than 5% to prevent admission of air under the diaphragm.

3.12 Sample source tank for activity prior to transfer from Unit 1 to Unit 2.

3.13 When filling the WMT's, estimate the time that the WMT tank will reach 80% level. The estimated time to reach 80% may be determined by timing the WMT level increase for at least 5% and extrapolating the time to reach 80%. WHEN the WMT reaches 80%, THEN continuously monitor the WMT level indication to ensure the WMT filling is secured at the desired level. (IR 2-96-167)

4.0 Instructions

4.1 Reactor Coolant Drain Tank (RCDT) Operation.

4.1.1 RCDT system startup and recirculation

> **NOTE: IF necessary to establish adequate recirc flow to keep an RCDT pump running, THEN RCDT RECIRC VALVE N1G21HV7143 may be opened. This condition should be tracked using a caution tag or administrative tracking item to ensure that it is restored when recirc is no longer required.**

4.1.1.1 RCDT system is aligned per system checklist FNP-1-SOP-50.0A.

4.1.1.2 RCDT level is greater than 20%.

4.1.1.3 Verify open the following valves:

- RCDT RECIRC ISO N1G21HV7144 (LWPP)
- RCDT OUTLET ISO N1G21HV7127 (LWPP)

4.1.1.4 Verify that RCDT LCV Q1G21LCV1003 (Q1G21V064) is in manual and closed (LWPP)

4.1.1.5 Start an RCDT pump.

4.1.1.6 IF desired to adjust tank level while on recirc, THEN adjust RCDT LCV Q1G21LCV1003 (Q1G21V064) as required in manual or automatic to control RCDT level.

4.1.2 RCDT normal operation

NOTES:

- **Venting of the RCDT should be performed as needed in accordance with FNP-1-SOP-51.0, WASTE GAS SYSTEM.**
- **The RCDT should be pumped down periodically per sections 4.1.3 or 4.1.4 to maintain parameters within the following bands:**

	MIN	**MAX**
RCDT Level	**5%**	**75%**
RCDT Pressure	**3 PSIG**	**8 PSIG**
RCDT Temp	**N/A**	**170° F**

4.1.2.1 Place both RCDT pumps in pull to lock.

4.1.2.2 Verify that RCDT LCV Q1G21LCV1003 (Q1G21V064) is in manual and closed (LWPP)

4.1.2.3 Take RCDT LCV Q1G21LCV1003 (Q1G21V064) selector switch on MCB to OPEN and then spring return to AUTO.

4.1.2.4 Take RCDT PUMPS DISCH LINE ISO Q1G21HV7136 (Q1G21V006) handswitch on MCB, to OPEN and then spring return to AUTO.

4.1.2.5 WHEN necessary to lower tank level or pressure, THEN perform Section 4.1.3 to pump to the RHT OR 4.1.4 to pump to the WHT.

4.1.3 Manual Pump Down of RCDT to RHT

4.1.3.1 Verify open the following valves:

- RCDT RECIRC ISO N1G21HV7144 (LWPP)
- RCDT OUTLET ISO N1G21HV7127 (LWPP)

4.1.3.2 IF required to maintain RCDT pressure by addition of hydrogen, THEN perform the following:

a. Verify pressure controller H2 SUPP TO RCDT Q1G21HV7155 (Q1G21V063) set to maintain 3 psi. (155' Plant Grounds)

b. Open H_2 bottle isolation.

c. Open H2 BOTTLE TO RCDT ISO, N1G21V340.

d. Verify open H2 SUPP TO RCDT, N1G21V285 (at H_2 Bottle) with the bottle regulator set for approximately 20 psi.

4.1.3.3 Verify that RCDT LCV Q1G21LCV1003 (Q1G21V064) is in manual and closed (LWPP)

4.1.3.4 Take RCDT LCV Q1G21LCV1003 (Q1G21V064) selector switch on MCB to OPEN and then spring return to AUTO.

4.1.3.5 Take RCDT PUMPS DISCH LINE ISO Q1G21HV7136 (Q1G21V006) handswitch on MCB, to OPEN and then place in AUTO.

4.1.3.6 Place RCDT LCV, Q1G21LCV1003 (Q1G31V064) in MANUAL and open 20-50%. (LWPP)

4.1.3.7 Start 1A(B) RCDT pump, and verify flow through FI 1008 (LWPP).

4.1.3.8 WHEN desired level is reached, THEN stop 1A(B) RCDT pump.

4.1.3.9 Close RCDT LCV, Q1G21LCV1003 (Q1G21V064) (LWPP).

4.1.3.10 Verify RCDT pressure PI 1004 (LWPP) between 3 and 5 psi.

4.1.3.11 IF opened in Step 4.1.3.2, THEN perform the following:

a. Close H_2 bottle isolation.

b. Close H2 BOTTLE TO RCDT ISO, N1G21V340.

4.1.3.12 Restore the RCDT to normal operation per Section 4.1.2.

4.1.4 RCDT Discharge to WHT

NOTE:	**<u>IF</u> no RCDT pumps are operable, <u>THEN</u> it is permissible to gravity drain to WHT.**

4.1.4.1 Open RCDT DISCH TO WHT, Q1G21V009 (1-LWP-V-7137).

4.1.4.2 Close RCDT PUMP DISCH TO RHT ISO, Q1E21V315 (1-CVC-V-8551).

4.1.4.3 Verify open the following valves:

- RCDT RECIRC ISO N1G21HV7144 (LWPP)
- RCDT OUTLET ISO N1G21HV7127 (LWPP)

4.1.4.4 <u>IF</u> required to maintain RCDT pressure by addition of hydrogen, <u>THEN</u> perform the following:

a. Verify pressure controller H2 SUPP TO RCDT Q1G21HV7155 (Q1G21V063) set to maintain 5 psi. (155' Plant Grounds)

b. Open H_2 bottle isolation.

c. Open H2 BOTTLE TO RCDT ISO, N1G21V340.

d. Verify open H2 SUPP TO RCDT, N1G21V285 (at H_2 Bottle) with regulator set for approximately 20 psi.

4.1.4.5 Verify that RCDT LCV Q1G21LCV1003 (Q1G21V064) is in manual and closed (LWPP)

4.1.4.6 Take RCDT LCV Q1G21LCV1003 (Q1G21V064) selector switch on MCB to OPEN and then spring return to AUTO.

4.1.4.7 Take RCDT PUMPS DISCH LINE ISO Q1G21HV7136 (Q1G21V006) handswitch on MCB, to OPEN and then spring return to auto AUTO.

4.1.4.8 Place RCDT LCV, Q1G21LCV1003 (Q1G31V064) in MANUAL and open 20-50%. (LWPP)

4.1.4.9 Start 1A(B) RCDT pump, and verify flow through FI 1008 (LWPP).

4.1.4.10 WHEN desired level is reached, THEN stop 1A(B) RCDT pump.

4.1.4.11 Close RCDT LCV, Q1G21LCV1003 (Q1G21V064) (LWPP).

4.1.4.12 Realign valves as follows:

- Open RCDT PUMP DISCH TO RHT ISO, Q1E21V315 (1-CVC-V-8551).
- Close RCDT DISCH TO WHT Q1G21V009 (1-LWP-V-7137).

4.1.4.13 Verify RCDT pressure PI 1004 (LWPP) between 3 and 8 psi.

4.1.4.14 IF opened in Step 4.1.4.4, THEN perform the following:

a. Close H_2 bottle isolation.

b. Close H2 BOTTLE TO RCDT ISO, N1G21V340.

4.1.5 Draining refueling canal with the RCDT System to the RWST.

4.1.5.1 Stop all operating RCDT pumps.

4.1.5.2 Close RCDT OUTLET ISO N1G21HV7127 (N1G21V006).

4.1.5.3 Close RCDT RECIRC ISO N1G21HV7144 (N1G21V106).

4.1.5.4 Verify closed RCDT DISCH TO WHT Q1G21V009 (1-LWP-V-7137).

4.1.5.5 Verify closed RCDT PUMP DISCH TO RHT ISO, Q1E21V315 (1-CVC-V-8551).

4.1.5.6 Verify closed PRESSURIZER RELIEF TANK DRN N1B13V002 (N1B13HV8031).

4.1.5.7 Verify SFP purification loop is not in operation per FNP-1-SOP-54.0, SPENT FUEL PIT COOLING AND PURIFICATION SYSTEM.

APPENDIX 6

Use of the RCDT LCV-1003 Controller
(Q1G21LCV1003)

1. To select Automatic (AUTO) or Manual (MAN) mode of operation, press the **A/M** button on the keypad. The graphics display will have either A or M highlighted to show the selected mode.

2. In Manual, depressing Δ or ∇ controls the valve position. Valve position is monitored on the right hand bargraph display.

3. In Automatic, depressing Δ or ∇ controls the setpoint. The setpoint can be monitored on the left hand bargraph display.

4. To change the setpoint of LCV-1003 with the valve controller in Manual:

   a. Select the left-hand bargraph display by depressing **SEL** and observing the blue dot above the bargraph displays.

   b. Depress Δ or ∇ to control the setpoint. The bargraph will move up or down and the digital display will show the setpoint.

General Notes:

1. The new controller is a FOXBORO 760 series, microprocessor based, multi display system.

2. It has three "bargraph" LCD displays. From left they are:

   a. **Setpoint** - this shows the AUTO setpoint for RCDT level.

   b. **Variable** - this shows the actual RCDT level.

   c. **Demand** - this shows the demanded position of LCV-1003.

3. The digital display above the bargraphs gives a readout for whichever bargraph is currently selected.

4. The keypad on the lower Section of the controller has eight buttons:

Δ	-	to increase the selected variable.
∇	-	to decrease the selected variable.
W/P	-	not used
R/L	-	not used
A/M	-	selects Auto or Manual
SEL	-	selects the function for the up/down buttons and the bargraph display which will have the digital display. Also used by I&C.
TAG	-	used by I&C.