Facility:	HB ROBINSON	Task No.:	01002100402
Task Title:	Perform the RCS Leakage Surveillance Procedure	JPM No.:	2011-2 NRC JPM Admin RO A1-1
K/A Reference:	G2.1.7 (RO 4.4)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

<u>Method of testing:</u>

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

Task Standard: Candidate calculates the Unidentified and Identified Leakage.

Required Materials: OST-051 Reactor Coolant System Leakage Evaluation
Station Curve 8.10, RCDT Level
Calculator

General References: OST-051 Reactor Coolant System Leakage Evaluation
Station Curve 8.10, RCDT Level

Handouts: OST-051 Reactor Coolant System Leakage Evaluation, Revision 45 marked up to the step for verifying current RCS temperature is equal to initial RCS temperature (Step 8.1.7.1). Attachment 10.1 must be marked with the initial parameter values and Attachment 10.5 marked with collected data.

Time Critical Task: NO

Validation Time: 15 minutes

Initial Conditions:	Plant is at 50% RTP. You are the Reactor Operator.
Initiating Cue:	The previous shift started OST-051, Reactor Coolant System Leakage Evaluation. The plant has remained at steady state, with NO automatic make-ups for ONE (1) hour.

Complete the provided procedure through Step 8.1.10.3.

These final parameter values were recorded 60 minutes after the procedure was started except as noted for PRT and RCDT levels:

- RCS Temperature: 562ºF
- VCT Level: 20.8 inches
- PZR Level: 45%
- PZR RELIEF TANK: 70.9% (24 hour data)
- Accumulator A: 72%
- Accumulator B: 71%
- Accumulator C: 74%
- RCDT: 19% (12 hour data)
- Charging Pump Leakoff Collection Tank: 32%
- Attachment 10.5, Components with Known Measured Leakage, has leakage on valve LCV-115B outlet flange that has been measured during the performance of OST-051 at 1000 ml in a 5 minute period.

(Denote Critical Steps with an asterisk)

Performance Step: 1 Candidate obtains copy of the marked up OST-051.

Standard: Candidate reviews the partially completed OST-051.

Examiner's NOTE: **Provide candidate with a copy of the marked up Procedure and Attachment.**

Comment:

Performance Step: 2 WHEN at least 1 hour has elapsed, OR IF required by plant conditions to end this test, THEN perform the following: (Step 8.1.7.1, 2, 3).

1. Verify RCS temperature is equal to initial RCS temperature recorded on Attachment 10.1.
2. Record the Final Values for the parameters listed on Attachment 10.1.
3. Verify LCV-115A, VCT HLDP TK DIV, in the AUTO position.

Standard: RCS temperature is equal to the initial RCS temperature at the beginning of the OST.

Final values have been recorded on Attachment 10.1.

LCV-115A control switch has been placed in the AUTO position.

Examiner's NOTE:

Examiner's CUE **LCV-115A has been placed in AUTO.**

Comment:

Procedure NOTE: **A decrease in VCT level represents plus (+) RCS leakage.**

A decrease in Pressurizer level represents plus (+) RCS leakage.

* **Performance Step: 3** Calculate the Difference and Change in Volume for the parameters listed on Attachment 10.1 (Step 8.1.8).

Standard: Operator completes the Difference and Change in Volume calculations as directed on Attachment 10.1 (See KEY).

Examiner's NOTE:

Comment:

Performance Step: 4 Perform a peer check of the calculated values listed in Attachment 10.1. (Step 8.1.9)

Standard: Candidate requests a peer check for the calculations performed.

Examiner's NOTE:

Examiner's CUE: **State that a peer check has been performed.**

Comment:

Procedure NOTE: **A plus (+) calculated Total RCS Leakage Rate represents plus (+) RCS leakage.**

Leak-rates (in gpm) on Attachment 10.2 should be rounded to two decimal places.

* **Performance Step: 5** On Attachment 10.2, Perform the following: (Step 8.1.10)

- Calculate the Total RCS Leakage Rate.
- Calculate the Identified RCS Leakage Rate.
- Calculate the Unidentified RCS Leakage Rate.
- Perform a peer check of the calculations performed on Attachment 10.2.

Standard: Candidate completes the Total, Identified and Unidentified leakage calculations as directed on Attachment 10.2 (See KEY).

Candidate requests a peer check of the calculations performed on Attachment 10.2.

Examiner's NOTE:

Examiner's CUE: **Once the RO candidate has performed the Total, Identified and Unidentified RCS Leakage Rate calculations, inform them that they have completed the JPM task.**

Comment:

<u>END OF TASK</u>

Termination Cue: When the RCS leakage rate calculation is completed, the evaluation for this JPM is complete.

STOP TIME:________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC Admin JPM RO A1-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________ Date: ______________

INITIAL CONDITIONS: Plant is at 50% RTP.

You are the Reactor Operator.

INITIATING CUE: The previous shift started OST-051, Reactor Coolant System Leakage Evaluation. The plant has remained at steady state, with NO automatic make-ups for ONE (1) hour.

Complete the provided procedure through Step 8.1.10.3.

These final parameter values were recorded 60 minutes after the procedure was started <u>except as noted for PRT and RCDT levels</u>:

- RCS Temperature: 562°F
- VCT Level: 20.8 inches
- PZR Level: 45%
- PZR RELIEF TANK: 70.9% (24 hour data)
- Accumulator A: 72%
- Accumulator B: 71%
- Accumulator C: 74%
- RCDT: 19% (12 hour data)
- Charging Pump Leakoff Collection Tank: 32%
- Attachment 10.5, Components with Known Measured Leakage, has leakage on valve LCV-115B outlet flange that has been measured during the performance of OST-051 at 1000 ml in a 5 minute period.

Answer Key

Progress Energy

C
Continuous
Use

ROBINSON NUCLEAR PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

OST-051

REACTOR COOLANT SYSTEM LEAKAGE EVALUATION (EVERY 72 HOURS DURING STEADY STATE OPERATION AND WITHIN 12 HOURS AFTER REACHING STEADY STATE OPERATION)

REVISION 45

SUMMARY OF CHANGES
PRR #00448048
OST-051, Revision 45

STEP	REVISION COMMENTS
8.1.14.3	Added "**PERFORM** Peer Check of data entry fields prior to uploading any data." PRR 00448048
Note prior to 8.1.14	Deleted V:\Drive Link and added "N:\NGGWEB\RNP\Departments\Operations\RCS Leakage Program" PRR 00450337
Attachment 10.4 note prior to 3.a.2.b	Added "There is a single valve outside of containment to obtain this sample in pipe alley WD-1731A, RCDT Discharge Header to WHUT Drain." PRR 00453076
Attachment 10.4 3.a.2.b	Revised step to notify E&RC to obtain sample and analyze for activity and boron concentration IAW CP-003.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To evaluate RCS leakage and to satisfy Improved Technical Specification Surveillance Requirement (ITS SR) 3.4.13.1.

1.2 This test is required when in Modes 1, 2, 3 or 4. ITS SR 3.4.13.1 basis further defines the applicable conditions as "within 12 hours after reaching continuous steady state operation."

1.3 This test may be performed when in Mode 5 as long as the RCS is pressurized, there is a bubble in the Pressurizer and RCS/RHR temperature is constant. However, a test under these conditions will not satisfy ITS SR 3.4.13.1.

1.4 This procedure supports the License Renewal Aging Management Program Boric Acid Corrosion Program by providing RCS leakage monitoring criteria (Reference 2.11).

2.0 REFERENCES

2.1 Improved Technical Specifications LCO 3.4.13 and ITS 1.1 Definition of LEAKAGE

2.2 AP-030, NRC Reporting Requirements

2.3 EPCLA-01, Emergency Control

2.4 EGR-NGGC-0207, Boric Acid Corrosion Control (Generic Letter 88-05)

2.5 AOP-016, Excessive Primary Plant Leakage

2.6 OMM-015, Operations Surveillance Testing

2.7 ESR 94-471, Calculation for VCT Level vs. Volume

2.8 PLP-037, Conduct of Infrequently Performed Test or Evolutions and Pre-Job Briefs

2.9 CP-014, Primary-To-Secondary Leak Rate Calculation

2.10 SOER 97-1, Potential Loss of High Pressure Injection and Charging from Gas Intrusion (Credit taken for monitoring VCT level to address recommendation #1 of the SOER)

2.11 RNP-L/LR-0601, Aging Management Program, Boric Acid Corrosion Program

2.12 PWROG Letter, OG-07-286, Dated June 26, 2007 entitled "Recommendations for Implementation of Guidelines for PWROG RCS Leak Rate Programs"

2.13 PWROG Letter, OG-08-400 Dated November 19, 2008 entitled "Clarification of the Recommendation of Guidelines for PWROG RCS Leakage Rate Program with Respect to NEI-03-08 (PA-OSC-0189 and PA-OSC-0218)

2.14 WCAP-16423-NP, Pressurized Water Reactor Owners Group Standard Process and Methods for Calculating RCS Leak Rate for Pressurized Water Reactors

2.15 WCAP-16465-NP, Pressurized Water Reactor Owners Group Standard RCS Leakage Action Levels and Response Guidelines

3.0 RESPONSIBILITIES

3.1 Operations is responsible for:

3.1.1 Performance, review, and approval of this test.

3.1.2 Updating of the RCS Leakage Monitoring Spreadsheet after each performance of the surveillance.

3.2 Engineering is responsible for:

3.2.1 Development and maintenance of the RCS Leakage Monitoring Spreadsheet.

3.2.2 Establishment and updating of baseline mean (μ) and standard deviation (σ) values.

4.0 PREREQUISITES

INIT

4.1 This revision has been verified to be the latest revision available. Today Date

4.2 The Shift Manager has given permission to conduct this test. Today Date

4.3 RCS temperature is stable.

4.4 There is a bubble in the Pressurizer

NOTE: ITS SR 3.4.13.1 requires performance of this test within 12 hours after reaching steady state operating conditions in Modes 1, 2, 3, or 4. This test may be performed when stable in Mode 5 but only for tracking and trending purposes, not to satisfy the ITS SR requirements.

4.5 RCS pressure is stable.

4.6 Record RCS pressure. 2235 psig

4.7 Record Plant Mode. Mode 1

5.0 PRECAUTIONS AND LIMITATIONS

5.1 The accuracy of the RCS Leakage Rate Test is greatly improved when RCS temperature and Pressurizer level remain constant for the duration of the test.

5.2 This procedure should not be started unless the VCT level is high enough to avoid an automatic makeup during the performance of the RCS Leakage Rate Test.

5.3 Any steps not applicable shall be marked N/A and the reason(s) for any N/A noted in the Comments section of Attachment 10.6.

5.4 The principles of ALARA shall be used in planning and performing work and operations in the Radiation Control Area.

5.5 This procedure has been screened IAW PLP-037 criteria and determined to be outside the bounds of an Infrequently Performed Test or Evolution.

5.6 **IF** RCS pressure boundary **LEAKAGE** is verified, **THEN** the reactor shall be placed in Mode 3 within 6 hours and in Mode 5 within 36 hours of discovery of pressure boundary leakage. Pressure boundary **LEAKAGE** is leakage (except SG leakage) through a non-isolable fault in an RCS component body, pipe wall, or vessel wall. (ITS LCO 3.4.13)

5.7 For the purpose of this procedure, IDENTIFIED RCS Leakage is leakage collected in either the PRT, the RCDT, a Safety Injection Accumulator, or the Charging pump Seal Leak-off Collection Tank. This type of RCS leakage is through seat leakage, **NOT** through wall **OR** RCS Pressure Boundary (RCPB) leakage. This type leakage is **NOT** to be confused with Miscellaneous Identified RCS Leakage as it may be related to interconnected systems outside the RCS Pressure Boundary (See P&L 5.13).

5.8 Whenever possible, use the ERFIS Computer for data collection. This will improve accuracy and reduce the potential for human error.

5.9 The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during xenon transients or when in AOP-016, Excessive Primary Plant Leakage.

5.10 To improve the accuracy of the Pressurizer Relief Tank (PRT) level changes calculated during this procedure, a long term trend should be used for data collected from ERFIS. Duration of the long term PRT trend should be any period of stable PRT operation up to 24 hours. Due to possible evolutions affecting the PRT, the duration of the trend will be decided by the operator performing this test.

5.11 **IF** R-11 is increasing and cannot be attributed to any specific leak location based on search results with the unit on line, **THEN** a task should be added to the forced outage schedule to inspect normally inaccessible areas for indication of leakage to the maximum extent practical.

5.12 To improve the accuracy of the Reactor Coolant Drain Tank (RCDT) level changes calculated during this procedure, a long term trend should be used for data collected from LI-1003. Duration of the long term RCDT trend should be any period of stable RCDT operation up to 12 hours. Due to possible evolutions affecting the RCDT, the duration of long term trend will be determined by the SM/CRS.

5.13 Component leakage (valve packing, pump seal, fitting leakage, etc.) from accessible sources may only be treated as Miscellaneous Identified leakage if the source has been identified **AND** the actual value of the leakage is obtained by a measurement taken at the start or during the data taking interval for the surveillance test. The leakage must be measured each time the OST is performed if it is to be credited towards Miscellaneous Identified RCS Leakage. Each component leak must have an active Work Order.

5.14 This procedure has been reviewed and found to be not applicable as per the requirements of OPS-NGGC-1306, Reactivity Management.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 Calibrated Stop Watch (If needed to collect Miscellaneous RCS Identified Leakage)

6.2 Graduated Container (If needed to collect Miscellaneous RCS Identified Leakage)

7.0 ACCEPTANCE CRITERIA

7.1 This test is acceptable if:

- Unidentified RCS Leakage Rate does **NOT** exceed 1 gpm
- Identified RCS Leakage Rate does **NOT** exceed 10 gpm
- Primary-to-Secondary leakage does **NOT** exceed 75 gpd through any one steam generator as determined by CP-014.

7.2 The reviewing and approving authorities may accept this test in accordance with provisions set forth in OMM-015, Operations Surveillance Testing.

8.0 PROCEDURE

INIT

8.1 RCS Leakage Rate Test

8.1.1 **VERIFY** RCS MAKEUP MODE in the AUTO position. JM

8.1.2 **VERIFY** RCS MAKEUP SYSTEM is ON. JM

8.1.3 **IF** desired, **THEN PLACE** LCV-115A, VCT/HLDP TK DIV, in the VCT position. N/A

NOTES:	Whenever possible, use the ERFIS computer for data collection. This will improve accuracy and reduce the potential for human error. The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during a xenon transient or when in AOP-016, Excessive Primary Plant Leakage. Measurement of leakage in Step 8.1.4.c, and the calculation of Total Measured Leakage in Step 8.1.4.d may be performed immediately prior to or at any time during the duration of this test. The following step may be N/A if there is no active leakage issuing from components previously identified by work order.

8.1.4 **IF** there are any components that have known, active leakage, where the source is identified and can be treated as Miscellaneous Identified RCS Leakage or Known Non-RCPB Leakage per P&L 5.7 and P&L 5.13, **THEN PERFORM** the following on Attachment 10.5:

a. **LIST** the actively leaking component(s) JM

b. **RECORD** the Work Order number(s) for the component(s) JM

c. **RECORD** the measured leakage for the component(s) JM

d. **CALCULATE** the Total Measured Leakage ______

______
Peer Check

8.1.5 **RECORD** the Initial Values for the parameters listed on Attachment 10.1. JM

INIT

8.1.6 **IF** an automatic makeup occurs, **THEN PERFORM** the following:

1. **VERIFY** LCV-115A, VCT/HLDP TK DIV, in the AUTO position. N/A

2. **STOP** this procedure **AND NOTE** reason in Comments section. N/A

NOTES:	When this procedure is being performed to satisfy ITS SR 3.4.13.1, the preferred duration is greater than or equal to 1 hour and the minimum duration 15 minutes. When this procedure is being performed as directed by an AOP, there is not a minimum duration requirement.

8.1.7 **WHEN** at least 1 hour has elapsed, **OR, IF** required by Plant conditions to end this test, **THEN PERFORM** the following:

1. **VERIFY** RCS temperature is equal to initial RCS temperature recorded on Attachment 10.1. ____

2. **RECORD** the Final Values for the parameters listed on Attachment 10.1. ____

3. **VERIFY** LCV-115A, VCT/HLDP TK DIV, in the AUTO position. ____

NOTES:	A decrease in VCT level represents plus (+) RCS leakage. A decrease in Pressurizer level represents plus (+) RCS leakage.

8.1.8 **CALCULATE** the Difference and Change in Volume for the parameters listed on Attachment 10.1. ____

8.1.9 **PERFORM** a peer check of the calculated values listed in Attachment 10.1. ____

INIT

NOTES:	A plus (+) calculated Total RCS Leakage Rate represents plus (+) RCS leakage. Leak-rates (in gpm) on Attachment 10.2 should be rounded to two decimal places.

8.1.10 On Attachment 10.2, **PERFORM** the following:

1. **CALCULATE** the Total RCS Leakage Rate. ____
2. **CALCULATE** the Identified RCS Leakage Rate. ____
3. **CALCULATE** the Unidentified RCS Leakage Rate. ____
4. **PERFORM** a peer check of the calculations performed on Attachment 10.2 ____

8.1.11 **IF** unidentified RCS leakage is greater than 1.0 gpm **OR** the identified RCS leakage is greater than 10 gpm, **THEN PERFORM** the following:

1. **CONSULT** ITS LCO 3.4.13 for required actions. ____
2. **CONSULT** AP-030 for reporting requirements. ____
3. **CONSULT** EPCLA-01 for emergency action levels. ____
4. **CONSULT** AOP-016 for required actions. ____

8.1.12 **IF** RCS unidentified leakage is ≥ 0.05 gpm **AND** any valid R-24 monitor alarm **OR** any R-19 monitor indicates an increasing trend, **THEN** contact E&C Technician to perform Primary to Secondary Leakage Calculation for each steam generator in accordance with CP-014. (ITS LCO 3.4.13.d) ____

Primary to Secondary Leakage__________ gpd

INIT

8.1.13 **IF** unidentified RCS leakage is equal to or greater than 0.03 gpm for 3 consecutive leak rate calculations, **THEN** perform the following:

1. Start an investigation immediately and inform plant staff. ____

2. **IF** not currently in progress, **THEN** start daily leak rate calculations. ____

NOTE:	The RCS Leakage Monitoring Spreadsheet can be located at N:\NGGWEB\RNP\Departments\Operations\RCS Leakage Program or accessed from the OPS Tool Database

8.1.14 **Update** the RCS Leakage Monitoring Spreadsheet as follows:

1. **LOG** date and time. ____

2. **ENTER** RCS Identified and Unidentified RCS leakage. ____

3. **PERFORM** Peer Check of data entry fields prior to uploading any data. ____

4. **CLICK** UPLOAD DATA. ____

8.1.15 **RECORD** the following Unidentified Leak Rate data from the RCS Leakage Monitoring Spreadsheet:

1. Current Mean (μ) value _____gpm ____

2. Current Sigma (σ) value _____gpm ____

3. Current [μ + 2σ] value _____gpm ____

4. Current [μ + 3σ] value _____gpm ____

5. 7 Day Rolling Average _____gpm ____

6. Number of Consecutive Days greater than (μ) _____days ____

7. Last 3 Daily Unidentified Leak Rates

   ______gpm ______gpm _______gpm ____

INIT

8.1.16 Evaluate Unidentified Leakage against the Action Level Criteria Below:

Action Level	Action Level Limit Description	Action Level Exceeded (Circle One)
Tier One Action Level	7-day rolling average of **daily** Unidentified RCS leak rates is greater than 0.1 gpm	YES / NO
	Nine consecutive **daily** unidentified RCS leakage values > mean (μ)	YES / NO
Tier Two Action Level	Two consecutive **daily** Unidentified RCS leak rates are greater than 0.15 gpm	YES / NO
	Two of three consecutive **daily** Unidentified leak rates greater than [μ+2σ]	YES / NO
Tier Three Action Level	One **daily** Unidentified RCS leak rate is greater than 0.3 gpm	YES / NO
	One **daily** Unidentified RCS leak rate is greater than [μ+3σ]	YES / NO

8.1.17 **IF** any Unidentified RCS leakage Action Level (AL) is exceeded, **THEN PERFORM** the following:

1. **REVIEW** and implement the appropriate actions of Attachment 10.4, Action Level Response Guidelines while continuing with this procedure. ____

2. **INITIATE** an Action Plan IAW PLP-121 to document actions taken. ____

8.1.18 **UPDATE** leakage rate on Control Room status board. ____

8.1.19 **IF** Attachment 10.4, Action Level Response Guidelines was required, **THEN ATTACH** it to this OST when submitting to Records. ____

9.0 RECORDS

9.1 Completed procedure, included completed partials shall be retained as a non-permanent QA record

10.0 ATTACHMENTS

10.1 Leakage Evaluation Data Sheet

10.2 Leakage Evaluation Calculation Sheet

10.3 Level to Gallons Conversion Table

10.4 Action Level Response Guidelines

10.5 Components with Known Measured Leakage

10.6 Surveillance Test Procedure Certification and Review Form

LEAKAGE EVALUATION DATA SHEET

REF STEP	ITEM	VCT LVL (5) LI-115 or LI-112	PZR LVL (5) LI-459A or LI-460	RCS TEMP (5) T_{avg} ≥540°F TR-408 T_{avg} <540°F TR-413	PZR RELIEF TANK (1) (7) LI-470 1440 minutes	ACCUM "A" (5) (6) LI-920 or LI-922	ACCUM "B" (5) (6) LI-924 or LI-926	ACCUM "C" (5) (6) LI-928 or LI-930	RCS DRAIN TANK LI-1003 (2) 120 Minutes	CHARGING PUMP LEAK OFF COLL. TANK LIC-200 (3)	TIME
8.1.5	Initial Values	24.0 in	45 %	562 °F	Date/Time 70.2 % / 7094.5 gal(1)	72 %	71 %	74 %	Date/Time 10 % / 45 gal(2)	10 % / 2.33 gal(3)	1815
8.1.7.2	Final Values	20.8 in	45 %	562 °F	Date/Time 70.9 % / 7162.75 gal(1)	72 %	71 %	74 %	Date/Time 19 % / 77 gal(2)	32 % / 11.84 gal(3)	1915
8.1.8	Difference (+/-)	3.2 in	0 %		68.25 gal	0 %	0 %	0 %	32 gal	9.51 gal	60 min(4)
Multiplier		23.99 gal/in	50.56 gal/%			7 gal/%	7 gal/%	7 gal/%			
8.1.8	Change in Volume (gals)	76.768	0		68.25	0	0	0	32	9.51	

Comments

ATTACHMENT 10.1
Page 2 of 2

(1) Use Curve Book, Curve 8.23 or Attachment 10.3, to convert PRT level into gallons **OR** mark as N/A if level did not increase.

(2) Use Curve Book, Curve 8.10, to convert RCDT level into gallons <u>OR</u> mark as N/A if level did not increase. To improve the accuracy of the Reactor Coolant Drain Tank (RCDT) level changes calculated during this procedure, a long term trend should be used for data collected from LI-1003. A spreadsheet was developed to log RCDT levels that would provide a graph of the RCDT Trend. The file is located at V:\Operations\STA\RCDT Level. This graph or an ERFIS plot should be monitored for changes in inleakage rates into the RCDT. Duration of the long term RCDT trend should be any period of stable RCDT operation up to 12 hours. (Actual duration of long term trend will be determined by the SM/CRS).

(3) Use Curve Book, Curve 8.22 or Attachment 10.3, to convert Charging Pump Leak-off Collection Tank level into gallons or mark as N/A if level did not increase.

(4) Minimum test duration of 15 minutes is required when performing this procedure to satisfy ITS SR 3.4.13.1.

(5) Circle the respective indicator/indication used. **IF** ERFIS is in service, **THEN** use it to obtain values. **IF** ERFIS is not in service, **THEN** obtain the values from the respective RTGB indicators **AND** make a comment in the Comments section that RTGB indicators were used for the OST.

(6) An increase in SI Accumulator is (+) RCS Leakage. **IF** the increase is due to SI Accumulators sluicing from one accumulator to another, **THEN** do not include the change in the identified RCS leakage rate. A decrease in SI Accumulator is (-) RCS leakage **ONLY IF** RCS pressure is less than SI Accumulator pressure.

(7) PZR RELIEF TANK Level Initial & Final should be collected from ERFIS using long term trend up to 24 hours of Stable PRT Operation. An ERFIS plot should be monitored for changes in inleakage rates into the PRT. Duration of the long term PRT trend should be any period of stable PRT operation up to 24 hours. (Actual duration of long term trend will be determined by the SM/CRS)

LEAKAGE EVALUATION CALCULATION SHEET

Total RCS Leakage Rate			Tolarances
VCT Volume Change Test Duration	76.768 gal 60 min	1.28 gpm	1.27 - 1.28
PZR Volume Change Test Duration	0 gal 60 min	+ 0 gpm	
Total RCS Leakage Rate		1.28 gpm	1.27-1.28

Identified RCS Leakage Rate			
PRT Volume Change Test Duration	68.25 gal 1440 min	0.05 gpm	0.04-0.05
SI ACC A/B/C Volume Change Test Duration	0 gal 60 min	+ 0 gpm	
RCDT Volume Change Test Duration	32 gal 720 min	+ 0.04 gpm	0.04-0.044
Leak-Off Coll Tk Volume Change Test Duration	9.51 gal 60 min	+ 0.16 gpm	0.15-0.16
Miscellaneous Identified RCS Leakage Rate from Att. 10.5		+ 0.05 gpm	0.05-0.06
Total Identified RCS Leakage Rate (MSPI)		0.3 gpm	0.28-0.314

Unidentified RCS Leakage Rate		
Total RCS Leakage Rate	1.28 gpm	1.27-1.28
Total Identified RCS Leakage Rate	- 0.3 gpm	0.28-0.314
Unidentified RCS Leakage Rate	0.98 gpm	0.956-1.00

LEVEL TO GALLONS CONVERSION TABLE

Charging Pump Leakoff Collection Tank Curve 8.22			
Level Indicated %	Gallons	Level Indicated %	Gallons
1	0.17	51	22.00
2	0.33	52	22.66
3	0.50	53	23.17
4	0.66	54	23.66
5	1.00	55	24.17
6	1.17	56	24.66
7	1.33	57	25.33
8	1.66	58	25.84
9	2.00	59	26.33
10	2.33	60	26.84
11	2.66	61	27.51
12	3.00	62	28.00
13	3.33	63	28.50
14	3.66	64	29.00
15	4.00	65	29.33
16	4.33	66	30.17
17	4.66	67	30.66
18	5.33	68	31.17
19	5.66	69	31.66
20	6.00	70	32.17
21	6.50	71	32.66
22	7.00	72	33.33
23	7.33	73	33.66
24	7.84	74	34.33
25	8.33	75	34.66
26	8.83	76	35.17
27	9.33	77	35.66
28	9.84	78	36.00
29	10.33	79	36.50
30	10.83	80	36.84
31	11.33	81	37.33
32	11.84	82	37.66
33	12.33	83	38.00
34	13.00	84	38.50
35	13.49	85	38.83
36	14.00	86	39.17
37	14.66	87	39.66
38	15.18	88	40.00
39	15.66	89	40.33
40	16.17	90	40.50
41	16.66	91	40.84
42	17.00	92	41.00
43	17.66	93	41.33
44	18.33	94	41.66
45	18.83	95	41.83
46	19.33	96	41.84
47	20.00	97	42.33
48	20.50	98	42.66
49	21.00	99	42.83
50	21.50	100	43.00

Pressurizer Relief Tank Curve 8.23			
Level Indicated %	Gallons	Level Indicated %	Gallons
70.0	7075.00	75.1	7572.25
70.1	7084.75	75.2	7582.00
70.2	7094.50	75.3	7591.75
70.3	7104.25	75.4	7601.50
70.4	7114.00	75.5	7611.25
70.5	7123.75	75.6	7621.00
70.6	7133.50	75.7	7630.75
70.7	7143.25	75.8	7640.50
70.8	7153.00	75.9	7650.25
70.9	7162.75	76.0	7660.00
71.0	7172.50	76.1	7669.75
71.1	7182.25	76.2	7679.50
71.2	7192.00	76.3	7689.25
71.3	7201.75	76.4	7699.00
71.4	7211.50	76.5	7708.75
71.5	7221.25	76.6	7718.50
71.6	7231.00	76.7	7728.25
71.7	7240.75	76.8	7738.00
71.8	7250.50	76.9	7747.75
71.9	7260.25	77.0	7757.50
72.0	7270.00	77.1	7767.25
72.1	7279.75	77.2	7777.00
72.2	7289.50	77.3	7786.75
72.3	7299.25	77.4	7796.50
72.4	7309.00	77.5	7806.25
72.5	7318.75	77.6	7816.00
72.6	7328.50	77.7	7825.75
72.7	7338.25	77.8	7835.50
72.8	7348.00	77.9	7845.25
72.9	7357.75	78.0	7855.00
73.0	7367.50	78.1	7864.75
73.1	7377.25	78.2	7874.50
73.2	7387.00	78.3	7884.25
73.3	7396.75	78.4	7894.00
73.4	7406.50	78.5	7903.75
73.5	7416.25	78.6	7913.50
73.6	7426.00	78.7	7923.25
73.7	7435.75	78.8	7933.00
73.8	7445.50	78.9	7942.75
73.9	7455.25	79.0	7952.50
74.0	7465.00	79.1	7962.25
74.1	7474.75	79.2	7972.00
74.2	7484.50	79.3	7981.75
74.3	7494.25	79.4	7991.50
74.4	7504.00	79.5	8001.25
74.5	7513.75	79.6	8011.00
74.6	7523.50	79.7	8020.75
74.7	7533.25	79.8	8030.50
74.8	7543.00	79.9	8040.25
74.9	7552.75	80.0	8050.00
75.0	7562.50		

ACTION LEVEL RESPONSE GUIDELINES

DEFINITIONS: "**Daily**" means the "daily average value" which is "the average of all valid measurements performed on a given calendar day."

MEAN (μ) – Average of the valid leak rates for a given period of time.

STANDARD DEVIATION (σ) – A measure of the degree of dispersion of the data from the mean value.

NOTE: "**Daily** for below Action Levels should be interpreted as "periodic" if the ULR measurements are performed on less than a daily basis. That is, a "periodic" value is always a "daily average value" but is not evaluated every calendar day.

INIT

1. Response Guidelines for Exceeding **Tier One Action Levels**

   a. **IF** one 7-day rolling average of **daily** Unidentified RCS leak rates is greater than 0.1 gpm **OR** nine consecutive daily unidentified RCS leakage values > mean (μ), **THEN PERFORM** the following:

      1) **CONFIRM** indication. ____
      2) **PERFORM** a confirmatory leak rate calculation. ____
      3) **CHECK** for abnormal trends on other leakage indicators. ____
      4) **FORWARD** data to Engineering to evaluate trends. ____
      5) **INCREASE** monitoring as recommended by Engineering. ____
      6) **INITIATE** a condition report. NCR # ____________ ____
      7) **NOTIFY** Operations Management ____

ACTION LEVEL RESPONSE GUIDELINES

INIT

2. Response Guidelines for Exceeding **Tier Two Action Levels**

   a. **IF** two consecutive **daily** Unidentified RCS leak rates are greater than 0.15 gpm **OR** two of three consecutive daily Unidentified leak rates greater than [μ+2σ], **THEN PERFORM** the following:

      1) **VERIFY** Tier One response guidelines have been performed. ____

      2) **COMMENCE** a leak investigation as follows:

         .a) **REVIEW** recent plant evolutions. ____

         .b) **EVALUATE** changes in other leakage detection indications. ____

         .c) **INITIATE** walkdowns of various portions of potentially affected systems outside containment. ____

      3) **IDENTIFY** the source of the increase in leakage as follows:

         .a) **CHECK** any components **OR** flow paths recently changed or placed in service, shutdown, vented, drained, or filled. ____

         .b) **CHECK** any maintenance activity that may have resulted in increasing leakage. ____

         .c) **CHECK** any filters recently alternated **OR** changed for leakage from their vents or drains. ____

            – **INSPECT** filter housing for gaskets leakage. ____

            – **CHECK** seal injection filters **AND** reactor coolant filter for signs of leakage. ____

      4) **NOTIFY** Operations Management ____

ACTION LEVEL RESPONSE GUIDELINES

INIT

3. Response Guidelines for Exceeding **Tier Three Action Levels**

   a. **IF** one **daily** Unidentified RCS leak rate is greater than 0.3 gpm **OR** [$\mu+3\sigma$], **THEN PERFORM** the following:

      1) **VERIFY** Tier One **AND** Tier Two response guidelines have been performed. ____

      2) **IF** increased leak rate is indicated inside containment, **THEN PERFORM** the following:

         .a) **BEGIN PLANNING** for a containment entry. ____

NOTE:	There is a single valve outside of containment to obtain this sample in pipe alley - WD-1731A.

         .b) **NOTIFY** E&RC to **OBTAIN** a containment sump sample (during pump out) **AND** analyze for activity and boron concentration IAW CP-003, (looking for a larger than expected boric acid concentration **OR** other unexpected chemicals). ____

         ____
         E&RC NOTIFIED

         .c) **EVALUATE** other systems for indications of leakage. ____

         .d) **OBTAIN** a containment atmosphere sample for indications of RCS leakage. ____

ACTION LEVEL RESPONSE GUIDELINES

3.0 (Continued) Response Guidelines for Exceeding **Tier Three Action Levels** INIT

3) **IDENTIFY** the source of the leak. ____

4) **QUANTIFY** the leakage. ____

5) **INITIATE** a plan to repair the leak. ____

6) **MONITOR** containment airborne radiation levels **AND** area radiation monitors. ____

7) **SAMPLE** containment atmosphere for indications of RCS leakage. ____

8) **MONITOR** other containment parameters (temperature, pressure, humidity, etc.). ____

9) **IF** the leak source is found **AND** isolated **OR** stopped, **THEN RE-PERFORM** RCS leak rate calculation. ____

10) **NOTIFY** Operations Management ____

COMPONENTS WITH KNOWN MEASURED LEAKAGE

NOTE: If leakage can **NOT** be collected in a suitable container to accurately measure in milliliters per minute (such as when leakage is in a high dose area but can be viewed by camera), this "drops per minute conversion" may be used. To convert **drops per minute** to gallons per minute, multiply drops per minute by 1.32 x 10-5 (0.0000132). The drop counting method shall only be allowed if **NO** other means is available to measure leakage due to inaccessibility from a radiation dose or personnel safety standpoint based on CRS/SM guidance.

To convert **milliliters per minute** to gallons per minute, multiply milliliters per minute by 2.64×10^{-4} (0.000264). This is the preferred method for calculating leakage.

Individual component leakage should not be rounded. Rounding should be completed in the Total Measured Leakage calculation to 2 significant digits, as this is what will be used by the Leak Rate program.

Component	Measured Leakage (gpm)	Measured Leakage Volume	Duration Time	Active Work Order Number
ACV-115B Outlet Flange	0.05	1000 ml	5 MIN.	2011-XXXX

Total Measured Leakage	0.05 gpm

SURVEILLANCE TEST PROCEDURE CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____

____

____

Test Performed By:

Initials	Name (Print)	Date
ROM	R.O. Moore	Today

Test Complete: Date:__________ Time:__________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ______________________ Shift Technical Advisor ____________ Date

Comments: (Required if results were unsatisfactory)

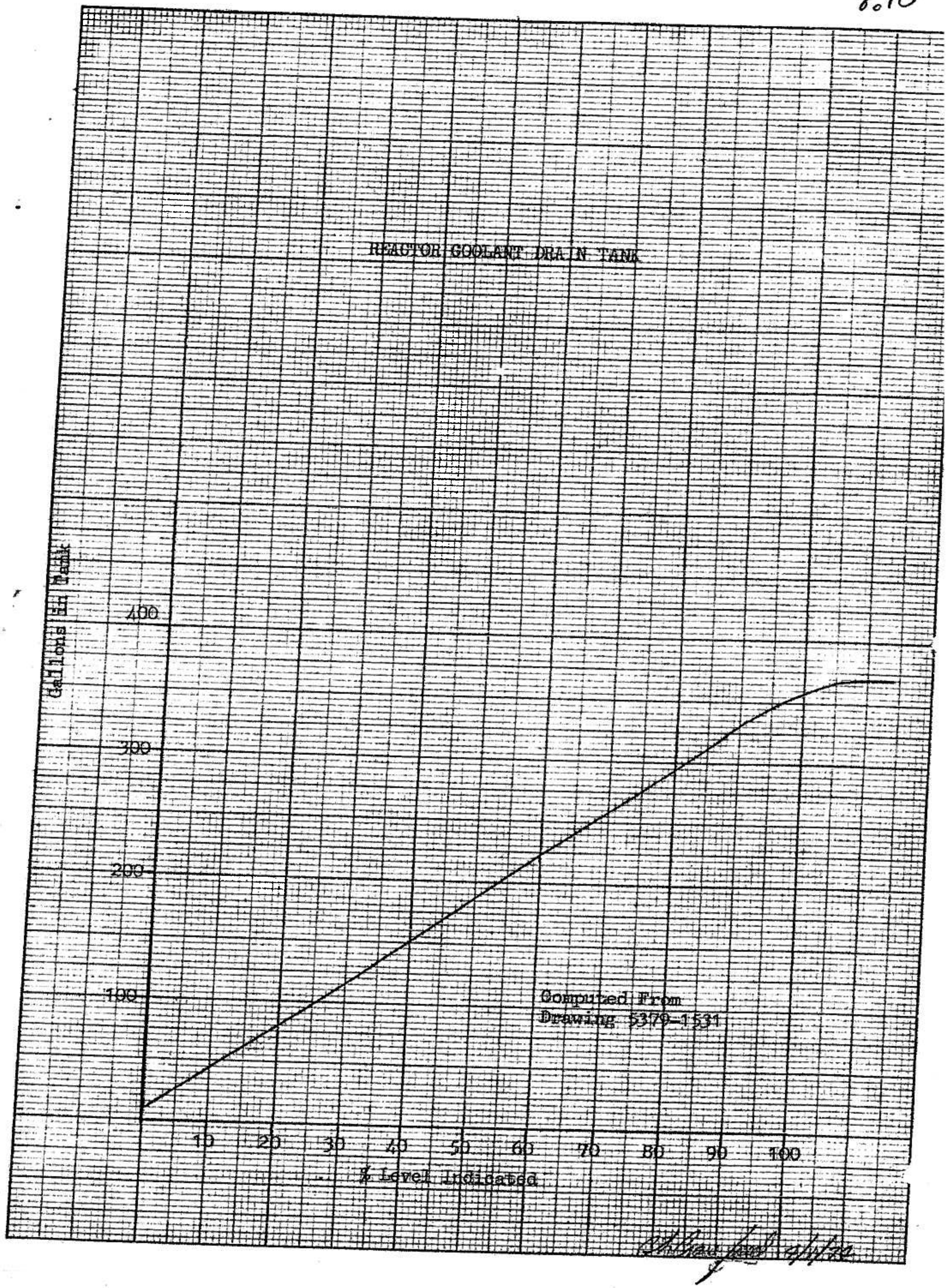
____

____

____

____

Approved by: ______________________ Shift Manager ____________ Date


REACTOR COOLANT DRAIN TANK
Gallons in Tank
400
300
200
100
10 20 30 40 50 60 70 80 90 100
% Level Indicated
Computed From
Drawing 5379-1531

INITIAL CONDITIONS: Plant is at 50% RTP.

You are the Reactor Operator.

INITIATING CUE: The previous shift started OST-051, Reactor Coolant System Leakage Evaluation. The plant has remained at steady state, with NO automatic make-ups for ONE (1) hour.

Complete the provided procedure through Step 8.1.10.3.

These final parameter values were recorded 60 minutes after the procedure was started <u>except as noted for PRT and RCDT levels</u>:

- RCS Temperature: 562ºF
- VCT Level: 20.8 inches
- PZR Level: 45%
- PZR RELIEF TANK: 70.9% (24 hour data)
- Accumulator A: 72%
- Accumulator B: 71%
- Accumulator C: 74%
- RCDT: 19% (12 hour data)
- Charging Pump Leakoff Collection Tank: 32%
- Attachment 10.5, Components with Known Measured Leakage, has leakage on valve LCV-115B outlet flange that has been measured during the performance of OST-051 at 1000 ml in a 5 minute period.

ROBINSON NUCLEAR PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

OST-051

REACTOR COOLANT SYSTEM LEAKAGE EVALUATION (EVERY 72 HOURS DURING STEADY STATE OPERATION AND WITHIN 12 HOURS AFTER REACHING STEADY STATE OPERATION)

REVISION 45

SUMMARY OF CHANGES
PRR #00448048
OST-051, Revision 45

STEP	REVISION COMMENTS
8.1.14.3	Added "**PERFORM** Peer Check of data entry fields prior to uploading any data." PRR 00448048
Note prior to 8.1.14	Deleted V:\Drive Link and added "N:\NGGWEB\RNP\Departments\Operations\RCS Leakage Program" PRR 00450337
Attachment 10.4 note prior to 3.a.2.b	Added "There is a single valve outside of containment to obtain this sample in pipe alley WD-1731A, RCDT Discharge Header to WHUT Drain." PRR 00453076
Attachment 10.4 3.a.2.b	Revised step to notify E&RC to obtain sample and analyze for activity and boron concentration IAW CP-003.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To evaluate RCS leakage and to satisfy Improved Technical Specification Surveillance Requirement (ITS SR) 3.4.13.1.

1.2 This test is required when in Modes 1, 2, 3 or 4. ITS SR 3.4.13.1 basis further defines the applicable conditions as "within 12 hours after reaching continuous steady state operation."

1.3 This test may be performed when in Mode 5 as long as the RCS is pressurized, there is a bubble in the Pressurizer and RCS/RHR temperature is constant. However, a test under these conditions will not satisfy ITS SR 3.4.13.1.

1.4 This procedure supports the License Renewal Aging Management Program Boric Acid Corrosion Program by providing RCS leakage monitoring criteria (Reference 2.11).

2.0 REFERENCES

2.1 Improved Technical Specifications LCO 3.4.13 and ITS 1.1 Definition of LEAKAGE

2.2 AP-030, NRC Reporting Requirements

2.3 EPCLA-01, Emergency Control

2.4 EGR-NGGC-0207, Boric Acid Corrosion Control (Generic Letter 88-05)

2.5 AOP-016, Excessive Primary Plant Leakage

2.6 OMM-015, Operations Surveillance Testing

2.7 ESR 94-471, Calculation for VCT Level vs. Volume

2.8 PLP-037, Conduct of Infrequently Performed Test or Evolutions and Pre-Job Briefs

2.9 CP-014, Primary-To-Secondary Leak Rate Calculation

2.10 SOER 97-1, Potential Loss of High Pressure Injection and Charging from Gas Intrusion (Credit taken for monitoring VCT level to address recommendation #1 of the SOER)

2.11 RNP-L/LR-0601, Aging Management Program, Boric Acid Corrosion Program

2.12 PWROG Letter, OG-07-286, Dated June 26, 2007 entitled "Recommendations for Implementation of Guidelines for PWROG RCS Leak Rate Programs"

2.13 PWROG Letter, OG-08-400 Dated November 19, 2008 entitled "Clarification of the Recommendation of Guidelines for PWROG RCS Leakage Rate Program with Respect to NEI-03-08 (PA-OSC-0189 and PA-OSC-0218)

2.14 WCAP-16423-NP, Pressurized Water Reactor Owners Group Standard Process and Methods for Calculating RCS Leak Rate for Pressurized Water Reactors

2.15 WCAP-16465-NP, Pressurized Water Reactor Owners Group Standard RCS Leakage Action Levels and Response Guidelines

3.0 RESPONSIBILITIES

3.1 Operations is responsible for:

3.1.1 Performance, review, and approval of this test.

3.1.2 Updating of the RCS Leakage Monitoring Spreadsheet after each performance of the surveillance.

3.2 Engineering is responsible for:

3.2.1 Development and maintenance of the RCS Leakage Monitoring Spreadsheet.

3.2.2 Establishment and updating of baseline mean (μ) and standard deviation (σ) values.

4.0 PREREQUISITES

INIT

4.1 This revision has been verified to be the latest revision available. Today Date

4.2 The Shift Manager has given permission to conduct this test. Today Date

4.3 RCS temperature is stable.

4.4 There is a bubble in the Pressurizer

NOTE: ITS SR 3.4.13.1 requires performance of this test within 12 hours after reaching steady state operating conditions in Modes 1, 2, 3, or 4. This test may be performed when stable in Mode 5 but only for tracking and trending purposes, not to satisfy the ITS SR requirements.

4.5 RCS pressure is stable.

4.6 Record RCS pressure. 2235 psig

4.7 Record Plant Mode. Mode 1

5.0 PRECAUTIONS AND LIMITATIONS

5.1 The accuracy of the RCS Leakage Rate Test is greatly improved when RCS temperature and Pressurizer level remain constant for the duration of the test.

5.2 This procedure should not be started unless the VCT level is high enough to avoid an automatic makeup during the performance of the RCS Leakage Rate Test.

5.3 Any steps not applicable shall be marked N/A and the reason(s) for any N/A noted in the Comments section of Attachment 10.6.

5.4 The principles of ALARA shall be used in planning and performing work and operations in the Radiation Control Area.

5.5 This procedure has been screened IAW PLP-037 criteria and determined to be outside the bounds of an Infrequently Performed Test or Evolution.

5.6 **IF** RCS pressure boundary **LEAKAGE** is verified, **THEN** the reactor shall be placed in Mode 3 within 6 hours and in Mode 5 within 36 hours of discovery of pressure boundary leakage. Pressure boundary **LEAKAGE** is leakage (except SG leakage) through a non-isolable fault in an RCS component body, pipe wall, or vessel wall. (ITS LCO 3.4.13)

5.7 For the purpose of this procedure, IDENTIFIED RCS Leakage is leakage collected in either the PRT, the RCDT, a Safety Injection Accumulator, or the Charging pump Seal Leak-off Collection Tank. This type of RCS leakage is through seat leakage, **NOT** through wall **OR** RCS Pressure Boundary (RCPB) leakage. This type leakage is **NOT** to be confused with Miscellaneous Identified RCS Leakage as it may be related to interconnected systems outside the RCS Pressure Boundary (See P&L 5.13).

5.8 Whenever possible, use the ERFIS Computer for data collection. This will improve accuracy and reduce the potential for human error.

5.9 The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during xenon transients or when in AOP-016, Excessive Primary Plant Leakage.

5.10 To improve the accuracy of the Pressurizer Relief Tank (PRT) level changes calculated during this procedure, a long term trend should be used for data collected from ERFIS. Duration of the long term PRT trend should be any period of stable PRT operation up to 24 hours. Due to possible evolutions affecting the PRT, the duration of the trend will be decided by the operator performing this test.

5.11 **IF** R-11 is increasing and cannot be attributed to any specific leak location based on search results with the unit on line, **THEN** a task should be added to the forced outage schedule to inspect normally inaccessible areas for indication of leakage to the maximum extent practical.

5.12 To improve the accuracy of the Reactor Coolant Drain Tank (RCDT) level changes calculated during this procedure, a long term trend should be used for data collected from LI-1003. Duration of the long term RCDT trend should be any period of stable RCDT operation up to 12 hours. Due to possible evolutions affecting the RCDT, the duration of long term trend will be determined by the SM/CRS.

5.13 Component leakage (valve packing, pump seal, fitting leakage, etc.) from accessible sources may only be treated as Miscellaneous Identified leakage if the source has been identified **AND** the actual value of the leakage is obtained by a measurement taken at the start or during the data taking interval for the surveillance test. The leakage must be measured each time the OST is performed if it is to be credited towards Miscellaneous Identified RCS Leakage. Each component leak must have an active Work Order.

5.14 This procedure has been reviewed and found to be not applicable as per the requirements of OPS-NGGC-1306, Reactivity Management.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 Calibrated Stop Watch (If needed to collect Miscellaneous RCS Identified Leakage)

6.2 Graduated Container (If needed to collect Miscellaneous RCS Identified Leakage)

7.0 ACCEPTANCE CRITERIA

7.1 This test is acceptable if:

- Unidentified RCS Leakage Rate does **NOT** exceed 1 gpm
- Identified RCS Leakage Rate does **NOT** exceed 10 gpm
- Primary-to-Secondary leakage does **NOT** exceed 75 gpd through any one steam generator as determined by CP-014.

7.2 The reviewing and approving authorities may accept this test in accordance with provisions set forth in OMM-015, Operations Surveillance Testing.

8.0 PROCEDURE

INIT

8.1 RCS Leakage Rate Test

8.1.1 **VERIFY** RCS MAKEUP MODE in the AUTO position.

8.1.2 **VERIFY** RCS MAKEUP SYSTEM is ON.

8.1.3 **IF** desired, **THEN PLACE** LCV-115A, VCT/HLDP TK DIV, in the VCT position.

> **NOTES:** Whenever possible, use the ERFIS computer for data collection. This will improve accuracy and reduce the potential for human error.
>
> The ERFIS on-screen historic information may be used to assist with data collection. This is especially helpful during a xenon transient or when in AOP-016, Excessive Primary Plant Leakage.
>
> Measurement of leakage in Step 8.1.4.c, and the calculation of Total Measured Leakage in Step 8.1.4.d may be performed immediately prior to or at any time during the duration of this test.
>
> The following step may be N/A if there is no active leakage issuing from components previously identified by work order.

8.1.4 **IF** there are any components that have known, active leakage, where the source is identified and can be treated as Miscellaneous Identified RCS Leakage or Known Non-RCPB Leakage per P&L 5.7 and P&L 5.13, **THEN PERFORM** the following on Attachment 10.5:

a. **LIST** the actively leaking component(s)

b. **RECORD** the Work Order number(s) for the component(s)

c. **RECORD** the measured leakage for the component(s)

d. **CALCULATE** the Total Measured Leakage

Peer Check

8.1.5 **RECORD** the Initial Values for the parameters listed on Attachment 10.1.

INIT

8.1.6 **IF** an automatic makeup occurs, **THEN PERFORM** the following:

1. **VERIFY** LCV-115A, VCT/HLDP TK DIV, in the AUTO position. N/A

2. **STOP** this procedure **AND NOTE** reason in Comments section. N/A

NOTES:	When this procedure is being performed to satisfy ITS SR 3.4.13.1, the preferred duration is greater than or equal to 1 hour and the minimum duration 15 minutes. When this procedure is being performed as directed by an AOP, there is not a minimum duration requirement.

8.1.7 **WHEN** at least 1 hour has elapsed, **OR**, **IF** required by Plant conditions to end this test, **THEN PERFORM** the following:

1. **VERIFY** RCS temperature is equal to initial RCS temperature recorded on Attachment 10.1. ____

2. **RECORD** the Final Values for the parameters listed on Attachment 10.1. ____

3. **VERIFY** LCV-115A, VCT/HLDP TK DIV, in the AUTO position. ____

NOTES:	A decrease in VCT level represents plus (+) RCS leakage. A decrease in Pressurizer level represents plus (+) RCS leakage.

8.1.8 **CALCULATE** the Difference and Change in Volume for the parameters listed on Attachment 10.1. ____

8.1.9 **PERFORM** a peer check of the calculated values listed in Attachment 10.1. ____

INIT

NOTES:	A plus (+) calculated Total RCS Leakage Rate represents plus (+) RCS leakage. Leak-rates (in gpm) on Attachment 10.2 should be rounded to two decimal places.

8.1.10 On Attachment 10.2, **PERFORM** the following:

1. **CALCULATE** the Total RCS Leakage Rate. ____
2. **CALCULATE** the Identified RCS Leakage Rate. ____
3. **CALCULATE** the Unidentified RCS Leakage Rate. ____
4. **PERFORM** a peer check of the calculations performed on Attachment 10.2 ____

8.1.11 **IF** unidentified RCS leakage is greater than 1.0 gpm **OR** the identified RCS leakage is greater than 10 gpm, **THEN PERFORM** the following:

1. **CONSULT** ITS LCO 3.4.13 for required actions. ____
2. **CONSULT** AP-030 for reporting requirements. ____
3. **CONSULT** EPCLA-01 for emergency action levels. ____
4. **CONSULT** AOP-016 for required actions. ____

8.1.12 **IF** RCS unidentified leakage is ≥ 0.05 gpm **AND** any valid R-24 monitor alarm **OR** any R-19 monitor indicates an increasing trend, **THEN** contact E&C Technician to perform Primary to Secondary Leakage Calculation for each steam generator in accordance with CP-014. (ITS LCO 3.4.13.d) ____

Primary to Secondary Leakage__________ gpd

INIT

8.1.13 **IF** unidentified RCS leakage is equal to or greater than 0.03 gpm for 3 consecutive leak rate calculations, **THEN** perform the following:

1. Start an investigation immediately and inform plant staff. ____

2. **IF** not currently in progress, **THEN** start daily leak rate calculations. ____

NOTE:	The RCS Leakage Monitoring Spreadsheet can be located at N:\NGGWEB\RNP\Departments\Operations\RCS Leakage Program or accessed from the OPS Tool Database

8.1.14 **Update** the RCS Leakage Monitoring Spreadsheet as follows:

1. **LOG** date and time. ____

2. **ENTER** RCS Identified and Unidentified RCS leakage. ____

3. **PERFORM** Peer Check of data entry fields prior to uploading any data. ____

4. **CLICK** UPLOAD DATA. ____

8.1.15 **RECORD** the following Unidentified Leak Rate data from the RCS Leakage Monitoring Spreadsheet:

1. Current Mean (μ) value _____gpm ____

2. Current Sigma (σ) value _____gpm ____

3. Current [μ + 2σ] value _____gpm ____

4. Current [μ + 3σ] value _____gpm ____

5. 7 Day Rolling Average _____gpm ____

6. Number of Consecutive Days greater than (μ) _____days ____

7. Last 3 Daily Unidentified Leak Rates

   ______gpm ______gpm _______gpm ____

INIT

8.1.16 Evaluate Unidentified Leakage against the Action Level Criteria Below:

Action Level	Action Level Limit Description	Action Level Exceeded (Circle One)
Tier One Action Level	7-day rolling average of **daily** Unidentified RCS leak rates is greater than 0.1 gpm	YES / NO
	Nine consecutive **daily** unidentified RCS leakage values > mean (μ)	YES / NO
Tier Two Action Level	Two consecutive **daily** Unidentified RCS leak rates are greater than 0.15 gpm	YES / NO
	Two of three consecutive **daily** Unidentified leak rates greater than [μ+2σ]	YES / NO
Tier Three Action Level	One **daily** Unidentified RCS leak rate is greater than 0.3 gpm	YES / NO
	One **daily** Unidentified RCS leak rate is greater than [μ+3σ]	YES / NO

8.1.17 **IF** any Unidentified RCS leakage Action Level (AL) is exceeded, **THEN PERFORM** the following:

1. **REVIEW** and implement the appropriate actions of Attachment 10.4, Action Level Response Guidelines while continuing with this procedure. ____

2. **INITIATE** an Action Plan IAW PLP-121 to document actions taken. ____

8.1.18 **UPDATE** leakage rate on Control Room status board. ____

8.1.19 **IF** Attachment 10.4, Action Level Response Guidelines was required, **THEN** ATTACH it to this OST when submitting to Records. ____

INIT

9.0 RECORDS

9.1 Completed procedure, included completed partials shall be retained as a non-permanent QA record

10.0 ATTACHMENTS

10.1 Leakage Evaluation Data Sheet

10.2 Leakage Evaluation Calculation Sheet

10.3 Level to Gallons Conversion Table

10.4 Action Level Response Guidelines

10.5 Components with Known Measured Leakage

10.6 Surveillance Test Procedure Certification and Review Form

ATTACHMENT 10.1
Page 1 of 2

LEAKAGE EVALUATION DATA SHEET

REF STEP	ITEM	VCT LVL (5) LI-115 or LI-112	PZR LVL (5) LI-459A or LI-460	RCS TEMP (5) T_{avg} ≥540°F TR-408 T_{avg} <540°F TR-413	PZR RELIEF TANK (1) (7) LI-470	ACCUM "A" (5) (6) LI-920 or LI-922	ACCUM "B" (5) (6) LI-924 or LI-926	ACCUM "C" (5) (6) LI-928 or LI-930	RCS DRAIN TANK LI-1003 (2)	CHARGING PUMP LEAK OFF COLL. TANK LIC-200 (3)	TIME
8.1.5	Initial Values	24.0 in	45 %	562 °F	Date/Time 70.2 % 7094.5 gal(1)	72 %	71 %	74 %	Date/Time 10 % 45 gal(2)	10 % 2.33 gal(3)	1815
8.1.7.2	Final Values	in	%	°F	Date/Time % gal(1)	%	%	%	Date/Time % gal(2)	% gal(3)	1915
8.1.8	Difference (+/-)	in	%		gal	%	%	%	gal	gal	min(4)
Multiplier		23.99 gal/in	50.56 gal/%			7 gal/%	7 gal/%	7 gal/%			
8.1.8	Change in Volume (gals)										

Comments

ATTACHMENT 10.1
Page 2 of 2

(1) Use Curve Book, Curve 8.23 or Attachment 10.3, to convert PRT level into gallons **OR** mark as N/A if level did not increase.

(2) Use Curve Book, Curve 8.10, to convert RCDT level into gallons <u>OR</u> mark as N/A if level did not increase. To improve the accuracy of the Reactor Coolant Drain Tank (RCDT) level changes calculated during this procedure, a long term trend should be used for data collected from LI-1003. A spreadsheet was developed to log RCDT levels that would provide a graph of the RCDT Trend. The file is located at V:\Operations\STA\RCDT Level. This graph or an ERFIS plot should be monitored for changes in inleakage rates into the RCDT. Duration of the long term RCDT trend should be any period of stable RCDT operation up to 12 hours. (Actual duration of long term trend will be determined by the SM/CRS).

(3) Use Curve Book, Curve 8.22 or Attachment 10.3, to convert Charging Pump Leak-off Collection Tank level into gallons or mark as N/A if level did not increase.

(4) Minimum test duration of 15 minutes is required when performing this procedure to satisfy ITS SR 3.4.13.1.

(5) Circle the respective indicator/indication used. **IF** ERFIS is in service, **THEN** use it to obtain values. **IF** ERFIS is not in service, **THEN** obtain the values from the respective RTGB indicators **AND** make a comment in the Comments section that RTGB indicators were used for the OST.

(6) An increase in SI Accumulator is (+) RCS Leakage. **IF** the increase is due to SI Accumulators sluicing from one accumulator to another, **THEN** do not include the change in the identified RCS leakage rate. A decrease in SI Accumulator is (-) RCS leakage **ONLY IF** RCS pressure is less than SI Accumulator pressure.

(7) PZR RELIEF TANK Level Initial & Final should be collected from ERFIS using long term trend up to 24 hours of Stable PRT Operation. An ERFIS plot should be monitored for changes in inleakage rates into the PRT. Duration of the long term PRT trend should be any period of stable PRT operation up to 24 hours. (Actual duration of long term trend will be determined by the SM/CRS)

LEAKAGE EVALUATION CALCULATION SHEET

Total RCS Leakage Rate		
VCT Volume Change / Test Duration	______ gal / min	______ gpm
PZR Volume Change / Test Duration	______ gal / min	+ ______ gpm
Total RCS Leakage Rate		______ gpm

Identified RCS Leakage Rate		
PRT Volume Change / Test Duration	______ gal / min	______ gpm
SI ACC A/B/C Volume Change / Test Duration	______ gal / min	+ ______ gpm
RCDT Volume Change / Test Duration	______ gal / min	+ ______ gpm
Leak-Off Coll Tk Volume Change / Test Duration	______ gal / min	+ ______ gpm
Miscellaneous Identified RCS Leakage Rate from Att. 10.5		+ ______ gpm
Total Identified RCS Leakage Rate (MSPI)		______ gpm

Unidentified RCS Leakage Rate	
Total RCS Leakage Rate	______ gpm
Total Identified RCS Leakage Rate	- ______ gpm
Unidentified RCS Leakage Rate	______ gpm

LEVEL TO GALLONS CONVERSION TABLE

Charging Pump Leakoff Collection Tank Curve 8.22

Level Indicated %	Gallons	Level Indicated %	Gallons
1	0.17	51	22.00
2	0.33	52	22.66
3	0.50	53	23.17
4	0.66	54	23.66
5	1.00	55	24.17
6	1.17	56	24.66
7	1.33	57	25.33
8	1.66	58	25.84
9	2.00	59	26.33
10	2.33	60	26.84
11	2.66	61	27.51
12	3.00	62	28.00
13	3.33	63	28.50
14	3.66	64	29.00
15	4.00	65	29.33
16	4.33	66	30.17
17	4.66	67	30.66
18	5.33	68	31.17
19	5.66	69	31.66
20	6.00	70	32.17
21	6.50	71	32.66
22	7.00	72	33.33
23	7.33	73	33.66
24	7.84	74	34.33
25	8.33	75	34.66
26	8.83	76	35.17
27	9.33	77	35.66
28	9.84	78	36.00
29	10.33	79	36.50
30	10.83	80	36.84
31	11.33	81	37.33
32	11.84	82	37.66
33	12.33	83	38.00
34	13.00	84	38.50
35	13.49	85	38.83
36	14.00	86	39.17
37	14.66	87	39.66
38	15.18	88	40.00
39	15.66	89	40.33
40	16.17	90	40.50
41	16.66	91	40.84
42	17.00	92	41.00
43	17.66	93	41.33
44	18.33	94	41.66
45	18.83	95	41.83
46	19.33	96	41.84
47	20.00	97	42.33
48	20.50	98	42.66
49	21.00	99	42.83
50	21.50	100	43.00

Pressurizer Relief Tank Curve 8.23

Level Indicated %	Gallons	Level Indicated %	Gallons
70.0	7075.00	75.1	7572.25
70.1	7084.75	75.2	7582.00
70.2	7094.50	75.3	7591.75
70.3	7104.25	75.4	7601.50
70.4	7114.00	75.5	7611.25
70.5	7123.75	75.6	7621.00
70.6	7133.50	75.7	7630.75
70.7	7143.25	75.8	7640.50
70.8	7153.00	75.9	7650.25
70.9	7162.75	76.0	7660.00
71.0	7172.50	76.1	7669.75
71.1	7182.25	76.2	7679.50
71.2	7192.00	76.3	7689.25
71.3	7201.75	76.4	7699.00
71.4	7211.50	76.5	7708.75
71.5	7221.25	76.6	7718.50
71.6	7231.00	76.7	7728.25
71.7	7240.75	76.8	7738.00
71.8	7250.50	76.9	7747.75
71.9	7260.25	77.0	7757.50
72.0	7270.00	77.1	7767.25
72.1	7279.75	77.2	7777.00
72.2	7289.50	77.3	7786.75
72.3	7299.25	77.4	7796.50
72.4	7309.00	77.5	7806.25
72.5	7318.75	77.6	7816.00
72.6	7328.50	77.7	7825.75
72.7	7338.25	77.8	7835.50
72.8	7348.00	77.9	7845.25
72.9	7357.75	78.0	7855.00
73.0	7367.50	78.1	7864.75
73.1	7377.25	78.2	7874.50
73.2	7387.00	78.3	7884.25
73.3	7396.75	78.4	7894.00
73.4	7406.50	78.5	7903.75
73.5	7416.25	78.6	7913.50
73.6	7426.00	78.7	7923.25
73.7	7435.75	78.8	7933.00
73.8	7445.50	78.9	7942.75
73.9	7455.25	79.0	7952.50
74.0	7465.00	79.1	7962.25
74.1	7474.75	79.2	7972.00
74.2	7484.50	79.3	7981.75
74.3	7494.25	79.4	7991.50
74.4	7504.00	79.5	8001.25
74.5	7513.75	79.6	8011.00
74.6	7523.50	79.7	8020.75
74.7	7533.25	79.8	8030.50
74.8	7543.00	79.9	8040.25
74.9	7552.75	80.0	8050.00
75.0	7562.50		

ACTION LEVEL RESPONSE GUIDELINES

DEFINITIONS: "**Daily**" means the "daily average value" which is "the average of all valid measurements performed on a given calendar day."

MEAN (μ) – Average of the valid leak rates for a given period of time.

STANDARD DEVIATION (σ) – A measure of the degree of dispersion of the data from the mean value.

NOTE: "**Daily** for below Action Levels should be interpreted as "periodic" if the ULR measurements are performed on less than a daily basis. That is, a "periodic" value is always a "daily average value" but is not evaluated every calendar day.

INIT

1. Response Guidelines for Exceeding **Tier One Action Levels**

   a. **IF** one 7-day rolling average of **daily** Unidentified RCS leak rates is greater than 0.1 gpm **OR** nine consecutive daily unidentified RCS leakage values > mean (μ), **THEN PERFORM** the following:

      1) **CONFIRM** indication. ____

      2) **PERFORM** a confirmatory leak rate calculation. ____

      3) **CHECK** for abnormal trends on other leakage indicators. ____

      4) **FORWARD** data to Engineering to evaluate trends. ____

      5) **INCREASE** monitoring as recommended by Engineering. ____

      6) **INITIATE** a condition report. NCR # ___________ ____

      7) **NOTIFY** Operations Management ____

ACTION LEVEL RESPONSE GUIDELINES

INIT

2. Response Guidelines for Exceeding **Tier Two Action Levels**

a. **IF** two consecutive **daily** Unidentified RCS leak rates are greater than 0.15 gpm **OR** two of three consecutive daily Unidentified leak rates greater than [$\mu+2\sigma$], **THEN PERFORM** the following:

1) **VERIFY** Tier One response guidelines have been performed. ____

2) **COMMENCE** a leak investigation as follows:

.a) **REVIEW** recent plant evolutions. ____

.b) **EVALUATE** changes in other leakage detection indications. ____

.c) **INITIATE** walkdowns of various portions of potentially affected systems outside containment. ____

3) **IDENTIFY** the source of the increase in leakage as follows:

.a) **CHECK** any components **OR** flow paths recently changed or placed in service, shutdown, vented, drained, or filled. ____

.b) **CHECK** any maintenance activity that may have resulted in increasing leakage. ____

.c) **CHECK** any filters recently alternated **OR** changed for leakage from their vents or drains. ____

– **INSPECT** filter housing for gaskets leakage. ____

– **CHECK** seal injection filters **AND** reactor coolant filter for signs of leakage. ____

4) **NOTIFY** Operations Management ____

ACTION LEVEL RESPONSE GUIDELINES

INIT

3. Response Guidelines for Exceeding **Tier Three Action Levels**

   a. **IF** one **daily** Unidentified RCS leak rate is greater than 0.3 gpm **OR** [$\mu+3\sigma$], **THEN PERFORM** the following:

      1) **VERIFY** Tier One **AND** Tier Two response guidelines have been performed. ____

      2) **IF** increased leak rate is indicated inside containment, **THEN PERFORM** the following:

         .a) **BEGIN PLANNING** for a containment entry. ____

NOTE:	There is a single valve outside of containment to obtain this sample in pipe alley - WD-1731A.

         .b) **NOTIFY** E&RC to **OBTAIN** a containment sump sample (during pump out) **AND** analyze for activity and boron concentration IAW CP-003, (looking for a larger than expected boric acid concentration **OR** other unexpected chemicals). ____

         ____
         E&RC NOTIFIED

         .c) **EVALUATE** other systems for indications of leakage. ____

         .d) **OBTAIN** a containment atmosphere sample for indications of RCS leakage. ____

ACTION LEVEL RESPONSE GUIDELINES

		INIT
3.0 (Continued)	Response Guidelines for Exceeding **Tier Three Action Levels**	
3)	**IDENTIFY** the source of the leak.	____
4)	**QUANTIFY** the leakage.	____
5)	**INITIATE** a plan to repair the leak.	____
6)	**MONITOR** containment airborne radiation levels **AND** area radiation monitors.	____
7)	**SAMPLE** containment atmosphere for indications of RCS leakage.	____
8)	**MONITOR** other containment parameters (temperature, pressure, humidity, etc.).	____
9)	**IF** the leak source is found **AND** isolated **OR** stopped, **THEN RE-PERFORM** RCS leak rate calculation.	____
10)	**NOTIFY** Operations Management	____

COMPONENTS WITH KNOWN MEASURED LEAKAGE

NOTE: If leakage can **NOT** be collected in a suitable container to accurately measure in milliliters per minute (such as when leakage is in a high dose area but can be viewed by camera), this "drops per minute conversion" may be used. To convert **drops per minute** to gallons per minute, multiply drops per minute by 1.32 x 10-5 (0.0000132). The drop counting method shall only be allowed if **NO** other means is available to measure leakage due to inaccessibility from a radiation dose or personnel safety standpoint based on CRS/SM guidance.

To convert **milliliters per minute** to gallons per minute, multiply milliliters per minute by 2.64 x 10^{-4} (0.000264). This is the preferred method for calculating leakage.

Individual component leakage should not be rounded. Rounding should be completed in the Total Measured Leakage calculation to 2 significant digits, as this is what will be used by the Leak Rate program.

Component	Measured Leakage (gpm)	Measured Leakage Volume	Duration Time	Active Work Order Number
LCV-115B	0.05	1000 ml	5 min	2011-XXXX
outlet flange				

Total Measured Leakage	0.05 gpm

SURVEILLANCE TEST PROCEDURE CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____

____

____

Test Performed By:

Initials	Name (Print)	Date
ROM	R.O. Moore	Today

Test Complete: Date:__________ Time:__________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ______________________ Shift Technical Advisor ________ Date

Comments: (Required if results were unsatisfactory)

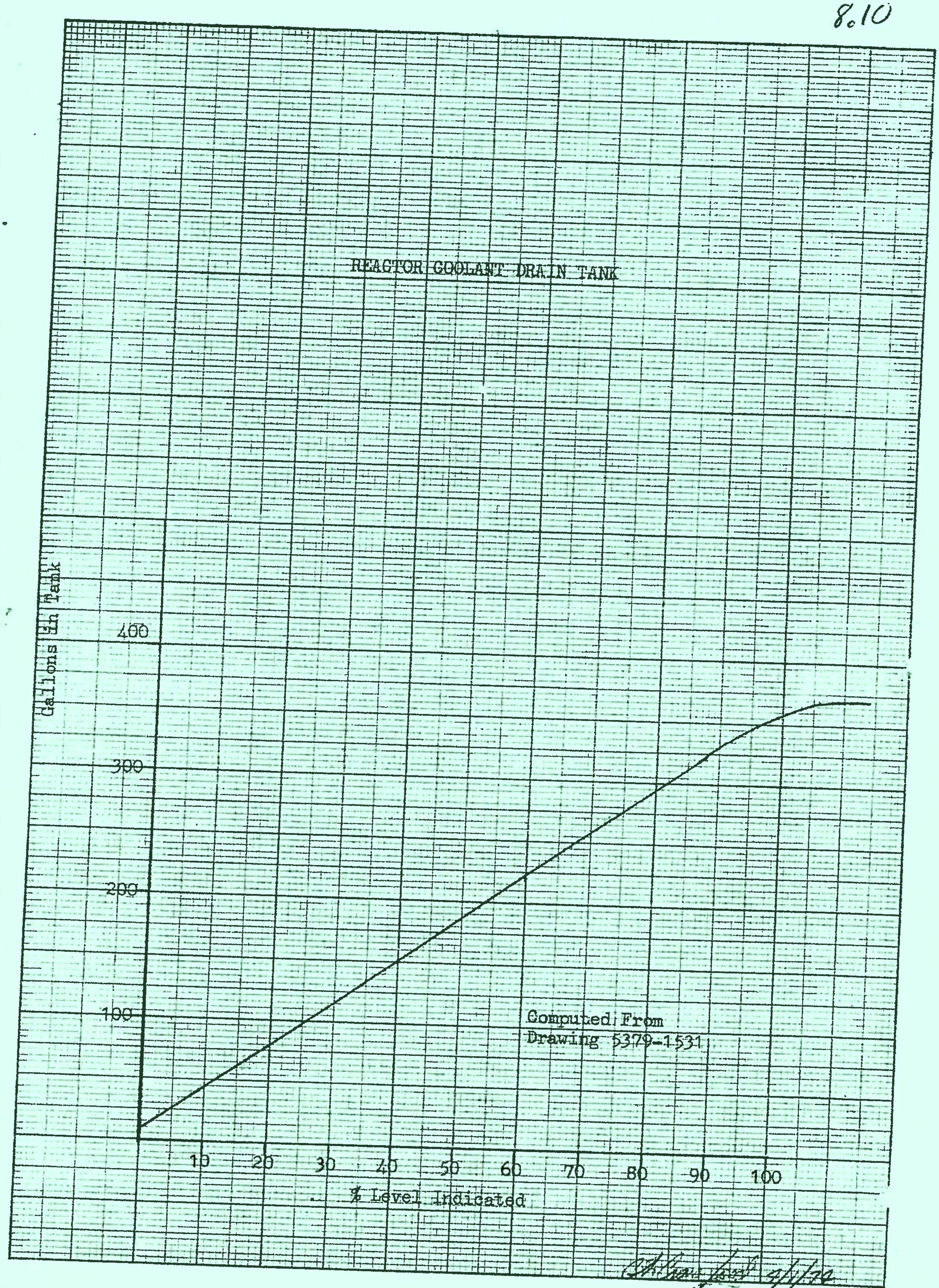
____

____

____

____

Approved by: ______________________ Shift Manager ________ Date


REACTOR COOLANT DRAIN TANK
Gallons in Tank
400
300
200
100
10
20
30
40
50
60
70
80
90
100
% Level Indicated
Computed From
Drawing 5379-1531

Facility:	HB ROBINSON	Task No.:	01000100905
Task Title:	Calculate the Boron Addition Required Prior to Initiating a Natural Circulation Cooldown to CSD	JPM No.:	2011-2 NRC JPM RO A1-2

K/A Reference: G2.1.25 3.9 / 4.2

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: __X__

Classroom __X__ Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- The plant tripped from 50% RTP when a loss of off-site power occurred.
- The crew is performing EPP-5, Natural Circulation Cooldown.
- The TSC is NOT staffed.
- Core Burnup is 11000 MWD/MTU
- Boron Concentration is 600 PPM
- Tavg is 547°F
- Boric Acid Storage Tank "A" is in service, aligned to blend with level at 85%.
- POWERTRAX is NOT available.

Task Standard: Boron addition and BAST level change calculated within stated standards.

Required Materials: Station Curve Book
Straight Edge
EPP-5, Step 11

General References: EPP-5, Natural Circulation Cooldown, Revision 15

	Station Curve Book, Revision 199
Handouts:	EPP-5, Step 11
Initiating Cue:	The CRS wants to initiate boration while necessary support personnel are reporting. You have been directed to determine the minimum required boron concentration for CSD (200°F) and then calculate the boron addition necessary to achieve that boron concentration **(with no allowance for PZR outsurge).** In accordance with OP-301, "For large additions, **ESTIMATE** expected BAST level decrease for target boration".
Time Critical Task:	NO
Validation Time:	12 minutes

(Denote Critical Steps with an asterisk)

Performance Step: 1 Determine minimum CSD Boron Concentration.

Standard: Determines Station Curve Book Curve 1.14 or Table 1.14 applies.

Examiner's Note:

Comment:

* **Performance Step: 2** Determine minimum CSD Boron Concentration.

Standard: Reads no less than 1075 PPM and no more than 1100 PPM on Curve 1.14 or 1081 PPM from Table 1.14.

Examiner's Note: **The curve line falls between the 1050 PPM and the 1100 PPM line, allowing for a minor curve reading error since increments are 50 PPM.**

Comment:

* **Performance Step: 3** Determine the boron concentration change required.

Standard: 1081 PPM – 600 PPM = 481 PPM

Examiner's Note: 1075 PPM – 600 PPM = 475 PPM
1100 PPM - 600 PPM = 500 PPM

Comment:

* **Performance Step: 4** Determine boration required.

Standard: Using Boron / Dilution Table 5.11 of the Station Curve Book, System Temperature of 547°F, calculated boric acid addition is 1195.9 gallons (1081 PPM)

Minimum - 1075 PPM, boration volume is 1180.8 gallons

Maximum - 1100 PPM, boration volume is 1243.7 gallons

Examiner's Note:

Comment:

* **Performance Step: 5**	"For large additions, **ESTIMATE** expected BAST level decrease for target boration".
Standard:	Utilizing Station Curve 8.18, determines final BAST level to be between 60 – 62.5%.

Examiner's Note:

Calculation on Curve 8.18 as follows:

GALLONS to % LEVEL = (GALLONS – 1024) / 52.36

% LEVEL to GALLONS = (% LEVEL)(52.36) + 1024 BAST level of 85% = 5474.6 gallons

Volume of boric acid to be added to the RCS = >1180.8 gallons and <1243.7 gallons.

5474.6 – 1195.9 = 4278.7 gallons which equates to a BAST level of 62.16%.

5474.6 – 1180.8 = 4293.8 gallons which equates to a BAST level of 62.45%.

5474.6 – 1243.7 = 4230.9 gallons which equates to a BAST level of 61.25%.

Examiner's Note:

If candidate reads Curve 8.18 for level change:

5425 – 1195.9 = 4229.1 gallons which equates to a BAST level of 62%.

5425 – 1180.8 = 4244.2 gallons which equates to a BAST level of 62%.

5425 – 1243.7 = 4181.3 gallons which equates to a BAST level of 60%.

* **Performance Step: 6**

OPTIONAL STEP: To be used if FIGURE S-3.1-3 (Curve Book 5.3), BORON ADDITION-COOLANT HOT is used for boration volume determination.

Determine boration required and **ESTIMATE** expected BAST level decrease for target boration.

Standard:

Using FIGURE S-3.1-3 (Curve Book 5.3), BORON ADDITION-COOLANT HOT, determines boric acid addition of 1100 gallons (Range of 1068 to 1131 gallons.).

Final BAST level is 63-64.5%.

Examiner's Note:

5425 – 1100 = 4325 gallons which equates to a BAST level of 63%.

5475 – 1100 = 4375 gallons which equates to a BAST level of 64%.

5425 – 1068 = 4357 gallons which equates to a BAST level of 64%.

5425 – 1131 = 4294 gallons which equates to a BAST level of 63%.

5475 – 1068 = 4407 gallons which equates to a BAST level of 64.5%.

5475 – 1131 = 4344 gallons which equates to a BAST level of 63%.

Examiner's Cue:

If candidate determines boration requirement using

FIGURE S-3.1.3, question the candidate as to whether there are alternative means of determining the required boration volume (See JPM Performance Steps). Allow the candidate the opportunity to re-calculate the boration using the previous JPM steps.

Comment:

END OF TASK

Terminating Cue: **When the BAST Level estimate is complete, inform Candidate that the evaluation on this JPM is complete.**

STOP TIME: ________________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM RO A1-2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________ Date: ______________

INITIAL CONDITIONS:

- The plant tripped from 50% RTP when a loss of off-site power occurred.
- The crew is performing EPP-5, Natural Circulation Cooldown.
- The TSC is NOT staffed.
- Core Burnup is 11000 MWD/MTU
- Boron Concentration is 600 PPM
- Tavg is 547°F
- Boric Acid Storage Tank "A" is in service, aligned to blend with level at 85%.
- POWERTRAX is NOT available.

INITIATING CUE:

The CRS wants to initiate boration while necessary support personnel are reporting. You have been directed to determine the required boron concentration for CSD (200°F) and then calculate the boron addition necessary to achieve that boron concentration **(with no allowance for PZR outsurge).** In accordance with OP-301, "For large additions, **ESTIMATE** expected BAST level decrease for target boration".

INITIAL CONDITIONS:

- The plant tripped from 50% RTP when a loss of off-site power occurred.
- The crew is performing EPP-5, Natural Circulation Cooldown.
- The TSC is NOT staffed.
- Core Burnup is 11000 MWD/MTU
- Boron Concentration is 600 PPM
- Tavg is 547˚F
- Boric Acid Storage Tank "A" is in service, aligned to blend with level at 85%.
- POWERTRAX is NOT available.

INITIATING CUE:

The CRS wants to initiate boration while necessary support personnel are reporting. You have been directed to determine the required boron concentration for CSD (200˚F) and then calculate the boron addition necessary to achieve that boron concentration **(with no allowance for PZR outsurge).** In accordance with OP-301, "For large additions, **ESTIMATE** expected BAST level decrease for target boration".

Facility:	HB ROBINSON	Task No.:	
Task Title:	Perform Section 8.2.3 of OST-020, Shiftly Surveillances	JPM No.:	2011-2 NRC JPM RO A2
K/A Reference:	G2.2.37 3.6 / 4.6		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:	The unit is in Mode 3 at 547°F and 2235 psig. All MSIVs are open.
Task Standard:	Identify all out of specification readings.
Required Materials:	OST-020
General References:	OST-020 Shiftly Surveillances, Revision 41
Handouts:	OST-020
Initiating Cue:	You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings and document any unsatisfactory conditions in the comments section of Attachment 10.1.
Time Critical Task:	NO
Validation Time:	15 minutes

(Denote Critical Steps with an asterisk)

Examiner's Cue: Provide OST-020 Cover Page through Section 7.0 and Section 8.2.3.

Performance Step: 1 Review procedure OST-020.

Standard: Reviews Precautions and Limitations and remainder of handout.

Examiner's Note:

Comment:

Performance Step: 2 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.1)

1. PZR Level (Channels LI-459A, 460 and 461)

Standard: Candidate compares the channel readings and determines that all channels are within 5% for PZR level.

Examiner's Note:

Comment:

* **Performance Step: 3**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.2)

2. PZR Pressure (Channels PI-455, 456 and 457)

Standard:

Candidate compares the channel readings and determines that channel PI-455 is outside of the tolerance of 40 psig from the other 2 channels.

Examiner's Note:

Comment:

* **Performance Step: 4**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.3)

S/G Pressure for A S/G (Channels PI-474, 475 and 476)

S/G Pressure for B S/G (Channels PI-484, 485 and 486)

S/G Pressure for C S/G (Channels PI-494, 495 and 496)

Standard:

Candidate compares the channel readings and determines that channel PI-484 is outside of the tolerance of 70 psig from the other 2 channels for S/G B.

Examiner's Note:

Comment:

* **Performance Step: 5** IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.4)

S/G Level for A S/G (Channels LI-474, 475 and 476)

S/G Level for B S/G (Channels LI-484, 485 and 486)

S/G Level for C S/G (Channels LI-494, 495 and 496)

Standard: Candidate compares the channel readings and determines that channel LI-475 is outside of the tolerance of 5% from the other 2 channels for S/G A.

Examiner's Note:

Comment:

Performance Step: 6 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.5)

Steam Header Pressure (Channels PI-464A, 466 and 468)

Standard: Candidate compares the channel readings and determines all of the Steam Header pressure channels are within the tolerance of 70 psig.

Examiner's Note:

Comment:

Performance Step: 7 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.6)

S/G Steam Flows for S/G A (Channels FI-474 and 475)

S/G Steam Flows for S/G B (Channels FI-484 and 485)

S/G Steam Flows for S/G C (Channels FI-494 and 495)

Standard: Candidate compares the channel readings and determines all of the Steam Flow channels are within tolerance.

Examiner's Note:

Comment:

* **Performance Step: 8** IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.7)

Tavg (Channels TI-412D, 422D and 432D)

Standard: Candidate compares the channel readings and determines that channel TI-432D is outside of the tolerance of 4°F from the other channels for Tavg.

Examiner's Note:

Comment:

Performance Step: 9 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.8)

SI Accumulator A Level (LI-920 and 922)

SI Accumulator B Level (LI-924 and 926)

SI Accumulator C Level (LI-928 and 930)

Standard: Candidate compares the channel readings and determines all of the SI Accumulator level channels are within the tolerance of 5%.

Examiner's Note:

Comment:

Performance Step: 10 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.9)

SI Accumulator A Pressure (PI-921 and 923)

SI Accumulator B Pressure (PI-925 and 927)

SI Accumulator C Pressure (PI-929 and 931)

Standard: Candidate compares the channel readings and determines all of the SI Accumulator pressure channels are within the tolerance of 40 psig.

Examiner's Note:

Comment:

END OF TASK

Terminating Cue: **When the instrument readings have been evaluated and comments made for any out of spec readings, the evaluation on this JPM is complete.**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM RO A2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________ Date: ______________

INITIAL CONDITIONS: The unit is in Mode 3 at 547°F and 2235 psig.

All MSIVs are open.

INITIATING CUE: You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings and document any unsatisfactory conditions in the comments section of Attachment 10.1.

INITIAL CONDITIONS: The unit is in Mode 3 at 547°F and 2235 psig.

All MSIVs are open.

INITIATING CUE: You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings and document any unsatisfactory conditions in the comments section of Attachment 10.1.

Progress Energy

C
Continuous
Use

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 9

OST-020

SHIFTLY SURVEILLANCES

REVISION 41

SUMMARY OF CHANGES
PRR 00453883
OST-020, Rev. 41

STEP	REVISION COMMENTS
8.7.2.4.A	Removed reference to the local wind up chart recorder. Changed the step wording from **CHECK** a value from a calibrated temperature instrument to a **CHECK** local temperature using a calibrated temperature instrument.
New NOTE prior to step 8.7.2.4.B	Removed reference to the local wind up chart recorder. Changed the step wording three instruments do not take temperatures to two instruments may not take temperatures.
8.7.2.4.B	Removed reference to the local wind up chart recorder.
8.7.2.8A	Removed reference to the local wind up chart recorder. Changed the step wording from **CHECK** a value from a calibrated temperature instrument to a **CHECK** local temperature using a calibrated temperature instrument.
New NOTE prior to step 8.7.2.8.B	Removed reference to the local wind up chart recorder. Changed the step wording three instruments do not take temperatures to two instruments may not take temperatures.
8.7.2.8B	Removed reference to the local wind up chart recorder.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To provide instructions for performing ITS, TRM or ODCM required shiftly surveillances during Modes 1 through 5, AND REFER TO OST-020-1,for required shiftly surveillances during movement of irradiated fuel assemblies, DSC loading, Mode 6 and defueled operation.

THIS PROCEDURE HAS BEEN SCREENED IAW OPS-NGGC-1306 AND DETERMINED NOT APPLICABLE TO THE REACTIVITY MANAGEMENT PROGRAM (PRR 00374090)

2.0 REFERENCES

2.1 Improved Technical Specifications (ITS)

2.2 OST-020-1, Shiftly Surveillances (Irradiated Fuel Movement, DSC Loading, Mode 6 and Defueled Operation)

2.3 OMM-015, Operations Surveillance Testing

2.4 OMM-001-11, Logkeeping

2.5 OP-006, Pressurizer PORV Pneumatic System/LTOPP

2.6 OMM-024, Rod Position Channel Check

2.7 OP-920, Radiation Monitoring System

2.8 PLP-100, Technical Requirements Manual (TRM)

2.9 ODCM, Offsite Dose Calculation Manual

2.10 EST-047, Reactor Coolant Flow Test

2.11 ESR 97-00601, Channel Check Tolerances for Steam Flow at Low Power Levels.

2.12 ESR 97-00611, Rod Position Indication Drift

2.13 RNP-I/INST-1040, Revision 1, Main Steam Accuracy and Scaling Calculation

2.14 RNP-I/INST-1128, Revision 0, FT-424 Error/Uncertainty Calculation

2.15 8S19-P-101, Station Blackout Coping Analysis Report

2.16 CR 97-02328, SR 3.1.6.2 Documentation

2.17 GP-010, Refueling

2.18 ESR 99-00220, Alternate method of determining Seal Injection flow

2.19 EC 47162, Set-Points, Uncertainty Calc change for Appendix K Uprate

2.20 LDCR 03-0002, Proposed change to LCO 3.1.7, Required Action A.1

2.21 NCR 188409, New Containment Analysis from Westinghouse

2.22 NCR290724, Black Creek Temperature Exceedance [CAPR]

2.23 RNP-I/INST-1127, LTOP Loop Uncertainty and Sealing Calculation (P-500 & 501)

3.0 RESPONSIBILITES

3.1 Operations personnel are responsible for the performance, review and approval of this test.

3.2 Unit one Chemistry personnel is responsible for checking the local wind up chart recorder indication as required by plant procedure.

3.3 Unit one control room personnel is responsible for providing the Control Board Indication for Discharge Canal Weir temperature.

4.0 PREREQUISITES

INIT

4.1 This revision has been verified to be the latest revision available. ________ Date ____

4.2 The Shift Manager has given permission to conduct this test. ____

4.3 **RECORD** plant mode which shiftly checks are being performed.

(07-19)MODE ____ ____

(19-07)MODE ____ ____

5.0 PRECAUTIONS AND LIMITATIONS

5.1 Any steps not applicable shall be marked N/A and the reason(s) noted in the COMMENTS section of Attachment 10.1 or 10.2.

5.2 This procedure has been screened IAW PLP-037 criteria and determined not applicable to PLP-037.

5.3 Steps within this procedure may be performed in any sequence, unless specified.

5.4 Steps may be done concurrently between watchstations.

5.5 The following guidance does **NOT** apply to Steam Flow instruments when turbine load is less than 20% **AND** only applies to RTGB instrumentation. It is **NOT** intended to apply to instrumentation of different types sensing the same parameter (i.e., direct reading local pressure gauge shall **NOT** be compared against a pressure transmitter driving a remote meter): (CR 95-02700)

5.5.1 A deviation greater than 5% of full scale is used as the OOS limit. The instrument shall be declared OOS.

5.6 Steam Flow loops are pressure compensated to account for density changes in the steam that occur from low-load to full-load operation. The calibration of the loops are set up for optimum performance at 100% of rated flow. As a result, the performance of the loops at low flows is not as accurate, and can be operable but may not meet the 5% tolerance. Based on this information, the following should be used for channel check of the redundant Steam Flow instruments: (CR 95-02700)

5.6.1 **IF** Turbine load is less than or equal to 20%, **THEN**

- Steam Flow should be greater than 90% of indicated Feed Flow.

AND

- The tolerance between redundant Steam Flows should be within $0.4x10^6$pph. (ESR 97-00601)

5.6.2 **IF** Turbine load is greater than 20%, **THEN** the tolerance between redundant Steam Flow instruments should be within 5%.

5.6.3 **If** it appears that the 5% tolerance will not be met prior to exceeding 20% Turbine load, **THEN** Engineering should be contacted to evaluate the specific situation.

5.7 A channel check can be performed when a redundant channel is unavailable (OOS). The qualitative check includes observation of the channel for unexplained changes that are not attributable to known activities such as changes in power level, filling, draining, heatup, cooldown, etc. Erratic behavior or unexplained changes in the channel indication would be conditions that would warrant declaring the channel OOS and applying the ITS/TRM/ODCM required actions.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 **IF** NEEDED, **THEN VERIFY** the following test equipment calibration is current **AND RECORD** the test equipment identification below:

Equipment	Identification	INIT
Calibrated Thermometer	______________	____

7.0 ACCEPTANCE CRITERIA

7.1 All steps for the applicable Mode have been completed.

7.2 Performance of the surveillance satisfies the ITS, TRM and ODCM requirements and the OST should be considered SAT. **IF** the stated condition(s) is not met, **THEN** the applicable Action Statement is required to be entered.

7.3 The reviewing and approving authorities may accept this test IAW provisions set forth in OMM-015.

8.0 PROCEDURE

	INIT 07-19	INIT 19-07

8.1 Reactivity Control Systems

8.1.1 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** Individual Rod Positions are within alignment limits. (ITS SR 3.1.4.1) ____ ____

2. **VERIFY** each Shutdown Bank is within the limits specified in the COLR. (ITS SR 3.1.5.1) ____ ____

> **NOTE:** When the Rod Insertion Limit monitor (APP-005-C5) is inoperable, ITS SR 3.1.6.2 requires the Control Bank position to be verified above the insertion limits specified in the COLR once within 4 hours and every 4 hours thereafter. This can be performed by making an entry in the COs narrative log every 4 hours referencing this SR number.
>
> A WR should be initiated when comparisons between Analog Rod Position indication and bank demand position indication approach 7.5 inches.

3. **VERIFY** each Control Bank position is above the insertion limits specified in the COLR. (ITS SR 3.1.6.2) ____ ____

4. **VERIFY** Sequence and Overlap Limits specified in the COLR are met for Control Banks not fully withdrawn from the core. (ITS SR 3.1.6.3) ____ ____

8.1.1 (Continued)

	INIT 07-19	INIT 19-07
5. For bank demand position at or above 200 steps, **PERFORM** CHANNEL CHECK by comparing Analog Rod Position indication and bank demand position indication. (The individual rod position indication (RPI) shall be within +/-15 inches of the bank demand position)(ITS SR 3.1.7.1)	____	____

NOTE: OMM-024, Rod Position Channel Check, provides applicable actions when ERFIS is inoperable.

The use of ERFIS is an acceptable alternate method for determining ARPI System Operability IAW Improved Tech Specs if the RTGB RPI indicators are not indicating properly. In cases where both indications (RPI and ERFIS) are tracking closely, and one of the indications is outside the required limits with the other indication still within the limits, ERFIS should be considered the most accurate indication and actions taken should be based on the ERFIS indication. If the ERFIS readout is used to replace the RPI indicators, it shall be continuously displayed on a terminal accessible to the Reactor Operator.
(ESR 97-00611)

A WR should be initiated when comparisons between ERFIS Individual Rod Position indication and bank demand position indication approach 7.5 inches.

6. For bank demand position at or above 200 steps, **PERFORM** CHANNEL CHECK by comparing ERFIS Individual Rod Position indication and bank demand position indication. (The ERFIS individual rod position indication shall be within +/-15 inches of the bank demand position)	____	____

INIT INIT
07-19 19-07

8.2 Instrumentation

8.2.1 **IF** MODE 1 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement), it is unacceptable.

1. RCS Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 9.a and 9.b) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-414 FI-415 FI-416	0-120%	6%	RNP-I/INST-1036
FI-424 FI-425 FI-426	0-120%	6%	RNP-I/INST-1036
FI-434 FI-435 FI-436	0-120%	6%	RNP-I/INST-1036

8.2.1 (Continued)

INIT 07-19 INIT 19-07

2. Turbine Impulse Pressure
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 17.e) ____ ____

INSTRUMEN T	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-446 PI-447	0-900 psig	45 psig	RNP-I/INST-1045

8.2.2 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement, except for S/G Feed Flow when <10% rated thermal power), it is unacceptable. (ESR 97-00601)

1. Overtemperature ΔT Setpoint
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 5) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412C TI-422C TI-432C	0-75°F	4°F	WCAP 11889

2. Overpower ΔT Setpoint
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 6) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412B TI-422B TI-432B	0-75°F	4°F	WCAP 11889

8.2.2 (Continued)

INIT 07-19 INIT 19-07

3. Loop Protection ΔT
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 5 and 6) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412A TI-422A TI-432A	0-75°F	4°F	WCAP 11889

4. S/G Feed Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 14)
(ESR 97-00601)

– **IF** ≥10% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-476 FI-477	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041
FI-486 FI-487	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041
FI-496 FI-497	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041

– **IF** <10% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-476 FI-477	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041
FI-486 FI-487	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041
FI-496 FI-497	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041

8.2.2 (Continued)

INIT 07-19 | INIT 19-07

> **NOTE:** Source Range Neutron Flux check is applicable in MODE 2.
>
> Per Calculations RNP-I/INST-1134, RNP-I/INST -1135, and Engineering determination from NCR 00268640, the following Channel Check Acceptance Criteria has been deemed appropriate, for the Reactor Protection Source Range, Intermediate Range, and Power Range:
>
> Power Range (N-41, N-42, N-43 and N-44): The acceptable deviation for the power range indication **SHALL** be within 2% power.
>
> Intermediate Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.78.
>
> Source Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.48.
>
> Due to the difficulty in reading a logarithmic meter with a fluctuating signal, the digital indication from ERFIS or NR-45 should be used to perform the Channel Checks whenever possible.
>
> The LOG function of an available calculator or the scientific calculator on the Control Room PC may be used to determine the logarithmic values. (NCR 268640)

5. Power Range Neutron Flux (ITS SR 3.3.1.1, Table 3.3.1-1 Item 2.a and 2.b):

   a. **PERFORM** the following:

      RECORD NI-41 indication _______ % Power ____

      RECORD NI-42 indication _______ % Power ____

      RECORD NI-43 indication _______ % Power ____

      RECORD NI-44 indication _______ % Power ____

8.2.2.5 (Continued)

INIT 07-19 INIT 19-07

b. **CALCULATE** maximum deviation:
Recorded (highest) minus Recorded (lowest)
equals: ________ ____

c. **PEER CHECK** calculation. ____

d. **DOCUMENT** results (within 2% power):

SAT / UNSAT ____
(Circle One)

6. **PERFORM** the following:

RECORD NI-41 indication.________ % Power ____

RECORD NI-42 indication.________ % Power ____

RECORD NI-43 indication ________ % Power ____

RECORD NI-44 indication ________ % Power ____

a. **CALCULATE** maximum deviation
Recorded (highest) minus Recorded (lowest)
equals: ________ ____

b. **PEER CHECK** calculation. ____

c. **DOCUMENT** results (within 2% power):
SAT / UNSAT ____
(Circle One)

8.2.2 (Continued)

		INIT 07-19	INIT 19-07
7.	Intermediate Range Neutron Flux (ITS SR 3.3.1.1, Table 3.3.1-1 Item 3)		
a.	**RECORD** NI-35 indication.	________	____
b.	**RECORD** N-36 indication.	________	____
c.	**CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals:	________	____
d.	**PEER CHECK** calculation.		____
e.	**DOCUMENT** results (≤ 1.78). SAT / UNSAT (Circle one)		____

8.2.2 (Continued)

		INIT 07-19	INIT 19-07
8.	Intermediate Range Neutron Flux (ITS SR 3.3.1.1, Table 3.3.1-1 Item 3)		
a.	**RECORD** NI-35 indication.	______	____
b.	**RECORD** N-36 indication.	______	____
c.	**CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals:	______	____
d.	**PEER CHECK** calculation.		____
e.	**DOCUMENT** results (≤ 1.78). SAT / UNSAT (Circle one)		____
9.	**IF** required, **THEN** perform Source Range Neutron Flux check (if below P-6 Interlock) (ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)		
a.	**RECORD** NI-31 indication.	______	____
b.	**RECORD** N-32 indication.	______	____
c.	**CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals:	______	____
d.	**PEER CHECK** calculation.		____
e.	**DOCUMENT** results (≤ 1.48). SAT / UNSAT (Circle one)		____
10.	**IF** required, **THEN** perform Source Range Neutron Flux check (if below P-6 Interlock) (ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)		
a.	**RECORD** NI-31 indication.	______	____
b.	**RECORD** N-32 indication.	______	____

8.2.2.10 (Continued)

INIT 07-19 INIT 19-07

c. **CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals: _______ ____

d. **PEER CHECK** calculation. ____

e. **DOCUMENT** results (≤ 1.48). SAT / UNSAT (Circle one ____

8.2.3 **IF** MODE 1, 2, **OR** 3 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement, except for S/G Steam Flow when <20% rated thermal power), it is unacceptable. (ESR 97-00601)

1. PZR Level
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 8 and
ITS SR 3.3.3.1, Table 3.3.3-1 Item 12) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-459A LI-460 LI-461	0-100%	5%	RNP-I/INST-1060

8.2.3 (Continued)

INIT 07-19 | INIT 19-07

2. PZR Pressure
IF Pressurizer Pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A.
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 7.a, 7.b and ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.d and 6.a) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-455 PI-456 PI-457	1700-2500 psig	40 psig	RNP-I/INST-1042

3. S/G Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.e, 1.g and 4.e, ITS SR 3.3.3.1, Table 3.3.3-1 Item 20) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-474 PI-475 PI-476	0-1400 psig	70 psig	RNP-I/INST-1072
PI-484 PI-485 PI-486	0-1400 psig	70 psig	RNP-I/INST-1072
PI-494 PI-495 PI-496	0-1400 psig	70 psig	RNP-I/INST-1072

8.2.3 (Continued)

INIT 07-19 | INIT 19-07

4. S/G Level
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 13 and 14,
ITS SR 3.3.3.1, Table 3.3.3-1 Item 13,
ITS SR 3.3.8.1, Table 3.3.8-1 Item 1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-474 LI-475 LI-476	0-100%	5%	RNP-I/INST-1070
LI-484 LI-485 LI-486	0-100%	5%	RNP-I/INST-1070
LI-494 LI-495 LI-496	0-100%	5%	RNP-I/INST-1070

5. Steam Header Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.e) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-464A PI-466 PI-468	0-1400 psig	70 psig	RNP-I/INST-1050

8.2.3 (Continued)

INIT 07-19 INIT 19-07

6. S/G Steam Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 14 and ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.f, 1.g, 4.d and 4.e) (ESR 97-00601)

– **IF** ≥20% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-474 FI-475	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040
FI-484 FI-485	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040
FI-494 FI-495	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040

– **IF** <20% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION
FI-474 FI-475	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-474 <u>AND</u> FI-475 *FI-474 <u>AND</u> FI-477 *FI-475 <u>AND</u> FI-476
FI-484 FI-485	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-484 <u>AND</u> FI-485 *FI-484 <u>AND</u> FI-487 *FI-485 <u>AND</u> FI-486
FI-494 FI-495	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-494 <u>AND</u> FI-495 *FI-494 <u>AND</u> FI-497 *FI-495 <u>AND</u> FI-496

* The Steam Flow Channel is checked against the corresponding Feed Flow channel for acceptance.

8.2.3 (Continued)

INIT 07-19 INIT 19-07

7. Tavg
IF Tavg is outside the indicating range due to normal plant conditions, **THEN** mark N/A.
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.f, 4.d and 6.b) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412D TI-422D TI-432D	540-615°F	4°F	WCAP 11889

8. SI Accumulator Level
(TRMS TR 4.2.1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-920 LI-922	0-100%	5%	RNP-I/INST-1052
LI-924 LI-926	0-100%	5%	RNP-I/INST-1052
LI-928 LI-930	0-100%	5%	RNP-I/INST-1052

9. SI Accumulator Pressure
(TRMS TR 4.2.1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-921 PI-923	0-800 psig	40 psig	RNP-I/INST-1036
PI-925 PI-927	0-800 psig	40 psig	RNP-I/INST-1036
PI-929 PI-931	0-800 psig	40 psig	RNP-I/INST-1036

8.2 (Continued)

INIT 07-19 | INIT 19-07

8.2.4 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement), it is unacceptable.

1. CV Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.c, 2.c, 3.b.3 and 4.c) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-950A PI-951 PI-952 PI-953 PI-954 PI-955	-5 - 75 psig	4 psig	RNP-I/INST-1044

8.2.4 (Continued)

INIT 07-19 INIT 19-07

2. PZR Pressure
IF RCS pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A. ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-500 PI-501A	200-600 psig	20 psig	RNP-I/INST-1127

1) **IF** RCS pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A. ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-444 PI-445	1700-2500 psig	40 psig	RNP-I/INST-1042

NOTE: The following instrument does not have a redundant indicator; therefore Maximum Deviation values are not provided.

OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

3. Control Room Radiation Monitor - R-1
(ITS SR 3.3.7.1, Table 3.3.7-1 Item 2) ____ ____

8.2 (Continued)

NOTE: Per Calculation RNP-I/INST-1134 and Engineering determination from NCR 00268640, the following Channel Check Acceptance Criteria has been deemed appropriate for the Reactor Protection Source Range Instrumentation: – Source Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.48. Due to the difficulty in reading a logarithmic meter with a fluctuating signal, the digital indication from ERFIS or NR-45 should be used to perform the Channel Checks whenever possible. The LOG function of an available calculator or the scientific calculator on the Control Room PC may be used to determine the logarithmic values. (NCR 268640)

8.2.5 **IF** MODE 3, 4 **OR** 5 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK on the Source Range Neutron Flux monitors. (ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)

INIT
07-19

1. Day Shift (07-19)
   a. **RECORD** NI-31 indication. _______ ____
   b. **RECORD** N-32 indication. _______ ____
   c. **CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals: _______ ____
   d. **PEER CHECK** calculation. ____
   e. **DOCUMENT** results: SAT / UNSAT (Circle one) ____

8.2.5 (continued)

			INIT 19-07
2.	Night Shift (19-07)		
a.	**RECORD** NI-31 indication.	________	____
b.	**RECORD** NI-32 indication.	________	____
c.	**CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals:	________	____
d.	**PEER CHECK** calculation.		____
e.	**DOCUMENT** results.	SAT / UNSAT	____

8.2 (Continued)

	INIT 07-19	INIT 19-07
8.2.6 **IF** movement of irradiated fuel assemblies in Spent Fuel Building **OR** Containment is occurring **OR** will occur, **THEN PERFORM** CHANNEL CHECK on the Control Room Radiation Monitor - R-1. (ITS SR 3.3.7.1, Table 3.3.7-1 Item 2)	____	____
8.2.7 **IF** the DSC is loaded **OR** being loaded **AND** is NOT sealed IAW ISFS-014, **THEN PERFORM** CHANNEL CHECK on the Control Room Radiation Monitor - R-1 until notified by maintenance that the sealing operation is complete. (ITS SR 3.3.7.1, Table 3.3.7-1 Item 2)	____	____

NOTE: ITS 3.3.6.1 and Table 3.3.6-1, Containment Ventilation Isolation Instrumentation, is applicable in modes 1, 2, 3, 4 **OR** during movement of **RECENTLY** irradiated fuel (decay time of less than 56 hours). Fuel is no longer recently irradiated if greater than 56 hours have elapsed since reactor shutdown.

OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

8.2.8 **IF** MODE 1, 2, 3, **OR** 4 shift checks are required, **OR** movement of **RECENTLY** irradiated fuel assemblies in Containment is occurring **OR** will occur, **THEN PERFORM** a CHANNEL CHECK on the Containment Radiation monitors. (ITS SR 3.3.6.1, Table 3.3.6-1 Item 3.a and 3.b)

– R-11, CV AIR & PLANT VENT PARTICULATE	____	____
– R-12, CV AIR & PLANT VENT RADIOACTIVE GAS	____	____

	INIT 07-19	INIT 19-07

8.3 Reactor Coolant System

8.3.1 **IF** MODE 1 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** PZR Pressure is greater than or equal to 2205 psig. (ITS SR 3.4.1.1)

   (07-19)_____ psig ____

   (19-07)_____ psig ____

2. **VERIFY** RCS Average Temperature is less than or equal to 579.4°F. (ITS SR 3.4.1.2)

   (07-19)_____ °F ____

   (19-07)_____ °F ____

8.3.1 (Continued)

INIT 07-19 INIT 19-07

NOTE: ITS SR 3.4.1.3 requires that the RCS Total Flow be verified to be greater than or equal to 97.3×10^6 lbm/hr every 12 hours. RCS flow is not indicated in lbm/hr. Therefore, EST-047 was performed and provided the following values for performing this SR.

LOOP "A"	
Transmitter	Min Flow
FT-414	98.81
FT-415	98.81
FT-416	98.76

LOOP "B"	
Transmitter	Min Flow
FT-424	97.72
FT-425	97.04
FT-426	95.61

LOOP "C"	
Transmitter	Min Flow
FT-434	101.94
FT-435	101.86
FT-436	102.26

3. **IF** ERFIS is available, **THEN VERIFY** RCS flow indicated on ERFIS is greater than the Min Flow values provided. (ITS SR 3.4.1.3) ____ ____

LOOP "A"		
Transmitter	Flow 07	Flow 19
RCF0400A (FT-414)		
RCF0401A (FT-415)		
RCF0402A (FT-416)		

LOOP "B"		
Transmitter	Flow 07	Flow 19
RCF0420A (FT-424)		
RCF0421A (FT-425)		
RCF0422A (FT-426)		

LOOP "C"		
Transmitter	Flow 07	Flow 19
RCF0440A (FT-434)		
RCF0441A (FT-435)		
RCF0442A (FT-436)		

8.3.1 (Continued)

INIT INIT
07-19 19-07

NOTE: ITS SR 3.4.1.3 requires that the RCS Total Flow be verified to be greater than or equal to 97.3x10^6 lbm/hr every 12 hours. RCS flow is not indicated in lbm/hr. Therefore, EST-047 was performed and provided the following values for performing this SR.

LOOP "A"	
Transmitter	Min Flow
FT-414	98.81
FT-415	98.81
FT-416	98.76

LOOP "B"	
Transmitter	Min Flow
FT-424	97.72
FT-425	97.04
FT-426	95.61

LOOP "C"	
Transmitter	Min Flow
FT-434	101.94
FT-435	101.86
FT-436	102.26

NOTE: The marked increments of the RCS flow indicators on the RTGB are 2%. This means they can not be read in less than 1% increments.

4. **IF** ERFIS is unavailable, **THEN VERIFY** RCS flow as follows: (ITS SR 3.4.1.3)

   a. **RECORD** RCS flow as indicated on the RTGB. ____ ____

LOOP "A"		
Transmitter	Flow	
	07	19
FT-414 (RCF0400A)		
FT-415 (RCF0401A)		
FT-416 (RCF0402A)		

LOOP "B"		
Transmitter	Flow	
	07	19
FT-424 (RCF0420A)		
FT-425 (RCF0421A)		
FT-426 (RCF0422A)		

LOOP "C"		
Transmitter	Flow	
	07	19
FT-434 (RCF0440A)		
FT-435 (RCF0441A)		
FT-436 (RCF0442A)		

INIT 07-19 INIT 19-07

8.3.1.4 (Continued)

b. **IF** any RTGB RCS flow indication for Loop 1 and Loop 2 is less than 100%, **OR IF** any RTGB RCS flow indication for Loop 3 is less than 101%, **THEN** contact RES for assistance in verifying RCS flow.

_______________________ ____ ____
RESS Contact (Print name)

8.3.2 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN VERIFY** each RCS Loop is in operation. (ITS SR 3.4.4.1) ____ ____

8.3.3 **IF** MODE 1, 2 **OR** 3 shiftly checks are required, **THEN PERFORM** the following:

NOTE: PZR Level limits are ≤ 63.3% when in MODE 1 and ≤92% when in MODE 2 **OR** 3.

1. **VERIFY** PZR Level is within limits. (ITS SR 3.4.9.1) (07-19)_____ % ____

(19-07) _____ % ____

NOTE: OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

8.3.4 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** the following:

1. CHANNEL CHECK of the required CV Atmosphere Radioactivity Monitor. (ITS SR 3.4.15.1)

(07-19) Required Monitor R-11 / R-12 ____
(Circle one)

(07-19) CHANNEL CHECK Complete ____

(19-07) Required Monitor R-11 / R-12 ____
(Circle one)

(19-07) CHANNEL CHECK Complete ____

8.3.4 (Continued)

INIT
07-19

2. **VERIFY** Seal Injection flow of greater than or equal to 6 gpm to each RCP. (ITS SR 3.4.17.1)

07-19

- FI-130, RCP "A" _____ gpm ____
- FI-127, RCP "B" _____ gpm ____
- FI-124, RCP "C" _____ gpm ____

NOTE: **IF** FI-127, FI-124 OR FI-130 is OOS **THEN** manual calculation of Seal Injection Flow can be performed IAW OP-301-1 to satisfy ITS SR 3.4.17.1. (ESR 99-00220)

- **IF** FI-130 is OOS, **THEN** notify maintenance to **PERFORM** PM 57033. (ITS LCO 3.4.17) ____
- **IF** FI-127 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57032. (ITS LCO 3.4.17) ____
- **IF** FI-124 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57031. (ITS LCO 3.4.17) ____

8.3.4.2 (Continued)

INIT
19-07

19-07

- FI-130, RCP "A" ______ gpm ____
- FI-127, RCP "B" ______ gpm ____
- FI-124, RCP "C" ______ gpm ____

NOTE: **IF** FI-127, FI-124 OR FI-130 is OOS **THEN** manual calculation of Seal Injection Flow can be performed IAW OP-301-1 to satisfy ITS SR 3.4.17.1. (ESR 99-00220)

- **IF** FI-130 is OOS, **THEN** notify maintenance to **PERFORM** PM 57033. (ITS LCO 3.4.17) ____
- **IF** FI-127 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57032. (ITS LCO 3.4.17) ____
- **IF** FI-124 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57031. (ITS LCO 3.4.17) ____

	INIT 07-19	INIT 19-07

8.3.5 **IF** MODE 3 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** required RCS Loops are in operation. (ITS SR 3.4.5.1) ____ ____

2. **VERIFY** S/G secondary side water levels are greater than or equal to 16% NR for required RCS Loops. (ITS SR 3.4.5.2)

07-19	S/G "A" _____ %	____	
	S/G "B" _____ %	____	
	S/G "C" _____ %	____	
19-07	S/G "A" _____ %		____
	S/G "B" _____ %		____
	S/G "C" _____ %		____

3. **IF** only one RCS loop is in operation, **THEN PERFORM** ONE of the following:

   a. **VERIFY** the Rod Control System is not capable of rod withdrawal. (ITS SR 3.4.5.3) ____ ____

   b. **VERIFY** the Reactor Trip Breakers are open. (ITS SR 3.4.5.4) ____ ____

   c. **VERIFY** the Lift Coil Disconnect Switches for all Control Rods not fully withdrawn are open. (ITS SR 3.4.5.5) ____ ____

		INIT 07-19	INIT 19-07
8.3.6	**IF** MODE 4 shiftly checks are required, **THEN PERFORM** the following:		
1.	**VERIFY** one RHR train **OR** RCS Loop is in operation. (ITS SR 3.4.6.1) (07-19) RHR / RCS (Circle one)	____	
	(19-07) RHR / RCS (Circle one)		____
2.	**VERIFY** S/G secondary side water levels are greater than or equal to 16% NR for <u>required</u> RCS loops. (ITS SR 3.4.6.2) (07-19) "A"/ "B" / "C" _____ % (Circle one)	____	
	(19-07) "A"/ "B" / "C" _____ % (Circle one)		____

INIT 07-19 INIT 19-07

> **NOTE:** Steps 8.3.7 **OR** 8.3.8, along with step 8.3.9, are required to meet Low Temperature Overpressure Protection (LTOP) requirements of ITS LCO 3.4.12 in MODES 4 and 5.
>
> When in MODES 4 OR 5, an OPERABLE Power Operated Relief Valve (PORV) will have a nominal lift setting of 400 psig and an allowed value of ≤418 psig.

8.3.7 **IF** MODE 4 **OR** 5 shiftly checks are required, and use of OPERABLE Power Operated Relief Valves is desired to meet Low Temperature Overpressure Protection per ITS LCO 3.4.12.a, **THEN VERIFY** the following:

1. Two Power Operated Relief Valves (PORVs) are operable and each associated PORV block valve is OPEN.

   - PCV-456, PZR PORV (07-19) OPERABLE ____
   - RC-535, PORV BLOCK (07-19) OPEN ____
   - PCV-455C, PZR PORV (07-19) OPERABLE ____
   - RC-536, PORV BLOCK (07-19) OPEN ____
   - PCV-456, PZR PORV (19-07) OPERABLE ____
   - RC-535, PORV BLOCK (19-07) OPEN ____
   - PCV-455C, PZR PORV (19-07) OPERABLE ____
   - RC-536, PORV BLOCK (19-07) OPEN ____

2. A maximum of one Safety Injection (SI) pump capable of injecting into the RCS when all cold leg temperatures are ≥175°F. ____ ____

3. No SI pump capable of injecting into the RCS when any cold leg temperature is <175°F. ____ ____

NOTE: ITS Bases for LCO 3.4.12 states for an RCS Vent to meet the flow capacity requirement, it requires removing a pressurizer safety valve, removing a PORV's internals or physically blocking the valve stem of the PORV in the open position, and disabling its block valve in the open position. ITS LCO 3.4.12.b identifies that the required vent size for the RCS to be considered vented is greater than or equal to 4.4 square inches. One safety valve removed provides an opening greater than 10 square inches. Both PORVs Blocked Open with the Block Valves Open are required to meet the 4.4 square inches.

The required frequency for ITS SR 3.4.12.5 is 72 hours. This SR is performed shiftly for ease of tracking, since there is no OST which is performed on a 72 hour frequency.

INIT 07-19 | INIT 19-07

8.3.8 **IF** MODE 4 **OR** 5 shiftly checks are required, and use of a depressurized RCS with a vent path of ≥4.4 square inches, is desired to meet Low Temperature Overpressure Protection per ITS LCO 3.4.12.b, **THEN VERIFY** the following:

1. **IF** using Safety Valve Removed to comply with ITS LCO 3.4.12.b, **THEN VERIFY** at least ONE Safety Valve removed and FME cover not restricting flow.

   a. RC-551A / RC-551B / RC-551C
      Circle One Removed (07-19) ____

   b. RC-551A / RC-551B / RC-551C
      Circle One Removed (19-07) ____

8.3.8 (continued)

	INIT 07-19	INIT 19-07

2. **IF** using PORVs to comply with ITS LCO 3.4.12.b, **THEN VERIFY** both PZR PORVs are BLOCKED OPEN IAW OP-006 **AND** the associated Block Valves are OPEN.

		07-19	19-07
– PCV-456, PZR PORV	(07-19) BLOCKED OPEN	____	
– RC-535, PORV BLOCK	(07-19) OPEN	____	
– PCV-455C, PZR PORV	(07-19) BLOCKED OPEN	____	
– RC-536, PORV BLOCK	(07-19) OPEN	____	
– PCV-456, PZR PORV	(19-07) BLOCKED OPEN		____
– RC-535, PORV BLOCK	(19-07) OPEN		____
– PCV-455C, PZR PORV	(19-07) BLOCKED OPEN		____
– RC-536, PORV BLOCK	(19-07) OPEN		____

INIT 07-19 | INIT 19-07

> **NOTE:** ITS LCO 3.4.12 contains a Note which amplifies when SI Accumulators are required to be isolated. The following step is a simplified method to ensure compliance and eliminates the need to use ITS LCO 3.4.3 curves.

8.3.9 **IF** MODE 4 **OR** 5 shiftly checks are required and any SI Accumulator is pressurized, **THEN VERIFY** each SI Accumulator isolation valve is closed **AND** deenergized for Low Temperature Overpressure Protection. (ITS SR 3.4.12.3)

1. SI Accumulator "A"

   – SI-865A, ACCUMULATOR "A" DISCHARGE — (07-19) CLOSED ____ — (19-07) CLOSED ____

   – SI-865A, ACCUMULATOR "A" DISCHARGE breaker on MCC-5, CMPT 14F — (07-19) OPEN ____ — (19-07) OPEN ____

2. SI Accumulator "B"

   – SI-865B, ACCUMULATOR "B" DISCHARGE — (07-19) CLOSED ____ — (19-07) CLOSED ____

   – SI-865B, ACCUMULATOR "B" DISCHARGE breaker on MCC-6, CMPT 10J — (07-19) OPEN ____ — (19-07) OPEN ____

8.3.9 (Continued)

	INIT 07-19	INIT 19-07
3. SI Accumulator "C"		
– SI-865C, ACCUMULATOR "C" DISCHARGE (07-19) CLOSED	____	
(19-07) CLOSED		____
– SI-865C, ACCUMULATOR "C" DISCHARGE breaker on MCC-5, CMPT 9F (07-19) OPEN	____	
(19-07) OPEN		____

8.3.10 **IF** MODE 5 shiftly checks are required, **THEN PERFORM** the following:

	INIT 07-19	INIT 19-07
1. **VERIFY** one RHR Train is in operation. (ITS SR 3.4.7.1 and 3.4.8.1) (07-19) "A" / "B" (Circle one)	____	
(19-07) "A" / "B" (Circle one)		____
2. **IF** RCS loops are filled **AND** only one RHR train is operable, **THEN VERIFY** S/G secondary side water level is greater than or equal to 16% NR in the <u>required</u> S/G. (ITS SR 3.4.7.2) (07-19) "A" / "B" / "C" _____ % (Circle one)	____	
(19-07) "A" / "B" / "C" _____ % (Circle one)		____

INIT 07-19 INIT 19-07

8.4 Emergency Core Cooling Systems

8.4.1 **IF** MODE 1, 2 **OR** 3 shiftly checks are required, **THEN PERFORM** the following:

1. **IF** RCS pressure is greater than 1000 psig, **THEN PERFORM** the following:

   a. **VERIFY** Borated Water Volume in each SI Accumulator is greater than or equal to 825 ft^3 (61.5%) and less than or equal to 841 ft^3 (80.4%). (ITS SR 3.5.1.2)

   – SI Accumulator "A" (07-19) _____ % ____

   – SI Accumulator "B" (07-19) _____ % ____

   – SI Accumulator "C" (07-19) _____ % ____

   – SI Accumulator "A" (19-07) _____ % ____

   – SI Accumulator "B" (19-07) _____ % ____

   – SI Accumulator "C" (19-07) _____ % ____

8.4.1.1 (Continued)

		INIT 07-19	INIT 19-07
b.	**VERIFY** Nitrogen Cover pressure in each SI Accumulator is greater than or equal to 600 psig and less than or equal to 660 psig. (ITS SR 3.5.1.3)		
–	SI Accumulator "A" (07-19) _____ psig	_____	
–	SI Accumulator "B" (07-19) _____ psig	_____	
–	SI Accumulator "C" (07-19) _____ psig	_____	
–	SI Accumulator "A" (19-07) _____ psig		_____
–	SI Accumulator "B" (19-07) _____ psig		_____
–	SI Accumulator "C" (19-07) _____ psig		_____

8.4.1 (Continued)

			INIT 07-19	INIT 19-07
2.	**VERIFY** the following valves are in the listed positions with Control Power to the valve operator removed. (ITS SR 3.5.2.1)			
	– SI-862A, RWST to RHR	OPEN	____	____
	– SI-862B, RWST to RHR	OPEN	____	____
	– SI-863A, RHR LOOP RECIRC	CLOSED	____	____
	– SI-863B, RHR LOOP RECIRC	CLOSED	____	____
	– SI-864A, RWST DISCH	OPEN	____	____
	– SI-864B, RWST DISCH	OPEN	____	____
	– SI-866A, LOOP 3 HOT LEG INJ	CLOSED	____	____
	– SI-866B, LOOP 2 HOT LEG INJ	CLOSED	____	____
	– SI-878A, SI DISCH CROSS CONN	OPEN	____	____
	– SI-878B, SI DISCH CROSS CONN	OPEN	____	____
	– SI-862A AC Control Power Defeat Switch	Defeated	____	____
	– SI-862B AC Control Power Defeat Switch	Defeated	____	____

8.4.1.2 (Continued)

		INIT 07-19	INIT 19-07
– SI-863A AC Control Power Defeat Switch	Defeated	____	____
– SI-863B AC Control Power Defeat Switch	Defeated	____	____
– SI-864A AC Control Power Defeat Switch	Defeated	____	____
– SI-864B AC Control Power Defeat Switch	Defeated	____	____
– SI-866A AC Control Power Defeat Switch	Defeated	____	____
– SI-866B AC Control Power Defeat Switch	Defeated	____	____
– SI-878A breaker on MCC-5 in CMPT No. 2C	OPEN	____	____
– SI-878B breaker on MCC-6 in CMPT NO. 15C	OPEN	____	____

	INIT 07-19	INIT 19-07

8.5 Containment Systems

8.5.1 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** CV Pressure is greater than or equal to -0.8 psig and less than or equal to 1.0 psig. (ITS SR 3.6.4.1)

   (07-19) _____ psig ____

   (19-07) _____ psig ____

2. **VERIFY** IVSW Tank Pressure is greater than or equal to 49 psig (includes instrument uncertainties) (NCR 188409) indicated locally on PI-1910 **OR** as indicated on a locally installed temporary gage with an accuracy equal to or less than ±2 psig. (ITS SR 3.6.8.1)

   (07-19)_____ psig ____

   (19-07) _____ psig ____

INIT 07-19 | INIT 19-07

8.6 Plant Systems

8.6.1 **IF** MODE 1, 2, 3 shiftly checks are required **OR** mode 4 shiftly checks are required when any S/G is being used for heat removal, **THEN PERFORM** the following:

> **NOTE:** 8S19-P-101 allows 24 hours of operation with CST level between 50% and 26%.
>
> If LI-1454A or LI-1454B is unavailable, LI-1454C may be used to check CST level.
>
> CST level indications used should be within 5% of one another to satisfy OST-023 and OST-918 requirements. (ITS 3.3.3 Table 3.3.3-1 item 14.)

1. **VERIFY** CST Level is greater than or equal to 50%. (Admin. limit per 8S19-P-101 & Appendix R Separation Analysis) (ITS SR 3.7.5.1 limit of 35,000 gallons (≥26%)).

   – LI-1454A (07-19) _____% ____

   – LI-1454B (07-19) _____% ____

   – LI-1454A (19-07) _____% ____

   – LI-1454B (19-07) _____% ____

8.6.2 **IF** MODE 1, 2, 3, 4, **OR** 5 shiftly checks are required, **OR** during movement of irradiated fuel assemblies, **THEN PERFORM** the following:

1. **VERIFY** Control Room temperature is less than or equal to 85°F using TIC-6513 if available **OR** a calibrated thermometer placed near the return duct inlet. (TRMS TR 4.7.1)

   (07-19) TIC-6513 _____°F ____

   (19-07) TIC-6513 _____°F ____

   Calibrated Thermometer (07-19) _____°F ____

   Calibrated Thermometer (19-07) _____°F ____

	INIT 07-19	INIT 19-07

8.7 Other

8.7.1 **IF** MODE 1, 2, 3, 4 OR 5 shiftly checks are required, **THEN VERIFY** the following Dedicated Shutdown/SBO Equipment:

1. DS Diesel Fuel Oil Storage Tank level greater than or equal to 2500 gallons. (07-19) ______ gal ____

   (19-07) ______ gal ____

INIT 07-19 | INIT 19-07

NOTE: This section should be performed during dayshift when Unit 1 Chemistry personnel will be available.

8.7.2 **IF** Mode 1, 2, 3, **OR** 4 daily checks are required, **THEN** **PERFORM** the following:

1. **RECORD** the ERFIS reading for CWT9021A, Black Creek Temperature. _______ °F ____ N/A

NOTE: Reviewing the Circulating Water Effluent Monitoring Log hourly print out will aid in performance of this step.

2. **RECORD** ERFIS reading for CWT2400A, TE-3091A, COND "A" CW Inlet Temp _______ °F ____ N/A

3. **COMPARE** ERFIS point CWT9021A, Black Creek Temperature, to the temperature in 8.7.2.2 **AND RECORD** the difference. [CAPR, NCR 00290724] _______ °F ____ N/A

NOTE: Temperature indication will not be reliable if there is no circulating water flow (i.e. water box not in service). Additionally a margin of 3°F **OR** greater could be caused by wind direction, lake level, and stratification due to rainfall, or other possible causes. No additional checks required when differences can be explained and no instrument failures suspected.

4. **IF** CWT9021A varies from ERFIS point CWT2400A by 3°F **OR** greater **AND** cannot be explained, **THEN PERFORM** the following:

   a. **REQUEST** Unit 1 Control Room to have Unit 1 Chemistry personnel **CHECK** local temperature using a calibrated temperature instrument for comparison. ____ N/A

8.7.2.4 (Continued)

INIT 07-19 | INIT 19-07

NOTE: The following step requires that a WR be initiated for the "suspect instrument" when the margin is 2°F or greater between ERFIS point CWT9021A and the calibrated temperature instrument. However, latitude should be given to reflect that the two instruments may not take temperatures in the same location in the flow stream and as such are affected by stratification caused by a rise in tail flow and associated rainfall. A work request is not needed when the difference can be explained and no instrument failure is suspect.

b. **IF** a delta of 2°F **OR** more is observed between ERFIS point CWT9021A **AND** the calibrated temperature instrument, **THEN** **INITIATE** a work request for the suspect temperature instrument **AND** perform all applicable actions of PLP-023. W/R# ____________ ____ N/A

5. **RECORD** the ERFIS reading for CWT9022A, Discharge Canal Weir temperature. ________ °F ____ N/A

NOTE: Step 8.7.2.6 may be performed by contacting the Unit 1 Control Room.

6. From Unit 1 Control Board Indication for Discharge Canal Weir temperature, **RECORD** the temperature.

________ °F ____ N/A

INIT 07-19 | INIT 19-07

8.7.2 (Continued)

7. **PERFORM** a "channel check" on ERFIS point CWT9022A, Discharge Canal Weir temperature, by comparing to the reading from the Unit 1 Control Board Indication for Discharge Canal Weir temperature **AND RECORD** the difference. [CAPR NCR 290724] _______ °F____ N/A

8. **IF** CWT9022A varies from the Unit 1 Control Board Indication by 3 degrees **OR** greater **AND** the delta cannot be explained, **THEN PERFORM** the following:

   a. **REQUEST** Unit 1 Control Room to have Unit 1 Chemistry personnel **CHECK** local temperature using a calibrated temperature instrument for comparison. ____ N/A

NOTE: The following step requires that a WR be initiated for the "suspect instrument" when the margin is 2°F or greater between ERFIS point CWT9022A and the calibrated temperature instrument. However, latitude should be given to reflect that the two instruments may not take temperatures in the same location in the flow stream and as such are affected by stratification caused by a rise in tail flow and associated rainfall. A work request is not needed when the difference can be explained and no instrument failure is suspect.

   b. **IF** a delta of 2 degrees **OR** more is observed between ERFIS point CWT9022A **AND** the calibrated temperature instrument, **THEN INITIATE** a work request for the suspect temperature instrument.
   W/R# ______________ ____ N/A

INIT INIT

NOTE: When the SI accumulators are pressurized **AND** Boron Injection to RCS Check Valve leakage is present this section should be performed to maintain the BIT header pressure above 650 psig. (SI-873C/SI-873F, SI-873B/SI-873E, OR SI-873A/SI-873D) APP-002-C3, BIT HDR HI PRESS, provides guidance for draining the BIT line via an SI pump(s) to relieve the BIT Header pressure. OP-202-1, SI System Venting, provides guidance to re-pressurize the BIT header if it becomes necessary. PT-943 and PT-940 can be used to trend pressure changes which would indicate potential leakage into and out of the piping sections.

8.7.3 **IF** Accumulator to SI check valves leakage is present, **THEN PERFORM** the following:

1. **CHECK AND RECORD** BIT Header Pressure (PI-934).

   (07-19) _____ psig ____

   (19-07) _____ psig ____

2. **IF** BIT Header Pressure (PI-934) is less than 650 psig, **THEN PERFORM** OP-202-1, Section 8.15.

   (07-19) ____

   (19-07)____

9.0 RECORDS

9.1 The completed procedure and any partials are forwarded to Plant Records.

10.0 ATTACHMENTS

10.1 Surveillance Test Procedure Certification and Review Form (Shift 07-19)

10.2 Surveillance Test Procedure Certification and Review Form (Shift 19-07)

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

SHIFT 07-19

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____
____
____

	Initials	Name (Print)	Date
Test Performed By:	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________

Test Complete: Date:__________ Time:__________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ______________________ __________
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)

____
____
____
____

Approved by: ______________________ __________
Shift Manager Date

SURVEILLANCE TEST PROCEDURE CERTIFICATION AND REVIEW FORM

SHIFT 19-07

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____

____

____

Test Performed By:	Initials	Name (Print)	Date
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________

Test Complete: Date:__________ Time:__________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ________________________ ________
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)

____

____

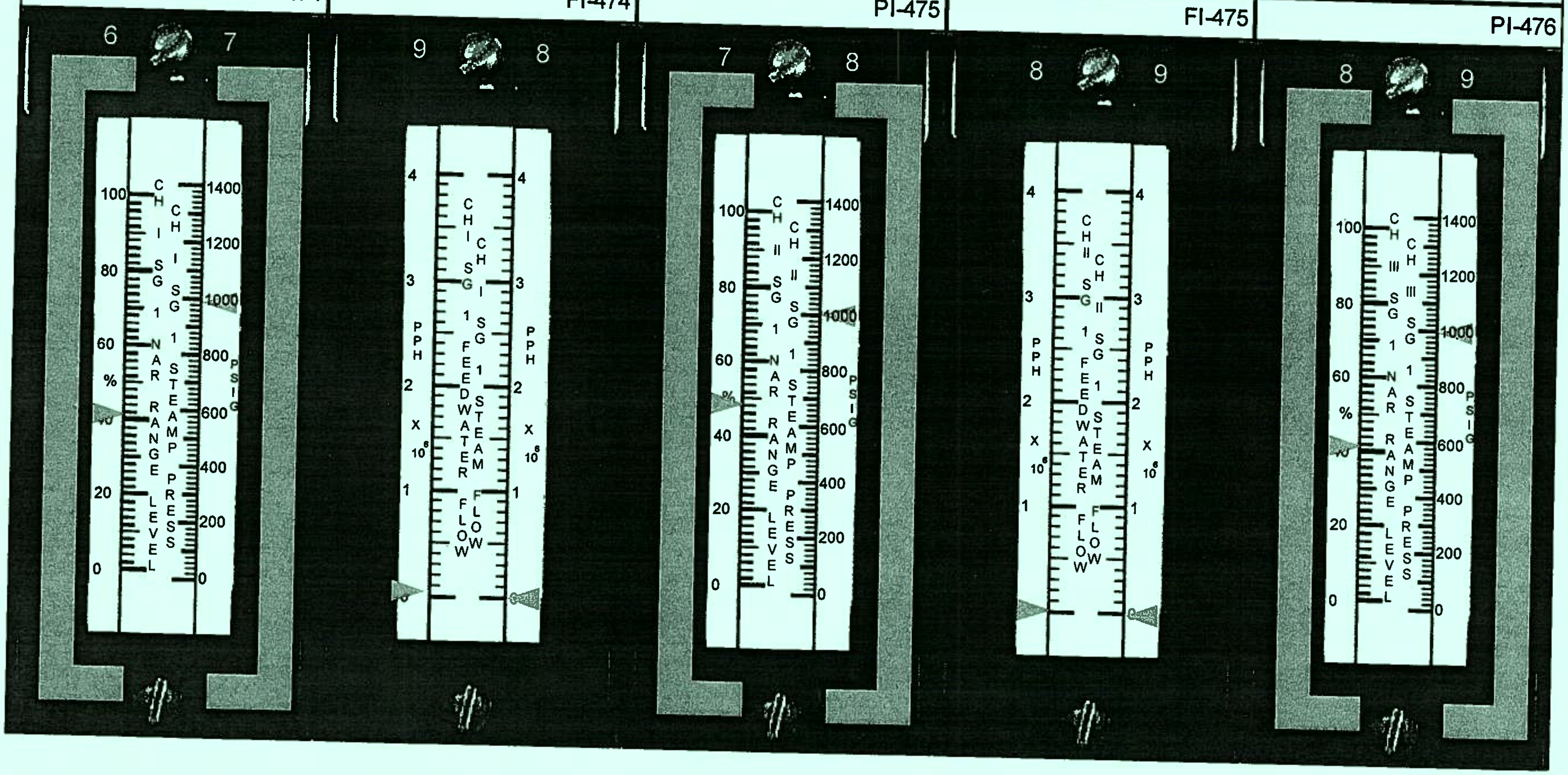
____

____

Approved by: ________________________ ________
Shift Manager Date

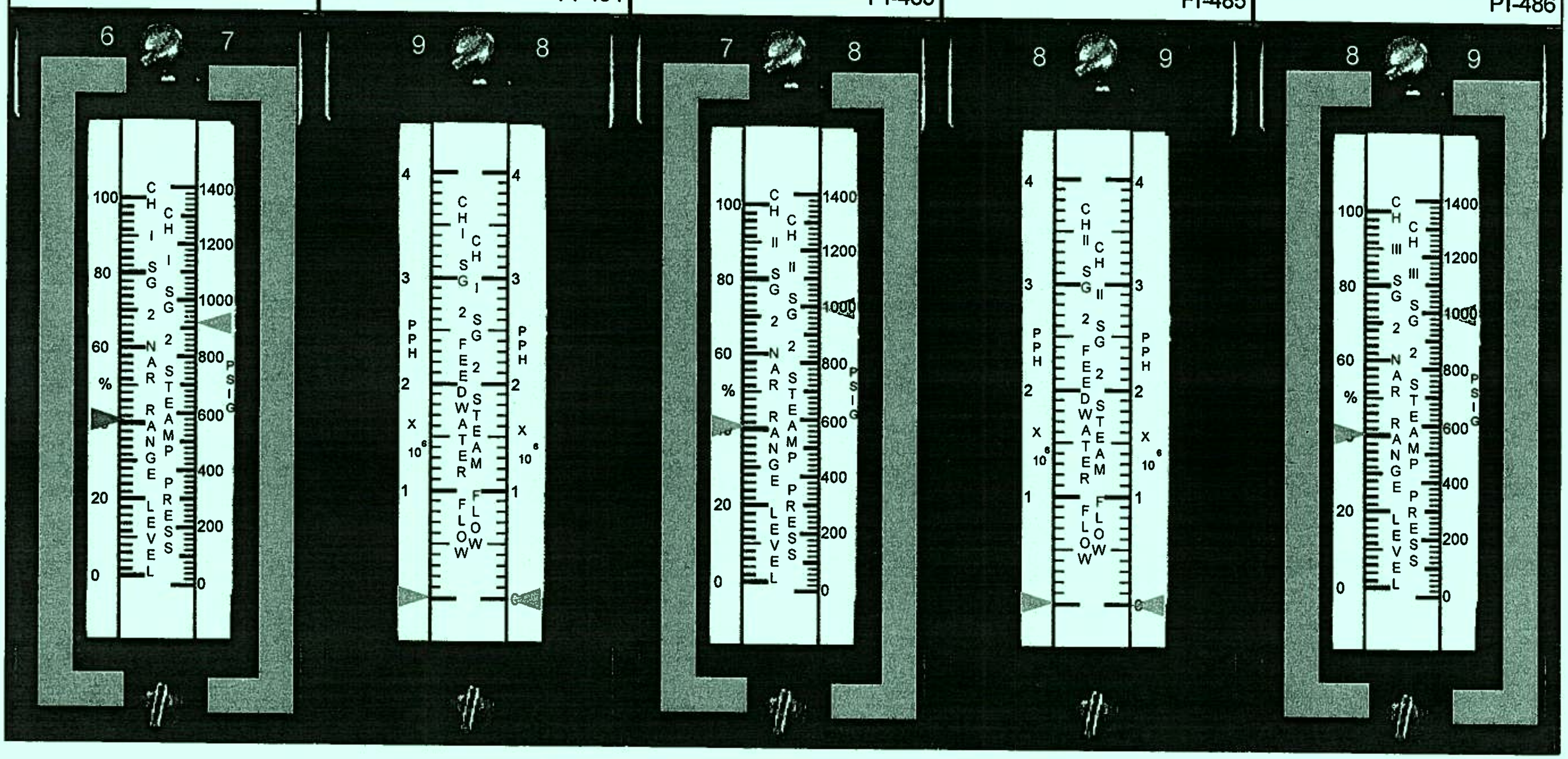
A STEAM GENERATOR

LI-474	FI-476	LI-475	FI-477	LI-476
PI-474	FI-474	PI-475	FI-475	PI-476



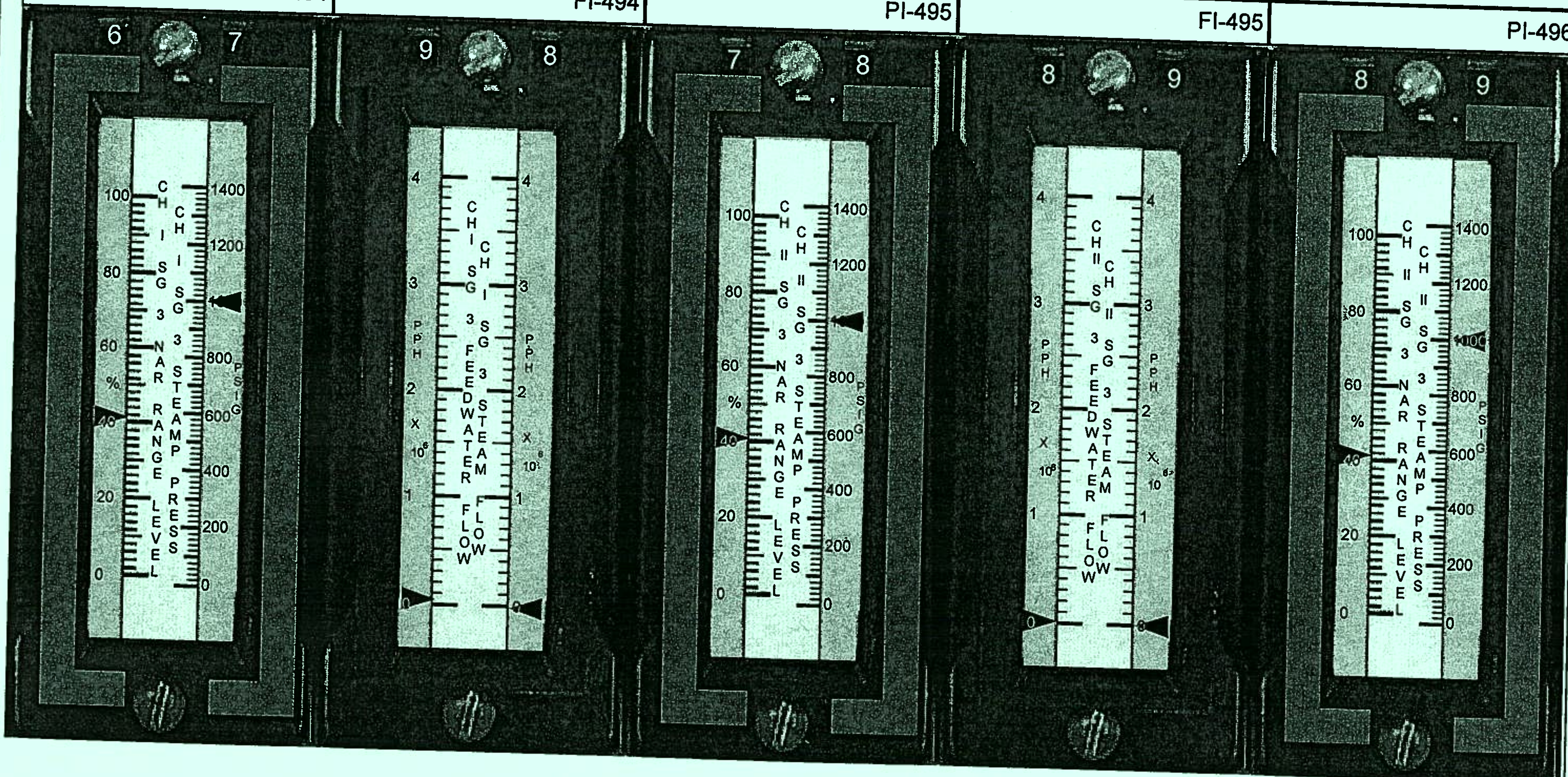
B STEAM GENERATOR

LI-484	FI-486	LI-485	FI-487	LI-486
PI-484	FI-484	PI-485	FI-485	PI-486



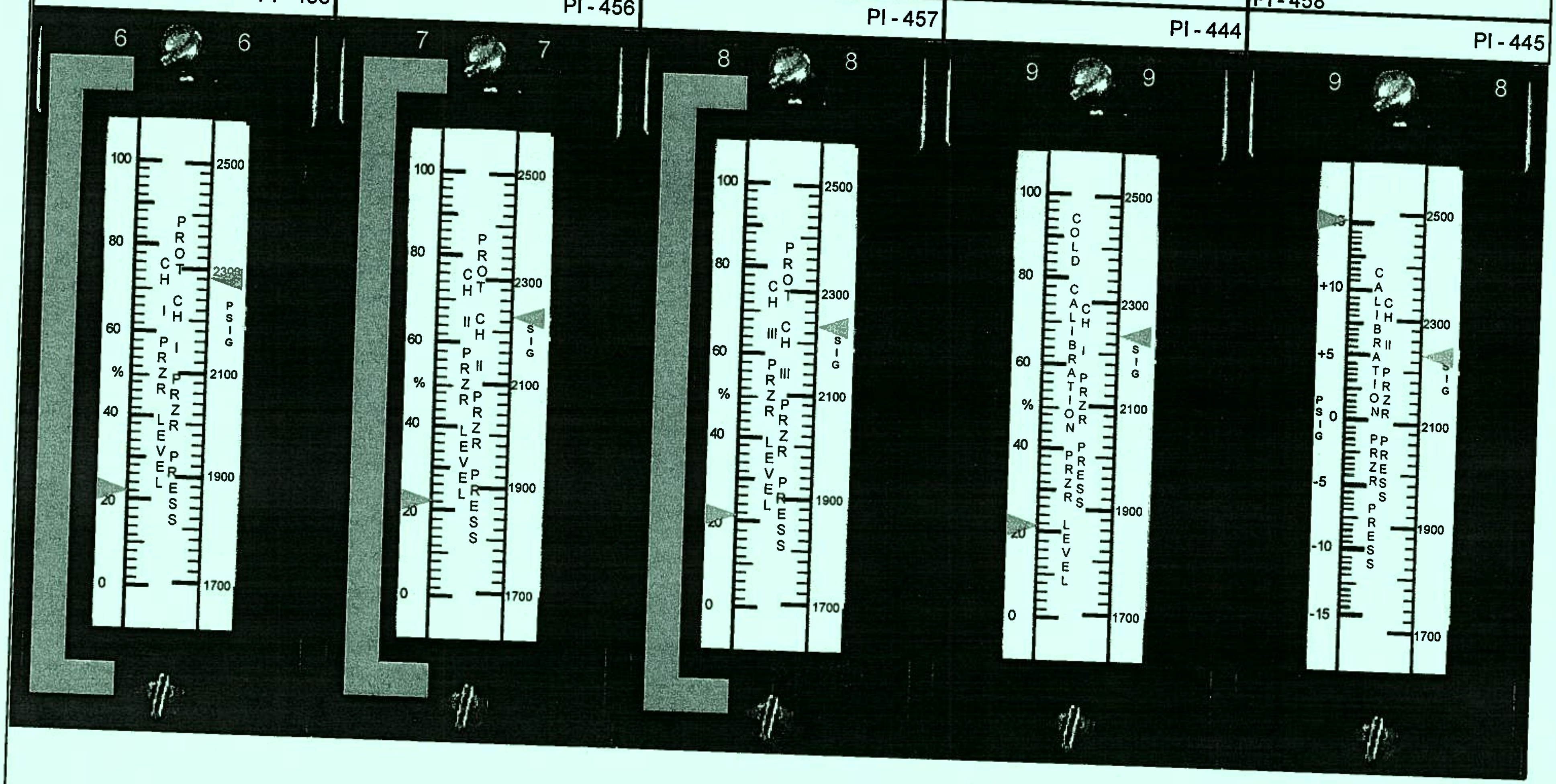
C STEAM GENERATOR

LI-494	FI-496	LI-495	FI-497	LI-496
PI-494	FI-494	PI-495	FI-495	PI-496



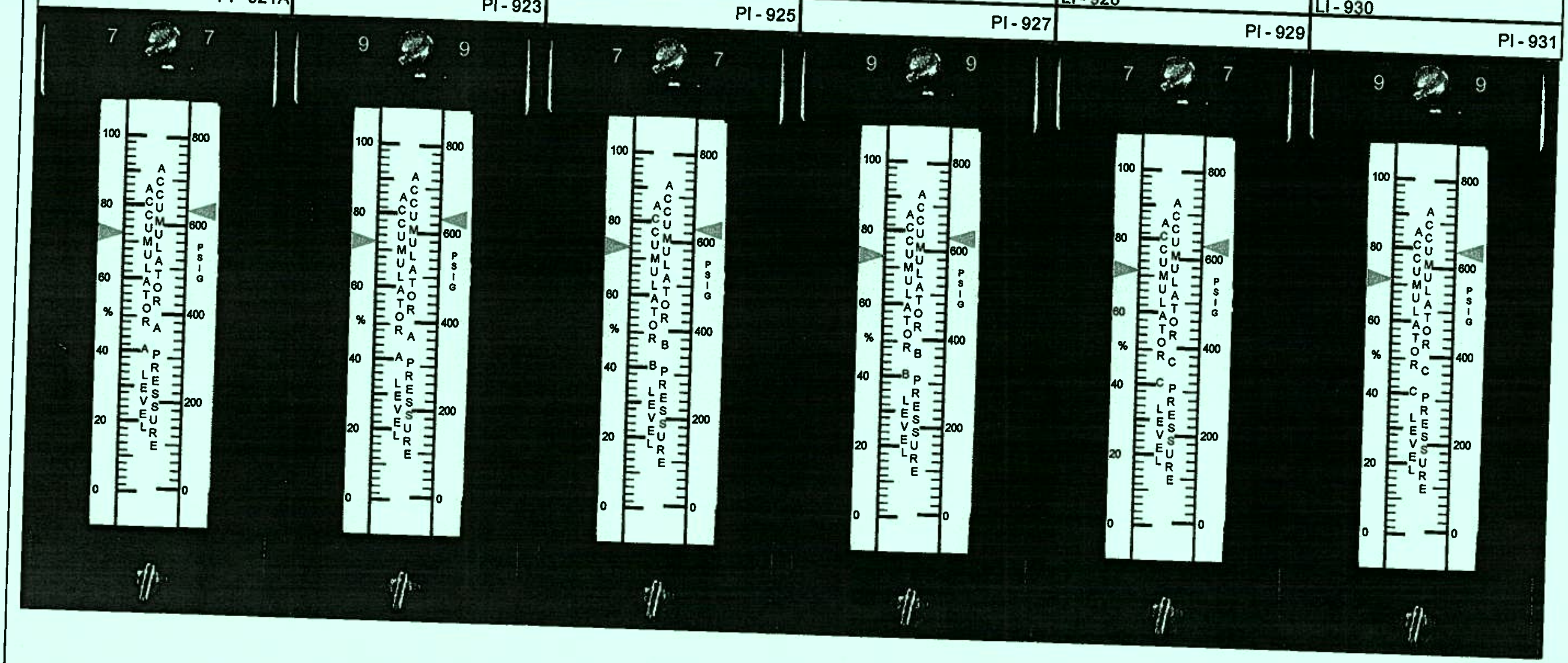
PZR PRESSURES AND LEVELS

LI - 459A	LI - 460	LI - 461	LI -462	PI - 458
PI - 455	PI - 456	PI - 457	PI - 444	PI - 445



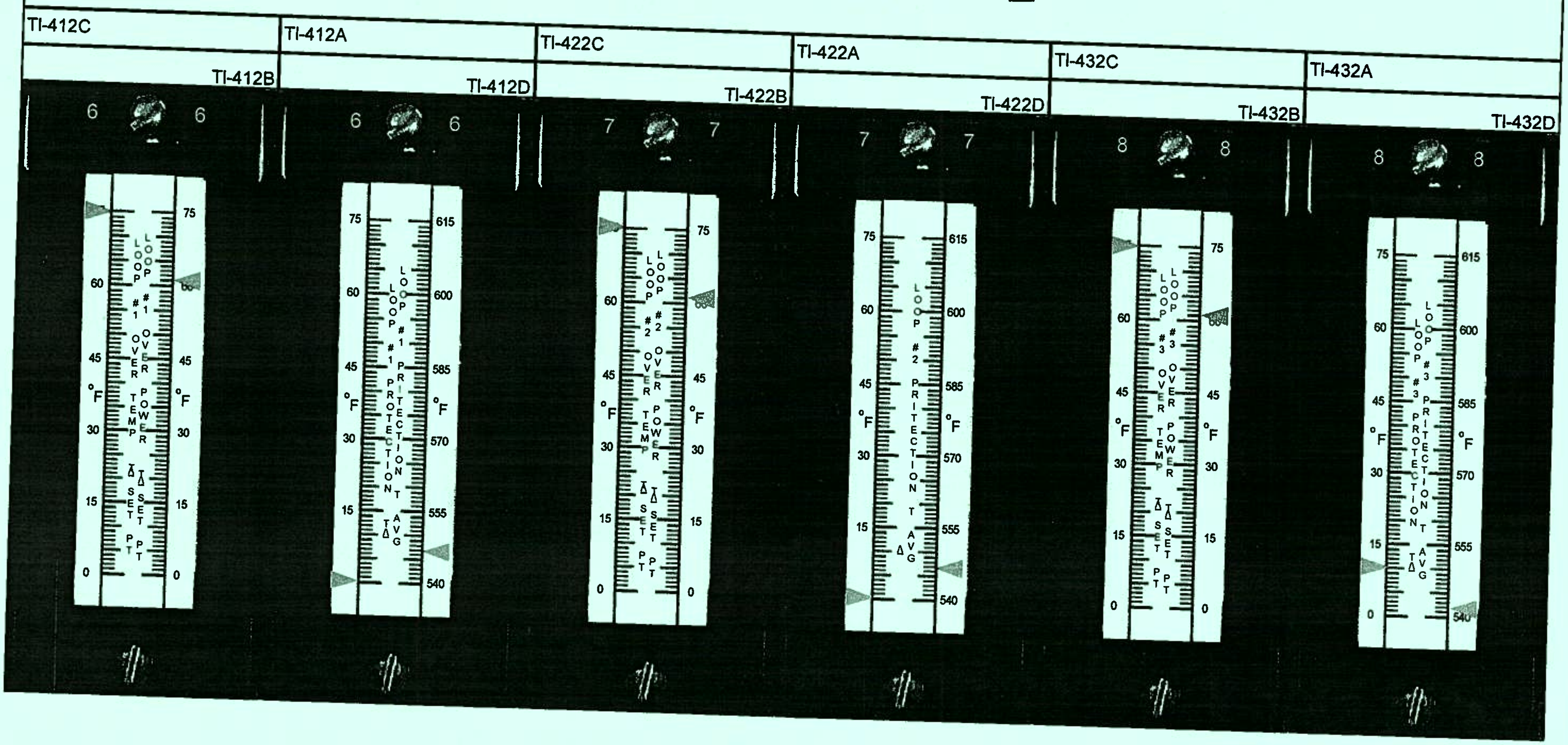
ACCUMULATORS

LI - 920	LI - 922	LI - 924	LI - 926	LI - 928	LI - 930
PI - 921A	PI - 923	PI - 925	PI - 927	PI - 929	PI - 931

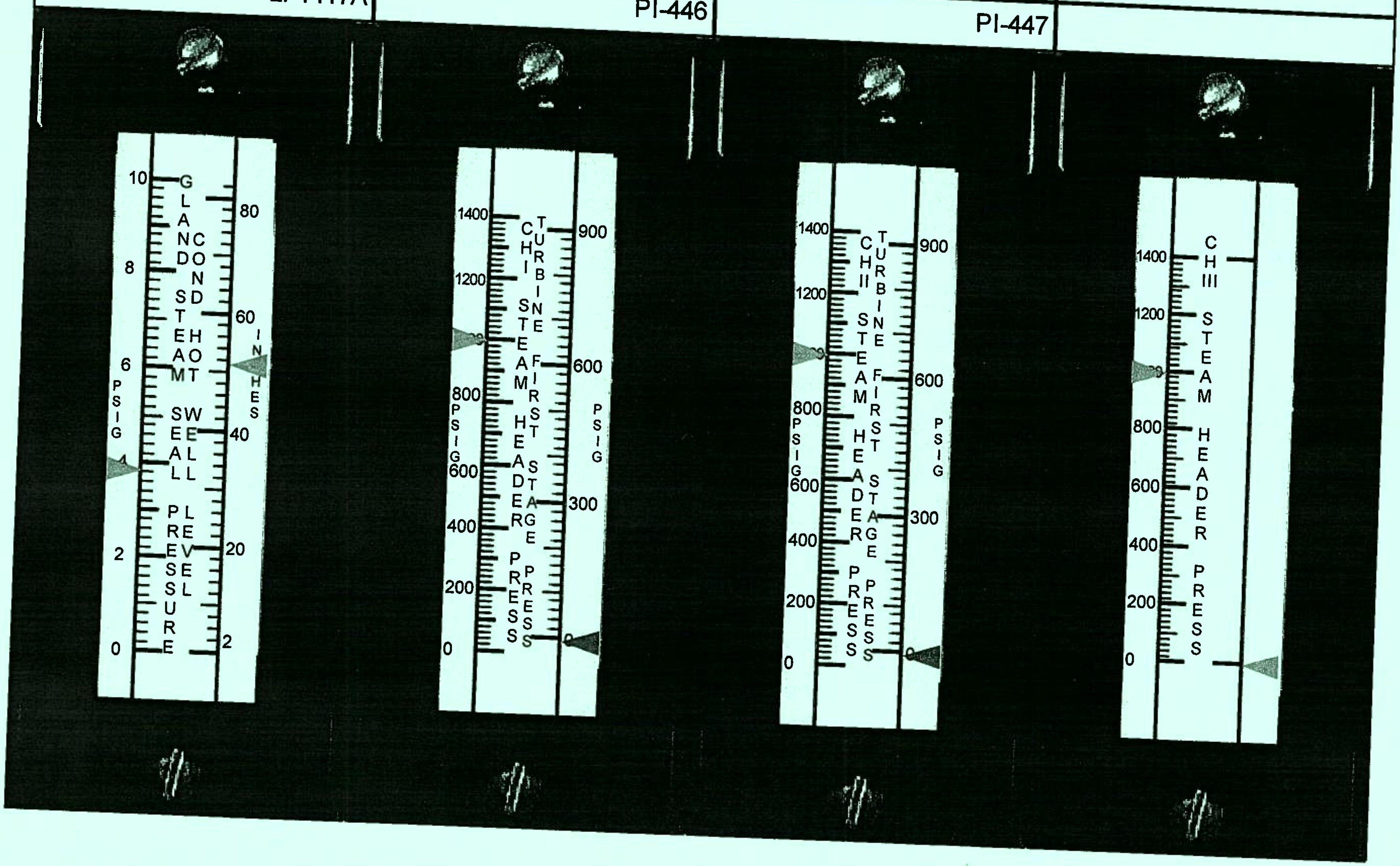


[redacted]

PROTECTION TAVG AND ΔT



PI-4004	PI-464A	PI-466	PI-468
LI-1417A	PI-446	PI-447	



Facility: HB ROBINSON

Task No.:

Task Title: Calculate the Maximum Permissible Stay Time with Emergency Dose Limits

JPM No.: 2011-2 NRC JPM Admin RO A3

K/A Reference: G2.3.4 (3.2/3.7)

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- An emergency event has been declared.
- A Containment entry would enhance the pressure control of the plant but is NOT required to protect valuable plant equipment.
- The tasks to be performed are:

Task Number	Task	Time Required (minutes)	Dose Rate (R/hr)
1	Fail closed PCV-455A	8	21.42
2	Manually open RC-536	6	3.65
3	Manually close CVC-312		9.51

NOTE: Assume that NO dose is received while traveling between the tasks.

Task Standard: Calculate the dose received and the maximum time allowed to perform the final task.

Required Materials: Calculator
NGGM-PM-0002

General References: NGGM-PM-0002, EPCLA-01

Handouts:	NONE
Initiating Cue:	The Inside Auxiliary Operator has completed Tasks #1 and 2 in the time required. How long does he have to complete Task #3 without exceeding the applicable Emergency Dose Limit? **(Perform all calculations to 2 decimal places)**
Time Critical Task:	NO
Validation Time:	10 minutes

SIMULATOR SETUP

N/A

(Denote Critical Steps with an asterisk)

START TIME: ________

* **Performance Step: 1** Determine the dose received while performing Task #1.

Standard: Candidate determines the dose received while performing Task #1:

21.42 R/hr X 8 minutes X 1 hour/60 minutes = 2.86 R.

Examiner's Note:

Comment:

* **Performance Step: 2** Determine the dose received while performing Task #2.

Standard: Candidate determines the dose received while performing Task #2:

3.65 R/hr X 6 minutes X 1 hour/60 minutes =0.37 R.

Examiner's Note:

Comment:

*	**Performance Step: 3**	Determine the remaining dose to reach the Emergency Dose Limit.
	Standard:	Candidate calculates the dose remaining for the Emergency Dose Limit: 5.00 R – 2.86 R – 0.37 R = 1.77 R
	Examiner's Note:	
	Comment:	

*	**Performance Step: 4**	Determine the time available for the Inside Auxiliary Operator to complete Task #3 with exceeding the Emergency Dose Limit.
	Standard:	Candidate determines within +1, - 3 minutes the time available for the Inside Auxiliary Operator to complete Task #3 without exceeding the Emergency Dose Limit: Available Dose/ Dose Rate = 1.77 R/ 9.51 R/hr = 0.19 hrs 0.19 hrs X 60 minutes/1 hour = 11.4 minutes (11 minutes 24 seconds) Allowable tolerance of 11.22 minutes (11 minutes, 13 seconds) to 11.4 minutes (11 minutes, 24 seconds)
	Examiner's Note:	
	Comment:	

END OF TASK

Termination Cue: When the candidate has calculated the allowable dose for Task #3, the evaluation of this JPM is complete.

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM Admin RO A3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: ____________________ Date: ____________

INITIAL CONDITIONS:

- An emergency event has been declared.
- A Containment entry would enhance the pressure control of the plant but is NOT required to protect valuable plant equipment.
- The tasks to be performed are:

Task Number	Task	Time Required (minutes)	Dose Rate (R/hr)
1	Fail closed PCV-455A	8	21.42
2	Manually open RC-536	6	3.65
3	Manually close CVC-312		9.51

NOTE: Assume that NO dose is received while traveling between the tasks.

INITIATING CUE:

The Inside Auxiliary Operator has completed Tasks #1 and 2 in the time required.

How long does he have to complete Task #3 without exceeding the applicable Emergency Dose Limit?

(Perform all calculations to 2 decimal places)

INITIAL CONDITIONS:

- An emergency event has been declared.
- A Containment entry would enhance the pressure control of the plant but is NOT required to protect valuable plant equipment.
- The tasks to be performed are:

Task Number	Task	Time Required (minutes)	Dose Rate (R/hr)
1	Fail closed PCV-455A	8	21.42
2	Manually open RC-536	6	3.65
3	Manually close CVC-312		9.51

NOTE: Assume that NO dose is received while traveling between the tasks.

INITIATING CUE:

The Inside Auxiliary Operator has completed Tasks #1 and 2 in the time required.

How long does he have to complete Task #3 without exceeding the applicable Emergency Dose Limit?

(Perform all calculations to 2 decimal places)

Facility:	HB ROBINSON	Task No.:	02341101103
Task Title:	Heat Stress Work Limits	JPM No.:	2011-2 NRC JPM SRO A1-1
K/A Reference:	G2.1.26 3.4/3.6		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: __X__

Classroom __X__ Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Plant is in Mode 3 with RCS cooldown in progress.
- RHR System needs to be aligned for core cooling IAW GP-007 and OP-201
- 2 AOs have been briefed on performing the valve alignments.
- Work time is 30 minutes per AO (1 hour total)
- RC has determined that OREX coveralls will be used.

Task Standard: Candidate is to determine the following:

- Metabolic heat load
- Action time in minutes
- Recovery period in minutes

Required Materials: AP-020, Heat Stress Program, Revision 16

General References: AP-020, Heat Stress Program

Handouts: AP-020, Heat Stress Program

Initiating Cue: Using AP-020, Complete Attachment 10.3 to determine the metabolic heat load, allowable working time and recovery period for work in the specified plant area. This is a succeeding evaluation. Additional information on CUE sheet.

Time Critical Task: NO

Validation Time: 12 minutes

(Denote Critical Steps with an asterisk*)

Start Time: ________

Performance Step: 1 Candidate reviews AP-020 Attachment 10.3, Heat Stress Evaluation Form

Standard: Candidate reviews AP-020 Attachment 10.3, Heat Stress Evaluation Form

Examiner's Note:

Comment:

Performance Step: 2 Determine the correct clothing for the type of job. (Step 8.1.4)

Standard: Candidate determines that Attachment 10.2, Page 4 of 11, OREX over Scrub Suit (CS) or SMS polypropylene coveralls (PP) over Scrub Suit (CS) is the proper attachment to be used in the heat stress determination.

Examiner's Note:

Comment:

* **Performance Step: 3** Determines the Metabolic Heat Load to be Moderate Work. (Step uses Attachment 10.1)

Standard: Candidate determines performing valve alignments to be Moderate Work

Examiner's Note: .

Comment:

Performance Step: 4 Determines the temperature in the Auxiliary Building Pipe Alley

Standard: Candidate circles "Estimate" for WBGT on Attachment 10.3

Examiner's Note: **Candidate uses Attachment 10.4, Estimating WBGT to estimate WBGT from dry temperature.**

Comment:

* **Performance Step: 5** Determines WBGT to be 101°F

Standard: Candidate determines WBGT to be Dry bulb plus 4°F from Attachment 10.4 (97°F +4°F =101°F)

Examiner's Note:

Comment:

* **Performance Step: 6** Determines Action Time to be 35 minutes

Standard: Candidate uses Attachment 10.2 to determine Action Time to be 35 minutes. Page 4 of 11, Recommended Heat Stress Control Action Times OREX Over Scrub Suit (CS) for Moderate Work at 101°F WBGT

Examiner's Note:

Comment:

* **Performance Step: 7** Determines the Recovery time to be 51 minutes (Step 8.3.1)

Standard: Candidate uses 30 minutes as time in hot environment (2 men working for 1.0 person hour)

(30*60)/35 = (1800/35) = 51.4 Minutes **(Range of 51 to 52 minutes)**

Examiner's Note:

Comment:

Performance Step: 8 Circles "YES" for the workers have received a pre-job brief including Heat Stress Concerns

Standard: Candidate circles "YES", this information was in the initial conditions.

Examiner's Note:

Comment:

Performance Step: 9 Sign and Date Attachment 10.3

Standard: Candidate reviews and then signs and dates Attachment 10.3

Examiner's Note:

Comment:

END OF TASK

Terminating Cue: **Candidate completes Heat Stress Evaluation Form**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC Admin JPM SRO A1-1

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________ Date: ______________

ANSWER KEY

ATTACHMENT 10.3
Page 1 of 1

HEAT STRESS EVALUATION FORM

JOB DATE: Today

JOB LOCATION: Aux. Building Pipe Alley

TASK(S): OP-201 Valve Alignments

SUPERVISOR: R.O. Moore

EST. PERSON-HOURS: 1.0

NUMBER OF WORKERS: 2

PLANT STATUS (for job planning use): Mode 3

CLOTHING TYPE: OREX Coveralls

METABOLIC HEAT LOAD (CIRCLE ONE):

LIGHT **MODERATE** **HEAVY**

TEMPERATURE (CIRCLE ONE):

MEASUREMENT **ESTIMATE**

WBGT = 101 F

DB = ________F **WB** = ________F **GT** = ________F

ACTION TIME = 35 minutes (from Attachment 10.2)

RECOVERY PERIOD = 51.4 minutes = (Time in minutes in Hot Environment) x (60) / (Action Time in minutes)

HAVE WORKERS RECEIVED A PRE-JOB BRIEFING INCLUDING HEAT STRESS CONCERNS? (CIRCLE ONE)

YES **NO**

ADDITIONAL INFORMATION:

Signature (Job Supervisor): R O Moore Date: Today

INITIAL CONDITIONS:

- Plant is in Mode 3 with RCS cooldown in progress.
- RHR System needs to be aligned for core cooling IAW GP-007 and OP-201
- 2 AOs have been briefed on performing the valve alignments.
- Work time is 30 minutes per AO (1 hour total)
- RC has determined that OREX overalls will be used.

INITIATING CUE:

Using AP-020, Complete Attachment 10.3 to determine the metabolic heat load, allowable working time and recovery period for work in the specified plant area. This is a succeeding evaluation.

Work to be performed	Valve alignments in overhead
Pipe Alley Thermometer:	97°F
Relative Humidity:	Not Available

Pipe Alley is a Contaminated Area

INITIAL CONDITIONS:

- Plant is in Mode 3 with RCS cooldown in progress.
- RHR System needs to be aligned for core cooling IAW GP-007 and OP-201
- 2 AOs have been briefed on performing the valve alignments.
- Work time is 30 minutes per AO (1 hour total)
- RC has determined that OREX overalls will be used.

INITIATING CUE:

Using AP-020, Complete Attachment 10.3 to determine the metabolic heat load, allowable working time and recovery period for work in the specified plant area. This is a succeeding evaluation.

Work to be performed	Valve alignments in overhead
Pipe Alley Thermometer:	97°F
Relative Humidity:	Not Available

Pipe Alley is a Contaminated Area

Progress Energy

I
INFORMATION
USE

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 1

PART 1

AP-020

HEAT STRESS PROGRAM

REVISION 16

SUMMARY OF CHANGES

PRR 00476573

AP-020 REVISION 16

STEP/SECTION	REVISION COMMENTS
Attachment 10.2	Updated NOTE to include (refer to 8.4.2) for PCR references - Editorial

TABLE OF CONTENTS

1.0 **PURPOSE**

1.1 The purpose of this procedure is to provide guidance to management and all employees for preventing heat-induced illnesses while performing work activities on the plant site.

2.0 **REFERENCES**

2.1 EPRI NP-4453-L, "Heat Stress Management Program for Nuclear Power Plants" Revision 1, Aug. 1991.

2.2 Clothing Update of EPRI NP-4453-L, 1991 Report, TR-109445, Final Report, July 1998.

2.3 CP&L Corporate Guidance Document SAF-CPL-032 Heat Stress.

2.4 NCR 49246, Use Of Tube Suits

3.0 **RESPONSIBILITIES**

3.1 Section Managers - Robinson Plant are responsible for:

3.1.1 Ensuring that personnel who perform work in moderate/high heat stress work environment(s) follow the guidelines in this procedure.

3.1.2 Ensuring that supervisors follow this the guidelines in this procedure when planning work in moderate/high heat stress work environments.

3.2 Supervisors are responsible for:

3.2.1 Ensuring that heat stress mitigation has been considered during job planning. The work crew supervisor or designee shall determine the Wet Bulb Globe Temperature and metabolic heat load using the guidance available in Attachments 10.1, 10.2 and 10.6.

3.2.2 Ensuring that either Attachment 10.3, "Heat Stress Evaluation Form" is completed, OR that proper means of determining action times and control measures have taken place and have been included as part of pre-job planning when Heat Stress has been determined to be an issue.

3.2.3 Ensuring that a pre-job briefing is conducted prior to workers entering the high temperature environment to perform work. The Precautions and Limitations found in section 5.1 of this procedure should be covered in the briefing.

3.2.4 Ensuring that proper control methods are used to protect against heat stress.

3.2.5 Ensuring that all heat-stress caused incidents which require medical attention are recorded on FRM-SUBS-00979, Injury and Illness Incident Report Form. These forms can be obtained on the Progress Energy Intranet.

3.3 Individuals are responsible for:

3.3.1 Following instructions for the handling of body cooling devices and using them as needed to prevent heat stress.

3.3.2 Being attentive to symptoms of heat stress while working in moderate/high heat stress work environments, stopping work, leaving it in a safe condition, and exiting the hot environment, if they feel ill due to heat stress.

3.3.3 Reporting to their supervisor any occurrence of heat stress or heat related illness.

3.3.4 Reporting to their supervisor any condition that might adversely impact their ability to perform their duties as a Fire Brigade Member. These conditions include but are not limited to general health, illness, medications, etc.

3.4 RC Unit is responsible for:

3.4.1 Providing Ice vests for work activities inside the RCA.

3.5 Unit 2 Control Room personnel are responsible for ensuring actions are taken to provide first aid or medical attention when notified of conditions involving heat stress victims.

3.6 Site Industrial Hygiene and Safety Representative is responsible for:

3.6.1 Providing technical assistance on heat stress issues, including the development of plant heat stress training programs and maintenance of this procedure.

3.6.2 Ensuring that instruction on heat stress mitigation is arranged and conducted for employees prior to initial work in high temperature environments.

3.6.3 Assisting supervisors in the implementation of this procedure, when requested.

3.7 Maintenance is responsible for:

3.7.1 Maintaining and issuing Tube Suits.

40 PREREQUISITES

N/A

5.0 PRECAUTIONS AND LIMITATIONS

NOTE:	These precautions should be covered in employee training as well as in the pre-job briefings prior to performing moderate or high heat stress work. During time-critical evolutions involving emergency response where the safety of personnel and the public is a critical issue, personnel may not be able to comply with all of the requirements of this procedure. All reasonable attempts should be made to ensure the safety of personnel involved in the emergency response without compromising the timely completion of the response.

5.1 If an individual begins to feel symptoms of heat illness, the person should put their work in a safe condition, exit the area, notify their supervisor, rest in a cool area, and drink fluids. The Control Room should be called at ext. 5555 if symptoms persist in order to dispatch appropriate site first aid providers.

5.2 All jobs in high temperature environments should address heat stress controls in the planning stages. Planned action times and the use of body cooling devices should be considered.

5.3 Individuals who work in high temperature environments for the first time are more susceptible to heat illness than those accustomed to hot environments. After working in hot environments for several days, their bodies tend to acclimatize to heat exposure and they may tolerate longer heat exposures at higher work rates.

5.4 Work shall be planned so that an adequate number of workers are prepared to work in a high temperature environment. Workers should never work alone in high heat stress areas.

5.5 Individuals vary greatly in their tolerance to heat exposure. Factors which may affect heat tolerances may include:

- Age
- Weight
- Sex
- physical fitness
- general health
- colds, viruses, and infections
- some medications
- consumption of alcoholic beverages

5.6 In situations where individuals know that their work schedule for the following day involves entering a heat stress area, they should drink plenty of liquids in the 24 hours prior to reporting to work.

5.7 Whenever feasible, engineering controls should be used to eliminate/reduce the heat exposure (i.e., isolation of the heat source, introduction of cooled air, circulation of present air, reduced humidity, etc.). The impact of these engineering controls should be reviewed with the Radiation Control (RC) unit for jobs in radiologically controlled areas.

5.8 Individuals who work in high temperature environments may become dehydrated due to sweating. Lost body water and electrolytes should be replaced at rest breaks to prevent heat-related illness. Liquids designed to replace these electrolytes (gatorade) may be obtained from the bulk warehouse prior to or after entry, and should be consumed in frequent, small amounts. (Salt tablets are not recommended.)

5.9 Individuals who work in high temperature environments must periodically rest in a cooler area to shed body heat. Duration of breaks, extent of clothing removal, and rest area should be determined by the job supervisor, using the guidance in Step 8.3.1. Certain employees may require longer rest periods than others.

5.10 Workers should be encouraged to drink one pint of water/fluid per hour of scheduled work prior to entering high heat stress areas.

5.11 Workers should also be encouraged to drink water/fluids after high temperature work to maintain fluid balance.

5.12 Where feasible, high heat stress work should be scheduled to minimize thermal stress in the work area. This includes scheduling work at times where the WBGT and/or the metabolic heat load are lower and/or protective clothing requirements are less restrictive.

5.13 For pre-job briefings in heat stress related work areas, utilize Attachment 10.6 during the briefing.

6.0 SPECIAL TOOLS AND EQUIPMENT

N/A

7.0 ACCEPTANCE CRITERIA

N/A

8.0 INSTRUCTIONS

8.1 Heat Stress Evaluation

8.1.1 The heat stress evaluation process involves assessing the variables that effect heat stress, including WBGT measurements, metabolic work load, clothing type and recovery periods. These factors are converted to recommended action times without regard to personal cooling devices for job planning purposes. A "Heat Stress Evaluation Form", Attachment 10.3, may be used for heat stress job planning.

> **NOTE:** The Temperature/Relative Humidity meters should be placed in the shade, where possible. These meters may display inaccurate readings if in direct sunlight (higher than actual temperature and lower than actual relative humidity). The crew supervisor/designee should contact the Site Industrial Hygiene and Safety Representative for assistance in conducting Heat Stress Evaluations.

8.1.2 The work crew supervisor/designee should measure the WBGT of the work area when he/she feels that heat stress conditions may exist. WBGT is calculated using the following WBGT formulas:

Indoor WBGT = (0.7 x wet bulb) + (0.3 x globe)

Outdoor WBGT = (0.7 x wet bulb) + (0.2 x globe) + (0.1 x dry bulb)

Initial WBGT readings should be made with a Wet Bulb Globe Thermometer, available from the calibration lab. Instructions for the use of the Wet Bulb Globe Thermometer are found on Attachment 10.5, Using the Wet Bulb Globe Thermometer. Measurements should be representative of the work area thermal load. Succeeding evaluations may be based solely on dry bulb temperature and relative humidity by using Attachment 10.4, "Estimating WBGT". Temperature/Relative Humidity meters are posted at various locations around site to assist with conducting these estimates. Charts on these meters have been developed in accordance with Attachment 10.4, and should be consulted to assist in the estimation of WBGT.

8.1.3 The work crew supervisor/designee should determine the metabolic heat load using the guide available in Attachment 10.1.

8.1.4 The work crew supervisor/designee should determine the type of work clothing required or being used for the job. The categories include; work clothes (WC), cloth coveralls (CC), cloth coveralls over scrub suit (CS), double cloth coveralls (DC), OREX coveralls, SMS polypropylene coveralls (PP), MB polyethylene coveralls (PE), polyester coveralls (P2), polyester coveralls with scrubs (PS), water-barrier vapor-permeable coveralls (WB-1), water barrier vapor-permeable coveralls (WB-2), vapor-barrier coveralls (VB), encapsulating suit or turn-out gear (ES), flame retardant shirt and pants (FR).

8.2 Use of Recommended Action Times

8.2.1 Knowing the WBGT measurements, metabolic heat load, and protective clothing used, the work crew supervisor or designee should determine the planned action time from Attachment 10.2 and identify the desired methods to mitigate heat stress if longer work times are necessary.

8.2.2 Action times are used for job planning. Action times are not absolute because of the great variability in worker response to heat-stress. Some workers could experience heat stress symptoms prior to reaching the maximum action time.

8.2.3 By using the planned action time limits and assessing the physical condition of the workers, the work crew supervisor or designee can determine how long his workers can be expected to work before rest breaks should be given. Workers have the right to and should immediately exit the hot environment prior to the time limit if they begin to experience heat stress symptoms.

8.2.4 If there are changes in the WBGT, the metabolic work load category, or the required clothing type during the course of the job, then a re-evaluation of the job action time is necessary.

8.2.5 Absolute Stay Time will be two times the Recommended Action Time IAW Attachment 10.2 and EPRI guidelines.

8.3 Determination of Recovery Period Times

8.3.1 When work cannot be completed in the estimated action time, the supervisor must calculate an appropriate recovery period for workers to dissipate excess heat and replace water. Recovery should take place in a cool location (less than 80 degrees F.) where drinking water or gatorade is available. The length of recovery period depends on the length of exposure and the action time of the job. Recovery periods of up to one hour may be necessary for jobs which approach or exceed the planned action times. The following formula should be used as a guide for determining the minimum length of recovery period. All times are in minutes.

$$REC = \frac{AET \times 60}{MST}$$

REC-------Recovery Time

AET-------Actual Exposure Time to the Hot Environment

MST------Appropriate Action Time determined from Attachment 10.2

8.4 Use of Personal Cooling Devices

CAUTION
The personal cooling device should not be donned until just prior to entering the hot environment. The ice vest or Tube Suit will provide body cooling only while the ice is melting. Once the ice has melted, body temperature will increase quickly. Workers should monitor their condition and exit the work area as soon as the ice vest has lost its cooling effectiveness.

8.4.1 By using Attachment 10.2, "Recommended Heat Stress Control Action Times", the work crew leader's supervisor can determine if personal cooling devices would be beneficial for the job.

8.4.2 Individual workers should have the option of wearing a personal cooling device for any job when they feel there is a need. If a personal cooling device is worn, then the recommended action time is 60 minutes or until the ice melts.

8.4 (Continued)

8.4.3 Ice vests are available in dressout areas in the Radiation Control Area.

8.4.4 The ice vest should be worn so that the vest fits snugly. A t-shirt should be worn under the vest.

8.4.5 Tube Suits are available in the Maintenance Shop.

CAUTION
Use of supplied air hoods results in forced air cooling of the head, but not the body. This can lead to a false sense of body cooling, and delayed awareness of heat stress by the hood user.

8.5 Use of Supplied Air Hoods

8.5.1 Supplied air hoods are used mainly as respirators and their uses are authorized only by the Radiation Control Unit.

8.5.2 When authorized for use, supplied air hoods will supply respirable air and cooling air to the head. Normal action times per Attachment 10.2 are applicable.

8.6 First Aid For Heat Illness

8.6.1 If any individual begins to feel symptoms of heat illness, then the person should immediately exit the area, notify the supervisor, rest in a cool area, and drink fluids. The Control Room (ext. 5555) should be called if symptoms persist.

8.6.2 Examples of symptoms that should necessitate calling the Control Room are as follows:

- Pulse rate does not decrease in 30-45 minutes
- Unconsciousness
- Cannot drink fluids without vomiting
- Heat stroke
- Any other symptom deemed to be of concern.

8.6.3 The individual in the Control Room who receives the call shall take appropriate actions to ensure further first aid and/or medical attention is provided.

8.6.4 The following first aid actions should be taken at the first sign of heat stress symptoms.

1. Heat Illness - occurs due to an increased body temperature and/or a loss of body fluids and salts.

   First Aid - Rest in cool area, drink water or other liquids to replace body fluids, and eat food high in salt content.

2. Heat Cramps - are muscle spasms due to a loss of salt through sweating. Leg, stomach, and back muscles are most often affected and are often a sign of approaching heat exhaustion. Cramps can also result from drinking large amounts of water without electrolytes (salt, sugar).

   First Aid: Rest in cool area, drink water or other liquids, and eat food high in salt content.

3. Heat Exhaustion - Condition caused by an insufficient flow of blood to the brain (blood is shunted to the skin to lose heat). Symptoms can include cool, pale clammy skin, weakness, dizziness, headache, nausea, and fainting.

   First Aid: Rest in cool area, lie down, elevate feet, apply cool wet cloths, fan with air, and drink liquids.

4. Heat Stroke - a serious medical emergency caused by a failure of the body's cooling mechanisms. Symptoms include hot, dry skin (sweating stops), extremely high body temperatures, strong, rapid pulse, and unconsciousness.

   First Aid: Immediate, rapid cooling of the body is necessary. Use safety showers, move air over the body with a fan or by fanning, or cover the body with a wet sheet. **Seek immediate medical attention.**

9.0 RECORDS

N/A

10.0 ATTACHMENTS

10.1 Metabolic Heat Load Guidelines

10.2 Recommended Heat Stress Control Action Times

10.3 Heat Stress Evaluation Form

10.4 Estimating WBGT

10.5 Using the Wet Bulb Globe Thermometer

10.6 Heat Stress Pre-Job Briefing

METABOLIC HEAT LOAD GUIDELINES

LIGHT WORK

Light work are those average demands that are typical of job supervision, inspections, instrument repair and calibration, surveying. Light work can be performed indefinitely by everyone.

MODERATE WORK

Moderate work are those average demands that are typical of a system walk-down, valve alignments, valve and motor repairs, and light materials handling. Under cool conditions, moderate work can be easily performed by most people if there is a 10-minute break every hour. Most physically demanding work falls into this category.

HEAVY WORK

Heavy work are those average demands that are typical of gross decontamination, heavy materials handling, and extensive ladder and stair climbing. Even in comfortable conditions, heavy work can be sustained by most people for no more than 60 minutes. It is not often that heavy work is the appropriate classification because rest breaks will reduce the overall demand to the moderate category.

ATTACHMENT 10.2
Page 1 of 11
RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
WORK CLOTHES (WC) – (Cotton)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
81	NL	NL	NL
82	NL	NL	240
83	NL	NL	150
84	NL	240	120
85	NL	210	100
86	NL	165	90
87	NL	135	80
88	NL	110	70
89	240	95	65
90	230	85	55
91	215	80	50
92	200	70	45
93	180	65	40
94	165	55	40
95	150	50	35
96	130	50	35
97	115	45	30
98	110	40	25
99	100	40	25
100	90	35	20
101	85	35	20
102	75	35	20
103	65	30	20
104	60	30	15
105	55	25	PCR
106	50	25	PCR
107	50	25	PCR
108	45	25	PCR
109	40	20	PCR
110	35	20	PCR
111	30	20	PCR
112	30	20	PCR
113	25	20	PCR
114	25	15	PCR
115	25	15	PCR
116	25	PCR	PCR
117	20	PCR	PCR
118	20	PCR	PCR
119	20	PCR	PCR
120	20	PCR	PCR
121	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
CLOTH COVERALLS OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
73	NL	NL	NL
74	NL	NL	240
75	NL	NL	150
76	NL	240	120
77	NL	210	100
78	NL	165	90
79	NL	135	80
80	NL	110	70
81	240	95	65
82	230	85	55
83	215	80	50
84	200	70	45
85	180	65	40
86	165	55	40
87	150	50	35
88	130	50	35
89	115	45	30
90	110	40	25
91	100	40	25
92	90	35	20
93	85	35	20
94	75	35	20
95	65	30	20
96	60	30	15
97	55	25	PCR
98	50	25	PCR
99	50	25	PCR
100	45	25	PCR
101	40	20	PCR
102	35	20	PCR
103	30	20	PCR
104	30	20	PCR
105	25	20	PCR
106	25	15	PCR
107	25	15	PCR
108	25	PCR	PCR
109	20	PCR	PCR
110	20	PCR	PCR
111	20	PCR	PCR
112	20	PCR	PCR
113	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
DOUBLE CLOTH COVERALLS (DC) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
69	NL	NL	NL
70	NL	NL	240
71	NL	NL	150
72	NL	240	120
73	NL	210	100
74	NL	165	90
75	NL	135	80
76	NL	110	70
77	240	95	65
78	230	85	55
79	215	80	50
80	200	70	45
81	180	65	40
82	165	55	40
83	150	50	35
84	130	50	35
85	115	45	30
86	110	40	25
87	100	40	25
88	90	35	20
89	85	35	20
90	75	35	20
91	65	30	20
92	60	30	15
93	55	25	PCR
94	50	25	PCR
95	50	25	PCR
96	45	25	PCR
97	40	20	PCR
98	35	20	PCR
99	30	20	PCR
100	30	20	PCR
101	25	20	PCR
102	25	15	PCR
103	25	15	PCR
104	25	PCR	PCR
105	20	PCR	PCR
106	20	PCR	PCR
107	20	PCR	PCR
108	20	PCR	PCR
109	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
OREX OVER SCRUB SUIT (CS) or SMS POLYPROPYLENE COVERALLS (PP) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
81	NL	NL	NL
82	NL	NL	240
83	NL	NL	150
84	NL	240	120
85	NL	210	100
86	NL	165	90
87	NL	135	80
88	NL	110	70
89	240	95	65
90	230	85	55
91	215	80	50
92	200	70	45
93	180	65	40
94	165	55	40
95	150	50	35
96	130	50	35
97	115	45	30
98	110	40	25
99	100	40	25
100	90	35	20
101	85	35	20
102	75	35	20
103	65	30	20
104	60	30	15
105	55	25	PCR
106	50	25	PCR
107	50	25	PCR
108	45	25	PCR
109	40	20	PCR
110	35	20	PCR
111	30	20	PCR
112	30	20	PCR
113	25	20	PCR
114	25	15	PCR
115	25	15	PCR
116	25	PCR	PCR
117	20	PCR	PCR
118	20	PCR	PCR
119	20	PCR	PCR
120	20	PCR	PCR
121	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
MB POLYETHYLENE COVERALLS (PE) (Tyvek 1422A) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
76	NL	NL	NL
77	NL	NL	240
78	NL	NL	150
79	NL	240	120
80	NL	210	100
81	NL	165	90
82	NL	135	80
83	NL	110	70
84	240	95	65
85	230	85	55
86	215	80	50
87	200	70	45
88	180	65	40
89	165	55	40
90	150	50	35
91	130	50	35
92	115	45	30
93	110	40	25
94	100	40	25
95	90	35	20
96	85	35	20
97	75	35	20
98	65	30	20
99	60	30	15
100	55	25	PCR
101	50	25	PCR
102	50	25	PCR
103	45	25	PCR
104	40	20	PCR
105	35	20	PCR
106	30	20	PCR
107	30	20	PCR
108	25	20	PCR
109	25	15	PCR
110	25	15	PCR
111	25	PCR	PCR
112	20	PCR	PCR
113	20	PCR	PCR
114	20	PCR	PCR
115	20	PCR	PCR
116	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
POLYESTER COVERALLS (P2) (ProTech 2000) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
76	NL	NL	NL
77	NL	NL	240
78	NL	NL	150
79	NL	240	120
80	NL	210	100
81	NL	165	90
82	NL	135	80
83	NL	110	70
84	240	95	65
85	230	85	55
86	215	80	50
87	200	70	45
88	180	65	40
89	165	55	40
90	150	50	35
91	130	50	35
92	115	45	30
93	110	40	25
94	100	40	25
95	90	35	20
96	85	35	20
97	75	35	20
98	65	30	20
99	60	30	15
100	55	25	PCR
101	50	25	PCR
102	50	25	PCR
103	45	25	PCR
104	40	20	PCR
105	35	20	PCR
106	30	20	PCR
107	30	20	PCR
108	25	20	PCR
109	25	15	PCR
110	25	15	PCR
111	25	PCR	PCR
112	20	PCR	PCR
113	20	PCR	PCR
114	20	PCR	PCR
115	20	PCR	PCR
116	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
WATER-BARRIER, VAPOR-PERMEABLE COVERALLS (WB-1) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
68	NL	NL	NL
69	NL	NL	240
70	NL	NL	150
71	NL	240	120
72	NL	210	100
73	NL	165	90
74	NL	135	80
75	NL	110	70
76	240	95	65
77	230	85	55
78	215	80	50
79	200	70	45
80	180	65	40
81	165	55	40
82	150	50	35
83	130	50	35
84	115	45	30
85	110	40	25
86	100	40	25
87	90	35	20
88	85	35	20
89	75	35	20
90	65	30	20
91	60	30	15
92	55	25	PCR
93	50	25	PCR
94	50	25	PCR
95	45	25	PCR
96	40	20	PCR
97	35	20	PCR
98	30	20	PCR
99	30	20	PCR
100	25	20	PCR
101	25	15	PCR
102	25	15	PCR
103	25	PCR	PCR
104	20	PCR	PCR
105	20	PCR	PCR
106	20	PCR	PCR
107	20	PCR	PCR
108	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
WATER-BARRIER VAPOR-PERMEABLE COVERALLS (WB-2) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
74	NL	NL	NL
75	NL	NL	240
76	NL	NL	150
77	NL	240	120
78	NL	210	100
79	NL	165	90
80	NL	135	80
81	NL	110	70
82	240	95	65
83	230	85	55
84	215	80	50
85	200	70	45
86	180	65	40
87	165	55	40
88	150	50	35
89	130	50	35
90	115	45	30
91	110	40	25
92	100	40	25
93	90	35	20
94	85	35	20
95	75	35	20
96	65	30	20
97	60	30	15
98	55	25	PCR
99	50	25	PCR
100	50	25	PCR
101	45	25	PCR
102	40	20	PCR
103	35	20	PCR
104	30	20	PCR
105	30	20	PCR
106	25	20	PCR
107	25	15	PCR
108	25	15	PCR
109	25	PCR	PCR
110	20	PCR	PCR
111	20	PCR	PCR
112	20	PCR	PCR
113	20	PCR	PCR
114	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
VAPOR-BARRIER COVERALLS (VB) OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
64	NL	NL	NL
65	NL	NL	240
66	NL	NL	150
67	NL	240	120
68	NL	210	100
69	NL	165	90
70	NL	135	80
71	NL	110	70
72	240	95	65
73	230	85	55
74	215	80	50
75	200	70	45
76	180	65	40
77	165	55	40
78	150	50	35
79	130	50	35
80	115	45	30
81	110	40	25
82	100	40	25
83	90	35	20
84	85	35	20
85	75	35	20
86	65	30	20
87	60	30	15
88	55	25	PCR
89	50	25	PCR
90	50	25	PCR
91	45	25	PCR
92	40	20	PCR
93	35	20	PCR
94	30	20	PCR
95	30	20	PCR
96	25	20	PCR
97	25	15	PCR
98	25	15	PCR
99	25	PCR	PCR
100	20	PCR	PCR
101	20	PCR	PCR
102	20	PCR	PCR
103	20	PCR	PCR
104	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
ENCAPSULATING SUIT OR TURN-OUT GEAR (ES) - OVER SCRUB SUIT (CS)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
62	NL	NL	NL
63	NL	NL	240
64	NL	NL	150
65	NL	240	120
66	NL	210	100
67	NL	165	90
68	NL	135	80
69	NL	110	70
70	240	95	65
71	230	85	55
72	215	80	50
73	200	70	45
74	180	65	40
75	165	55	40
76	150	50	35
77	130	50	35
78	115	45	30
79	110	40	25
80	100	40	25
81	90	35	20
82	85	35	20
83	75	35	20
84	65	30	20
85	60	30	15
86	55	25	PCR
87	50	25	PCR
88	50	25	PCR
89	45	25	PCR
90	40	20	PCR
91	35	20	PCR
92	30	20	PCR
93	30	20	PCR
94	25	20	PCR
95	25	15	PCR
96	25	15	PCR
97	25	PCR	PCR
98	20	PCR	PCR
99	20	PCR	PCR
100	20	PCR	PCR
101	20	PCR	PCR
102	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

ATTACHMENT 10.2

RECOMMENDED HEAT STRESS CONTROL ACTION TIMES
FLAME RETARDANT SHIRT AND PANTS (FR)

WBGT	METABOLIC HEAT LOAD and ACTION TIMES IN MINUTES		
degrees F	Light	Moderate	Heavy
79	NL	NL	NL
80	NL	NL	240
81	NL	NL	150
82	NL	240	120
83	NL	210	100
84	NL	165	90
85	NL	135	80
86	NL	110	70
87	240	95	65
88	230	85	55
89	215	80	50
90	200	70	45
91	180	65	40
92	165	55	40
93	150	50	35
94	130	50	35
95	115	45	30
96	110	40	25
97	100	40	25
98	90	35	20
99	85	35	20
100	75	35	20
101	65	30	20
102	60	30	15
103	55	25	PCR
104	50	25	PCR
105	50	25	PCR
106	45	25	PCR
107	40	20	PCR
108	35	20	PCR
109	30	20	PCR
110	30	20	PCR
111	25	20	PCR
112	25	15	PCR
113	25	15	PCR
114	25	PCR	PCR
115	20	PCR	PCR
116	20	PCR	PCR
117	20	PCR	PCR
118	20	PCR	PCR
119	PCR	PCR	PCR

NOTES: NL = No Limit, PCR = Personal Cooling Required (refer to 8.4.2)

HEAT STRESS EVALUATION FORM

JOB DATE: ______________________

JOB LOCATION: ______________________

TASK(S):

____

____

____

SUPERVISOR: ______________________

EST. PERSON-HOURS: ______________________

NUMBER OF WORKERS: ______________________

PLANT STATUS (for job planning use): ______________________

CLOTHING TYPE: ______________________

METABOLIC HEAT LOAD (CIRCLE ONE):

LIGHT **MODERATE** **HEAVY**

TEMPERATURE (CIRCLE ONE):

MEASUREMENT **ESTIMATE**

WBGT = ________F

DB = ________F **WB** = ________F **GT** = ________F

ACTION TIME = ________ minutes (from Attachment 10.2)

RECOVERY PERIOD = _______ minutes = $\frac{\text{(Time in minutes in Hot Environment) x (60)}}{\text{(Action Time in minutes)}}$

HAVE WORKERS RECEIVED A PRE-JOB BRIEFING INCLUDING HEAT STRESS CONCERNS? (CIRCLE ONE)

YES **NO**

ADDITIONAL INFORMATION:

____

____

Signature (Job Supervisor): ______________________ Date: ______________

ESTIMATING WBGT

Measuring WBGT may require entering the work area prior to the start of the job. However, this action could also create an ALARA concern.

There are two methods which can be used to estimate the WBGT without entering the work area.

- The first method is to estimate the WBGT based on previously recorded measurements, such as those obtained from the Heat Stress Evaluation Form (Attachment 10.3). The plant condition and work location must be essentially identical to use this method.

NOTE:	The following method may underestimate the actual WBGT for work performed directly adjacent to hot steam pipes or other radiant heat sources.

- The second method is based on a remote reading of the dry bulb temperature (DB) and an estimation of the relative humidity as follows: (When the relative humidity is not known, use 100% value for estimation)

RELATIVE HUMIDITY	ESTIMATED WBGT
100%	DB + 4°F
90%	DB + 2°F
80%	DB
70%	DB - 3°F
60%	DB - 5°F
50%	DB - 7°F
40%	DB – 9°F

USING THE WET BULB GLOBE THERMOMETER

Measuring WBGT by using the Wet Bulb Globe thermometer will require entering the work area prior to the start of the job. Be sure to prepare the meter for use, prior to bringing it into the hot environment, in order to save time.

To prepare the meter:

1. Connect each of the wet bulb, dry bulb, and globe sensors to the unit. Look at the symbols located on the top of the unit to determine the appropriate connector for each sensor. Use caution to insure that the connector prongs are aligned properly in order to avoid damaging the sensors.
2. Use distilled water to saturate the sponge and wick on the wet bulb sensor.

To operate the meter:

1. Turn the meter on to the desired function; WBGT in for indoor measurements, or WBGT out for outdoor measurements.
2. Allow the sensors to stabilize in the environment where reading is being taken. Typical response times may be as long as 15 minutes.
3. Take reading once display has stabilized.

Changing Batteries/Meter Calibration:

1. Consult owners manual.

HEAT STRESS PRE-JOB BRIEFING

Advise persons entering a heat stress area of the recommended action time and the absolute stay time.

Advise persons entering a heat stress area of any required engineering controls or of any personal cooling device requirements, such as ice vests or Tube Suits.

Advise persons entering a heat stress area:

- They may become dehydrated due to sweating.
- Lost body water and electrolytes should be replaced by drinking during rest breaks to prevent heat-related illness.
- Where they may obtain drinking water and/or Gatorade.
- Where cooler rest areas are located and the duration of minimum recovery times.

First Aid for Heat Stress:

Heat Cramps - are muscle spasms due to a loss of salt through sweating. Leg, stomach, and back muscles are most often affected and are often a sign of approaching heat exhaustion. Cramps can also result from drinking large amounts of water without electrolytes (salt, sugar).

First Aid: Rest in cool area, drink water or Gatorade, and eat food high in salt content.

Heat Exhaustion - Condition caused by an insufficient flow of blood to the brain (blood is shunted to the skin to lose heat). Symptoms can include cool, pale clammy skin, weakness, dizziness, headache, nausea, and fainting.

First Aid: Rest in cool area, lie down, elevate feet, apply cool wet cloths, fan with air, and drink liquids.

Heat Stroke - a serious medical emergency caused by a failure of the body's cooling mechanisms. Symptoms include hot, dry skin (sweating stops), extremely high body temperatures, strong, rapid pulse, and unconsciousness.

First Aid: Immediate, rapid cooling of the body is necessary. Use safety showers, move air over the body with a fan or by fanning, or cover the body with a wet sheet. **Seek immediate medical attention.**

DEFINITIONS

- Absolute Stay Time – Two times the Recommended Action Time (IAW Attachment 10.2 and EPRI guidelines)
- Acclimation - The gradual process of improved heat tolerance after continuous exposure to heat. Acclimation consists of reduced heart rate, increased sweat production, production of less salty sweat, and lower body temperature.
- Action Time - An estimate of the length of time workers may be exposed in hot environments without personal cooling devices and not suffer heat stress disorders (used for planning purposes). The length of action times is not absolute because of worker variability in response to heat.
- ALARA (As Low As Reasonably Achievable) - Making every reasonable effort to maintain exposure to radiation as far below the dose limits as is practical, taking into account the state of technology, and the economics of improvements in relation to the benefits.
- Cloth Coveralls (CC) - A standard configuration of anticontamination coveralls with a hood and hand and foot coverings. The fabric is either a cotton or cotton/polyester blend with weights of about 8 to 9 oz/sqyd.
- Cloth Coveralls over Scrub Suit (CS) - The configuration described as CC plus a set of 2 oz/sqyd cloth underalls (a.k.a. surgical scrub suit).
- Double Cloth Coveralls (DC) - The configuration described as CC plus a second set of cloth coveralls only.
- Dry Bulb Temperature (DB) - The temperature as measured by a standard thermometer, without respect to humidity or radiant heat.
- Encapsulating Suit or Turn-out Gear (ES) - Total encapsulating suits (eg, Level A); re-usable, whole body chemical protective suits; firefighter turn-out gear.
- Flame-Retardant Shirt and Pants (FR) - Long-sleeve shirt and pants made from a treated cotton fabric.
- Globe Temperature (GT) - Temperature resulting from radiant heat sources, measured with a globe thermometer.
- Globe Thermometer - A thermometer with a black globe at its end, used for measuring radiant heat.

DEFINITIONS (Continued)

- Heat Stress - The physiological stress which occurs when the body temperature rises above normal. This occurs when the body produces or gains more heat than it is capable of losing. It is caused by any combination of air temperature, thermal radiation, humidity, air flow, restrictive clothing, and physical work load which may result in elevated core body temperature and subsequent illness.
- High Heat Stress Job/Work - Any job or work in which the calculated action time, without regard to personal cooling equipment, is less than 30 minutes.
- MB Polyethylene Coveralls (PE) - Limited use coveralls with hood (particle barrier only) made from a meltblown polyethylene (Tyvek 1422A).
- Metabolic Heat Load - Heat generated by the body, which increases with physical work. Examples may be found on Attachment 10.1.
- Moderate Heat Stress Job/Work - Any job/work in which the calculated action time, without regard to personal cooling equipment, is greater than 30 minutes but less than 240 minutes.
- OREX – Disposable coveralls made of poly vinyl alcohol (PVA).
- Personal Cooling Device - Equipment such as ice vests or Tube Suits, used to minimize heat gain and/or increase heat loss.
- Polyester Coveralls (P2) - Light-weight polyester (98% nylon)(3 oz/sqyd) coveralls worn with a hood of the same material (ProTech 2000).
- Polyester Coveralls with Scrubs (PS) - Light-weight polyester coveralls and hood (P2) worn over a typical surgical scrub suit (cotton or cotton/polyester blend).
- Protective Clothing - Items worn to prevent radioactive contamination.
- Recovery Period - Time allowed to be spent outside of a hot area allocated to workers who have performed work in hot environments. Water or gatorade should be available for consumption in the recovery area.
- Relative Humidity - The amount of moisture in the air compared to the amount of moisture the air can hold for a given temperature.
- Self Determination - Allowing for worker discretion to exit Heat Stress Work Areas.

DEFINITIONS (Continued)

- SMS Polypropylene Coveralls (PP) - Limited-use coveralls with hood (particle barrier only) made from a spunbonded, meltblown polypropylene.
- Supplied Air Hood - Air-supplied hood respirator which will deliver respirable air over the head and upper body.
- Vapor-Barrier Coveralls (VB) - Coveralls and hood made of light weight fabrics designed for limited use. Typical fabrics might be a polyethylene coated spunbonded polyethylene or a polyvinylchloride.
- Water-Barrier, Vapor Permeable Coveralls (WB-1) - Limited-use coverall with hood made from tri-laminate fabric with a tetrafluoroethylene microporous film.
- Water-Barrier, Vapor Permeable Coveralls (WB-2) - Coverall with hood made from tri-laminate fabric with a microporous film.
- Wet-Bulb Temperature (WB) - The temperature as determined by a wet bulb thermometer. This temperature is influenced by the evaporation rate of water, which is dependent upon the relative humidity in air.
- Wet-Bulb Globe Temperature (WBGT) - An index of heat-stress based on globe, dry and wet bulb temperatures.
- Wet-Bulb Globe Thermometer - A thermometer with sensors to measure wet bulb, dry bulb, and globe temperatures.
- Work Clothes (WC) - A standard ensemble that includes a 4 oz/sqyd cotton shirt with long sleeves and 8 oz/sqyd cotton pants.

Facility:	HB ROBINSON	Task No.:	02344101203
Task Title:	Complete Equipment Inoperable Record	JPM No.:	2011-2 NRC JPM Admin SRO A1-2
K/A Reference:	G2.1 18 (3.6 / 3.8)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- Unit operating at 100% RTP steady state
- CCW Pump B removed from service at 1245 hours on 12/1/11 due to failed inboard motor bearing
- No additional equipment is inoperable
- Current plans will return to service in 44 hours
- Work order # 47548629 has been initiated
- NCR # 407627 has been initiated

Task Standard: Complete OMM-007, Attachment 10.1 and 10.11

Required Materials: OMM-007, Equipment Inoperable Record, Rev. 85
PLP-100, Technical Requirements Manual, Rev. 36

General References: OMM-007, Equipment Inoperable Record, Rev. 85

Handouts: OMM-007, Equipment Inoperable Record, Rev. 85
PLP-100, Technical Requirements Manual, Rev. 36

Initiating Cue:	The CRS has directed you to complete the necessary OMM-007 attachment(s) for the inoperability of CCW Pump B Another SRO will perform the checklist of OMM-001-8, Control of Equipment and System Status and OPS-NGGC-1000, Fleet Conduct of Operations. All necessary outside notifications will be made by the Shift Manager.
Time Critical Task:	NO
Validation Time:	30 minutes

(Denote Critical Steps with an asterisk*)

Start Time: ________

NOTE: Completion of EIR – Ultimate Heat Sink (UHS) for Service Water Temperature Exceeding 97°F will be used versus this section if entering ITS LCO 3.7.8 (UHS) REQUIRED ACTIONS due to Service Water temperature exceeding 97°F.

Performance Step: 1 Perform the Revision Verification (Step 8.2.1)

Standard: Candidate performs the revision verification or states that he uses the Control Room copy, enters today's date and initials on Attachment 10.1, EIR – ITS/TRM/ODCM/RG 1.97.

Examiner's Note:

Examiner's Cue: **Revision verification is the correct revision.**

Comment:

Performance Step: 2 Enter the name of the equipment which is inoperable in Section "A" (Step 8.2.2)

Standard: Candidate enters **CCW Pump B** in Section A.

-

Examiner's Note:

Comment:

Performance Step: 3 Record the reason for the equipment inoperability. This may include MOD number, problems with the equipment, and/or work to be performed (Step 8.2.3)

Standard: Candidate documents that motor bearing failure is the reason for the inoperability.

Examiner's Note:

Comment:

Performance Step: 4 Verify a Work Request has been initiated (if applicable) AND record the WR number (ACR 94-00281) (Step 8.2.4)

Standard: Candidate documents a work request number and fills in the WR # blank.

Examiner's Note:

Comment:

* **Performance Step: 5** IF the unavailability is unplanned, AND the component is part of a system listed on Attachment 10.10, THEN review OMM-048 AND the Maintenance Rule Scoping and Performance Criteria basis section of the Maintenance Rule Database to determine if the listed function(s) of the system is/are affected.

IF a system function is affected, THEN initiate a CR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and record the CR# in Section "D" (Step 8.2.5)

Standard: Candidate determines that the unavailability is unplanned and the component is listed in Attachment 10.10. A CR number is recorded in the blank under Section D.

Examiner's Note: **Attachment 10.10, Maintenance Rule Systems, lists System # 4080, Component/Cooling Water System to be considered a High Safety Significant System under the Maintenance Rule.**

Comment:

Performance Step: 6 Complete Section "E" as follows:
Item 1 – Enter the TIME AND DATE that the equipment was declared inoperable (Step 8.2.6)

Standard: Candidate enters the TIME as **1245** and DATE as **12/1/11.**

Examiner's Note:

Comment:

* **Performance Step: 7**	Complete Section "E" as follows: Item 2 – Circle the applicable document abbreviation and enter applicable LCO, TRMS or Specification number. Be specific. For example, provide table number and item number where applicable.(Step 8.2.6)
Standard:	Candidate circles **ITS** and enters **LCO 3.7.6, Condition A.**
Examiner's Note:	
Comment:	

* **Performance Step: 8**	Complete Section "E" as follows: Item 3 – Enter any applicable actions required to satisfy the document identified in Item 2 and any required completion time. (Step 8.2.6)
Standard:	Candidate enters as follows: **Restore required CCW Train to operable status within 72 hours. THEN apply Condition B – Be in Mode 3 in 6 hours and Mode 5 in 36 hours.**
Examiner's Note:	
Comment:	

* **Performance Step: 9** Complete Section "E" as follows:

Item 4 – Enter the maximum time the equipment is allowed to be inoperable in the applicable blank. Circle hrs/days as they apply to the Special Report. (Step 8.2.6)

Standard: Candidate enters **78** hours in the MODE 3 blank and **108** hours in the MODE 5 blank.

Examiner's Note:

Comment:

* **Performance Step: 10** Complete Section "E" as follows:

Item 5 – Enter the Time and Date that Item4 is required in the applicable blank. (Step 8.2.6)

Standard: Candidate enters **1845** in the Time blank and **12/4/11** in the Date blank for MODE 3.

Candidate enters **0045** in the Time blank and **12/6/11** in the Date blank for MODE 5.

Examiner's Note:

Comment:

NOTE: ODCM required initial compensatory samples lack a "grace period."

Performance Step: 11 Complete Section "E" as follows:

Item 6 – Enter any applicable surveillances or activities and required frequencies which are required as a result of the component inoperability. (Step 8.2.6)

Standard: Candidate enters **NONE**.

Examiner's Note:

Comment:

Performance Step: 12 IF the component is an ITS Support System component, THEN perform Attachment 10.11, which is provided to ensure Safety Function Determinations are performed consistently. The TRM contains in-depth guidance for performing Safety Function Determinations. [CAPR 193057] (Step 8.2.7) (Attachment 10.1, Section F)

Standard: Candidate determines the following from Attachment 10.11, Loss of Safety Function Worksheet, Page 1 of 4:

1. TS Support Feature is Inoperable –

   Yes, CCW Pump B.

2. Determine the impact the inoperability has on applicable supported systems.

3. Does the TS support feature result in a supported feature LCO not met –

   NO

4. Exit the SFDP.

Attachment 10.11, Page 2 of 4 completed as follows:

Revision status checked with **Date** and **INIT** filled in.

Date of **12/1/11** and Time of **1245** completed

MODE **1**, Power – **100%**, RCS Temperature - **575.9°F**, RCS Pressure – **2235 psig.**

1) List inoperable ITS Support Feature: **CCW Pump B listed and step initialed.**

2) IF inoperable ITS Support Feature does NOT result in ITS Supported Feature inoperability, THEN perform the following:

   a) N/A Steps 3 through 8 and **step initialed.**

   b) Sign and Date and **step initialed.**

Examiner's Note:

Comment:

* **Performance Step: 13**

IF the component is an ITS Supported System Component, THEN review open Loss of Safety Function Worksheets (Attachment 10.11) for impact AND log in AUTO log to document review. [CAPR 193057] (Step 8.2.8) (Attachment 10.1, Section G)

Standard:

Candidate determines that there are no open Loss of Safety Function worksheets.

Examiner's Note:

Comment:

Performance Step: 14

Initial the blank in Section "H" when the Load Dispatcher has been notified when the component inoperability could force plant shutdown or load reduction. [SOER 99-1. Rec. 1C] (Step 8.2.9)

Standard:

Candidate initials blank for Load Dispatcher notification.

Examiner's Cue:

If requested, respond as the Load Dispatcher that notification has been received.

Comment:

Performance Step: 15

Initial the blank in Section "I" when Planning and Scheduling has been notified when ITS/TRM/ODCM/RG 1.97 actions have been entered and plant shutdown is anticipated. (Step 8.2.10)

Standard:

Candidate initials the blank that Planning and Scheduling has been notified of anticipated plant shutdown.

Examiner's Cue:

If requested, respond as Planning and Scheduling that notification has been received.

Comment:

Performance Step: 16 IF the EIR is completed due to a Radiation Monitor, Flowrate Monitor or Tank Level Monitor inoperability, THEN enter the E&C Technician's name, time and date of notification in the blanks in Section "J." (Step 8.2.11)

Standard: Candidate determines that the component inoperability does not involve any radiation monitor, flowrate monitor or tank level monitor and N/As the blanks in Section J of Attachment 10.1.

Examiner's Note:

Comment:

NOTE: Maintenance Rule data can be found by clicking on Start, Programs, Engineering, RNP, and RNP System Notebook. When the database opens move the desired system(s) from the list of available systems to the list of selected systems. From the list of Systems Notebook links click on M.R. System Specific Reports, then click on Performance Summary.

* **Performance Step: 17**

IF a Maintenance Rule System monitored for unavailability (Attachment 10.10, page 2) is affected, THEN record the Allowed Unavailability hours, subtract the actual unavailability hours, and record the remaining unavailability hours in Section "K." (NCR 102997) (Step 8.2.12)

Standard:

Candidate determines that System 4080-CCW, CCW Pump Trains is listed in Attachment 10.10, Page 2.

Candidate determines that the Allowed Unavailability hours is **132** hours, the actual unavailability hours is **94.25** hours and the remaining unavailability hours is **38** hours.

132 Hours Allowed – **94.25** Hours Actual = **38** Hours Remaining will be entered in Section K of Attachment 10.1.

(Allowable band of 37.75 to 38.0 unavailability hours remaining)

Examiner's Note:

Data will be provided to the candidate from the Maintenance Rule Database.

Comment:

Performance Step: 18

IF the unavailability is unplanned and remaining unavailability hours are less the 72, THEN notify the RES Duty Manager and record the name, date, and time in Section "K." (NCR 102997) (Step 8.2.13)

Standard:

Candidate determines that the remaining hours is less than 72 hours and notifies the RES Duty Manager. He documents the name, date and time that the notification was made.

Examiner's Note:

Comment:

Performance Step: 19	The SM OR the CRS shall review the EIR AND sign AND date following completion in Section "L." (Step 8.2.14)
Standard:	Candidate will sign and date the Completed By portion of Attachment 10.1, Section L.
Examiner's Note:	
Comment:	

Performance Step: 20	The comments section is used for documenting failed testing or changed equipment status. (Step 8.2.15)
Standard:	Candidate can place any comments needed or mark the comments as N/A or NONE.
Examiner's Note:	
Comment:	

<u>END OF TASK</u>

Termination Cue: **EIR completion for the CCW Pump B inoperability completes the JPM.**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM Admin SRO A1-2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________________ Date: __________________

Answer Key

ATTACHMENT 10.1
Page 1 of 2
EIR – ITS/TRM/ODCM/RG 1.97

CONTINUOUS USE

This revision has been verified to be the latest revision available. Today Date ______ INIT

A. Equipment Inoperable: CCW Pump B

B. Reason for Equipment Inoperability: Failure of inboard motor bearing

C. WR initiated: (ACR 94-00281) WR # 47548629

D. **IF** an unplanned unavailability **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate CR stating a potential safety significant functional failure has occurred. CR # 487627

E. Operating Limitations:

1. Equipment declared inoperable: Time 1245 Date 12/1/11
2. ITS/TRM/ODCM/RG 1.97Other reference number LCO 3.7.6, Condition A (Circle one)
3. Other actions and associated completion time: Restore required CCW Train to operable status within 72 hours. Then Apply Condition B – Be in Mode 3 in 6 hours and Mode 5 in 36 hours
4. Maximum time equipment allowed inoperable before: MODE 2 ___ Hrs MODE 3 78 Hrs MODE 4 ___ Hrs MODE 5 108 Hrs Special Report ________ hrs/days
5. Time **AND** Date Action Required:

MODE 2	Time: ______	Date: ______
MODE 3	Time: 1845	Date: 12/4/11
MODE 4	Time: ______	Date: ______
MODE 5	Time: 0045	Date: 12/6/11
Special Report	Time: ______	Date: ______

6. Record any surveillance required to be performed as a result of the inoperability of this component. (ODCM initial compensatory samples lack a "grace period".)

NONE

EIR – ITS/TRM/ODCM/RG 1.97

F. **IF** this is an ITS Support System Component, **THEN** perform Attachment 10.11. [CAPR 193057]

G. **IF** this is an ITS Supported System Component, **THEN** review open Loss of Safety Function Worksheets (Attachment 10.11) for impact.

H. Load Dispatcher notified of REQUIRED ACTION which could force plant shutdown/load reduction. [initials] (SM/CRS Initials) [SOER 99-1, Rec. 1C]

I. Planning and Scheduling notified to develop Forced Outage Schedule if ITS/TRM/ODCM/RG 1.97 actions are entered **AND** plant shutdown anticipated.
[initials] (SM/CRS Initials)

J. **IF** this EIR is for a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C of equipment inoperability:

Time N/A Date N/A N/A
E&C Shift Technician (Print name)

K. **IF** a Maintenance Rule System Function is affected, **THEN** record Allowed Unavailability Hours, Actual Unavailability Hours, and Unavailability Hours Remaining.

132 Hours Allowed - 94.25 Hours Actual = 38 Hours Remaining

IF unplanned and less than 72 Hours remaining, **THEN** notify the RES Duty Manager.

Ken Jones 12/1/11 1310
Name Date Time

L. Completed By: [signature] 12/1/11
SM/CRS Date

M. Comments: NONE

N. Restoration

1. Equipment operable: Time ________ Date ________

2. **IF** this EIR is for a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C of equipment return to service:

   Time ________ Date ________ ____________________
   E&C Shift Technician (Print Name)

3. Equipment no longer required due to plant conditions:

   Time ________ Date ________

   Reason: ____________________

4. Completed By: ____________________ ____________
   SM/CRS Date

MAINTENANCE RULE SYSTEMS

INFORMATION USE

The following systems are considered to be High Safety Significant Systems under the Maintenance rule.

1000	Containment Isol Valve – Pseudo System	5098	Dedicated Shutdown Diesel Generator
1005	Reactor Vessel and Internals System	5100	Fuel Oil System
1045	Excore Nuclear Instrument System	5114	Dedicated Shutdown System
1065	Rod Control System	5120	Switchyard and Transformer System
1080	Reactor Protection and Safeguards System	5170	4 KV AC Distribution System
2005	Reactor Coolant System	5175	480V AC Distribution System
2045	Residual Heat Removal System	5185	208-120 VAC Distribution System
2060	Chemical and Volume Control System	5235	125V DC Battery/Charger/Distribution System
2080	Safety Injection System	6135	Instrument Air System
3005	Steam Generator	6150	Nitrogen Supply/Blanketing System
3020	Main Steam	6175	Site Fire Protection System
3050	Feedwater System	6270	Primary and Demineralized Water Makeup System
3065	Auxiliary Feedwater	8010	Containment System
3070	Condensate System	8150	HVAC Containment Building System
4060	Service Water System	8210	HVAC Auxiliary Building
4080	Component/Cooling Water System	8220	HVAC Control Room Area
5095	Emergency Diesel Generator System		

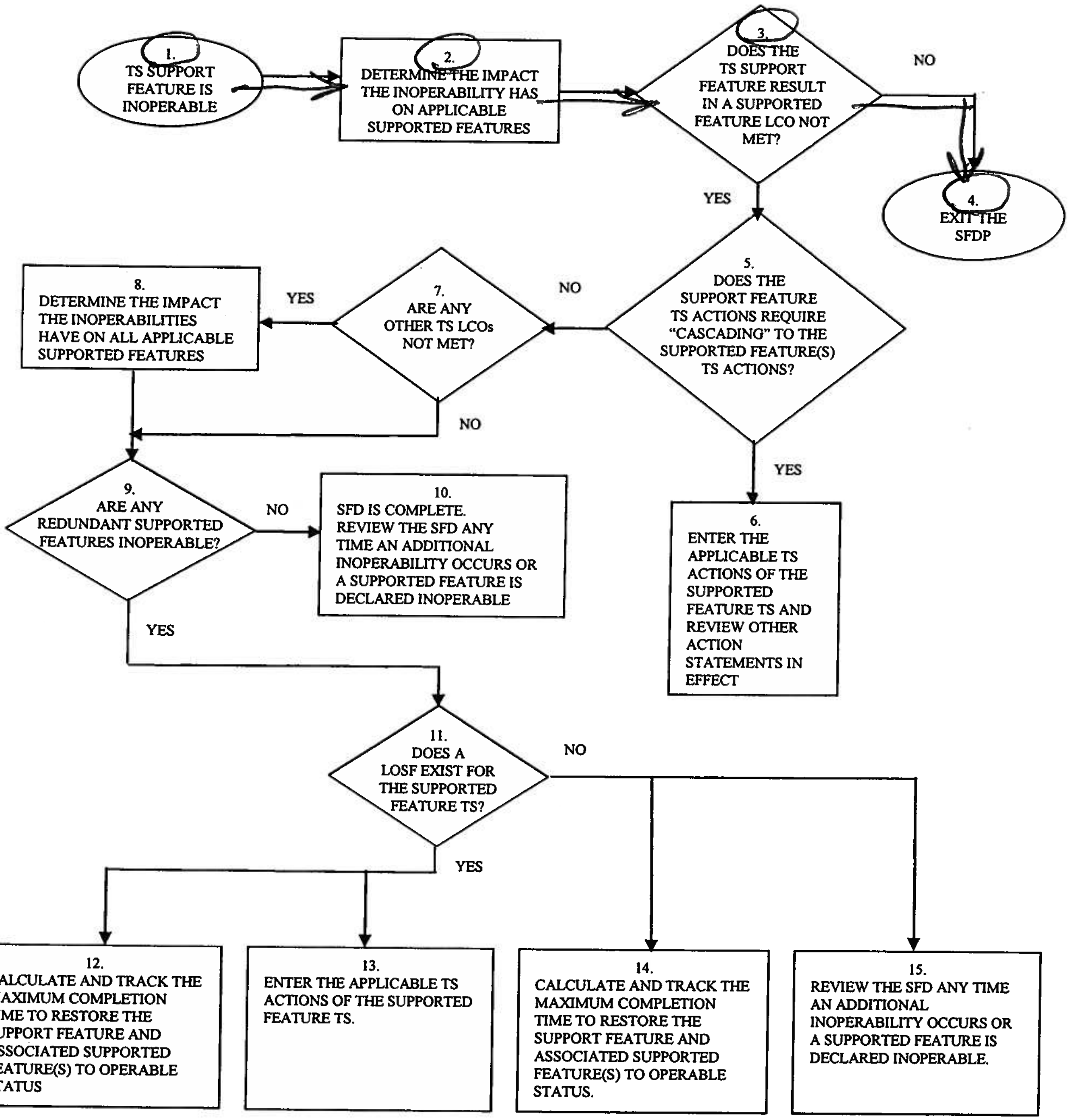
MAINTENANCE RULE SYSTEMS

The following systems require unavailability monitoring for the maintenance rule:

System	What's Monitored
1065 – Rod Drive	Reactor trip breakers
2005 – RCS	RCS PORVs and block valves
2045 – RHR	RHR trains
2060 – CVCS	Charging pump trains, boric acid pumps, emergency boration flowpath
2080 – SI	SI Pump trains, CV Spray trains, Accumulators
3020 – MS	S/G PORVs, Steam Supplies to SDAFW
3065 – AFW	AFW Pump trains, injection lines
4060 – SW	SW pumps, SW booster pumps, north and south headers, Turbine Building Isolation
4080 – CCW	CCW pump trains, heat exchangers
5095 – EDG	EDG trains
5098 – DSDG	Dedicated Shutdown Diesel
5114 – DS	DS bus, DS-UPS-Inverter
5170 – 4 KV	Auto Bus Transfer breakers
5175 – 480 V	Bus E-1, Bus E-2
5185 – 120 / 208 VAC	Constant voltage transformers
5235 – 125 VDC	Battery Chargers, Inverters, DC Buses
6004 – ERFIS	ERFIS Computer
6135 – IA	Compressors, Backup Air Supply For Charging Pumps
6175 – FP	Pumps, Flowpath to SI, AFW, CVCS Pump cooling / suction
6270 – Primary Water	Deep Well Pump "D", Primary Water Pumps and Header
8150 – CV HVAC	HVH units
8220 – MCR HVAC	Ventilation fans, Emergency Filtration Unit, Control Room Envelope Integrity

LOSS OF SAFETY FUNCTION WORKSHEET
[CAPR 193057]
CONTINUOUS USE

NOTE: The numbers in the flow chart correspond to the description of SFD steps in Appendix C of the TRM.



LOSS OF SAFETY FUNCTION WORKSHEET

This revision has been verified to be the latest revision available. 12/1/11 Date [signature] INIT

Date: 12/1/11	Plant Conditions		Time: 1245
MODE	Power	RCS Temperature	RCS Pressure
1	100 %	575.9 °F	2235 psig

NOTE: This Safety Function Determination should be performed by a licensed Senior Reactor Operator and should be reviewed any time additional inoperabilities occur or an ITS Supported Feature is declared inoperable.

INIT

1) List inoperable ITS Support Feature. [signature]

CCW Pump B

2) **IF** inoperable ITS Support Feature does **NOT** result in ITS Supported Feature inoperability, **THEN** perform the following:

   a) N/A steps 3 through 8. [signature]

   b) Sign and date. [signature]

   c) Forward worksheet to SM for review. ____

   d) **IF** the Support Feature will **NOT** be returned to service prior to end of shift, **THEN** attach completed worksheet to the EIR for the Support Feature. ____

   e) **IF** the Support Feature will be returned to service prior to end of shift, **THEN** file LOSF Worksheet in EIR notebook. N/A

3) **IF** inoperable ITS Support Feature results in ITS Supported Feature inoperability, **THEN** list inoperable ITS Supported Feature(s). N/A

N/A

LOSS OF SAFETY FUNCTION WORKSHEET

INIT

4) **IF** support feature ITS Actions require cascading to Supported Feature(s) ITS Actions, **THEN** perform the following:

   a) Enter applicable ITS Actions of Supported Feature(s) ITS. N/A

   b) N/A steps 5 through 8. N/A

   c) Sign and date. N/A

   d) Forward worksheet to SM for review. N/A

   e) Attach completed worksheet to the EIR for the Support Feature. N/A

5) **IF** any other ITS LCOs are **NOT** met, **THEN** determine the impact the inoperabilities have on all applicable Supported Features **AND** list. N/A

   N/A
   ____
   ____

6) **IF** there are NO redundant Supported Features inoperable, **THEN** perform the following:

   a) N/A steps 7 and 8. N/A

   b) Sign and date. N/A

   c) Forward worksheet to SM for review. N/A

   d) Attach completed worksheet to the EIR for the Supported Feature. N/A

7) **IF** a LOSF does **NOT** exist for the Supported Feature ITS, **THEN** perform the following:

   a) Calculate and record the maximum completion time to restore the ITS Support Feature and associated ITS Supported Feature(s) to operable status. N/A

      N/A hrs + N/A hrs = N/A hrs
      1st Support Feature — Supported Feature — Max Completion

   b) N/A step 8. N/A

   c) Sign and date. N/A

   d) Forward worksheet to SM for review. N/A

   e) Attach completed worksheet to the EIR for the Supported Feature. N/A

LOSS OF SAFETY FUNCTION WORKSHEET

INIT

8) **IF** a LOSF exists for the Supported Feature ITS, **THEN** perform the following:

a) Calculate and record the maximum completion time to restore the ITS Support Feature and associated ITS Supported Feature(s) to operable status. N/A

N/A hrs + N/A hrs = N/A hrs

1st Support Feature | Supported Feature | Max Completion

b) Enter the applicable ITS LCO for the ITS Supported Feature or ITS LCO 3.0.3 as applicable. N/A

c) Attach completed worksheet to the EIR for the Supported Feature. N/A

Remarks: N/A

Completed By: [signature] Date: 12/1/11
SRO

Reviewed By: ____________ Date: ____________
SM

INITIAL CONDITIONS:

- Unit operating at 100% RTP
- CCW Pump B removed from service at 1245 hours on 12/1/11 due to failed inboard motor bearing
- No additional equipment is inoperable
- Current plans will return to service in 44 hours
- Work order # 47548629 has been initiated
- NCR # 407627 has been initiated

INITIATING CUE:

The CRS has directed you to complete the necessary OMM-007 attachment(s) for the inoperability of CCW Pump B

Another SRO will perform the checklist of OMM-001-8, Control of Equipment and System Status and OPS-NGGC-1000, Fleet Conduct of Operations.

All necessary outside notifications will be made by the Shift Manager.

INITIAL CONDITIONS:

- Unit operating at 100% RTP
- CCW Pump B removed from service at 1245 hours on 12/1/11 due to failed inboard motor bearing
- No additional equipment is inoperable
- Current plans will return to service in 44 hours
- Work order # 47548629 has been initiated
- NCR # 407627 has been initiated

INITIATING CUE:

The CRS has directed you to complete the necessary OMM-007 attachment(s) for the inoperability of CCW Pump B

Another SRO will perform the checklist of OMM-001-8, Control of Equipment and System Status and OPS-NGGC-1000, Fleet Conduct of Operations.

All necessary outside notifications will be made by the Shift Manager.

ROBINSON NUCLEAR PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 1

OMM-007

EQUIPMENT INOPERABLE RECORD

REVISION 85

SUMMARY OF CHANGES
PRR 00475956
OMM-007, Revision 85

STEP	REVISION COMMENTS
2.41	Added reference to NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants (NCR 471699)
Step 8.2.9	Added information to refer to NGGM-IA-0003. (PRR 00475956, NCR 471699) (Editorial Change)

TABLE OF CONTENTS

SECTION PAGE

TABLE OF CONTENTS (Continued)

SECTION | PAGE

1.0 PURPOSE

1.1 To provide a means of documenting the inoperability of ITS components, TRM components, ODCM components, Fire Protection equipment, Dedicated Shutdown and SBO equipment, NRC Maintenance Rule equipment, Regulatory Guide 1.97 (RG 1.97) instruments, or other equipment important to safety for unplanned component inoperability **OR** when the component will remain inoperable past shift turnover. (CR 95-02199)

1.2 To provide a means of tracking inoperable equipment from the time of inoperability until the equipment is returned to operable or no longer required to be operable due to plant conditions.

1.3 To provide a record of the time remaining before further action is required.

1.4 To provide a mechanism to consistently control out of service time of equipment which is important to safety, including RG 1.97 instruments, that is not associated with an ITS LCO and to provide the mechanism for determining the vulnerability while a component is inoperable and for identifying compensatory measures as a pre-planned course of action. (ACR 94-1172)

1.5 To provide a check for NRC Maintenance Rule High Safety Significant System applicability, when the unavailability is unplanned, and provide documentation that a CR was generated.

1.6 To provide a mechanism to ensure inoperable inputs to calorimetric are deleted from scan and thereby preventing potentially erroneous output from the program.

1.7 To provide instructions and a form to supplement the instruction contained in the TRM for performing a Safety Function Determination.

1.8 To provide a method of tracking event based surveillance's. (CR 98-00890)

2.0 REFERENCES

2.1 OMM-001-12, Minimum Equipment List and Shift Relief

2.2 Improved Technical Specifications (ITS)

2.3 PLP-100, Technical Requirements Manual (TRM)

2.4 Offsite Dose Calculation Manual (ODCM)

2.5 CAP-NGGC-0200, Condition Identification and Screening Process

2.6 RAIL # 88-RO429 (Attachment 6.7)

2.7 AOP-041, Response to Fire Event

2.8 FP-001, Fire Emergency

2.9 FP-012, Fire Protection Systems Minimum Equipment and Compensatory Actions

2.10 FP-014, Control of Fire Barrier Penetrations

2.11 PPP-114, Service Water Temperature Measurement to HVH 1-4

2.12 CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance

2.13 ACR 94-00281, LT-604 was declared out of service and a Work Request was not promptly initiated

2.14 ACR 92-00076, Spurious Fire Alarms Firing Dampers

2.15 ACR 94-01019, Failure to Report Fire Protection System Impairment in a Timely Manner

2.16 ACR 94-1172, Potential Violation Identified Concerning Failure to Provide Guidance for Removal of Post Accident Hydrogen Vent "B" Train Filter from Service for Maintenance

2.17 ACR 94-00407, Changing "HS" to "FH" Prefix Due to Redundant Use

2.18 CR 95-02199, NRC Maintenance Rule Implementation

2.19 CR 95-02660, Inconsistent Use of the Miscellaneous Equipment Important to Safety EIR

2.20 CR 95-02670, WR Did Not Identify Equipment OOS Time Was Limited

2.21 CR 96-01631, CT-494 for “C” S/G Pressure Channel

2.22 CR 97-01941, NAS Assessment R-OP-97-01 Weakness

2.23 OMM-048, Work Coordination and Risk Assessment

2.24 CR 97-02229, Maintenance Rule Violation for Missed Unavailability Monitoring

2.25 CR 98-00890, Failure to Perform OST-014

2.26 CR 98-02232, Appendix R Self-Assessment

2.27 CR 99-00434, NAS Assessment R-FP-99-01 Weakness

2.28 CR 99-00505, HVE-15A not declared out of service following RFO-18.

2.29 RNP-M/MECH-1649, EDG Heat Exchanger Analysis to Determine Allowable Ultimate Heat Sink Temperature

2.30 RNP-E-8.016, Emergency Diesel Generator Static and Dynamic Analysis

2.31 SOER 99-1, Loss of Grid (Credit taken in recommendation 1C for notification of Load Dispatcher concerning equipment limitations which may be load affecting.)

2.32 EC 47152, Ultrasonic Feedwater Flow Measurement

2.33 EC 51539, SDAFW Self Cooling Modification

2.34 NCR 102997, Deep Well Pump A Unavailability

2.35 EC 52753, CS/SI Pump Test Line

2.36 EC 54786, Secondary Fighting Positions

2.37 EC 59128, Temporary Skid Diesel

2.38 SP-1517, Operating the Temporary Skid Diesel

2.39 NCR 193057 (CAPR), SFD Required and Not Done Prior to WCCU-1A OOS

2.40 TMM-026, List of Regulatory Guide 1.97 Components

2.41 NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants

3.0 RESPONSIBILITIES

3.1 The SM **OR** CRS shall ensure:

- Applicable EIRs are initiated when equipment is made or found inoperable.

AND

- The EIRs are completed **OR** electronically closed out when the equipment is returned to service (operable) or when the equipment is no longer required due to a change in plant conditions.

3.2 For consistency, the Manager-Operations should be contacted to provide guidance for establishing the maximum allowed time equipment may be inoperable, for equipment without specific ITS/TRM/ODCM/RG 1.97 limitations and compensatory measures to be taken during that time.

4.0 PREREQUISITES

N/A

5.0 PRECAUTIONS AND LIMITATIONS

N/A

6.0 SPECIAL TOOLS AND EQUIPMENT

N/A

7.0 ACCEPTANCE CRITERIA

N/A

8.0 INSTRUCTIONS

8.1 General Use

8.1.1 Attachment 10.1 is required to be performed for components required by ITS, TRM, ODCM, or RG 1.97. An electronic equivalent EIR, in leiu of Attachment 10.1, may be used provided the requirements of the attachment are met. This EIR is performed under all plant conditions, except as noted below, without regards to Mode applicability or plant condition. This is necessary to ensure that ITS LCO 3.0.6 is applied appropriately. This EIR is required since the components which are tracked by this EIR are required by ITS, TRM, ODCM, or RG 1.97. Attachment 10.6 could also fall into this category, depending upon the equipment being tracked. (CR 95-2660)

1. Components which are normally out of service for an extended period of time under Modes which are not applicable to the LCO need not be tracked provided the below conditions are met:

   – The affected component is not required for the current plant Mode.

   – Procedures **OR** programs are in place that will assure the component is restored to service prior to entering a Mode requiring the component.

2. Examples of these types of components are:

   – HVE-15A, only required when moving irradiated fuel.

   – “B” SI Pump, only required when replacing “A” or “C”.

8.1.2 Attachments 10.2, 10.3, 10.4 and/or 10.5 are required to be performed under all plant conditions. These EIRs are generally referred to as Fire Protection EIRs. These EIRs are required since the equipment which is tracked by these EIRs is necessary to meet NFPA requirements and to meet commitments made to the nuclear unit insurance carrier, Nuclear Electric Insurance Limited (NEIL). (CR 95-2660)

8.1.3 Attachment 10.6 is required to be performed when a component/system identified on Attachment 10.12 is found inoperable **OR** when it has been determined necessary or desirable to document and track the inoperability of other components/systems. This EIR is required in MODE 1, 2, 3 or 4 if the equipment is listed in the DS/SBO Equipment List of Attachment 10.12 since much of the equipment tracked is credited for coping with an Appendix R fire or a Station Blackout event. This EIR is generally referred to as the Dedicated Shutdown / SBO and Other Equipment Important to Safety EIR. (CR 95-2660)

8.1.4 Attachment 10.7 is required to be performed when a component that supplies an input into the Continuous Calorimetric Program becomes inoperable. This EIR is generally referred to as the Continuous Calorimetric Program Instrumentation EIR. (CR 96-01631)

8.1.5 Attachment 10.8 is required to be performed when the Service Water temperature exceeds 97°F and entry into ITS LCO 3.7.8 REQUIRED ACTIONS is necessary in Modes 1, 2, 3, or 4. This EIR identifies the necessary checks to insure plant documentation and equipment supports elevated Service Water temperatures up to 99°F.

8.1.6 Attachment 10.9 is required to track event based surveillances and other similar events. An electronic equivalent may be used to track surveillances. (CR 98-00890)

8.1.7 Attachment 10.10 is referenced from all EIRs to determine whether the equipment inoperability affects a Maintenance Rule High Safety Significant System. If so, the system's required functions are checked on the Maintenance Rule Database. Attachment 10.10 also contains a list of all systems which require unavailability monitoring for the maintenance rule.

8.1.8 Attachment 10.11 is used when a Safety Function Determination (SFD) is performed. [CAPR 193057]

8.1.9 During the performance of planned activities where the component will be returned to service prior to the end of the shift, an EIR is not required. However, any compensatory actions required by the EIR must still be performed (such as posting a continuous fire watch or deleting ERFIS points from scan). In addition, the component should be logged for tracking purposes. Use Attachment 10.13, Flowchart for ITS/TRM/ODCM/RG 1.97 Components Out of Service Less Than One Shift, when it is anticipated that ITS/TRM/ODCM/RG 1.97 components that have become inoperable will be returned to service prior to the end of shift. [CAPR 193057]

8.1.10 The EIR form **OR** electronic equivalent can be used for a variety of inoperable equipment. Those spaces for documentation that do not apply to the current use should be marked N/A.

8.1.11 The outstanding EIR(s) shall be maintained in the Control Room EIR Book **OR** tracked electronically **AND** reviewed each shift as long as the equipment is inoperable.

8.1.12 When equipment out of service time is approaching the time allowed identified on the EIR, Operations management should be notified to escalate the priority of the task using the Work Control process. (CR 95-02670)

8.1.13 Prior to implementing compensatory actions, evaluate the need to perform a screen under REG-NGGC-0010 to assess to impact of the compensatory action on the facility or procedures described in the UFSAR.

8.2 Completion of EIR – ITS/TRM/ODCM/RG 1.97

NOTE:	Completion of EIR – Ultimate Heat Sink (UHS) For Service Water Temperature Exceeding 97°F will be used versus this section if entering ITS LCO 3.7.8 (UHS) REQUIRED ACTIONS due to Service Water temperature exceeding 97°F.

8.2.1 Perform the Revision Verification.

8.2.2 Enter the name of the equipment which is inoperable in Section “A”.

8.2.3 Record the reason for the equipment inoperability. This may include MOD number, problems with the equipment, and/or work to be performed.

8.2.4 Verify a Work Request has been initiated (if applicable) **AND** record the WR number (ACR 94-00281).

8.2.5 **IF** the unavailability is unplanned, **AND** the component is part of a system listed on Attachment 10.10, **THEN** review OMM-048 **AND** the Maintenance Rule Scoping and Performance Criteria Basis section of the Maintenance Rule Database to determine if the listed function(s) of the system is/are affected.

IF a system function is affected, **THEN** initiate a CR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and record the CR # in Section "D".

8.2.6 Complete Section "E" as follows:

- Item 1 – Enter the TIME **AND** DATE that the equipment was declared inoperable.
- Item 2 – Circle the applicable document abbreviation and enter applicable LCO, TRMS or Specification number. Be specific. For example, provide table number and item number where applicable.

  Examples: LCO 3.3.1, Table 3.3.1-1 Item 7.a

  TRMS 3.10, Table 3.10-1 Item 3

  Specification 2.6.3, Table 2.6-1 Item 4.c
- Item 3 – Enter any applicable actions required to satisfy the document identified in Item 2 and any required completion time.

  Examples: "Place channel in trip within 6 hours **OR** reduce THERMAL POWER to < P-7 within 12 hours."

  "Restore required channel to OPERABLE status within 7 days **OR** submit Special Report to NRC outlining... within 14 days"

  "Return instrument to operable status within 30 days and if unsuccessful explain reason in next Annual Radioactive Effluent Release Report"

8.2.6 (Continued)

- Item 4 – Enter the maximum time the equipment is allowed to be inoperable in the applicable blank. Circle hrs/days as they apply to the Special Report.

- Item 5 – Enter the Time **AND** Date that item 4 is required in the applicable blank.

NOTE:	ODCM required initial compensatory samples lack a "grace period".

- Item 6 – Enter any applicable surveillances or activities and required frequencies which are required as a result of the component inoperability.

  Examples: "ITS LCO 3.2.4 REQUIRED ACTION A.3 requires SR 3.2.1.1 and 3.2.2.1 once per 7 days."

  "ITS LCO 3.6.3 REQUIRED ACTION A.2 requires the affected penetration flow path verified isolated once per 31 days for isolation devices outside CV."

  "TRM TRMS 3.11 REQUIRED COMPENSATORY MEASURE requires obtaining and analyzing grab samples once per 24 hours thereafter, when degassing is not in progress."

8.2.7 **IF** the component is an ITS Support System component, **THEN** perform Attachment 10.11, which is provided to ensure Safety Function Determinations are performed consistently. The TRM contains in-depth guidance for performing Safety Function Determinations. [CAPR 193057]

8.2.8 **IF** the component is an ITS Supported System Component, **THEN** review open Loss of Safety Function Worksheets (Attachment 10.11) for impact **AND** log in AUTO log to document review. [CAPR 193057]

8.2.9 Initial the blank in Section "H" when the Load Dispatcher has been notified when the component inoperability could force plant shutdown or load reduction. Refer to NGGM-IA-0003.[SOER 99-1, Rec. 1C]

8.2.10 Initial the blank in Section "I" when Planning and Scheduling has been notified when ITS/TRM/ODCM/RG 1.97 actions have been entered and plant shutdown is anticipated.

8.2.11 **IF** the EIR is completed due to a Radiation Monitor, Flowrate Monitor or Tank Level Monitor inoperability, **THEN** enter the E&C Technician's name, time and date of notification in the blanks in Section "J".

NOTE:	Maintenance Rule data can be found by clicking on Start, Programs, Engineering, RNP, and RNP System Notebook. When the database opens move the desired system(s) from the list of available systems to the list of selected systems. From the list of System Notebook links click on M. R. System Specific Reports, then click on Performance Summary.

8.2.12 **IF** a Maintenance Rule System monitored for unavailability (Attachment 10.10, page 2) is affected, **THEN** record the Allowed Unavailability hours, subtract the actual unavailability hours, and record the remaining unavailability hours in Section "K". (NCR 102997)

8.2.13 **IF** the unavailability is unplanned and remaining unavailability hours are less the 72, **THEN** notify the RES Duty Manager and record the name, date, and time in Section "K". (NCR 102997)

8.2.14 The SM **OR** the CRS shall review the EIR **AND** sign **AND** date following completion in Section "L".

8.2.15 The comments section is used for documenting failed testing or changed equipment status.

8.2.16 Place the completed EIR in the Control Room EIR Book.

8.2.17 When the equipment is returned to service **OR** the equipment is no longer required due to a change in plant conditions, Section "N" is completed as follows:

- Item 1 – **IF** the equipment is declared operable, **THEN** enter the TIME **AND** DATE that the equipment is declared operable.
- Item 2 – **IF** the EIR is completed due to a Radiation Monitor, Flowrate Monitor or Tank Level Monitor inoperability, **THEN** enter the E&C Technician's name, time **AND** date returned to service.
- Item 3 – **IF** the equipment is no longer required, **THEN** enter the TIME, DATE, **AND** REASON why the equipment is no longer required (such as, MODE 5 entered).
- Item 4 – The SM **OR** CRS shall sign **AND** date the EIR.

8.3 Completion of EIR – Fire Protection

8.3.1 Perform the Revision Verification.

8.3.2 Enter the name of the inoperable equipment in Section "A".

8.3.3 Complete Section "B" by entering the TIME **AND** DATE the compensatory actions were initiated for the applicable inoperable equipment.

8.3.4 Complete Section "C" as follows:

- **IF** the unavailability is unplanned, **AND** the component is part of a system listed on Attachment 10.10, **THEN** review OMM-048 **AND** the Maintenance Rule Scoping and Performance Criteria Basis section of the Maintenance Rule Database, to determine if the system's listed function(s) is affected.
- **IF** a system function is affected, **THEN** initiate a CR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and record the CR #.
- Attachment 10.5 is not applicable to the Maintenance Rule or OMM-048 evaluation.

8.3.5 Complete Section "D" as follows:

- Item 1 – Enter the TIME **AND** DATE the equipment was declared inoperable.
- Item 2 – Explain why the equipment is inoperable. This may include MOD number, problems with the equipment, and/or work to be performed.
- Item 3 – Enter the TIME **AND** DATE the equipment is required to be returned to service. Refer to applicable portion of the EIR for the allowed equipment inoperable duration.

NOTE:	NCR's are generated for Fire Protection Equipment out of service for greater than the time allowed by FP-012 to ensure proper tracking.

a. **WHEN** an NCR is initiated due to the time allowed by FP-012 being exceeded, **THEN** CONSIDER the following:

1. The NCR should be assigned to the project that is creating the impairment for greater than the allowed time.

8.3.5 (Continued)

2. All NCRs should be given a Priority 3 for tracking AND trending purposes only.

3. Impairments exceeding the allowed time due to a project or other non-repair activity should not be listed as equipment related.

4. When an NCR is written, the project or reason for exceeding the allowed time needs to be included to allow assignment to the appropriate group OR individual.

5. NCR should be written as no further review required with an explanation that the NCR is written for tracking AND trending purposes.

– Item 4 – Enter as follows:

a. Attachments 10.2 and 10.3 – **IF** the equipment is expected to be inoperable more than 48 hours, **OR WHEN** the equipment has been inoperable for 48 hours, **THEN** within one working day, Operations shall notify the RESS Fire Protection Engineer personnel **AND** document this notification on the EIR.8.3.5 (Continued)

b. Attachment 10.4 – For inoperable damper(s) verify that appropriate compensatory actions have been determined **AND** initiated IAW FP-014 and complete Item D.4 of Attachment 10.4. (ACR 92-00076).

NOTE:	The nuclear unit insurance carrier, Nuclear Electric Insurance Limited (NEIL), requires notification when impairments to an active Fire Protection System (such as, Fire Pumps, Fire Hydrants/Hose Stations, Sprinkler/Deluge Systems, or Detection/ Suppression Systems) exceeds **OR** is expected to exceed 48 hours. Operations personnel shall notify the RESS Fire Protection Engineer of any such impairment.

– Item 5 – (Item 6 on Attachment 10.4, Item 4 on Attachment 10.5) Verify a Work Request has been initiated (if applicable) **AND** record the WR number. (ACR 94-00281)

8.3.5 (Continued)

NOTE:	Maintenance Rule data can be found by clicking on Start, Programs, Engineering, RNP, and RNP System Notebook. When the database opens move the desired system(s) from the list of available systems to the list of selected systems. From the list of System Notebook links click on M. R. System Specific Reports, then click on Performance Summary.

- Item 6 Attachment 10.3 – **IF** a Maintenance Rule System monitored for unavailability (Attachment 10.10, page 2) is affected, **THEN** record the Allowed Unavailability hours, subtract the actual unavailability hours, and record the remaining unavailability hours. (NCR 102997)
- Item 6 Attachment 10.3 – **IF** the unavailability is unplanned and remaining unavailability hours are less the 72, **THEN** notify the RES Duty Manager and record the name, date, and time. (NCR 102997)
- Item 7 – (Item 7 on Attachment 10.4, Item 5 on Attachment 10.5) The SM **OR** CRS shall sign **AND** date the EIR.
- Item 8 – (Item 8 on Attachment 10.4, Item 6 on Attachment 10.5) General comments, failed testing or changed equipment status can be added to the Comments portion.

8.3.6 Place the completed EIR in the Control Room EIR Book.

8.3.7 **WHEN** the equipment is returned to service, **THEN** complete Section "E" as follows:

- Enter the TIME **AND** DATE that the equipment is returned to service.
- The SM **OR** CRS shall sign **AND** date the EIR

NOTE:	The EIR for DS / SBO equipment is **NOT** required if the affected component is required by Technical Specifications and therefore covered under another EIR and the ITS required actions are more limiting than the allowed out of service time for the DS/SBO.

8.4 Completion of EIR – DS / SBO Equipment And Other Equipment Important to Safety

8.4.1 Perform the Revision Verification.

8.4.2 **IF** a safe shutdown pathway is made inoperable due to blocking of the pathway **OR** a security door or gate will not allow access/egress for safe shutdown events, **THEN** initiate an EIR.

8.4.3 A safe shutdown pathway blocked by a cold weather enclosure may be declared operable if the enclosure is approved by the Appendix R Engineer (the pathway is inoperable during the construction/installation of the enclosure). NCR 248962

NOTE:	Items powered from PP-50 remain operable as long as their TS surveillances are met. Specifically, these components are still operable as long as they are energized and operating, even if the DS battery or DS UPS is inoperable.

8.4.4 In Section C, enter the name of the Equipment Inoperable from the list provided in Attachment 10.12, DS / SBO Equipment List and Other Equipment Important to Safety. Indicate whether the equipment is Important to Safety **OR** needed for Dedicated Shutdown/SBO.

8.4.5 Complete Section D as follows:

- **IF** "D" Deepwell Pump becomes unavailable, **THEN** notify Security immediately to implement Security Compensatory Actions.

- List any component that can be used to serve the same purpose (whether from the same location **OR** not) in the REDUNDANT EQUIPMENT AVAILABLE column, as applicable.

NOTE: The instruments listed in Attachment 10.12 are those which are used to make major decisions in the EOPs/AOPs/DSPs. (CR 95-02660)

For consistency, the Manager-Operations or On-call Manager should be contacted to provide guidance for establishing the maximum allowable time equipment may be inoperable and compensatory measures to be taken during that time.

- Assess **AND** identify the VULNERABILITIES DUE TO UNAVAILABILITY of the component when evaluated against affected procedures listed in Attachment 10.12.

- **IF** the inoperable component is not listed in Attachment 10.12, but is to be tracked IAW this procedure, **THEN** identify the vulnerability that caused that determination. Examples of vulnerabilities that may be listed are: manual actions required, local monitoring of parameters, no annunciator available, no indication available, etc.

- **IF** any compensatory measures are determined to be necessary to aid in mitigating the vulnerability (such as an Instructional Aid attached to the inoperable component identifying alternate equipment, shift turnover discussion documented on the shift turnover sheets, ERFIS points to be trended, etc.), **THEN** state them in the COMPENSATORY MEASURES NECESSARY column.

8.4.6 The SM/Manager Operations shall sign and date Section E stating that the compensatory actions are adequate.

8.4.7 Complete Section F as follows:

- **IF** the unavailability is unplanned, **AND** the component is part of a system listed on Attachment 10.10, **THEN** review OMM-048 **AND** the Maintenance Rule Scoping and Performance Criteria Basis section of the Maintenance Rule Database, to determine if the system's listed function(s) is affected.

- **IF** a system function is affected, **THEN** initiate a CR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and record the CR #.

8.4.8 Complete Section G as follows:

- Item 1 – Enter the TIME **AND** DATE that the equipment was declared inoperable.

- Item 2 – Document the reason why the equipment is inoperable. This may include MOD number, problems with the equipment, and/or work to be performed.

- Item 3 – Verify a Work Request has been initiated (if applicable) **AND** record the WR number (ACR 94-00281).

- Item 4 – Document the time the component is allowed to be inoperable.

- Item 5 – Document individuals notified.

- Item 6 – **IF** this EIR is for the Dedicated Shutdown radios, **THEN** check at least nine Dedicated Shutdown radios are operable.

- Item 7 – **IF** the equipment is **NOT** inoperable due to scheduled work, **THEN** the SM/CRS shall verify that the WR contains the appropriate priority, time allowed out of service, and the statement that the equipment is important to safety and should not be downgraded.

8.4.8 (Continued)

NOTE:	Maintenance Rule data can be found by clicking on Start, Programs, Engineering, RNP, and RNP System Notebook. When the database opens move the desired system(s) from the list of available systems to the list of selected systems. From the list of System Notebook links click on M. R. System Specific Reports, then click on Performance Summary.

- Item 8 – **IF** a Maintenance Rule System monitored for unavailability (Attachment 10.10, page 2) is affected, **THEN** record the Allowed Unavailability hours, subtract the actual unavailability hours, and record the remaining unavailability hours. (NCR 102997)

- Item 8 – **IF** the unavailability is unplanned and remaining unavailability hours are less the 72, **THEN** notify the RES Duty Manager and record the name, date, and time. (NCR 102997)

- Item 9 – The SM **OR** CRS shall sign **AND** date the EIR.

- Item 10 – Self explanatory.

8.4.9 Place the completed EIR in the Control Room EIR Book.

8.4.10 **IF** the plant is in MODE 1, 2, 3 or 4, the equipment is listed on Attachment 10.12 DS/SBO Equipment List, **AND** the equipment is not restored to operable status within 14 days, **THEN** complete Section H by initiating a Condition Report **AND** recording in the space provided.

8.4.11 **WHEN** the equipment is returned to service **OR** the equipment is no longer required due to a change in plant conditions, **THEN** Section I shall be completed as follows:

- Item 1 – Enter the TIME **AND** DATE that the equipment is declared operable.

  OR

- Item 2 – Enter the TIME, DATE, **AND** REASON why the equipment is no longer required (such as, MODE 5 entered).

- Item 3 – The SM **OR** CRS shall sign **AND** date the EIR.

8.5 Completion of EIR – Continuous Calorimetric Program Instrumentation (CR 96-01631)

8.5.1 Perform the Revision Verification.

8.5.2 Enter the name of the EQUIPMENT INOPERABLE in Section "A".

8.5.3 Complete Section "B" as follows:

- Using the Turn on Code CALO select Delete Inputs for the ERFIS Point(s) associated with the inoperable equipment to remove the point(s) from Continuous Calorimetric Program calculations **OR** delete from scan the ERFIS point(s) associated with the inoperable equipment.
- Enter the DATE **AND** TIME the above action is performed.
- **IF** the Feedwater Ultrasonic Flow Measurement (FWUFM) system is **NOT** available, **THEN** apply TRMS 3.25.

8.5.4 Complete Section "C" as follows:

- **IF** the unavailability is unplanned, **AND** the component is part of a system listed on Attachment 10.10, **THEN** review OMM-048 **AND** the Maintenance Rule Scoping and Performance Criteria Basis section of the Maintenance Rule Database to determine if the listed function(s) of the system is/are affected.
- **IF** a system function is affected, **THEN** initiate a CR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and record the CR #.

8.5.5 Complete Section "D" as follows:

- Item 1 – Enter the TIME **AND** DATE that the equipment was declared inoperable, the CCP was disabled or the ERFIS point was removed from scan.
- Item 2 – Document the reason why the equipment is inoperable. This may include MOD number, problems with the equipment, and/or work to be performed.
- Item 3 – The SM **OR** CRS shall sign **AND** date the EIR.
- Item 4 – Self-explanatory.

8.5.6 Place the completed EIR in the Control Room EIR Book.

8.5.7 When the equipment is returned to service **OR** the equipment is no longer required due to a change in plant conditions, Section "E" shall be completed as follows:

- Item 1 – Enter the TIME **AND** DATE that the equipment was declared operable. The associated ERFIS point may now be restored to scan or the input restored to the Continuous Calorimetric Program.

  OR

- Item 2 – Enter the TIME, DATE, **AND** REASON why the equipment is no longer required (such as unit no longer in MODE 1).
- Item 3 – The SM **OR** CRS shall sign **AND** date the EIR.

8.6 Completion of EIR – Ultimate Heat Sink (UHS) For Service Water Temperature Exceeding 97°F

8.6.1 Perform the Revision Verification.

8.6.2 Record the time and date in Section "A" that entry into ITS LCO 3.7.8 REQUIRED ACTIONS occurred.

8.6.3 For Section "B", perform the following:

1. Verify Service Water temperature is less than or equal to 99°F once per hour and log temperature per PPP-114.
2. Within ONE HOUR:
   - Using PASSPORT verify the affected document revisions are current with the memo. **IF** PASSPORT is not available **OR** the revision and pending change status does not agree with the Engineering memo, **THEN** contact the On-Call RESS manager to assure no revision **OR** pending changes have been approved against the documents which would invalidate the Engineering memo **AND** the SM **OR** the CRS will sign when the initial check is completed.

8.6.3.2 (Continued)

- Review plant logs, EIRs, and scheduled work activities since the Engineering memo was initiated to assure any maintenance that was performed on the listed heat exchangers DID NOT involve tube plugging and that the components are OPERABLE **AND** the SM **OR** the CRS will sign when the initial check is completed.

- Record completion of reviews and equipment checks in Auto Log

8.6.4 Place the unit in the appropriate Mode as required by ITS LCO 3.7.8 REQUIRED ACTIONS if the above requirements are not met.

8.6.5 Initial the blank in Section "C" when the Load Dispatcher has been notified of the REQUIRED ACTION entry which could force plant shutdown or load reduction.

8.6.6 Initial the blank in Section "D" when Planning and Scheduling has been notified plant shutdown is anticipated.

8.6.7 Once every 12 hours, Section "E" is completed as follows:

- Verify the affected document revisions are current with the memo **AND** the SM **OR** the CRS will sign when the check is completed.

- Review plant logs, EIRs, and scheduled work activities for the previous 12 hours to assure no maintenance was performed on the listed heat exchangers that would affect OPERABILITY **AND** that the components are OPERABLE **AND** the SM **OR** the CRS will sign when the check is completed.

- Record completion of checks in Auto Log.

8.6.8 When the ITS LCO 3.7.8 REQUIRED ACTIONS have been exited **OR** the ITS LCO is no longer required due to a change in plant conditions, Section "F" is completed as follows:

– Item 1 – Enter the TIME **AND** DATE the LCO is exited.

OR

– Item 2 – Enter the TIME, DATE, **AND** REASON why the LCO is no longer required (such as, MODE 5 entered).

8.6.9 Item 3 – The SM **OR** CRS shall sign **AND** date the EIR.

8.7 Required Event Tracking (CR 98-00890)

NOTE:	For short period events requiring less than an eight hour period and is being tracked by auto log or other reliable means including E&RC tracking an ODCM item, a Required Event Tracking sheet is not required.

8.7.1 Record the affected component in the space provided.

8.7.2 Record the event that initiated the requirement to perform the surveillance or other event.

8.7.3 Describe the surveillance or event to be tracked, the conditions for termination and any references.

Example: Completion of OST-014 IAW ITS SR 3.0.3.

8.7.4 Record the first time and date the surveillance or event is due. A table is provided for documentation of multiple occurrences.

Example: Administratively verify Containment Isolation valve closed every 31 days.

8.7.5 The SM **OR** CRS shall sign and date the form.

8.7.6 Place the completed form in the Control Room EIR Book.

8.7.7 When the required surveillance or event is no longer required or has been performed, then complete Section "E" as follows:

– Document the date and time completed.

– The SM **OR** CRS shall sign and date the form.

8.8 Loss of Safety Function Worksheet [CAPR 193057]

NOTE:	These instructions do not supersede any instructions contained in the TRM regarding how to perform a Safety Function Determination (SFD). These instructions supplement the TRM instructions and provide an aid in completing the Loss of Safety Function (LOSF) Worksheet. This determination should be performed by a licensed Senior Reactor Operator and reviewed any time additional inoperabilities occur **OR** an ITS Supported Feature is declared inoperable.

8.8.1 Perform the Revision Verification.

8.8.2 Complete plant conditions table.

8.8.3 Record the ITS Support Feature which is inoperable by ITS LCO number and describe the inoperability.

8.8.4 Determine if the ITS Support Feature inoperability causes an ITS Supported Feature to not meet its LCO **AND** record as applicable.

8.8.5 **IF** no ITS Supported Feature is inoperable due to the ITS Support Feature being inoperable, **THEN** perform the following:

1. N/A the remaining steps and sign Completed By.
2. Forward the attachment to the SM for review.
3. **IF** the Support Feature will NOT be returned to service prior to end of shift, **THEN** attach the LOSF Worksheet to the EIR for the ITS Support Feature.
4. **IF** the Support Feature will be returned to service prior to end of shift, **THEN** file LOSF Worksheet in EIR notebook.

8.8.6 Determine if ITS Support Feature's LCO requires "CASCADING" to ITS Supported Feature(s) REQUIRED ACTION and record as applicable.

1. **IF** ITS Support Feature's LCO requires "CASCADING" to ITS Supported Feature(s) REQUIRED ACTION, **THEN** the SFD is complete.
2. N/A the remaining steps and sign Completed By.
3. Forward the attachment to the SM for review. Attach the LOSF Worksheet to the EIR for the ITS Support Feature.

8.8.7 Determine if any other ITS Support LCOs are not met, and record the impact of the inoperabilities on all applicable ITS Supported Features.

8.8.8 Determine if any redundant ITS Supported Features are inoperable.

1. **IF** no redundant ITS Supported Features are inoperable, **THEN** the SFD is complete.

2. N/A the remaining steps and sign Completed By.

3. Forward the attachment to the SM for review. Attach the LOSF Worksheet to the ITS Supported Feature's EIR.

8.8.9 **IF** a redundant ITS Supported Feature is inoperable, **THEN** determine if a Loss of Safety Function (LOSF) exists for the ITS Supported Feature.

8.8.10 **IF** there is no LOSF, **THEN** perform the following:

1. Calculate and record the maximum completion time to restore the ITS Support Feature **AND** associated ITS Supported Feature(s) to operable status.

2. N/A the remaining steps and sign Completed By.

3. Forward the attachment to the SM for review. Attach the LOSF Worksheet to the ITS Supported Feature's EIR.

8.8.11 **IF** there is a LOSF, **THEN** perform the following:

1. Calculate and record the maximum completion time to restore the ITS Support Feature and associated ITS Supported Feature(s) to operable status.

2. Enter the applicable ITS LCO for the ITS Supported Feature **OR** ITS LCO 3.0.3 as applicable.

3. Attach the LOSF Worksheet to the ITS Supported Feature's EIR.

8.8.12 The individual who completed the worksheet shall sign and date the worksheet.

8.8.13 The SM shall sign and date the worksheet.

8.9 Inoperable ITS/TRM/ODCM/RG 1.97 Components That Will Be Returned to Service Prior to End of Shift [CAPR 193057]

8.9.1 Enter the name of the equipment **AND** the reason for the equipment inoperability in AUTO log.

8.9.2 Verify a Work Request has been initiated (if applicable) **AND** enter the WR number in AUTO log.

8.9.3 **IF** the unavailability is unplanned, **AND** the component is part of a system listed on Attachment 10.10, **THEN** review OMM-048 **AND** the Maintenance Rule Scoping and Performance Criteria Basis section of the Maintenance Rule Database to determine if the listed function(s) of the system is/are affected.

8.9.4 **IF** a system function is affected, **THEN** initiate an NCR stating a potential Safety Significant Functional Failure has occurred IAW OMM-048, and enter the NCR # in AUTO log.

8.9.5 Enter applicable LCO, TRMS or Specification number in AUTO log. Be specific. For example, provide table number and item number where applicable.

Examples: LCO 3.3.1, Table 3.3.1-1 Item 7.a

TRMS 3.10, Table 3.10-1 Item 3

Specification 2.6.3, Table 2.6-1 Item 4.c

8.9.6 Determine the maximum time the equipment is allowed to be inoperable.

8.9.7 Determine applicable surveillances or activities and required frequencies which are required as a result of the component inoperability.

8.9.8 **IF** the component is an ITS Support System component, **THEN** perform Attachment 10.11, Loss of Safety Function Worksheet **AND** file worksheet in EIR notebook.

8.9.9 **IF** the component is an ITS Supported System Component, **THEN** review open Loss of Safety Function Worksheets for impact **AND** enter in AUTO log to document review.

8.9.10 **IF** the inoperable component is a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C.

8.9.11 **IF** the component inoperability could force a plant shutdown or load reduction, **THEN** notify the Load Dispatcher. [SOER 99-1, Rec. 1C]

8.9.12 **IF** ITS/TRM/ODCM/RG 1.97 actions have been entered **AND** a plant shutdown is anticipated, **THEN** notify Planning and Scheduling.

8.9.13 **WHEN** the equipment is returned to service **OR** the equipment is no longer required due to a change in plant conditions, **THEN** perform the following:

- **IF** the equipment is declared operable, **THEN** perform the following:
    - Enter in AUTO log.
    - **IF** the equipment is a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C.
- **IF** the equipment is no longer required, **THEN** enter the reason in AUTO log (such as, MODE 5 entered).

9.0 RECORDS

9.1 Completed EIRs **AND** Loss of Safety Function Worksheets shall be routed to Plant Records.

10.0 ATTACHMENTS

10.1 EIR – ITS/TRM/ODCM/RG 1.97

10.2 EIR – Fire Detection and Actuation System

10.3 EIR – Fire Water Systems

10.4 EIR – Gaseous Suppression and Fire Barriers

10.5 EIR – Miscellaneous Fire Protection Equipment

10.6 EIR – DS / SBO Equipment And Other Equipment Important to Safety

10.7 EIR – Continuous Calorimetric Program Instrumentation

10.8 EIR – Ultimate Heat Sink (UHS) For Service Water Temperature Exceeding 97°F

10.9 Required Event Tracking

10.10 Maintenance Rule Systems

10.11 Loss of Safety Function Worksheet

10.12 DS / SBO Equipment List And Other Equipment Important to Safety

10.13 Flowchart for Inoperable ITS/TRM/ODCM/RG 1.97 Components That Will Be Returned to Service Prior to End of Shift

EIR – ITS/TRM/ODCM/RG 1.97

CONTINUOUS USE

This revision has been verified to be the latest revision available. ________ Date ________ INIT

A. Equipment Inoperable: ____________________

B. Reason for Equipment Inoperability: ____________________

C. WR initiated: (ACR 94-00281) WR #____________

D. **IF** an unplanned unavailability **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate CR stating a potential safety significant functional failure has occurred. CR # ____________

E. Operating Limitations:

1. Equipment declared inoperable: Time ________ Date ________
2. ITS/TRM/ODCM/RG 1.97Other reference number ____________________
   (Circle one)
3. Other actions and associated completion time: ____________________
   ____
4. Maximum time equipment allowed inoperable before:
   MODE 2 ___ Hrs MODE 3 ___ Hrs MODE 4 ___ Hrs MODE 5 ___Hrs
   Special Report ________ hrs/days
5. Time **AND** Date Action Required:

MODE 2	Time: ________	Date: ________
MODE 3	Time: ________	Date: ________
MODE 4	Time: ________	Date: ________
MODE 5	Time: ________	Date: ________
Special Report	Time: ________	Date: ________

6. Record any surveillance required to be performed as a result of the inoperability of this component. (ODCM initial compensatory samples lack a "grace period".)
   ____
   ____
   ____
   ____
   ____
   ____
   ____

EIR – ITS/TRM/ODCM/RG 1.97

F. **IF** this is an ITS Support System Component, **THEN** perform Attachment 10.11. [CAPR 193057]

G. **IF** this is an ITS Supported System Component, **THEN** review open Loss of Safety Function Worksheets (Attachment 10.11) for impact.

H. Load Dispatcher notified of REQUIRED ACTION which could force plant shutdown/load reduction. ________________(SM/CRS Initials) [SOER 99-1, Rec. 1C]

I. Planning and Scheduling notified to develop Forced Outage Schedule if ITS/TRM/ODCM/RG 1.97 actions are entered **AND** plant shutdown anticipated. ______________(SM/CRS Initials)

J. **IF** this EIR is for a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C of equipment inoperability:

Time _________ Date __________ ________________________________
E&C Shift Technician (Print name)

K. **IF** a Maintenance Rule System Function is affected, **THEN** record Allowed Unavailability Hours, Actual Unavailability Hours, and Unavailability Hours Remaining.

_____Hours Allowed - ______ Hours Actual = ______ Hours Remaining

IF unplanned and less than 72 Hours remaining, **THEN** notify the RES Duty Manager.

____________________________ __________ __________
Name Date Time

L. Completed By: ______________________________ _________________
SM/CRS Date

M. Comments:____
____
____

N. Restoration

1. Equipment operable: Time __________ Date __________

2. **IF** this EIR is for a Radiation Monitor, Flowrate Monitor or Tank Level Monitor, **THEN** notify E&C of equipment return to service:

Time ________ Date ________ ______________________________
E&C Shift Technician (Print Name)

3. Equipment no longer required due to plant conditions:

Time ________ Date ________

Reason: ____

4. Completed By: _____________________________ _______________
SM/CRS Date

EIR – FIRE DETECTION AND ACTUATION SYSTEM

CONTINUOUS USE

This revision has been verified to be the latest revision available. ________ Date ________ INIT

A. Equipment Inoperable: ____________________

B. Equipment to be Inoperable / Compensatory Actions

COMPONENT/ZONE	COMPENSATORY ACTION	COMPENSATORY ACTION INITIATED	
		TIME	DATE
24[1], 25A[1], 25B[1], 25C[1], and 26	Initiate inspections once per shift[2].	______	______
1, 2, 3, 4, 5, 7, 8, 11, 13, 15, 16, 17, 21, 22, 23, 27, and 28	Within one hour, begin hourly inspections.	______	______
9[1], 10, 12[1], 19, 20[1] (Zones 1 and 2 if EDG operating)	Within one hour, post continuous Fire Watch with backup suppression[3].	______	______
Transceivers	Within one hour, begin continuous monitoring of the applicable FDAP.	______	______
FDAP & Loss of Detection Zone	Follow the compensatory action for the applicable system.	______	______
FAC	Within one hour, begin continuous monitoring of FDAPs A1, A2, B1, & B2.	______	______
Locked in Trouble Alarm on FDAP or Transceiver	Within one hour, perform an hourly review of applicable panel(s) for additional alarms received.	______	______

NOTES:

1. The following applies for Zones 9, 12, 24, 25A, 25B, 25C trains "A" and "B" and Zone 20 train "B":
   a. **IF** a detector has actuated in the ALARM position **AND** will not reset, **THEN** it has failed safe.
   b. **IF** the opposite detector train is operable **AND** not inhibited, **THEN** the suppression system **AND** fire detection system is considered operable. Hourly inspection **OR** fire watch **NOT** required.
   c. FP-012 should be reviewed.
2. **IF**, during SIT OR ILRT, fire alarms are received in containment, **THEN** no inspection can be made. AOP-041 shall be referenced for response to alarms in containment.
3. **IF** necessary, add additional sheets describing backup suppression provided.

EIR – FIRE DETECTION AND ACTUATION SYSTEM

C. **IF** an unplanned unavailability **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate a CR stating a potential safety significant functional failure has occurred. CR # ____________

D. Operating Limitations

1. Equipment declared inoperable. Time ________ Date __________

2. Reason for Equipment Inoperability: ____

____

NOTE: FP-012 states that an NCR shall be initiated if the allowed out of service time is exceeded.

3. Time equipment allowed inoperable is 14 days. Equipment required to be returned to service by:
   Time: __________ Date: __________

4. **IF** an impairment to an active Fire Protection System (Fire Pump, Fire Hydrant/Fire Hose, Sprinkler/Deluge System, Detection/Suppression System, etc.) exceeds **OR** is expected to exceed 48 hours, **THEN** the RESS Fire Protection Engineer **OR** Designee shall be notified within one working day (ACR 94-01019):

   ________________ Time: _______ Date: _______
   Person Contacted

5. WR initiated: (ACR 94-00281) WR # __________

6. Completed By: ______________________________ ____________
   SM/CRS Date

7. Comments:
   ____
   ____
   ____

E. Restoration

1. Equipment Operable: Time: _______ Date: _______

2. Completed By: ______________________________ ____________
   SM/CRS Date

EIR – FIRE WATER SYSTEMS

CONTINUOUS USE

This revision has been verified to be the latest revision available. ______ Date ______ INIT

A. Equipment Inoperable: ______________________________

B. Equipment to be Inoperable / Compensatory Actions

INOPERABLE EQUIPMENT	COMPENSATORY ACTION	COMPENSATORY ACTION INITIATED	
		TIME	DATE
RESTORE OPERABILITY WITHIN 7 DAYS			
1. Fire Water Pumps and Flowpath for Unit 2:			
a. Engine **OR** Motor Driven Fire Pump	None	N/A	N/A
b. Firewater Loop Flowpath with section of loop isolated by closing sectional isolation valve(s)	None (See Items B.2 through B.6 below, if applicable)	N/A	N/A
c. Firewater Loop Flowpath section isolation valve closed **OR** inoperable.	None	N/A	N/A
d. Supply Header section isolation **OR** system isolation valve for B.2 through B.6 systems closed **OR** inoperable.	NOTE: Compensatory actions shown below for B.2 through B.6 systems.	N/A	N/A
e. Both pumps **OR** flowpath inoperable from the intake structure to the distribution loop.	MODE 3 in 12 hours; MODE 5 within additional 36 hours **OR** backup suppression[1] available in 24 hours	______	______
RESTORE OPERABILITY WITHIN 14 DAYS			
2. Auxiliary Building Hall Pre-Action System (Detection Zone 12)	Post continuous Fire Watch with backup suppression[1] within 1 hour	______	______
3. CCW Room Wet Pipe Sprinkler System (Detection Zone 5)	Post continuous Fire Watch with backup suppression[1] within 1 hour	______	______
4. CV Electrical Penetration Pre-Action System	Within 12 hours initiate inspections once per shift[2]	______	______
5. RCP Bays A, B, and C Pre-Action System	Refer to FP-012[2]	______	______
6. Fire Hose Stations (Less Than FP-012)	For FH 31, 35, 52, 70, 78, 82, 83, 90, 93, 107, 122, 123, 124, 125, 126, 127, 128, 129, Hose House **AND** Hydrant FP-84 at Intake, within one hour, connect additional, equivalent capacity hose[2].	______	______

1. If necessary, add additional sheets describing backup suppression provided.
2. During ILRT **AND** SIT, FP-012 Containment hose stations are suspended.

EIR – FIRE WATER SYSTEMS

C. **IF** an unplanned unavailability, **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate CR stating a potential safety significant functional failure has occurred. CR # ____________

D. Operating Limitations

1. Equipment declared inoperable: Time ________ Date _________

2. Reason for Equipment Inoperability:___________________________________

____

NOTE: FP-012 states that an NCR shall be initiated if the allowed out of service time is exceeded.

3. Time equipment required to be returned to service IAW Section "B":

   Time: ______________ Date: ______________

4. **IF** an impairment to an active Fire Protection System (Fire Pump, Fire Hydrant/Fire Hose, Sprinkler/Deluge System, Detection/Suppression System, etc.) exceeds **OR** is expected to exceed 48 hours, **THEN** the RESS Fire Protection Engineer **OR** Designee shall be notified within one working day (ACR 94-01019):

   ________________ Time: _______ Date: _______
   Person Contacted

5. WR initiated: (ACR 94-00281) WR #____________

NOTE: Only the main fire water pumps and the alternate cooling/water supply to SI, AFW, and Charging Pumps are monitored for Maintenance Rule unavailability.

6. **IF** a Maintenance Rule System Function is affected, **THEN** record Allowed Unavailability Hours, Actual Unavailability Hours, and Unavailability Hours Remaining.

   _____Hours Allowed - ______ Hours Actual = ______ Hours Remaining

   IF unplanned and less than 72 Hours remaining, **THEN** notify the RES Duty Manager.

   ____________________________ __________ __________
   Name Date Time

7. Completed By: ______________________________ ________________
   SM/CRS Date

8. Comments:____

   ____

   ____

E. RESTORATION

1. Equipment Operable: Time _______ Date _______

2. Completed By: ______________________________ ________________
   SM/CRS Date

EIR – GASEOUS SUPPRESSION AND FIRE BARRIERS

CONTINUOUS USE

This revision has been verified to be the latest revision available. ______ Date ______ INIT

A. Equipment Inoperable: ____________________

B. Equipment to be Inoperable / Compensatory Actions

INOPERABLE EQUIPMENT	COMPENSATORY ACTION	ACTION INITIATED	
		TIME	DATE
RESTORE OPERABILITY WITHIN 14 DAYS			
1. CO_2 Systems (EDG Room **OR** Cable Vaults)	a. For Cable Vaults, within 1 hour post a continuous Fire Watch with backup suppression[1].	______	______
	b. For EDG Room, establish hourly inspections. **IF** EDG operating, **THEN** post a continuous Fire Watch with backup suppression[1].	______	______
2. Halon System (Zones 19 and 20)	Post continuous Fire Watch with backup suppression[1] within 1 hour IAW FP-012.	______	______
RESTORE OPERABILITY WITHIN 7 DAYS			
3. Fire Doors, Dampers, **OR** Penetration Seals[2]	a. Within 1 hour, check detection on both sides, as applicable.	______	______
	b. **IF** either detection system is inoperable, **THEN** within 1 hour, post continuous Fire Watch on one side with backup suppression[1].	______	______
	c. For inoperable Fire Dampers, refer to FP-014 **AND** complete Item D.4 on next page.	______	______
4. CCW Pump Room Conduit Fire Wrap, EDG "B" SW Pipe Insulation/Pipe Support Coatings in EDG "A" Room, **OR** MCC-A **AND** MCC-B Sealed Conduit Stubs / Cabinet Covers	a. Within 1 hour, check detection system for: – CCW Pump Room, Detection Zone 5 – EDG Room, Detection Zone 2 – Battery Room, Detection Zone 16	______	______
	IF applicable detection system is inoperable, **THEN** within 1 hour, post continuous Fire Watch with backup suppression[1].	______	______

1. If necessary, add additional sheets describing backup suppression provided.
2. Inoperability of Control Room dampers, penetration seals, **OR** fire doors (FDR-17, FDR-48, FDR-49) may disable Control Room HVAC System. Reference ITS 3.7.9 and 3.7.10.
   – **IF** the inoperable dampers are closed **AND** in an EDG Room, **THEN** the associated EDG is inoperable; reference ITS 3.8.1 and 3.8.2 (Zone 1: FD-2 & 75; Zone 2: FD-5 & 7).

EIR – GASEOUS SUPPRESSION AND FIRE BARRIERS

C. **IF** an unplanned unavailability, **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate CR stating a potential safety significant functional failure has occurred. CR # ____________

D. Operating Limitations

1. Equipment declared inoperable: Time ________ Date _________

2. Reason for Equipment Inoperability: ___________________________________

____

> **NOTE:** FP-012 states that an NCR shall be initiated if the allowed out of service time is exceeded.

3. Time equipment required to be returned to service IAW Section "B":

   Time: _____________ Date: _____________

4. **IF** an inoperable damper, **THEN** actions have been taken IAW FP-014:

   Time: _________ Date: ____________ Initials: ____________

5. **IF** an impairment to an active Fire Protection System (Fire Pump, Fire Hydrant/Fire Hose, Sprinkler/Deluge System, Detection/Suppression System, etc.) exceeds **OR** is expected to exceed 48 hours, **THEN** the RESS Fire Protection Engineer **OR** Designee shall be notified within one working day
   (ACR 94-01019):

   _______________ Time: _______ Date: _______
   Person Contacted

6. WR initiated: (ACR 94-00281) WR #___________

7. Completed By: ______________________________ SM/CRS ________________ Date

8. Comments:____
   ____

E. RESTORATION

1. Equipment Operable: Time _______ Date _______

2. Completed By: ______________________________ SM/CRS ________________ Date

EIR – MISCELLANEOUS FIRE PROTECTION EQUIPMENT

CONTINUOUS USE

This revision has been verified to be the latest revision available. ______ Date ______ INIT

A. Equipment Inoperable: ______________________________

B. Equipment to be Inoperable / Compensatory Actions

INOPERABLE EQUIPMENT	COMPENSATORY ACTION	ACTION INITIATED	
		TIME	DATE
IF THE MINIMUM EQUIPMENT IDENTIFIED BY THE COMPENSATORY ACTION IS NOT AVAILABLE, **THEN** RESTORE THE MINIMUM EQUIPMENT TO OPERABILITY WITHIN 14 DAYS			
1. Scott Air Packs and Cylinders	Check at least: 10 SCBAs are operable. 10 hours of air available in spare cylinders	______	______
2. Breathing Air Compressor	Check the Cascade Cylinders are operable with pressure between 5100 and 6000 psig.	______	______
3. Cascade Cylinders	Check the Breathing Air Compressor is operable **OR** six hours of air available in spare cylinders in addition to the 10 hours listed in step 1 above.	______	______
4. SCBA Fill Station	Suspend unnecessary usage of breathing air. Reference AP-038 for possible backup sources of air.	______	______
5. Fire Brigade Radios (Use Attachment 10.6, EIR – DS / SBO Equipment And Other Equipment Important to Safety)	Check at least nine (9) Fire Brigade radios are operable.	______	______
6. Motorized Emergency Response Cart (MERC)	N/A	N/A	N/A

EIR – MISCELLANEOUS FIRE PROTECTION EQUIPMENT

C. This section is not applicable to the Maintenance Rule or OMM-048 evaluation.

D. Operating Limitations

1. Equipment declared inoperable: Time ________ Date __________
2. Reason for Equipment Inoperability: ______________________________________

   ____
3. Time equipment required to be returned to service IAW Section "B":
   (N/A if minimum equipment identified by the Compensatory Action is available.)

   Time: _______________ Date: _______________
4. WR initiated: (ACR 94-00281) WR #____________
5. Completed By: ___________________________________ ___________________
   SM/CRS Date
6. Comments:____

   ____

   ____

E. RESTORATION

1. Equipment Operable: Time _______ Date _______
2. Completed By: ___________________________________ ___________________
   SM/CRS Date

EIR – DS / SBO EQUIPMENT AND OTHER EQUIPMENT IMPORTANT TO SAFETY

CONTINUOUS USE

This revision has been verified to be the latest revision available. ____________ Date ______ INIT

NOTE: Items powered from PP-50 remain operable as long as their TS surveillances are met. Specifically, these components are still operable as long as they are energized and operating, even if the DS battery or DS UPS is inoperable.

A. **IF** a safe shutdown pathway is made inoperable due to blocking of the pathway **OR** a security door or gate will not allow access/egress for safe shutdown events, **THEN** initiate an EIR.

B. **IF** the inoperability is due to the blocking of a safe shutdown pathway by a cold weather enclosure, **AND** the enclosure is approved by the Appendix R Engineer, **THEN** the impairment may be exited **AND** the safe shutdown pathway declared operable.

C. Document Equipment Inoperable from Attachment 10.12, DS / SBO Equipment List: And Other Equipment Important to Safety.

____

D. Redundant Equipment / Temporary Provisions: (CR 97-01941)

– **IF** "D" Deepwell Pump becomes unavailable, **THEN** Notify Security immediately to implement Security Compensatory Actions.

Security Contact: ______________________________
(Print name)

REDUNDANT EQUIPMENT AVAILABLE	VULNERABILITIES DUE TO INOPERABILITY	COMPENSATORY MEASURES NECESSARY

E. The compensatory measures documented above are adequate: (CR 97-01941)

______________________________ SM/Manager-Operations ____________ Date

EIR – DS / SBO EQUIPMENT AND OTHER EQUIPMENT IMPORTANT TO SAFETY

F. **IF** an unplanned unavailability, **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate an NCR stating a potential safety significant functional failure has occurred. NCR # ____________

G. Operating Limitations

1. Equipment declared inoperable: Time ________ Date _________
2. Reason for Equipment Inoperability:
   ____
   ____
3. WR initiated: (ACR 94-00281) WR # ____________________
4. Time equipment allowed inoperable: ___________hrs / days (Circle one)
5. **IF** this EIR is for the TSC/EOF/PAP Diesel Generator, **THEN** notify On-Call Security AND Emergency Planning personnel.
   – On-Call Security ____________________ (Print name) On-Call EP _______________ (Print name)
6. **IF** this EIR is for the Dedicated Shutdown radios, **THEN** check at least nine Dedicated Shutdown radios are operable.
7. **IF** the equipment is **NOT** inoperable for scheduled work, **THEN** the SM/CRS shall verify that a WR has been initiated and review the WR to ensure the following is stated on WR (CR 95-2670): WR # _________________ CRS/SM Initials ____

NOTE:	Priority 2 is the appropriate priority for equipment listed on Attachment 10.10.

   – Appropriate priority
   – Time allowed out of service
   – Equipment is Important to Safety and should **NOT** be downgraded
8. **IF** a Maintenance Rule System Function is affected, **THEN** record Allowed Unavailability Hours, Actual Unavailability Hours, and Unavailability Hours Remaining.

   _____Hours Allowed - ______ Hours Actual = ______ Hours Remaining

   IF unplanned and less than 72 Hours remaining, **THEN** notify the RES Duty Manager.

   ______________________________ Name ____________ Date ____________ Time
9. Completed By: ______________________________ SM/CRS ______________ Date
10. Comments:____
    ____
    ____

EIR – DS / SBO EQUIPMENT AND OTHER EQUIPMENT IMPORTANT TO SAFETY

H. Inoperability > 14 days
With less than the specified equipment listed on Attachment 10.12, DS/SBO Equipment and Other Equipment Important to Safety, operable when in MODE 1, 2, 3 or 4, the equipment must be restored to an operable status within 14 days or submit a CR.

CR # (N/A if not applicable) ________________

I. Restoration

1. Equipment operable: Time ________ Date ________

2. Equipment no longer required due to plant conditions:

   Time ________ Date ________

   Reason: ____

3. Completed By: ________________________________ ____________________
   SM/CRS Date

EIR – CONTINUOUS CALORIMETRIC PROGRAM INSTRUMENTATION

CONTINUOUS USE

This revision has been verified to be the latest revision available. ________ Date ______ INIT

A. Equipment Inoperable: ____________________

B. Equipment to be Inoperable / Compensatory Actions: (CR 96-01631)
Perform one of the following:

- Disable the input to the Continuous Calorimetric Program **OR** delete the affected ERFIS point from scan.

PARAMETER	LOOP	INSTRUMENT TAG NUMBER	ERFIS POINT TO BE DISABLED IN CALORIMETRIC PROGRAM **OR** DELETED FROM SCAN	COMPENSATORY ACTION INITIATED	
				DATE	TIME
Main Steam Pressure	1	PT-474	MSP0400A		
	1	PM-474A			
	1	PM-474D			
	1	PT-475	MSP0401A		
	1	PM-475A			
	1	PM-475C			
	1	PT-476	MSP0402A		
	1	PM-476A			
	1	PM-476B			
	2	PT-484	MSP0420A		
	2	PM-484A			
	2	PM-484B			
	2	PT-485	MSP0421A		
	2	PM-485A			
	2	PM-485B			

EIR – CONTINUOUS CALORIMETRIC PROGRAM INSTRUMENTATION

B. Equipment to be Inoperable / Compensatory Actions (Continued):

PARAMETER	LOOP	INSTRUMENT TAG NUMBER	ERFIS POINT TO BE DISABLED IN CALORIMETRIC PROGRAM **OR** DELETED FROM SCAN	COMPENSATORY ACTION INITIATED	
				DATE	TIME
Main Steam Pressure	2	PT-486	MSP0422A		
	2	PM-486A			
	2	PM-486B			
	3	PT-494	MSP0440A		
	3	PM-494A			
	3	PM-494D			
	3	PT-495	MSP0441A		
	3	PM-495A			
	3	PM-495C			
	3	PT-496	MSP0442A		
	3	PM-496A			
	3	PM-496B			
Feedwater Temperature	1	TE-3004	FWT0418A		
	2	TE-3005	FWT0438A		
	3	TE-3006	FWT0458A		
Feedwater Flow	1	FT-476	FWF0403A		
	1	FM-476B			
	1	FT-477	FWF0404A		
	1	FM-477B			
	2	FT-486	FWF0423A		
	2	FM-486B			
	2	FT-487	FWF0424A		
	2	FM-487B			
	3	FT-496	FWF0443A		
	3	FM-496B			
	3	FT-497	FWF0444A		
	3	FM-497B			

EIR – CONTINUOUS CALORIMETRIC PROGRAM INSTRUMENTATION

B. Equipment to be Inoperable / Compensatory Actions (Continued):

NOTE: Blowdown Flow is required by the ODCM 2.6 and should also be tracked using Attachment 10.1

PARAMETER	LOOP	INSTRUMENT TAG NUMBER	ERFIS POINT TO BE DISABLED IN CALORIMETRIC PROGRAM **OR** DELETED FROM SCAN	COMPENSATORY ACTION INITIATED	
				DATE	TIME
Blowdown Flow	1	FIT-1328A	MSF1407A		
	2	FIT-1328B	MSF1427A		
	3	FIT-1328C	MSF1447A		
Main Steam Flow	1	FT-474	MSF0405A		
	1	FM-474B			
	1	FT-475	MSF0406A		
	1	FM-475B			
	2	FT-484	MSF0425A		
	2	FM-484B			
	2	FT-485	MSF0426A		
	2	FM-485B			
	3	FT-494	MSF0445A		
	3	FM-494B			
	3	FT-495	MSF0446A		
	3	FM-495B			
Charging	N/A	FT-122	CHF0128A		
	N/A	FM-122A			
	N/A	TE-123	CHT0126A		
	N/A	TM-123			
Letdown	N/A	FT-150	CHF0134A		
	N/A	FM-150			
RCS	1	TE-412D	RCT0404A		
	1	TM-412P			
	1	TM-412			

EIR – CONTINUOUS CALORIMETRIC PROGRAM INSTRUMENTATION

B. Equipment to be Inoperable / Compensatory Actions (Continued):

PARAMETER	LOOP	INSTRUMENT TAG NUMBER	ERFIS POINT TO BE DISABLED IN CALORIMETRIC PROGRAM **OR** DELETED FROM SCAN	COMPENSATORY ACTION INITIATED	
FWUFM				DATE	TIME
Feedwater Temperature	1	Calculated	FWT1001A		
	1	Calculated	FWT2001A		
	2	Calculated	FWT1002A		
	2	Calculated	FWT2002A		
	3	Calculated	FWT1003A		
	3	Calculated	FWT2003A		
Feedwater Pressure	1	PT-1077A	FWP1001A		
	1		FWP2001A		
	2	PT-1077B	FWP1002A		
	2		FWP2002A		
	3	PT-1077C	FWP1003A		
	3		FWP2003A		
Feedwater Flow	1	FE11074A	FWF1001A		
	1		FWF2001A		
	2	FE11074B	FWF1002A		
	2		FWF2002A		
	3	FE11074C	FWF1003A		
	3		FWF2003A		
LEFM	N/A	CPU-A	N/A		
LEFM	N/A	CPU-B	N/A		

EIR – CONTINUOUS CALORIMETRIC PROGRAM INSTRUMENTATION

C. **IF** an unplanned unavailability, **AND** a High Safety Significant Maintenance Rule System FUNCTION is affected by the equipment, **THEN** initiate CR stating a potential safety significant functional failure has occurred. CR # ________

D. Operating Limitations

> **CAUTION**
>
> Since there is only one Feed Water temperature AND Blowdown Flow input per loop for the calculation, the ERFIS Feed Flow Automatic Calorimetric results become invalid if any of these inputs become unavailable.
>
> With one of the two redundant Feed Flow transmitters out of service in each of the three loops, the ERFIS Feed Flow Automatic Calorimetric results become invalid.

1. Equipment declared inoperable **OR** the inputs were removed from scan or disabled:

   Time ________ Date ________

2. Reason for Equipment Inoperability: ______________________________

   ____

3. Completed By: ______________________________
   SM/CRS Date

4. Comments: ______________________________

   ____

   ____

E. Restoration

1. Equipment operable: Time ________ Date ________
   (Associated Continuous Calorimetric Program or ERFIS points may be restored)

2. Equipment no longer required due to plant conditions:

   Time ________ Date ________

   Reason: ______________________________

3. Completed By: ____________________ ____________
   SM/CRS Date

EIR – ULTIMATE HEAT SINK (UHS) FOR SERVICE WATER TEMPERATURE EXCEEDING 97°F

CONTINUOUS USE

This revision has been verified to be the latest revision available. ________ Date ________ INIT

A. Entry into ITS LCO 3.7.8 REQUIRED ACTIONS for Service Water Temperature Exceeding 97°F: Time ________ Date: ________

B. Operating Limitations:

1. Verify Service Water temperature is less than or equal to 99 °F once per hour **AND** begin logging hourly Service Water temperature per PPP-114.

2. Within ONE HOUR verify the required cooling capacity of the Service Water System is maintained as follows **AND** record status in Auto Log:

> **NOTE:** Prior to exceeding 97 °F, Engineering should have provided a signed memo to the Control Room following review of the documents in the following step providing the current revision status and any pending changes associated with the calculations to ensure the assumptions for operating with a Service Water temperature up to 99 °F have not been affected.
>
> **NOTE:** Calculation revisions can be checked in PASSPORT by entering the calculation number, such as "RNP-M/MECH-1649", the same as procedures are checked. Any associated pending changes for the calculation would be listed under the "Pending Changes" tab.

a) Perform the following to check document revision status against the Engineering memo:

1) **IF** PASSPORT is available, **THEN** using PASSPORT, verify the revisions of the following documents **AND** any pending changes against the calculations are the same as listed in the Engineering memo.

- CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance, for Heat Exchanger Tube Plugging Limits
- Calculation RNP-M/MECH-1649
- EDG Loading Calculation RNP-E-8.016

EIR - ULTIMATE HEAT SINK (UHS) FOR SERVICE WATER TEMPERATURE EXCEEDING 97°F

2) **IF** PASSPORT is not available **OR** the document revision **AND** pending change status listed in PASSPORT does not agree with the Engineering memo, **THEN** contact the On-Call RESS Manager to ensure no revisions **OR** pending changes have been approved against the following documents which would invalidate the Engineering memo.

   – CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance, for Heat Exchanger Tube Plugging Limits

   – Calculation RNP-M/MECH-1649

   – EDG Loading Calculation RNP-E-8.016

Initial Check Completed: ______________________ SM/CRS ________ Date

b) Perform a review of plant logs, EIRs, and scheduled work activities since the Engineering memo was initiated to assure any maintenance that was performed on heat exchangers supplied with Service Water for any of the following components DID NOT involve tube plugging **AND** that the components are OPERABLE.

   – Component Cooling Water Heat Exchanger A

   – Component Cooling Water Heat Exchanger B

   – Emergency Diesel A

   – Emergency Diesel B

   – HVH-1

   – HVH-2

   – HVH-3

   – HVH-4

Initial Check Completed: ______________________ SM/CRS ________ Date

EIR - ULTIMATE HEAT SINK (UHS) FOR SERVICE WATER TEMPERATURE EXCEEDING 97°F

3. **IF** one of the following occurs, **THEN** place the unit in MODE 3 in 6 hours **AND** MODE 5 in 36 hours as required by ITS LCO 3.7.8:

   – Service Water temperature exceeds 99 °F as measured by PPP-114

   – Review of affected plant documents by Engineering identifies that the engineering assumptions for operating up to 99 °F are no longer valid

   – Review of revision status and pending changes is different than what is identified in the Engineering memo **AND** engineering has determined assumptions for operating up to 99 °F are no longer valid

   – Maintenance on any of the heat exchangers identified above which invalidate engineering assumptions for operating up to 99 °F.

C. Load Dispatcher notified of REQUIRED ACTION which could force plant shutdown/load reduction. ________________(SM/CRS Initials) [SOER 99-1, Rec. 1C]

D. Planning and Scheduling notified to develop Forced Outage Schedule if plant shutdown anticipated. ________________(SM/CRS Initials)

E. Once every 12 hours, perform the following **AND** record below **AND** in Auto Log:

1. Review memo supplied by Engineering **AND** verify the revisions of the following documents **AND** any pending changes against the calculations to ensure they are the same as listed in the memo.

   – CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance, for Heat Exchanger Tube Plugging Limits

   – Calculation RNP-M/MECH-1649

   – EDG Loading Calculation RNP-E-8.016

Date	Time	SM/CRS Signature

EIR - ULTIMATE HEAT SINK (UHS) FOR SERVICE WATER TEMPERATURE EXCEEDING 97°F

2. Verify the required cooling capacity of the Service Water System is maintained by performing a review of plant logs, EIRs and scheduled work activities for the previous 12 hours to assure no maintenance was performed that would affect heat exchanger OPERABILITY for the heat exchangers identified above for the initial check **AND** that the components remain OPERABLE.

Date	Time	SM/CRS Signature

F. Restoration

1. Exited ITS LCO 3.7.8 REQUIRED ACTIONS for Service Water Temperature Exceeding 97°F: Time ________ Date ________

2. ITS LCO 3.7.8 REQUIRED ACTIONS no longer required due to plant conditions:

   Time ________ Date ________

   Reason: ____

3. Completed By: ______________________________ ____________________
   SM/CRS Date

REQUIRED EVENT TRACKING

CONTINUOUS USE

This revision has been verified to be the latest revision available. ________ Date ________ INIT

A. Affected Component: ______________________________

B. Initiating Event: ______________________ TIME________ DATE________

C. Required Surveillance/Event

1. Describe the Surveillance/Event to be tracked and conditions which will terminate the need for tracking:
____
____
____

2. Reference: ______________________________

3. First TIME and DATE the Surveillance/Event is due: TIME_________ DATE__________

REQUIRED EVENT TRACKING

Section C (Continued)

4. **IF** the event being tracked will recur more than once, **THEN** record and track completion in the table below:

Time/Date Surveillance/Event is Required	Time/Date Surveillance/Event Completed	SM/CRS Signature

D. Completed By: ______________________________ DATE__________
SM/CRS

E. Restoration

1. Required Surveillance/Event no longer required or actions completed:

TIME__________ DATE__________

2. Completed By: ______________________________ DATE__________
SM/CRS

MAINTENANCE RULE SYSTEMS

INFORMATION USE

The following systems are considered to be High Safety Significant Systems under the Maintenance rule.

1000	Containment Isol Valve – Pseudo System	5098	Dedicated Shutdown Diesel Generator
1005	Reactor Vessel and Internals System	5100	Fuel Oil System
1045	Excore Nuclear Instrument System	5114	Dedicated Shutdown System
1065	Rod Control System	5120	Switchyard and Transformer System
1080	Reactor Protection and Safeguards System	5170	4 KV AC Distribution System
2005	Reactor Coolant System	5175	480V AC Distribution System
2045	Residual Heat Removal System	5185	208-120 VAC Distribution System
2060	Chemical and Volume Control System	5235	125V DC Battery/Charger/Distribution System
2080	Safety Injection System	6135	Instrument Air System
3005	Steam Generator	6150	Nitrogen Supply/Blanketing System
3020	Main Steam	6175	Site Fire Protection System
3050	Feedwater System	6270	Primary and Demineralized Water Makeup System
3065	Auxiliary Feedwater	8010	Containment System
3070	Condensate System	8150	HVAC Containment Building System
4060	Service Water System	8210	HVAC Auxiliary Building
4080	Component/Cooling Water System	8220	HVAC Control Room Area
5095	Emergency Diesel Generator System		

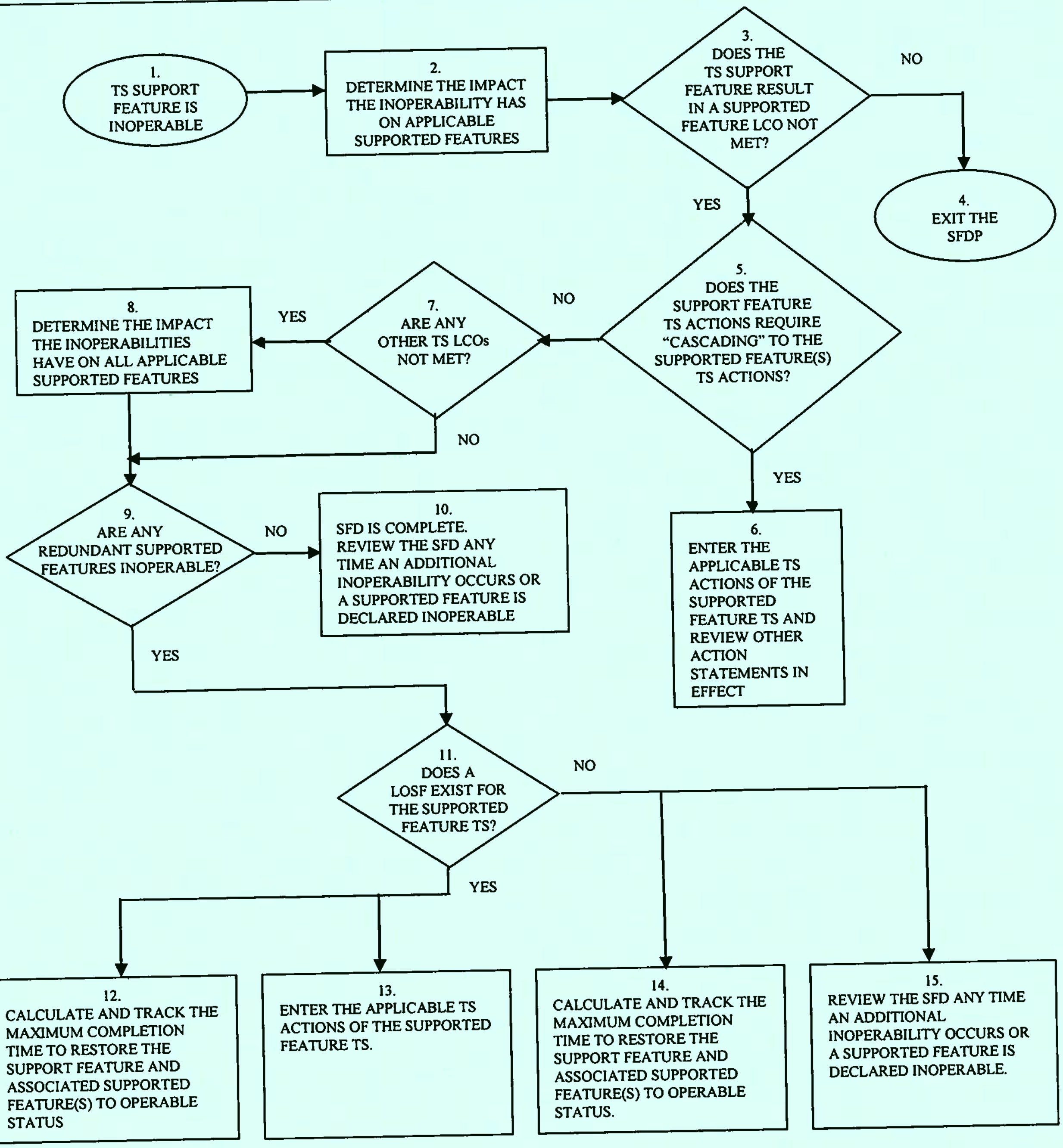
MAINTENANCE RULE SYSTEMS

The following systems require unavailability monitoring for the maintenance rule:

System	What's Monitored
1065 – Rod Drive	Reactor trip breakers
2005 – RCS	RCS PORVs and block valves
2045 – RHR	RHR trains
2060 – CVCS	Charging pump trains, boric acid pumps, emergency boration flowpath
2080 – SI	SI Pump trains, CV Spray trains, Accumulators
3020 – MS	S/G PORVs, Steam Supplies to SDAFW
3065 – AFW	AFW Pump trains, injection lines
4060 – SW	SW pumps, SW booster pumps, north and south headers, Turbine Building Isolation
4080 – CCW	CCW pump trains, heat exchangers
5095 – EDG	EDG trains
5098 – DSDG	Dedicated Shutdown Diesel
5114 – DS	DS bus, DS-UPS-Inverter
5170 – 4 KV	Auto Bus Transfer breakers
5175 – 480 V	Bus E-1, Bus E-2
5185 – 120 / 208 VAC	Constant voltage transformers
5235 – 125 VDC	Battery Chargers, Inverters, DC Buses
6004 – ERFIS	ERFIS Computer
6135 – IA	Compressors, Backup Air Supply For Charging Pumps
6175 – FP	Pumps, Flowpath to SI, AFW, CVCS Pump cooling / suction
6270 – Primary Water	Deep Well Pump "D", Primary Water Pumps and Header
8150 – CV HVAC	HVH units
8220 – MCR HVAC	Ventilation fans, Emergency Filtration Unit, Control Room Envelope Integrity

LOSS OF SAFETY FUNCTION WORKSHEET
[CAPR 193057]
CONTINUOUS USE

NOTE: The numbers in the flow chart correspond to the description of SFD steps in Appendix C of the TRM.



LOSS OF SAFETY FUNCTION WORKSHEET

This revision has been verified to be the latest revision available. ________ Date ____ INIT

Date:__________	Plant Conditions		Time:__________
MODE	Power	RCS Temperature	RCS Pressure

> **NOTE:** This Safety Function Determination should be performed by a licensed Senior Reactor Operator and should be reviewed any time additional inoperabilities occur or an ITS Supported Feature is declared inoperable.

INIT

1) List inoperable ITS Support Feature. ____

____

____

____

2) **IF** inoperable ITS Support Feature does **NOT** result in ITS Supported Feature inoperability, **THEN** perform the following:

   a) N/A steps 3 through 8. ____

   b) Sign and date. ____

   c) Forward worksheet to SM for review. ____

   d) **IF** the Support Feature will **NOT** be returned to service prior to end of shift, **THEN** attach completed worksheet to the EIR for the Support Feature. ____

   e) **IF** the Support Feature will be returned to service prior to end of shift, **THEN** file LOSF Worksheet in EIR notebook. ____

3) **IF** inoperable ITS Support Feature results in ITS Supported Feature inoperability, **THEN** list inoperable ITS Supported Feature(s). ____

____

____

____

LOSS OF SAFETY FUNCTION WORKSHEET

INIT

4) **IF** support feature ITS Actions require cascading to Supported Feature(s) ITS Actions, **THEN** perform the following:

   a) Enter applicable ITS Actions of Supported Feature(s) ITS. ____

   b) N/A steps 5 through 8. ____

   c) Sign and date. ____

   d) Forward worksheet to SM for review. ____

   e) Attach completed worksheet to the EIR for the Support Feature. ____

5) **IF** any other ITS LCOs are **NOT** met, **THEN** determine the impact the inoperabilities have on all applicable Supported Features **AND** list. ____

   ____

   ____

   ____

6) **IF** there are NO redundant Supported Features inoperable, **THEN** perform the following:

   a) N/A steps 7 and 8. ____

   b) Sign and date. ____

   c) Forward worksheet to SM for review. ____

   d) Attach completed worksheet to the EIR for the Supported Feature. ____

7) **IF** a LOSF does **NOT** exist for the Supported Feature ITS, **THEN** perform the following:

   a) Calculate and record the maximum completion time to restore the ITS Support Feature and associated ITS Supported Feature(s) to operable status. ____

____ hrs +	____ hrs =	____ hrs
1st Support Feature	Supported Feature	Max Completion

   b) N/A step 8. ____

   c) Sign and date. ____

   d) Forward worksheet to SM for review. ____

   e) Attach completed worksheet to the EIR for the Supported Feature. ____

LOSS OF SAFETY FUNCTION WORKSHEET

INIT

8) **IF** a LOSF exists for the Supported Feature ITS, **THEN** perform the following:

a) Calculate and record the maximum completion time to restore the ITS Support Feature and associated ITS Supported Feature(s) to operable status. ____

________ hrs + ________ hrs = ________ hrs
1st Support Feature / Supported Feature / Max Completion

b) Enter the applicable ITS LCO for the ITS Supported Feature or ITS LCO 3.0.3 as applicable. ____

c) Attach completed worksheet to the EIR for the Supported Feature. ____

Remarks:____

____

____

____

____

Completed By: ________________________ Date: ____________
SRO

Reviewed By: ________________________ Date: ____________
SM

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

INFORMATION USE

DS / SBO EQUIPMENT LIST
52/BYA, Reactor Trip Bypass Breaker Train A
52/BYB, Reactor Trip Bypass Breaker Train B
52/RTA, Reactor Trip Breaker A
52/RTB, Reactor Trip Breaker B
AFW-1, AFW Pump Suction from CST
AFW-4, SDAFW Pump Suction
AFW-7, SDAFW Pump Suction Vent
AFW-17, SDAFW PUMP RECIRC
AFW-18, SDAFW Pump Vent
AFW-20, SDAFW Pump Discharge
AFW-22, AFW Pump “A” and “B” Suction
AFW-24, AFW Suction from SW Emergency Backup
AFW-28, AFW Pump “A” Suction
AFW-29, AFW Pump “B” Suction
AFW-34, AFW Pump “A” Vent
AFW-35, AFW Pump “B” Vent
AFW-42, AFW Pump “A” Recirculation
AFW-43, AFW Pump “B” Recirculation
AFW-53, V2-16A Inlet Valve
AFW-54, V2-16B Inlet Valve
AFW-55, V2-16C Inlet Valve
AFW-62, V2-16A Outlet Valve
AFW-63, V2-16B Outlet Valve
AFW-64, V2-16C Outlet valve
AFW-104, AFW Pumps Suction from CST
AFW-110, AFW Pump “A” Recirculation Valve
AFW-111, AFW Pump “B” Recirculation Valve
AFW-117, SDAFW Pump Self Cooling Supply

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
AFW-PMP-A, Aux. Feedwater Pump "A"
AFW-PMP-A-O/C, AFW Pump "A" Oil Cooler
AFW-PMP-B, Aux. Feedwater Pump "B"
AFW-PMP-B-O/C, AFW Pump "B" Oil Cooler
AFW-V2-14A, SDAFW Pump FW Discharge to SG "A"
AFW-V2-14B, SDAFW Pump FW Discharge to SG "B"
AFW-V2-14C, SDAFW PUMP FW DISCHARGE TO SG "C"
AFW-V2-16A, AFW HEADER DISCHARGE TO SG "A"
AFW-V2-16B, AFW HEADER DISCHARGE TO SG "B"
AFW-V2-16C, AFW HEADER DISCHARGE TO SG "C"
AFW-V2-20A, AFW HEADER SUCTION ISOLATION VALVE
AFW-V2-20B, AFW HEADER SUCTION ISOLATION VALVE
AUX PANEL DC, AUXILIARY PANEL DC (125V DC)
BACKUP-GP-A, BACKUP GROUP "A" HEATERS (PRESSURIZER)
BACKUP-GP-B, BACKUP GROUP "B" HEATERS (PRESSURIZER)
BAT-CHRGR-A, 125VDC BATTERY CHARGER "A"
BAT-CHRGR-A1, 125VDC BATTERY CHARGER "A1"
BAT-CHRGR-B, 125VDC BATTERY CHARGER "B"
BAT-CHRGR-B1, 125VDC BATTERY CHARGER "B1"
C-47, CONDENSATE STORAGE TANK CONDENSER SUPPLY
C-66, CONDENSATE STORAGE TANK DRAIN
CC-701A, CC PUMP "A" SUCTION VALVE
CC-701B, CC PUMP "B" SUCTION VALVE
CC-701C, CC PUMP "C" SUCTION VALVE
CC-703A, CC PUMP "A" DISCHARGE VALVE
CC-703B, CC PUMP "B" DISCHARGE VALVE
CC-703C, CC PUMP "C" DISCHARGE VALVE
CC-710, CC SURGE LINE STOP VALVE

DS / SBO EQUIPMENT LIST
CC 712A, CC HX “B” INLET VALVE
CC 712B, CC HX “B” OUTLET VALVE
CC 713A, CC HX “A” INLET VALVE
CC 713B, CC HX “A” OUTLET VALVE
CC-716A, COOLING WATER INLET VALVE
CC-716B, COOLING WATER INLET VALVE
CC-718A, CC TO RCP “A” VALVE
CC-718B, CC TO RCP “B” VALVE
CC-718C, CC TO RCP “C” VALVE
CC-728A, RCP “A” THERMAL BARRIER CC OUTLET STOP VALVE
CC-728B, RCP “B” THERMAL BARRIER CC OUTLET STOP VALVE
CC-728C, RCP “C” THERMAL BARRIER CC OUTLET STOP VALVE
CC-728D, CC FROM RHR PUMP COOL
CC-735, THERMAL BARRIER OUTLET VALVE
CC-736, CC FROM RCP “A”, “B”, “C” THERMAL BARRIER VALVE
CC-737C, CC TO CHARGING PUMPS “A”, “B”, & “C”
CC-737D, CC FROM CHARGING PUMPS “A”, “B”, & “C”
CC-746A, CC TO RHR HX “A” VALVE
CC-746B, CC TO RHR HX “B” VALVE
CC-748A, CC FROM RHR HX “A” BUTTERFLY VALVE
CC-748B, CC FROM RHR HX “B” BUTTERFLY VALVE
CC-749A, CC FROM RHR HX “A” VALVE
CC-749B, CC FROM RHR HX “B” VALVE
CC-769A, CC FROM RHR PUMP “A” SEAL COOLER
CC-769B, CC FROM RHR PUMP “B” SEAL COOLER
CC-781, CC TO SEAL WATER HX VALVE
CC-784, CC FROM SEAL WATER HX THROTTLE VALVE
CC-785, CC FROM SEAL WATER HX VALVE
CC-794A, CC TO SI, CONT. SPRAY, & RHR PUMPS

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
CC-794B, CC FROM SI, CONT. SPRAY, & RHR PUMPS
CC-795E, CC TO SI PUMP “A” SEAL COOLER VALVE
CC-795F, CC TO SI PUMP “B” SEAL COOLER VALVE
CC-795G, CC TO SI PUMP “C” SEAL COOLER VALVE
CC-795H, CC FROM SI PUMP “A” SEAL COOLER VALVE
CC-795J, CC FROM SI PUMP “B” SEAL COOLER VALVE
CC-795K, CC FROM SI PUMP “C” SEAL COOLER VALVE
CC-825A, CC TO CHARGING PUMP “C” OIL COOLER
CC-825C, CC TO CHARGING PUMP “A” OIL COOLER
CC-825D, CC FROM CHARGING PUMP “C” OIL COOLER
CC-825F, CC FROM CHARGING PUMP “A” OIL COOLER
CC-927, CC TO RHR PUMP “A” COOLING
CC-928, CC TO RHR PUMP “B” COOLING
CCW-HTX-A, CCW HEAT EXCHANGER “A”
CCW-HTX-B, CCW HEAT EXCHANGER “B”
CCW-PMP-A, COMPONENT COOLING WATER PUMP “A”
CCW-PMP-B, COMPONENT COOLING WATER PUMP “B”
CCW-PMP-C, COMPONENT COOLING WATER PUMP “C”
CF-311, AMINE TO S/G “C” F.W. INLET
CF-312, AMINE TO S/G “B” F.W. INLET
CF-313, AMINE TO S/G “A” F.W. INLET
CHG-PMP-A, CHARGING PUMP “A”
CHG-PMP-B, CHARGING PUMP “B”
CHG-PMP-C, CHARGING PUMP “C”
Charging Pump Speed Controller Backup Air Supply (LCV-115B Backup Air Supply)
COND-STRG-TNK, CONDENSATE STORAGE TANK
CONTROL-GP, CONTROL GROUP HEATERS (PRESSURIZER)
CVC-200A, LETDOWN ORIFICE ISOLATION VALVE
CVC-200B, LETDOWN ORIFICE ISOLATION VALVE
CVC-200C, LETDOWN ORIFICE ISOLATION VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
CVC-202A, HCV-121 OUTLET VALVE
CVC-202B, HCV-121 INLET VALVE
CVC-257, VCT RELIEF VALVE
CVC-264, VCT TO DRAIN HEADER VALVE
CVC-267, CHARGING PUMP "C" SUCTION VALVE
CVC-268, CHARGING PUMP SUCTION LINE REFUELLING WATER SEL. VALVE
CVC-269, CHARGING PUMP "B" SUCTION VALVE
CVC-270, CHARGING PUMP "A" SUCTION VALVE
CVC-277A, CHARGING PUMP "C" RECIRC. ROOT VALVE
CVC-277B, CHARGING PUMP "B" RECIRC. ROOT VALVE
CVC-277C, CHARGING PUMP "A" RECIRC. ROOT VALVE
CVC-282, CHARGING LINE FLOW ISOLATION VALVE
CVC-286, CHARGING PUMP "C" TO CHARGING LINE VALVE
CVC-289, CHARGING PUMP "B" TO CHARGING LINE VALVE
CVC-290, CHARGING PUMP "A" TO CHARGING LINE VALVE
CVC-291, CHARGING PUMP "A" TO SEAL INJECTION VALVE
CVC-293A, SEAL INJ. FILTER "A" OUTLET VALVE
CVC-293B, SEAL INJ. FILTER "A" INLET VALVE
CVC-297A, RCP "A" SEAL WATER FLOW CONTROL VALVE
CVC-297B, RCP "B" SEAL WATER FLOW CONTROL VALVE
CVC-297C, RCP "C" SEAL WATER FLOW CONTROL VALVE
CVC-303A, RCP "A" SEAL LEAKOFF VALVE
CVC-303B, RCP "B" SEAL LEAKOFF VALVE
CVC-303C, RCP "C" SEAL LEAKOFF VALVE
CVC-304A, RCP "A" #1 SEAL RETURN FLOW FT-156A & B ISOL. VALVE
CVC-304B, RCP "A" #1 SEAL RETURN FLOW FT-156A & B ISOL. VALVE
CVC-304E, RCP "A" #1 SEAL RETURN FLOW FT-155A & B ISOL. VALVE
CVC-304F, RCP "A" #1 SEAL RETURN FLOW FT-155A & B ISOL. VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
CVC-304J, RCP "A" #1 SEAL RETURN FLOW FT-154A & B ISOL. VALVE
CVC-304K, RCP "A" #1 SEAL RETURN FLOW FT-154A & B ISOL. VALVE
CVC-309A, HCV-121 BYPASS
CVC-310A, CHARGING TO LOOP "A" HOT LEG
CVC-310B, CHARGING TO LOOP "B" COLD LEG
CVC-311, AUXILIARY PRESSURIZER SPRAY VALVE
CVC-312, CVC-310A BYPASS VALVE
CVC-320, SEAL WATER RETURN FILTER OUTLET VALVE
CVC-321, SEAL WATER RETURN HX OUTLET VALVE
CVC-356, BORIC ACID BLENDER BYPASS TO CHARGING PUMP SUCTION
CVC-358, RWST TO CHARGING PUMP SUCTION VALVE
CVC-361, SEAL WATER RETURN HX INLET VALVE
CVC-362, SEAL WATER RETURN HX BYPASS VALVE
CVC-365B, BORIC ACID BLENDER TO RWST
CVC-380, SEAL WATER RETURN FILTER INLET VALVE
CVC-381, RCP SEAL WATER RETURN VALVE
CVC-382, RCP SEAL RETURN LINE RELIEF VALVE
CVC-387, EXCESS LETDOWN LINE STOP VALVE
DA-18A, DG "A" UPPER AIR START INLET ISOLATION
DA-18B, DG "B" UPPER AIR START INLET ISOLATION
DA-22A, DG "A" LOWER AIR START INLET ISOLATION
DA-22B, DG "B" LOWER AIR START INLET ISOLATION
DG-A-GEN, GENERATOR FOR DIESEL GENERATOR "A"
DG-B-GEN, GENERATOR FOR DIESEL GENERATOR "B"
DP-A, DISTRIBUTION PANEL "A" (125VDC)
DP-A(DS), DISTRIBUTION PANEL "A" (125VDC) (DEDICATED SHUTDOWN)
DP-B, DISTRIBUTION PANEL "B" (125VDC)
DS CPR PANEL, DEDICATED SHUTDOWN CHARGING PUMP ROOM CONTROL PANEL

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
DS SEC CNT PNL, DEDICATED SHUTDOWN SECONDARY CONTROL PANEL
DS-A(DS)-PWR, 125VDC POWER SUPPLY FOR DP-A(DS)
DS-BUS, 480V BUS DS
DSDG FO TANK, DS DIESEL GENERATOR FUEL OIL TANK
DSDG PNL, DSDG CONTROL PANEL (REMOTE)
DS-UPS-BATTERY, DEDICATED SHUTDOWN UPS BATTERY (125VDC)
DS-UPS-INVERTER, DEDICATED SHUTDOWN UPS INVERTER
DSD-FO-PMP, DEDICATED SHUTDOWN DIESEL GENERATOR FUEL OIL PUMP
DSD-GEN, DEDICATED SHUTDOWN DIESEL GENERATOR
DSS-MAIN-XFMR, DEDICATED SHUTDOWN SYSTEM MAIN TRANSFORMER
DW-21, AFW SUCTION FROM DEEP WELL EMERGENCY BACKUP
E-1, 480V BUS E-1
E-2, 480V BUS E-2
EV-1702, RV1-1 SOLENOID VALVE
EV-1708, RV1-2 SOLENOID VALVE
EV-1711, RV1-3 SOLENOID VALVE
EV-4541, DSD FUEL OIL DAY TANK SUPPLY SOLENOID VALVE
FCV-478, FEED REG VALVE “A”
FCV-479, FEED REG BYPASS “A”
FCV-488, FEED REG VALVE “B”
FCV-489, FEED REG BYPASS “B”
FCV-498, FEED REG VALVE “C”
FCV-499, FEED REG BYPASS “C”
FCV-605, RHR HX BYPASS VALVE
FCV-626, THERMAL BARRIER OUTLET VALVE
FCV-1424, MDAFW PUMP “A” FLOW CONTROL VALVE
FCV-1425, MDAFW PUMP “B” FLOW CONTROL VALVE
FCV-1930A, SG “A” BLOWDOWN FLOW CONTROL

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
FCV-1931A, SG "B" BLOWDOWN FLOW CONTROL
FCV-1932A, SG "C" BLOWDOWN FLOW CONTROL
FCV-1933A, SG "A" SAMPLE FLOW CONTROL
FCV-1934A, SG "B" SAMPLE FLOW CONTROL
FCV-1935A, SG "C" SAMPLE FLOW CONTROL
FCV-6416, SDAFW PUMP DISCHARGE FLOW CONTROL VALVE
FI-124, SEAL INJECTION FLOW TO RCP "C"
FI-127, SEAL INJECTION FLOW TO RCP "B"
FI-130, SEAL INJECTION FLOW TO RCP "A"
FI-154B, RCP "C" #1 SEAL LEAKOFF LO RANGE INDICATOR
FI-155B, RCP "B" #1 SEAL LEAKOFF LO RANGE INDICATOR
FI-156B, RCP "A" #1 SEAL LEAKOFF LO RANGE INDICATOR
FI-605, RHR REGEN HX TOTAL FLOW
FI-613, CCW COMPONENT COOLING LOOP FLOW IND
FI-660, CCW CHARGING PUMP FLOW INDICATOR
FI-940, SI HOT LEG HEADER FLOW INDICATOR
FI-1426A, AFW SDAFW FLOW TO SG A
FI-1426C, AFW SDAFW FLOW TO SG C
FIC-626, CCW RCP THERMAL BARRIER FLOW INDICATOR
CCW RCP THERMAL BARRIER HI and LO FLOW ALARMS
FIC-626A, CCW BYPASS FLOW FROM THERMAL BARRIER
FIC-637, CCW RHR PUMP "B" FLOW INDICATOR
CCW RHR PUMP "B" LO FLOW ALARM
FIC-638, CCW RHR PUMP "A" FLOW INDICATOR
CCW RHR PUMP LO FLOW ALARM
FIC-658, CCW SI PUMP FLOW INDICATOR
CCW SI PUMP LO FLOW ALARM
FIC-1424, MDAFW PUMP "A" DISCHARGE FLOW IND CONTROLLER
(INCLUDES VALVE POSITION INDICATING LIGHTS)
FIC-1425, MDAFW PUMP "B" DISCHARGE FLOW IND CONTROLLER
(INCLUDES VALVE POSITION INDICATING LIGHTS)
FO-19A, EDG FUEL OIL TRANSFER PUMP "A" INLET VALVE
FO-19B, EDG FUEL OIL TRANSFER PUMP "B" INLET VALVE

DS / SBO EQUIPMENT LIST
FO-22A, EDG FUEL OIL TRANSFER PUMP "A" DISCHARGE VALVE
FO-22B, EDG FUEL OIL TRANSFER PUMP "B" DISCHARGE VALVE
FO-23A, DIESEL OIL DAY TANK "A" HEADER ISOLATION VALVE
FO-23B, DIESEL OIL DAY TANK "B" HEADER ISOLATION VALVE
FO-25A, DIESEL OIL DAY TANK "A" HEADER ISOLATION VALVE
FO-25B, DIESEL OIL DAY TANK "B" HEADER ISOLATION VALVE
FO-64, UNIT #2 FUEL OIL USAGE TOTALIZER DISCHARGE ISOLATION VALVE
FO-65, UNIT #2 FUEL OIL USAGE TOTALIZER SUCTION ISOLATION VALVE
FO-125, DS FUEL OIL PUMP FIRST SUCTION VALVE
FO-126, DS FUEL OIL PUMP SUCTION VALVE
FO-129, EV-4540 INLET VALVE
FO-131, EV-4540 OUTLET VALVE
FO-138, DS FUEL OIL DAY TANK INLET VALVE
FO-157, DS FUEL OIL SUPPLY CUTOFF VALVE
FO-176A, DG FUEL OIL DAY TANK EV-1963A-1 INLET VALVE
FO-176B, DG FUEL OIL DAY TANK EV-1963B-1 INLET VALVE
FO-177A, DG FUEL OIL DAY TANK EV-1963A-2 INLET VALVE
FO-177B, DG FUEL OIL DAY TANK EV-1963B-2 INLET VALVE
FO-178A, DG FUEL OIL DAY TANK EV-1963A-1 OUTLET VALVE
FO-178B, DG FUEL OIL DAY TANK EV-1963B-1 OUTLET VALVE
FO-179A, DG FUEL OIL DAY TANK EV-1963A-2 OUTLET VALVE
FO-179B, DG FUEL OIL DAY TANK EV-1963B-2 OUTLET VALVE
FO-XFER-PMP-A, FUEL OIL TRANSFER PUMP "A"
FO-XFER-PMP-B, FUEL OIL TRANSFER PUMP "B"
FT-154B, CVCS RCP "C" #1 SEAL LEAKOFF LO RANGE TRANSMITTER
FT-155B, CVCS RCP "B" #1 SEAL LEAKOFF LO RANGE TRANSMITTER
FT-156B, CVCS RCP "A" #1 SEAL LEAKOFF LO RANGE TRANSMITTER
FT-605, RHR REGEN. HX TOTAL FLOW TRANSMITTER
FT-613, CCW COMPONENT COOLING LOOP FLOW TRANSMITTER
FT-940, SIS LOOP "B" FLOW TRANSMITTER
FT-1424, AFW PUMP "A" DISCHARGE FLOW TRANSMITTER

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
FT-1425, AFW PUMP "B" DISCHARGE FLOW TRANSMITTER
FT-1426A, AFW FLOW TRANSMITTER TO SG "A"
FT-1426C, AFW FLOW TRANSMITTER TO SG "C"
FW-6A, S/G "A" FEED REGULATOR BYPASS OUTLET VALVE
FW-6B, S/G "B" FEED REGULATOR BYPASS OUTLET VALVE
FW-6C, S/G "C" FEED REGULATOR BYPASS OUTLET VALVE
FW-8A, S/G "A" INLET STOP CHECK
FW-8B, S/G "B" INLET STOP CHECK
FW-8C, S/G "C" INLET STOP CHECK
FW-201, SG WLU ISOL TO AND FROM SG "A"
FW-203, SG WLU ISOL TO AND FROM SG "B"
FW-205, SG WLU ISOL TO AND FROM SG "C"
FW-232, FULL FLOW RECIRCULATION ISOLATION VALVE
HCV-121, CHARGING FLOW
HCV-137, EXCESS LETDOWN FLOW VALVE
HCV-758, RHR HX OUTLET FLOW TO COLD LEGS VALVE
HVE-17, EDG ROOM "B" EXHAUST FAN
HVE-18, EDG ROOM "A" EXHAUST FAN
HVE-8A, BATTERY ROOM EXHAUST FAN "A"
HVE-8B, BATTERY ROOM EXHAUST FAN "B"
HVH-5A, CRDM COOLING FAN
HVH-5B, CRDM COOLING FAN
HVH-6A, HVH SAFETY INJECTION PUMP AREA COOLING UNIT
HVH-6B, HVH SAFETY INJECTION PUMP AREA COOLING UNIT
HVS-5, EDG ROOM "B" SUPPLY FAN
HVS-6, EDG ROOM "A" SUPPLY FAN
IA-291, INSTRUMENT AIR TO HCV-758
IA-292, INSTRUMENT AIR TO FCV-605
IA-297, HEADER STOP TO PORV STATION AND MSIVS
IA-297A, IA STOP BEFORE IA-298 AND IA-424

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
IA-298, INSTRUMENT AIR TO PORVS (BEFORE DRYER)
IA-299, INSTRUMENT AIR TO REMOTE PORV STATION
IA-423, NITROGEN TO STEAM LINE PORVS
IA-424, INSTRUMENT AIR TO REMOTE PORV STATION
IA-425, INSTRUMENT AIR TO REMOTE PORV STATION
IA-488, PHEUNMATIC SUPPLY TO SG PORV RV1-1
IA-490, PNEUMATIC SUPPLY TO SG PORV RV1-3
IA-492, PNEUMATIC SUPPLY TO SG PORV RV1-2
IA-633, PNEUMATIC SUPPLY TO SG PORV RV1-1
IA-634, PNEUMATIC SUPPLY TO SG PORV RV1-3
IA-635, PNEUMATIC SUPPLY TO SG PORV RV1-2
IA-3269, INSTRUMENT AIR TO PIC-477 UPPER I/P
IA-3270, INSTRUMENT AIR TO PIC-477 LOWER I/P
IA-3271, INSTRUMENT AIR TO PIC-487 UPPER I/P
IA-3272, INSTRUMENT AIR TO PIC-487 LOWER I/P
IA-3273, INSTRUMENT AIR TO PIC-497 UPPER I/P
IA-3274, INSTRUMENT AIR TO PIC-497 LOWER I/P
IA-3697A, PX-1361A ISOLATION VALVE
IA-3697B, PX-1361B ISOLATION VALVE
IA-3697C, PX-1361C ISOLATION VALVE
INST-1, INSTRUMENT BUS 1
INST-2, INSTRUMENT BUS 2
INST-3, INSTRUMENT BUS 3
INST-4, INSTRUMENT BUS 4
INST-6, INSTRUMENT BUS 6
INST-7, INSTRUMENT BUS 7
INST-8, INSTRUMENT BUS 8
INST-9, INSTRUMENT BUS 9
INVERTER-A, INVERTER A (7.5 KVA)
INVERTER-B, INVERTER B (7.5 KVA)

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
LCV-115B, EMERGENCY MAKEUP TO CHARGING PUMP SUCTION
LCV-115C, VOLUME CONTROL TANK OUTLET VALVE
LCV-460A, LETDOWN LINE STOP VALVE
LCV-460B, LETDOWN LINE STOP VALVE
LI-459A, PZR LEVEL- INDICATOR
LI-459B, PZR LEVEL – CHARGING PUMP STATION INDICATOR
LI-459C, PZR LEVEL- AUX F.W. PUMP STATION INDICATOR
LI-460, PZR LEVEL-INDICATOR
LI-461, PZR LEVEL
LI-474, CH I SG 1 NARROW RANGE LEVEL INDICATOR
LI-475, CH II SG 1 NARROW RANGE LEVEL INDICATOR
LI-476, CH III SG 1 NARROW RANGE LEVEL INDICATOR
LI-477A, SG “A” WIDE RANGE LEVEL INDICATOR
LI-477B, SG “A” WIDE RANGE LEVEL INDICATOR
LI-484, CH I SG 2 NARROW RANGE LEVEL INDICATOR
LI-485, CH II SG 2 NARROW RANGE LEVEL INDICATOR
LI-486, CH III SG 2 NARROW RANGE LEVEL INDICATOR
LI-487A, SG “B” WIDE RANGE LEVEL INDICATOR
LI-487B, SG “B” WIDE RANGE LEVEL INDICATOR
LI-494, CH I SG 3 NARROW RANGE LEVEL INDICATOR
LI-495, CH II SG 3 NARROW RANGE LEVEL INDICATOR
LI-496, CH III SG 3 NARROW RANGE LEVEL INDICATOR
LI-497A, SG “C” WIDE RANGE LEVEL INDICATOR
LI-497B, SG “C” WIDE RANGE LEVEL INDICATOR
LI-607A-1, SG “A” WIDE RANGE LEVEL INDICATOR (DS)
LI-607A-2, SG “A” WIDE RANGE LEVEL INDICATOR (DS)
LI-607B-1, SG “B” WIDE RANGE LEVEL INDICATOR (DS)
LI-607B-2, SG “B” WIDE RANGE LEVEL INDICATOR (DS)
LI-607C-1, SG “C” WIDE RANGE LEVEL INDICATOR (DS)
LI-607C-2, SG “C” WIDE RANGE LEVEL INDICATOR (DS)

DS / SBO EQUIPMENT LIST
LI-607D-2, PZR LEVEL
LI-607D1, PZR LEVEL
LI-1454A, CST LEVEL INDICATOR
LI-1454B, CST LEVEL INDICATOR
LI-1454C, CST LEVEL INDICATOR
LIC-947, SIS RWST LEVEL INDICATING CONTROLLER
LP-26, LIGHTING PANEL 26
LP-29, LIGHTING PANEL 29
LP-41, LIGHTING PANEL 41 (DSD ENCL MCC-24, COMPT. 2H)
LR-477 (PEN 1), MS STEAM GENERATORS WIDE RANGE LEVEL RECORDER
LR-477 (PEN 2), MS STEAM GENERATORS WIDE RANGE LEVEL RECORDER
LR-477 (PEN 3), MS STEAM GENERATORS WIDE RANGE LEVEL RECORDER
LT-459, PRESSURIZER LEVEL TRANSMITTER
LT-460, PRESSURIZER LEVEL TRANSMITTER
LT-461, PZR LEVEL TRANSMITTER
LT-474, MAIN STEAM S/G “A” NARROW RANGE LEVEL TRANSMITTER
LT-475, MAIN STEAM S/G “A” WIDE RANGE LEVEL TRANSMITTER
LT-476, MS SG A NARROW RANGE LEVEL TRANSMITTER
LT-477, MAIN STEAM S/G “A” WIDE RANGE LEVEL TRANSMITTER
LT-484, MAIN STEAM S/G “B” NARROW RANGE LEVEL TRANSMITTER
LT-485, MAIN STEAM S/G “B” WIDE RANGE LEVEL TRANSMITTER
LT-486, MS SG B NARROW RANGE LEVEL TRANSMITTER
LT-487, MAIN STEAM S/G “B” WIDE RANGE LEVEL TRANSMITTER
LT-494, MAIN STEAM S/G “C” NARROW RANGE LEVEL TRANSMITTER
LT-495, MAIN STEAM S/G “C” WIDE RANGE LEVEL TRANSMITTER
LT-496, MS SG C NARROW RANGE LEVEL TRANSMITTER
LT-497, MAIN STEAM S/G “C” WIDE RANGE LEVEL TRANSMITTER
LT-607A, DSD S/G “A” WIDE RANGE LEVEL TRANSMITTER (DEDICATED CHANNEL)
LT-607B, DSD S/G “B” WIDE RANGE LEVEL TRANSMITTER (DEDICATED CHANNEL)
LT-607C, DSD S/G “C” WIDE RANGE LEVEL TRANSMITTER (DEDICATED CHANNEL)

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
LT-607D, DSD PRESSURIZER LEVEL TRANSMITTER (DEDICATED CHANNEL)
LT-1454A, CONDENSATE STORAGE TANK LEVEL TRANSMITTER
LT-1454B, CONDENSATE STORAGE TANK LEVEL TRANSMITTER
LT-1454C, CONDENSATE STORAGE TANK LEVEL TRANSMITTER (DEDICATED CHANNEL)
MCC-1, MOTOR CONTROL CENTER #1 (480 VAC)
MCC-5, MOTOR CONTROL CENTER #5 (480 VAC)
MCC-6, MOTOR CONTROL CENTER #6 (480 VAC)
MCC-9, MOTOR CONTROL CENTER #9 (208 VAC)
MCC-10, MOTOR CONTROL CENTER #10 (208 VAC)
MCC-24, MOTOR CONTROL CENTER #24 (DEDICATED SHUTDOWN) (480 VAC)
MCC-A, 125VDC LOAD CENTER A
MCC-B, 125VDC LOAD CENTER B
MS-19, SG "A" STEAM LINE BEFORE SEAT DRAIN ROOT ISOL
MS-28, SG "B" STEAM LINE BEFORE SEAT DRAIN ROOT ISOL
MS-37, SG "C" STEAM LINE BEFORE SEAT DRAIN ROOT ISOL
MS-154, STEAM TO AFW PUMP ISOLATION VALVE
MS-262A, MS-V1-8A INLET ISOLATION VALVE
MS-262B, MS-V1-8B INLET ISOLATION VALVE
MS-262C, MS-V1-8C INLET ISOLATION VALVE
MS-353A, MSIV V1-3A BYPASS VALVE
MS-353B, MSIV V1-3B BYPASS VALVE
MS-353C, MSIV V1-3C BYPASS VALVE
MS-353A, MSIV V1-3A BYPASS VALVE BREAKER (MCC-8 CMPT 1C) (Note 1)
MS-353B, MSIV V1-3B BYPASS VALVE BREAKER (MCC-8 CMPT 2C) (Note 1)
MS-353C, MSIV V1-3C BYPASS VALVE BREAKER (MCC-8 CMPT 3C) (Note 1)
MS-V1-3A, MAIN STEAM ISOLATION VALVE "A"
MS-V1-3B, MAIN STEAM ISOLATION VALVE "B"
MS-V1-3C, MAIN STEAM ISOLATION VALVE "C"

Note 1 Appendix R concern only when breaker is closed.

DS / SBO EQUIPMENT LIST
MS-V1-8A, S/G “A” STEAM SUPPLY VALVE TO SDAFW PUMP
MS-V1-8B, S/G “B” STEAM SUPPLY VALVE TO SDAFW PUMP
MS-V1-8C, S/G “C” STEAM SUPPLY VALVE TO SDAFW PUMP
N-32, SOURCE RANGE NIS CHANNEL / DRAWER 32
N-51, REG GUIDE 1.97 EXCORE NEUTRON FLUX MON CH III
NE-32, SOURCE RANGE NIS CHANNEL 32 DETECTOR
NE-51, REG GUIDE 1.97 NIS CHANNEL III DETECTOR
NE-52, REG GUIDE 1.97 NIS CHANNEL IV DETECTOR
NI-32B, SOURCE RANGE NIS CH 32 COUNT RATE INDICATOR
NI-32D, SOURCE RANGE NIS CH 32 START-UP RATE INDICATOR
NI-51, SOURCE RANGE NIS COUNT RATE (REMOTE)
NI-51A, SOURCE RANGE NIS COUNT RATE (CHANNEL III)
NI-51B, WIDE RANGE NIS POWER INDICATOR (CHANNEL III)
NI-52A, SOURCE RANGE NIS COUNT RATE (CHANNEL IV)
NI-52B, WIDE RANGE NIS POWER INDICATOR (CHANNEL IV)
NS-116, NITROGEN FOR POST FIRE REPAIR OF HCV-758 AND FCV-605
OPP-3, NITROGEN SUPPLY VALVE
OPP-4, NITROGEN SUPPLY VALVE
OPP-24, TRAIN “B” ISOLATION VALVE
OPP-25, TRAIN “A” ISOLATION VALVE
OPP-26, TRAIN “B” ISOLATION VALVE
OPP-27, TRAIN “A” ISOLATION VALVE
OPP-28, TRAIN “B” IA-NITROGEN ISOLATION VALVE
OPP-29, TRAIN “A” IA-NITROGEN ISOLATION VALVE
PCV-3(OPP), TRAIN “A” NITROGEN REGULATOR VALVE
PCV-4(OPP), TRAIN “B” NITROGEN REGULATOR VALVE
PCV-455C, PRESSURIZER PORV
PCV-456, PRESSURIZER PORV
PCV-1093A, STEAM DUMP PRESSURE CONTROL VALVE (NITROGEN ACCUMULATOR)
PCV-1093B, STEAM DUMP PRESSURE CONTROL VALVE (NITROGEN ACCUMULATOR)

DS / SBO EQUIPMENT LIST
PCV-1093C, STEAM DUMP PRESSURE CONTROL VALVE (NITROGEN ACCUMULATOR)
PI-402, RCS WIDE RANGE PRESSURE
PI-455, PZR PRESSURE
PI-457, PZR PRESSURE
PI-474, CH I SG A STEAM PRESS INDICATOR
PI-475, CH II SG A STEAM PRESS INDICATOR
PI-484, CH I SG B STEAM PRESS INDICATOR
PI-485, CH II SG B STEAM PRESS INDICATOR
PI-494, CH I SG C STEAM PRESS INDICATOR
PI-495, CH II SG C STEAM PRESS INDICATOR
PI-607E-1, DS PZR PRESSURE
PI-607E-2, DS PZR PRESSURE
PI-612, CCW COMPONENT COOLING PUMP DISCHARGE PRESSURE INDICATOR
PI-940, SI HEADER PRESS INDICATOR
PI-943, SI HEADER PRESS INDICATOR
PI-956, CV PRESSURE INDICATOR EXTENDED RANGE CHANNEL 1
PI-1092, STEAM DUMP NITROGEN ACCUMULATOR PRESSURE INDICATOR
PI-1602A, SWBP "A" SUCTION PRESSURE GAUGE
PI-1602B, SWBP "B" SUCTION PRESSURE GAUGE
PI-1616, NORTH SW HEADER PRESSURE INDICATOR
PI-1619A, SW FROM CCW HEAT EXCHANGER "A" PRESSURE INDICATOR
PI-1619B, SW FROM CCW HEAT EXCHANGER "B" PRESSURE INDICATOR
PI-1684, SOUTH SW HEADER PRESSURE INDICATOR
PIC-477, MS S/G "A" STEAM LINE PRESSURE INDICATOR CONTROL FOR RV1-1
SECONDARY CONT. PNL. MS S/G "A" STEAM LINE PRESSURE INDICATOR
PIC-487, MS S/G "B" STEAM LINE PRESSURE INDICATOR CONTROL FOR RV1-2
SECONDARY CONT. PNL. MS S/G "B" STEAM LINE PRESSURE INDICATOR
PIC-497, MS S/G "C" STEAM LINE PRESSURE INDICATOR CONTROL FOR RV1-3
SECONDARY CONT. PNL. MS S/G "C" STEAM LINE PRESSURE INDICATOR

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
PP-50, 120VAC POWER PANEL #50 (DEDICATED SHUTDOWN)
PP-51, 480VAC POWER PANEL IN 4KV SWITCHGEAR ROOM (DEDICATED SHUTDOWN)
PRV-1806, CONTROL AIR TO S/G "A" PORV (RV1-1)
PRV-1807, CONTROL AIR TO S/G "C" PORV (RV1-1)
PRV-1808, CONTROL AIR TO S/G "B" PORV (RV1-1)
PT-402, RCS WIDE RANGE PRESSURE
PT-455, PRESSURIZER PRESSURE PROTECTION TRANSMITTER
PT-457, PZR PRESSURE TRANSMITTER
PT-474, S/G "A" PRESSURE
PT-475, MS SG A STEAM PRESS TRANSMITTER
PT-484, S/G "B" PRESSURE
PT-485, MS SG B STEAM PRESS TRANSMITTER LOOP 2
PT-494, S/G "C" PRESSURE
PT-495, MS SG C STEAM PRESS TRANSMITTER
PT-607E, DEDICATED SHUTDOWN PRESSURIZER PRESSURE TRANSMITTER
PT-940, SIS HEADER PRESSURE TRANSMITTER
PT-943, SIS HEADER PRESSURE TRANSMITTER
PT-956, CV PRESSURE
PT-1616, SW HDR PRESS TRANSMITTER
PT-1684, SW HDR PRESS TRANSMITTER
PX-1361A, INST. AIR PRESSURE TEST CONNECTION FOR MS-V1-3A
PX-1361B, INST. AIR PRESSURE TEST CONNECTION FOR MS-V1-3B
PX-1361C, INST. AIR PRESSURE TEST CONNECTION FOR MS-V1-3C
PX-1615A, SERVICE WATER TO CCW HX "A" PRESSURE TEST POINT
PX-1615B, SERVICE WATER TO CCW HX "B" PRESSURE TEST POINT
PZR-RLF-TNK, PRESSURIZER RELIEF TANK
RC-505A, DRAIN LINE ROOT ISOLATION VALVE
RC-508A, LOOP "B" TO DRAIN LINE ROOT ISOLATION VALVE
RC-515A, LOOP "C" TO DRAIN LINE ROOT ISOLATION VALVE
RC-523, PRESSURIZER RELIEF TANK DRAIN TO RCDT PUMP VALVE

DS / SBO EQUIPMENT LIST
RC-535, PCV-456 TO PRESSURIZER RELIEF LINE MOV
RC-536, PCV-455C TO PRESSURIZER RELIEF LINE MOV
RC-551A, PRESSURIZER RELIEF VALVE
RC-551B, PRESSURIZER RELIEF VALVE
RC-551C, PRESSURIZER RELIEF VALVE
RC-567, HEAD VENT SOLENOID ISOLATION VALVE (REACTOR VESSEL)
RC-568, HEAD VENT SOLENOID ISOLATION VALVE (REACTOR VESSEL)
RC-569, PRESSURIZER VENT SOLENOID ISOLATION VALVE
RC-570, PRESSURIZER VENT SOLENOID ISOLATION VALVE
RC-571, PRT SOLENOID ISOLATION VALVE
RC-572, CV ATMOSPHERE SOLENOID ISOLATION VALVE
REGEN-HX, REGENERATIVE HEAT EXCHANGER
RHR-743, RHR SYSTEM HEATUP LINE ISOLATION VALVE
RHR-744A, RHR RETURN COLD LEGS VALVE
RHR-744B, RHR RETURN COLD LEGS VALVE
RHR-750, LOOP "B" HOT LEG TO RHR SYSTEM VALVE
RHR-751, LOOP "B" HOT LEG TO RHR SYSTEM VALVE
RHR-752A, RHR PUMP "A" SUCTION VALVE
RHR-752B, RHR PUMP "B" SUCTION VALVE
RHR-754A, RHR PUMP "A" DISCHARGE VALVE
RHR-754B, RHR PUMP "B" DISCHARGE VALVE
RHR-757A, RHR HX "A" INLET VALVE
RHR-757B, RHR HX "B" INLET VALVE
RHR-757C, RHR HX "A" BYPASS ISOLATION VALVE
RHR-757D, RHR HX "B" BYPASS ISOLATION VALVE
RHR-759A, RHR HX "A" DISCHARGE VALVE
RHR-759B, RHR HX "B" DISCHARGE VALVE
RHR-760, RHR SYSTEM TO LETDOWN VALVE
RHR-764, HCV-758 BYPASS VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
RHR-HTX-A, RHR HEAT EXCHANGER "A"
RHR-HTX-B, RHR HEAT EXCHANGER "B"
RHR-PMP-A, RHR PUMP "A"
RHR-PMP-B, RHR PUMP "B"
RV1-1, S/G "A" STEAM LINE PORV
RV1-2, S/G "B" STEAM LINE PORV
RV1-3, S/G "C" STEAM LINE PORV
RWST, REFUELING WATER STORAGE TANK
SDAFW-PMP, STEAM DRIVEN AUXILIARY FEEDWATER PUMP
SDAFW-PMP-O/C, SDAFW PUMP OIL COOLER
SDN-6, PCV-1093A INLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-7, PCV-1093B INLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-8, PCV-1093C INLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-9, PCV-1093A OUTLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-10, PCV-1093B OUTLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-11, PCV-1093C OUTLET VALVE (STEAM DUMP NITROGEN ACCUMULATOR)
SDN-13, NITROGEN BACKUP SUPPLY (TO S/G PORV CONTROLLERS)
SDN-28, NITROGEN BACKUP TO STEAM LINE PORVS (S/G PORV CONTROL)
SDN-29, STEAM DUMP PORV NITROGEN BACKUP TO IA TELL-TALE DRAIN
SDN-30, PCV-1019 INLET VALVE (NITROGEN TO MSIV ISOLATION)
SDN-ACCUM, STEAM DUMP NITROGEN ACCUMULATOR
SEAL-WTR-HTX, SEAL WATER HEAT EXCHANGER
SFPC-805A, RWP PUMP SUCTION FROM RWST
SFPC-805B, RWST RETURN VALVE
SG-A, STEAM GENERATOR "A"
SG-B, STEAM GENERATOR "B"
SG-C, STEAM GENERATOR "C"
SI-837, RWST DRAIN
SI-841A, BIT RECIRCULATION VALVE
SI-856A, SI PUMP RECIRCULATION VALVE
SI-856B, SI PUMP RECIRCULATION VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
SI-860A, CV SUMP RECIRC. SUCTION VALVE
SI-860B, CV SUMP RECIRC. SUCTION VALVE
SI-861A, CV SUMP RECIRC. SUCTION VALVE
SI-861B, CV SUMP RECIRC. SUCTION VALVE
SI-862A, RHR LOOP RWST ISOLATION VALVE
SI-862B, RHR LOOP RWST ISOLATION VALVE
SI-863A, RHR LOOP RECIRCULATION VALVE
SI-863B, RHR LOOP RECIRCULATION VALVE
SI-864A, RWST DISCHARGE VALVE
SI-864B, RWST DISCHARGE VALVE
SI-865A, SI ACCUMULATOR "A" DISCHARGE VALVE
SI-865B, SI ACCUMULATOR "B" DISCHARGE VALVE
SI-865C, SI ACCUMULATOR "C" DISCHARGE VALVE
SI-866A, RC LOOP "C" HOT LEG INJECTION VALVE
SI-866B, RC LOOP "B" HOT LEG INJECTION VALVE
SI-867A, BIT INLET VALVE
SI-867B, BIT INLET VALVE
SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION VALVE
SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION VALVE
SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION VALVE
SI-869, LOOPS "B" AND "C" HOT LEG INJECTION SHUTOFF VALVE
SI-870A, BIT OUTLET VALVE
SI-870B, BIT OUTLET VALVE
SI-878A, SI PUMP DISCHARGE HEADER CROSS-CONNECT VALVE
SI-878B, SI PUMP DISCHARGE HEADER CROSS-CONNECT VALVE
SI-880A, CV SPRAY PUMP "A" DISCHARGE VALVE
SI-880B, CV SPRAY PUMP "A" DISCHARGE VALVE
SI-880C, CV SPRAY PUMP "B" DISCHARGE VALVE
SI-880D, CV SPRAY PUMP "B" DISCHARGE VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
SI-885, RHR PUMPS "A" AND "B" TO LOOPS CROSS CONNECT VALVE
SI-886A, RWST TO SI PUMP "A" SUCTION
SI-886B, RWST TO SI PUMP "B" SUCTION
SI-886C, RWST TO SI PUMP "C" SUCTION
SI-888A, SI PUMP "A" DISCHARGE VALVE
SI-888B, SI PUMP "B" DISCHARGE VALVE
SI-888C, SI PUMP "C" DISCHARGE VALVE
SI-891C, RHR PUMP DISCHARGE TO SI PUMPS "B" AND "C"
SI-891D, RHR PUMP DISCHARGE TO SI PUMPS "B" AND "C"
SI-892D, SPRAY ADDITIVE FLOW EDUCTOR TEST VALVE
SI-895P, SI TEST LINE ISOLATION VALVE
SI-895V, SI TEST LINE ISOLATION VALVE
SI-928, CS PUMP "B" FULL FLOW TEST LINE ROOT ISOLATION
SI-925, CS PUMP "A" FULL FLOW TEST LINE ROOT ISOLATION
SI-898D, RWST LOCAL SAMPLE ISOLATION
SI-898G, SI PUMP "A" MINIFLOW ISOLATION VALVE
SI-898H, SI PUMP "B" MINIFLOW ISOLATION VALVE
SI-898J, SI PUMP "C" MINIFLOW ISOLATION VALVE
SI-932, SI PUMP "A" FULL FLOW TEST LINE ROOT ISOLATION
SI-935, SI PUMP "B" FULL FLOW TEST LINE ROOT ISOLATION
SI-938, SI PUMP "C" FULL FLOW TEST LINE ROOT ISOLATION
SI-915, RHR PUMP "A" MINIMUM FLOW RECIRCULATION VALVE
SI-916, RHR PUMP "B" MINIMUM FLOW RECIRCULATION VALVE
SI-PMP-A, SAFETY INJECTION PUMP "A"
SI-PMP-B, SAFETY INJECTION PUMP "B"
SI-PMP-C, SAFETY INJECTION PUMP "C"
STATION A, 125VDC BATTERY "A"
STATION B, 125VDC BATTERY "B"
SV1-1A, S/G "A" SAFETY VALVE
SV1-1B, S/G "B" SAFETY VALVE
SV1-1C, S/G "C" SAFETY VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
SV1-2A, S/G "A" SAFETY VALVE
SV1-2B, S/G "B" SAFETY VALVE
SV1-2C, S/G "C" SAFETY VALVE
SV1-3A, S/G "A" SAFETY VALVE
SV1-3B, S/G "B" SAFETY VALVE
SV1-3C, S/G "C" SAFETY VALVE
SV1-4A, S/G "A" SAFETY VALVE
SV1-4B, S/G "B" SAFETY VALVE
SV1-4C, S/G "C" SAFETY VALVE
SW-5, SW PUMP "A" DISCHARGE VALVE
SW-6, SW PUMP "B" DISCHARGE VALVE
SW-7, SW PUMP "C" DISCHARGE VALVE
SW-8, SW PUMP "D" DISCHARGE VALVE
SW-20, CCW HEAT EXCHANGER "A" SUPPLY VALVE
SW-21, CCW HEAT EXCHANGER "B" SUPPLY VALVE
SW-23, SW RETURN FROM AUXILIARY BUILDING
SW-24, SOUTH SW HEADER SUPPLY TO SW BOOSTER PUMPS
SW-25, NORTH SW HEADER SUPPLY TO SW BOOSTER PUMPS
SW-28, SW BOOSTER PUMP "A" SUCTION VALVE
SW-29, SW BOOSTER PUMP "B" SUCTION VALVE
SW-52, SOUTH SUPPLY HEADER TO "A" TRAIN COMP. IN AUX. BLDG
SW-53, SOUTH SUPPLY HEADER TO "B" TRAIN COMP. IN AUX. BLDG
SW-79, HVH-6A SUPPLY VALVE
SW-79A, HVH-6A AND AIR DRYER SUPPLY VALVE
SW-80, HVH-6A RETURN VALVE
SW-80A, HVH-6A AND AIR DRYER RETURN VALVE
SW-81, HVH-6B SUPPLY VALVE
SW-82, HVH-6B RETURN VALVE

DS / SBO EQUIPMENT LIST
SW-83, DIESEL SUPPLY CROSS-CONNECT VALVE
SW-85, TCV-1660 INLET VALVE (D/G "A")
SW-86, TCV-1660 OUTLET VALVE (D/G "A")
SW-88, DIESEL "A" RETURN VALVE
SW-89, TCV-1661 INLET VALVE (D/G "B")
SW-90, TCV-1661 OUTLET VALVE (D/G "B")
SW-92, DIESEL "B" RETURN VALVE
SW-109, MOTOR DRIVEN AFW PUMP "A" SUPPLY VALVE
SW-110, INLET TO TCV-1903A (MDAFW PUMP "A")
SW-112, MOTOR DRIVEN AFW PUMP "A" SUPPLY VALVE
SW-113, INLET TO TCV-1903B (AFW PUMP OIL COOLER)
SW-115, MOTOR DRIVEN AFW PUMPS "A" AND "B" RETURN
SW-118, SW EMERGENCY BACKUP TO AFW SUCTION
SW-246, TCV-1902 INLET VALVE
SW-251, OIL COOLER OUTLET TO DRAIN
SW-251A, OIL COOLER OUTLET TO DRAIN
SW-252, INSTRUMENT STOP & NORMAL OIL COOLER RETURN TO PUMP
SW-253, NORMAL OIL COOLING RETURN TO PUMP
SW-258, ROOT VALVE PX-1615B
SW-259, NORMAL OIL COOLING SUPPLY FROM PUMP (SDAFW)
SW-260, ROOT VALVE PI-1619B
SW-269, ROOT VALVE PX-1615A
SW-270, MOTOR DRIVER AFW PUMP "A" OUTLET VALVE
SW-271, ROOT VALVE PI-1619A
SW-284, MOTOR DRIVER AFW PUMP "B" OUTLET VALVE
SW-510, SOUTH SUPPLY TO SI PUMPS
SW-511, NORTH SUPPLY TO SI PUMPS
SW-512, SI PUMP "A" SUPPLY VALVE

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
SW-513, SI PUMP "A" RETURN VALVE
SW-514, SI PUMP "B" SUPPLY VALVE
SW-515, SI PUMP "B" RETURN VALVE
SW-516, SI PUMP "C" SUPPLY VALVE
SW-517, SI PUMP "C" RETURN VALVE
SW-564, MOTOR DRIVEN AFW PUMPS "A" & "B" RETURN VALVE
SW-739, CCW HEAT EXCHANGER "A" RETURN VALVE
SW-740, CCW HEAT EXCHANGER "B RETURN VALVE
SW-741, CCW HX "B" AUX. BUILDING RETURN COMMON ISOLATION VALVE
SW-900, SW SUPPLY TO AFW PUMP OIL COOLER
SW-914, SW SUPPLY TO AFW PUMP OIL COOLER
SW-PMP-A, SERVICE WATER PUMP A
SW-PMP-B, SERVICE WATER PUMP B
SW-PMP-C, SERVICE WATER PUMP C
SW-PMP-D, SERVICE WATER PUMP D
TCV-659A, CHARGING PUMP "A" TO OIL TEMP CONTROL VALVE
TCV-659C, CHARGING PUMP "C" TO OIL TEMP CONTROL VALVE
TCV-1660, DIESEL "A" TEMP. CONTROL VALVE
TCV-1661, DIESEL "B" TEMP. CONTROL VALVE
TCV-1903A, MOTOR DRIVEN AFW PUMP "A" TEMP CONTROL VALVE
TCV-1903B, MOTOR DRIVEN AFW PUMP "B" TEMP CONTROL VALVE
TE-133, CVCS RCP SEAL WATER RETURN TEMP. RTD
TE-410, LOOP "A" WIDE RANGE COLD LEG TEMPERATURE RTD
TE-412B1, RCS LOOP 1 DELTA T/T AVG. PROT. TEMP. HOT LEG
TE-412B2, RCS LOOP 1 DELTA T/T AVG. PROT. TEMP. HOT LEG
TE-412B3, RCS LOOP 1 DELTA T/T AVG. PROT. TEMP. HOT LEG
TE-412D, RCS LOOP 1 DELTA T/T AVG. PROT. TEMP. COLD LEG
TE-413-1, LOOP "A" WIDE RANGE HOT LEG TEMPERATURE RTD

DS / SBO EQUIPMENT LIST
TE-420, LOOP "B" WIDE RANGE COLD LEG TEMPERATURE RTD
TE-423, LOOP "B" WIDE RANGE HOT LEG TEMPERATURE RTD
TE-430, LOOP "C" WIDE RANGE COLD LEG TEMPERATURE RTD
TE-433, LOOP "C" WIDE RANGE HOT LEG TEMPERATURE RTD
TE-604A, RHR PUMP "A" DISCHARGE TEMP. RTD
TE-604B, RHR PUMP "B" DISCHARGE TEMP. RTD
TI-133, RCP SEAL WATER RETURN TEMP IND
TI-410A, DS LOOP "A" T COLD
TI-410B, DS LOOP "A" T COLD
TI-412A, RCS LOOP "A" TAVG/DELTA T PROTECTION
TI-413A, DS T HOT
TI-413B, DS T HOT
TI-413C, RCS LOOP "A" T HOT TEMP
TI-420, DS LOOP "B" T COLD
TI-423, DS LOOP "B" T HOT
TI-430, DS LOOP "C" T COLD
TI-433, DS LOOP "C" T HOT
TR-604, RHR A & B PMPS DISCH & HTX OUTLET TEMP RECORDER
V6-12A, SOUTH SERVICE WATER HEADER SUPPLY VALVE
V6-12B, SW PUMP DISCHARGE HEADER CROSS-CONNECT VALVE
V6-12C, SW PUMP DISCHARGE HEADER CROSS-CONNECT VALVE
V6-12D, NORTH SERVICE WATER HEADER SUPPLY VALVE
V6-16A, SW NORTH HEADER SUPPLY TO TURBINE BUILDING
V6-16B, SW SOUTH HEADER SUPPLY TO TURBINE BUILDING
V6-16C, SW ISOLATION TO TURBINE BUILDING
VOL-CTRL-TK, VOLUME CONTROL TANK

DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

DS / SBO EQUIPMENT LIST
EMERGENCY LIGHTING
ELS-1
ELS-3 THRU ELS-41
ELS-46 THRU ELS-58
ELS-60 THRU ELS-72
ELS-74 AND ELS-75
ELS-77 AND ELS-78
ELS-80 THRU ELS-88
ELS-90 THRU ELS-116
ELS-118 AND ELS-119
ELS-121
ELS-162 AND ELS-167 THRU ELS-175
ELS-192 AND ELS-193
ELS-195, ELS-196, AND ELS-197
EOF/TSC/PAP DIESEL GENERATOR
SECURITY HIGH MAST LIGHTS 4 AND 6
RADIOS
TRANSCEIVER LOCATED IN 4KV SWITCHGEAR ROOM, ALONG NORTH WALL
DEDICATED SHUTDOWN RADIOS (MINIMUM OF NINE (9) OPERABLE FOR DEDICATED SHUTDOWN).
U-2 CONTROL ROOM CELLULAR PHONE COMMUNICATIONS WITH U-1 CONTROL ROOM

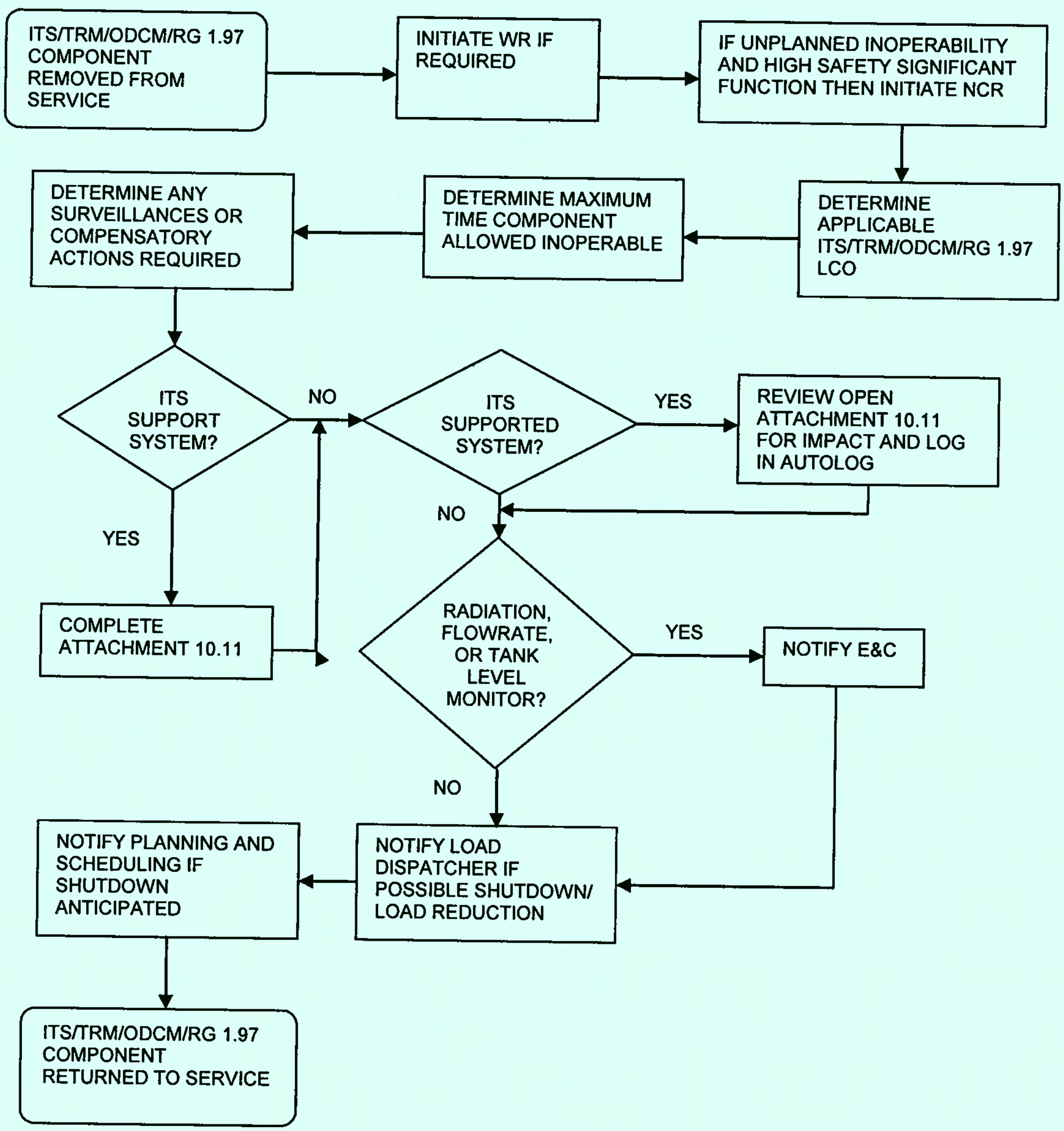
DS / SBO EQUIPMENT LIST AND OTHER EQUIPMENT IMPORTANT TO SAFETY

INOPERABLE COMPONENT AFFECT ON EMERGENCY PROCEDURE CROSS-REFERENCE			
SAFETY INJECTION			
Component Identification	EPPs, SUPPs & Foldouts Affected	AOPs Affected	FRPs Affected
FI-943	EPP-9, EPP-15	AOP-013, AOP-020, AOP-029, AOP-033	FRP-C.1, FRP-C.2, FRP-C.3, FRP-H.1
RESIDUAL HEAT REMOVAL			
Component Identification	EPPs, SUPPs & Foldouts Affected	AOPs Affected	FRPs Affected
FI-605	EPP-9, EPP-10	AOP-013, AOP-016, AOP-020, AOP-029, AOP-033	FRP-C.1, FRP-C.2, FRP-C.3, FRP-J.2
BORIC ACID & PRIMARY WATER			
Component Identification	EPPs, SUPPs & Foldouts Affected	AOPs Affected	FRPs Affected
FI-110	EPP-4, EPP-7	AOP-003, AOP-004, AOP-035	FRP-S.1

OTHER COMPONENTS IMPORTANT TO SAFETY	
Instrument Air Compressors (IA-CMP-A, IA-CMP-B, IA-CMP-D) and Primary Air Compressor (IA-PRI-CMP)	Any credited DS Pathway
Primary Water Pumps	Primary Water Header
NOTE: Minimum fuel oil supply is 2000 gallons in one or both Alternate Fuel Oil Storage Tanks.	
"A" Alternate Fuel Oil Storage Tank	"B" Alternate Fuel Oil Storage Tank
NOTE: Security compensatory actions are required within one hour of "D" Deep Well Pump becoming unavailable. A Temporary Modification to install the Skid Diesel must be in place within 14 days of "D" Deep Well Pump becoming unavailable. Information on installation and operation of the Skid Diesel may be found in EC 59128 and SP-1517.	
"D" Deep Well Pump	

FLOWCHART FOR INOPERABLE ITS/TRM/ODCM/RG 1.97 COMPONENTS THAT WILL BE RETURNED TO SERVICE PRIOR TO END OF SHIFT
[CAPR 193057]
REFERENCE USE

NOTE:	Refer to Section 8.9 for further guidance as needed.



Maintenance Rule Event List

RNP

System 4080

Event Date	End Date	Event Title	PMG	Monitoring	Value
Event Type	EVENT				
7/29/2010	7/29/2010	CCW-PMP-A-MTR TAKEN OOS TO LUBRICATE MOTOR BEARI	CCW Pump Train A	UNAVAILABLE HOURS	5.53
8/25/2010	8/25/2010	CCW-PMP-A Taken OOS for oil sample	CCW Pump Train A	UNAVAILABLE HOURS	7.10
1/14/2011	1/14/2011	CCW-PMP-A taken OOS for oil sample	CCW Pump Train A	UNAVAILABLE HOURS	4.01
5/31/2011	5/31/2011	CCW-PMP-A taken OOS for oil and oiler change	CCW Pump Train A	UNAVAILABLE HOURS	7.81
8/25/2011	8/25/2011	CCW-PMP-A OOS for planned maintenance	CCW Pump Train A	UNAVAILABLE HOURS	4.11
9/12/2011	9/14/2011	CCW-PMP-A unavailable due to DS bus outage	CCW Pump Train A	UNAVAILABLE HOURS	53.06
					81.62
7/27/2010	7/27/2010	CCW-PMP-B TAKEN OOS TO LUBRICATE MOTOR BEARINGS	CCW Pump Train B	UNAVAILABLE HOURS	7.75
8/24/2010	8/24/2010	CCW-PMP-B Taken OOS for oil sample	CCW Pump Train B	UNAVAILABLE HOURS	2.73
9/29/2010	10/1/2010	CCW-PMP-B Taken OOS to remove foreign material	CCW Pump Train B	UNAVAILABLE HOURS	45.68
1/14/2011	1/14/2011	CCW-PMP-B taken OOS for oil sample	CCW Pump Train B	UNAVAILABLE HOURS	3.88
1/22/2011	1/22/2011	CCW-PMP-B taken OOS for oil sample	CCW Pump Train B	UNAVAILABLE HOURS	5.66
1/23/2011	1/23/2011	CCW-PMP-B taken OOS for oil sample, follow-up	CCW Pump Train B	UNAVAILABLE HOURS	3.20
2/12/2011	2/12/2011	CCW-PMP-B OOS for Oil Sample	CCW Pump Train B	UNAVAILABLE HOURS	3.10
3/8/2011	3/8/2011	CCW-PMP-B OOS for OB bearing replacement	CCW Pump Train B	UNAVAILABLE HOURS	10.50
3/9/2011	3/9/2011	CCW-PMP-B OOS for oil sample	CCW Pump Train B	UNAVAILABLE HOURS	2.63
5/13/2011	5/13/2011	CCW-PMP-B taken OOS for oil flush and sample	CCW Pump Train B	UNAVAILABLE HOURS	2.53
6/3/2011	6/3/2011	CCW-PMP-B taken OOS for oil change and sample	CCW Pump Train B	UNAVAILABLE HOURS	3.48
8/25/2011	8/25/2011	CCW-PMP-B OOS for planned maintenance	CCW Pump Train B	UNAVAILABLE HOURS	3.11
					94.25
8/11/2010	8/11/2010	CCW-PMP-C taken OOS for oil sample and breaker inspections	CCW Pump Train C	UNAVAILABLE HOURS	6.41
9/12/2010	9/13/2010	CCW-PMP-C taken OOS to replace pump seals	CCW Pump Train C	UNAVAILABLE HOURS	33.41
4/5/2011	4/7/2011	CCW-PMP-C taken OOS for seal leak, sleeve nut repair	CCW Pump Train C	UNAVAILABLE HOURS	38.66
4/29/2011	4/29/2011	CCW-PMP-C taken OOS for oil sample	CCW Pump Train C	UNAVAILABLE HOURS	3.73
6/14/2011	6/15/2011	CCW-PMP-C taken OOS, measurements for seal leakage	CCW Pump Train C	UNAVAILABLE HOURS	19.13
8/15/2011	8/15/2011	CCW-PMP-C OOS for planned maintenance	CCW Pump Train C	UNAVAILABLE HOURS	2.96

Event Date	End Date	Event Title	PMG	Monitoring	Value
					104.30
Event Type	MISCELLANEOUS				
5/7/2010		ONLINE GEMCO SWITCH REFURBISHMENT - 1/CCW-C-MTR	CCW Pump Train C		
10/29/2010		CCW-PMP-C OOS to repair seal leak	CCW Pump Train C		
5/22/2010		CC-862F MAYBE CLOGGED	System Integrity and Cooling Flowpath		
5/29/2010		IMPLEMENT EC 63452 FOR CC-749A (CHILD EC 69284)	System Integrity and Cooling Flowpath		
6/30/2010		FIC-629 ON ERFIS INDICATES ``FLOW LO``	System Integrity and Cooling Flowpath		
4/14/2011		MCC-5(3M)-42/C; ESTABLISH PICKUP/DROPOUT VOLTAGES	System Integrity and Cooling Flowpath		

Maintenance Rule Monitoring Status

RNP

4080 Component/Cooling Water System

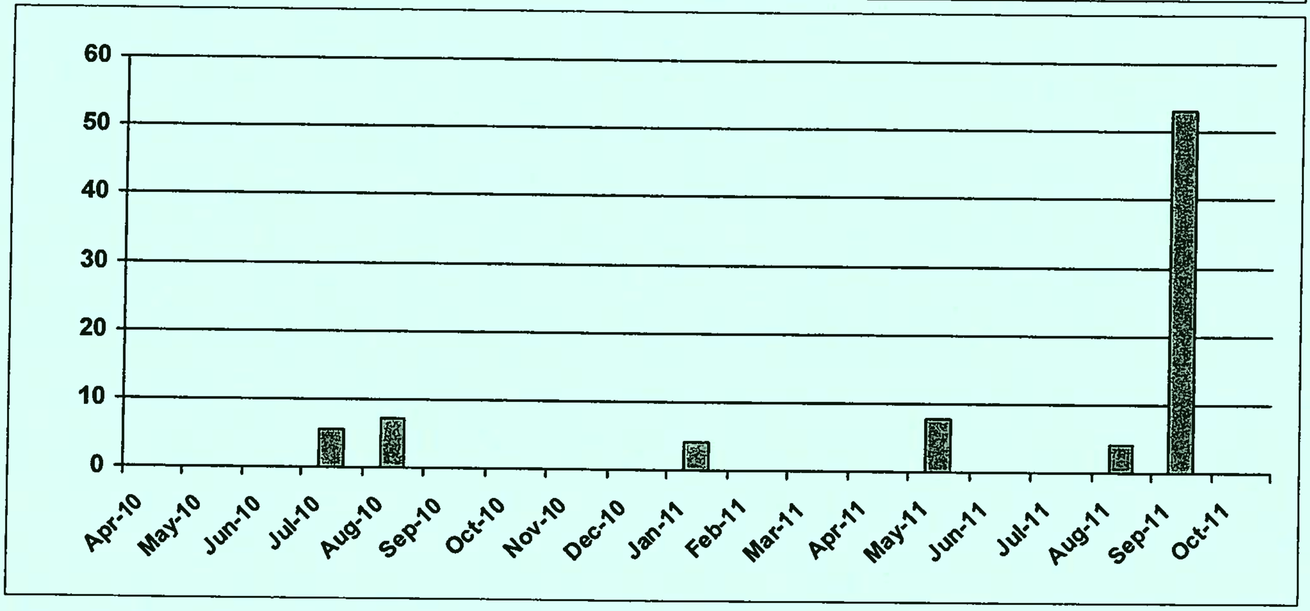
Type	Title	Since	Criteria	Actual	Remain'g	Status
PMG	***CCW Heat Exchangers***			**Status: A2**		
UNAVAILABILITY	UNAVAILABLE HOURS	4/11/2010	132	0	132	√
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	1	0	1	√
PMG	***CCW Pump Train A***			**Status: A2**		
UNAVAILABILITY	UNAVAILABLE HOURS	4/11/2010	188	81.62	106	√
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	1	0	1	√
PMG	***CCW Pump Train B***			**Status: A2**		
UNAVAILABILITY	UNAVAILABLE HOURS	4/11/2010	132	94.25	38	√
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	1	0	1	√
PMG	***CCW Pump Train C***			**Status: A2**		
UNAVAILABILITY	UNAVAILABLE HOURS	4/11/2010	132	104.3	28	√
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	1	0	1	√
PMG	***CCW Temperature and Level Instruments***			**Status: A2**		
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	2	0	2	√
PMG	***CCW Valve Isolation Monitoring***			**Status: A2**		
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	0	0	0	√
PMG	***System Integrity and Cooling Flowpaths***			**Status: A2**		
RELIABILITY	FUNCTIONAL FAILURES	10/13/2008	1	0	1	√

MR PMG Monitoring Trend

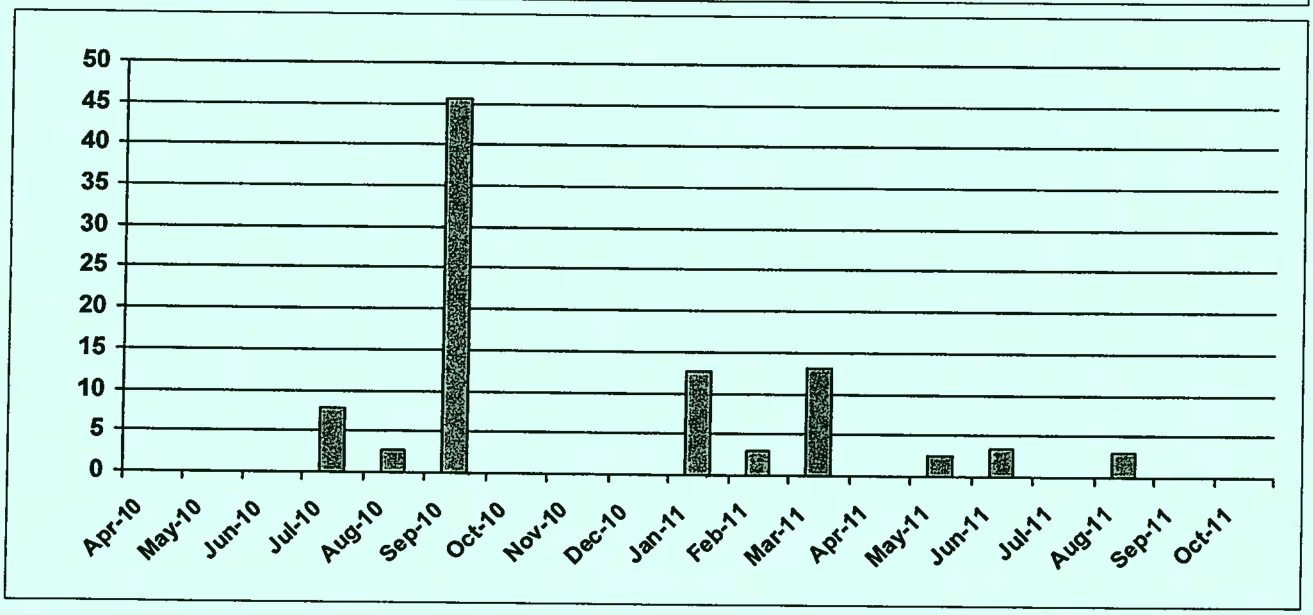
RNP

4080 Component/Cooling Water System

PMG:	CCW Pump Train A	Monitoring period (days):	550
Monitoring:	UNAVAILABLE HOURS	Allowable:	188
Goal:	N	Actual:	81.62



PMG:	CCW Pump Train B	Monitoring period (days):	550
Monitoring:	UNAVAILABLE HOURS	Allowable:	132
Goal:	N	Actual:	94.25

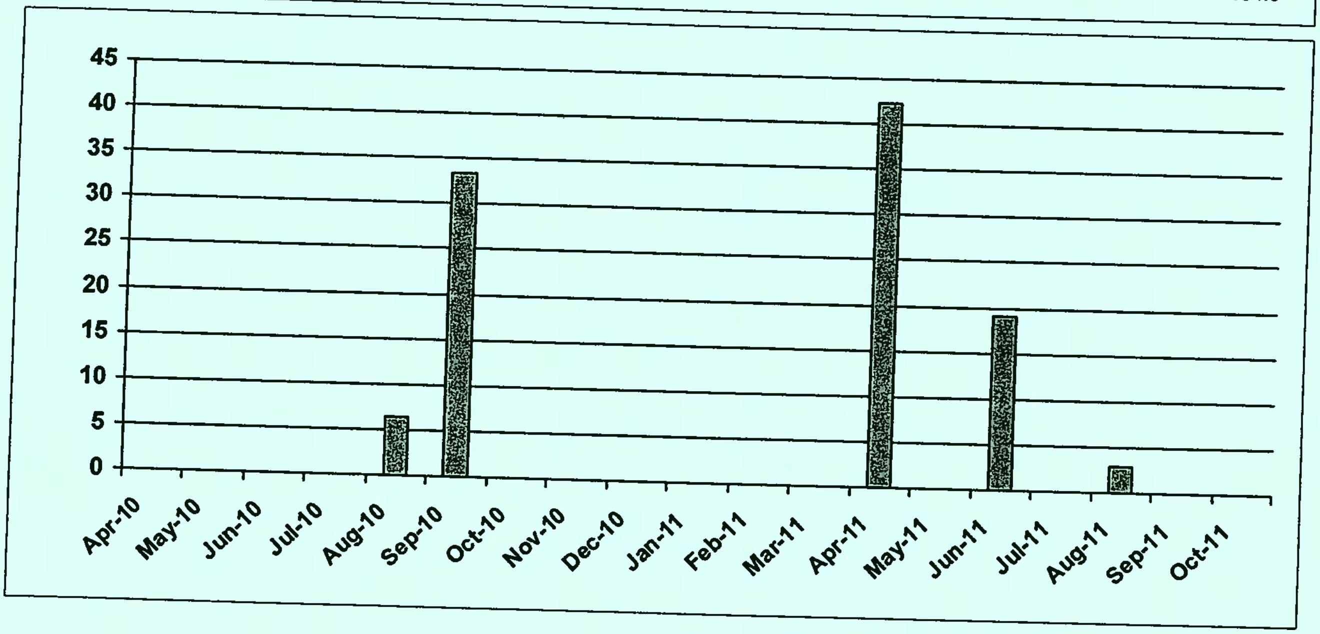


MR PMG Monitoring Trend

RNP

4080 ***Component/Cooling Water System***

PMG:	CCW Pump Train C	Monitoring period (days):	550
Monitoring:	UNAVAILABLE HOURS	Allowable:	132
Goal:	N	Actual:	104.3



Facility: HB ROBINSON

Task No.:

Task Title: Perform Section 8.2.3 of OST-020, Shiftly Surveillances

JPM No.: 2011-2 NRC JPM SRO A2

K/A Reference: G2.2.37 3.6 / 4.6

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: ____ Actual Performance: __X__

Classroom __X__ Simulator ____ Plant ____

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions: The unit is in Mode 3 at 547°F and 2235 psig.
All MSIVs are open.

Task Standard: Identify all out of specification readings and apply all applicable Technical Specification requirements.

Required Materials: OST-020
ITS

General References: OST-020 Shiftly Surveillances, Revision 41

Handouts: OST-020

Initiating Cue: You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings, document any unsatisfactory conditions in the comments section of Attachment 10.1 and identify any applicable Technical Specifications requirements.

Time Critical Task: NO

Validation Time: 25 minutes

(Denote Critical Steps with an asterisk)

Examiner's Cue: Provide OST-020.

Performance Step: 1 Review procedure OST-020.

Standard: Reviews Precautions and Limitations and remainder of handout.

Examiner's Note:

Comment:

Performance Step: 2 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.1)

1. PZR Level (Channels LI-459A, 460 and 461)

Standard: Candidate compares the channel readings and determines that all channels are within 5% for PZR level.

Examiner's Note:

Comment:

* **Performance Step: 3**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.2)

2. PZR Pressure (Channels PI-455, 456 and 457)

Standard:

Candidate compares the channel readings and determines that channel PI-455 is outside of the tolerance of 40 psig from the other 2 channels. ITS Table 3.3.2-1 Items 1.d and 6.a apply for Mode 3. Condition D applies for Item 1.d to Place the channel in trip within 6 hours or Be in Mode 4 within 18 hours. Condition H applies for Item 6.a to Verify the interlock is in the required state for existing unit condition within 1 hour or be in Mode 4 within 13 hours.

Examiner's Note:

ITS Table 3.3.1-1, Items 7.a and 7.b do not apply. Item 7 is applicable in Modes 1 and 2. The unit is in Mode 3.

The interlock verification for PZR Pressure being greater than 2000 psig is the LO PRESS SI BLOCK PERMIT 2 X 2 status light is extinguished.

Comment:

* **Performance Step: 4**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.3)

S/G Pressure for S/G A (Channels PI-474, 475 and 476)

S/G Pressure for S/G B (Channels PI-484, 485 and 486)

S/G Pressure for S/G C (Channels PI-494, 495 and 496)

Standard:

Candidate compares the channel readings and determines that channel PI-484 is outside of the tolerance of 70 psig from the other 2 channels for S/G B. ITS Table 3.3.2-1 Items 1.e, 1.g and 4.e apply for Mode 3. Condition D applies for Items 1.e, 1.g and 4.e to Place the channel in trip within 6 hours or Be in Mode 4 within 18 hours.

Examiner's Note:

ITS Table 3.3.3-1, Item 20 does not apply due to the required channels for steam generator pressure is 2 per S/G. The remaining channels for S/G B are operable and satisfy the specification.

Comment:

* **Performance Step: 5**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.4)

S/G Level for S/G A (Channels LI-474, 475 and 476)

S/G Level for S/G B (Channels LI-484, 485 and 486)

S/G Level for S/G C (Channels LI-494, 495 and 496)

Standard:

Candidate compares the channel readings and determines that channel LI-475 is outside of the tolerance of 5% from the other 2 channels for S/G A. ITS Table 3.3.8-1 Item 1 applies for Mode 3. Condition C applies for Item 1 to Place the channel in trip within 6 hours or Be in Mode 4 within 18 hours.

Examiner's Note:

ITS Table 3.3.1-1 Items 13 and 14 are applicable in Modes 1 and 2. The unit is in Mode 3.

ITS Table 3.3.3-1 Item 13 for Steam Generator Water Level (Narrow Range) does not apply due to the other 2 remaining S/G level channels are operable. The specification requires 2 per S/G.

Comment:

Performance Step: 6

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.5)

Steam Header Pressure (Channels PI-464A, 466 and 468)

Standard:

Candidate compares the channel readings and determines all of the Steam Header pressure channels are within the tolerance of 70 psig.

Examiner's Note:

Comment:

Performance Step: 7

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.6)

S/G Steam Flows for S/G A (Channels FI-474 and 475)

S/G Steam Flows for S/G A (Channels FI-484 and 485)

S/G Steam Flows for S/G A (Channels FI-494 and 495)

Standard:

Candidate compares the channel readings and determines that all of the steam flow channels are within the specified tolerance.

Examiner's Note:

Comment:

* **Performance Step: 8**

IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.7)

Tavg (Channels TI-412D, 422D and 432D)

Standard:

Candidate compares the channel readings and determines that channel TI-432D is outside of the tolerance of 4°F from the other channels for Tavg. ITS Table 3.3.2-1 Items 1.f, 4.d and 6.b apply for Mode 3. Condition D applies for Items 1.f, 4.d and 6.b to Place the channel in trip within 6 hours or Be in Mode 4 within 18 hours. Condition H applies for Item 6.b to Verify the interlock is in the required state for existing unit condition within 1 hour or be in Mode 4 within 13 hours.

Examiner's Note:

The interlock verification for Tavg being greater than 543°F is the STEAM DUMP T-AVG CONTROL BLOCKED 2 X 2 status light is extinguished.

Comment:

Performance Step: 9 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.8)

SI Accumulator A Level (LI-920 and 922)

SI Accumulator B Level (LI-924 and 926)

SI Accumulator C Level (LI-928 and 930)

Standard: Candidate compares the channel readings and determines all of the SI Accumulator level channels are within the tolerance of 5%.

Examiner's Note:

Comment:

Performance Step: 10 IF MODE 1, 2 OR 3 shiftly checks are required, THEN PERFORM CHANNEL CHECK for the following: (Step 8.2.3.9)

SI Accumulator A Pressure (PI-921 and 923)

SI Accumulator B Pressure (PI-925 and 927)

SI Accumulator C Pressure (PI-929 and 931)

Standard: Candidate compares the channel readings and determines all of the SI Accumulator pressure channels are within the tolerance of 40 psig.

Examiner's Note:

Comment:

END OF TASK

Terminating Cue: **When the instrument readings have been evaluated, comments made for any out of spec readings and the applicable Technical Specification requirements have been identified, the evaluation on this JPM is complete.**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM SRO A2

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________ Date: ______________

INITIAL CONDITIONS:	The unit is in Mode 3 at 547°F and 2235 psig. All MSIVs are open.
INITIATING CUE:	You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings, document any unsatisfactory conditions in the comments section of Attachment 10.1 and identify any applicable Technical Specifications requirements.

INITIAL CONDITIONS: The unit is in Mode 3 at 547°F and 2235 psig.

All MSIVs are open.

INITIATING CUE: You have relieved the OAC on the 07-1900 watch due to a sudden illness. He was performing but unable to complete OST-020, Shiftly Surveillances. Perform Section 8.2.3, evaluate the acceptability of the instrument readings, document any unsatisfactory conditions in the comments section of Attachment 10.1 and identify any applicable Technical Specifications requirements.

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 9

OST-020

SHIFTLY SURVEILLANCES

REVISION 41

SUMMARY OF CHANGES
PRR 00453883
OST-020, Rev. 41

STEP	REVISION COMMENTS
8.7.2.4.A	Removed reference to the local wind up chart recorder. Changed the step wording from **CHECK** a value from a calibrated temperature instrument to a **CHECK** local temperature using a calibrated temperature instrument.
New NOTE prior to step 8.7.2.4.B	Removed reference to the local wind up chart recorder. Changed the step wording three instruments do not take temperatures to two instruments may not take temperatures.
8.7.2.4.B	Removed reference to the local wind up chart recorder.
8.7.2.8A	Removed reference to the local wind up chart recorder. Changed the step wording from **CHECK** a value from a calibrated temperature instrument to a **CHECK** local temperature using a calibrated temperature instrument.
New NOTE prior to step 8.7.2.8.B	Removed reference to the local wind up chart recorder. Changed the step wording three instruments do not take temperatures to two instruments may not take temperatures.
8.7.2.8B	Removed reference to the local wind up chart recorder.

TABLE OF CONTENTS

1.0 **PURPOSE**

1.1 To provide instructions for performing ITS, TRM or ODCM required shiftly surveillances during Modes 1 through 5, AND REFER TO OST-020-1,for required shiftly surveillances during movement of irradiated fuel assemblies, DSC loading, Mode 6 and defueled operation.

THIS PROCEDURE HAS BEEN SCREENED IAW OPS-NGGC-1306 AND DETERMINED NOT APPLICABLE TO THE REACTIVITY MANAGEMENT PROGRAM (PRR 00374090)

2.0 **REFERENCES**

2.1 Improved Technical Specifications (ITS)

2.2 OST-020-1, Shiftly Surveillances (Irradiated Fuel Movement, DSC Loading, Mode 6 and Defueled Operation)

2.3 OMM-015, Operations Surveillance Testing

2.4 OMM-001-11, Logkeeping

2.5 OP-006, Pressurizer PORV Pneumatic System/LTOPP

2.6 OMM-024, Rod Position Channel Check

2.7 OP-920, Radiation Monitoring System

2.8 PLP-100, Technical Requirements Manual (TRM)

2.9 ODCM, Offsite Dose Calculation Manual

2.10 EST-047, Reactor Coolant Flow Test

2.11 ESR 97-00601, Channel Check Tolerances for Steam Flow at Low Power Levels.

2.12 ESR 97-00611, Rod Position Indication Drift

2.13 RNP-I/INST-1040, Revision 1, Main Steam Accuracy and Scaling Calculation

2.14 RNP-I/INST-1128, Revision 0, FT-424 Error/Uncertainty Calculation

2.15 8S19-P-101, Station Blackout Coping Analysis Report

2.16 CR 97-02328, SR 3.1.6.2 Documentation

2.17 GP-010, Refueling

2.18 ESR 99-00220, Alternate method of determining Seal Injection flow

2.19 EC 47162, Set-Points, Uncertainty Calc change for Appendix K Uprate

2.20 LDCR 03-0002, Proposed change to LCO 3.1.7, Required Action A.1

2.21 NCR 188409, New Containment Analysis from Westinghouse

2.22 NCR290724, Black Creek Temperature Exceedance [CAPR]

2.23 RNP-I/INST-1127, LTOP Loop Uncertainty and Sealing Calculation (P-500 & 501)

3.0 RESPONSIBILITES

3.1 Operations personnel are responsible for the performance, review and approval of this test.

3.2 Unit one Chemistry personnel is responsible for checking the local wind up chart recorder indication as required by plant procedure.

3.3 Unit one control room personnel is responsible for providing the Control Board Indication for Discharge Canal Weir temperature.

4.0 PREREQUISITES

INIT

4.1 This revision has been verified to be the latest revision available. ________ ____

Date

4.2 The Shift Manager has given permission to conduct this test. ____

4.3 **RECORD** plant mode which shiftly checks are being performed.

(07-19)MODE ____ ____

(19-07)MODE ____ ____

5.0 PRECAUTIONS AND LIMITATIONS

5.1 Any steps not applicable shall be marked N/A and the reason(s) noted in the COMMENTS section of Attachment 10.1 or 10.2.

5.2 This procedure has been screened IAW PLP-037 criteria and determined not applicable to PLP-037.

5.3 Steps within this procedure may be performed in any sequence, unless specified.

5.4 Steps may be done concurrently between watchstations.

5.5 The following guidance does **NOT** apply to Steam Flow instruments when turbine load is less than 20% **AND** only applies to RTGB instrumentation. It is **NOT** intended to apply to instrumentation of different types sensing the same parameter (i.e., direct reading local pressure gauge shall **NOT** be compared against a pressure transmitter driving a remote meter): (CR 95-02700)

5.5.1 A deviation greater than 5% of full scale is used as the OOS limit. The instrument shall be declared OOS.

5.6 Steam Flow loops are pressure compensated to account for density changes in the steam that occur from low-load to full-load operation. The calibration of the loops are set up for optimum performance at 100% of rated flow. As a result, the performance of the loops at low flows is not as accurate, and can be operable but may not meet the 5% tolerance. Based on this information, the following should be used for channel check of the redundant Steam Flow instruments: (CR 95-02700)

5.6.1 **IF** Turbine load is less than or equal to 20%, **THEN**

- Steam Flow should be greater than 90% of indicated Feed Flow.

AND

- The tolerance between redundant Steam Flows should be within 0.4×10^6pph. (ESR 97-00601)

5.6.2 **IF** Turbine load is greater than 20%, **THEN** the tolerance between redundant Steam Flow instruments should be within 5%.

5.6.3 **If** it appears that the 5% tolerance will not be met prior to exceeding 20% Turbine load, **THEN** Engineering should be contacted to evaluate the specific situation.

5.7 A channel check can be performed when a redundant channel is unavailable (OOS). The qualitative check includes observation of the channel for unexplained changes that are not attributable to known activities such as changes in power level, filling, draining, heatup, cooldown, etc. Erratic behavior or unexplained changes in the channel indication would be conditions that would warrant declaring the channel OOS and applying the ITS/TRM/ODCM required actions.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 **IF** NEEDED, **THEN VERIFY** the following test equipment calibration is current **AND RECORD** the test equipment identification below:

Equipment	Identification	INIT
Calibrated Thermometer	________________	_____

7.0 ACCEPTANCE CRITERIA

7.1 All steps for the applicable Mode have been completed.

7.2 Performance of the surveillance satisfies the ITS, TRM and ODCM requirements and the OST should be considered SAT. **IF** the stated condition(s) is not met, **THEN** the applicable Action Statement is required to be entered.

7.3 The reviewing and approving authorities may accept this test IAW provisions set forth in OMM-015.

8.0 PROCEDURE

INIT 07-19 | INIT 19-07

8.1 Reactivity Control Systems

8.1.1 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** Individual Rod Positions are within alignment limits. (ITS SR 3.1.4.1) ____ ____

2. **VERIFY** each Shutdown Bank is within the limits specified in the COLR. (ITS SR 3.1.5.1) ____ ____

> **NOTE:** When the Rod Insertion Limit monitor (APP-005-C5) is inoperable, ITS SR 3.1.6.2 requires the Control Bank position to be verified above the insertion limits specified in the COLR once within 4 hours and every 4 hours thereafter. This can be performed by making an entry in the COs narrative log every 4 hours referencing this SR number.
>
> A WR should be initiated when comparisons between Analog Rod Position indication and bank demand position indication approach 7.5 inches.

3. **VERIFY** each Control Bank position is above the insertion limits specified in the COLR. (ITS SR 3.1.6.2) ____ ____

4. **VERIFY** Sequence and Overlap Limits specified in the COLR are met for Control Banks not fully withdrawn from the core. (ITS SR 3.1.6.3) ____ ____

8.1.1 (Continued)

INIT 07-19 | INIT 19-07

5. For bank demand position at or above 200 steps, **PERFORM** CHANNEL CHECK by comparing Analog Rod Position indication and bank demand position indication. (The individual rod position indication (RPI) shall be within +/-15 inches of the bank demand position)(ITS SR 3.1.7.1) ____ ____

NOTE: OMM-024, Rod Position Channel Check, provides applicable actions when ERFIS is inoperable.

The use of ERFIS is an acceptable alternate method for determining ARPI System Operability IAW Improved Tech Specs if the RTGB RPI indicators are not indicating properly. In cases where both indications (RPI and ERFIS) are tracking closely, and one of the indications is outside the required limits with the other indication still within the limits, ERFIS should be considered the most accurate indication and actions taken should be based on the ERFIS indication. If the ERFIS readout is used to replace the RPI indicators, it shall be continuously displayed on a terminal accessible to the Reactor Operator.
(ESR 97-00611)

A WR should be initiated when comparisons between ERFIS Individual Rod Position indication and bank demand position indication approach 7.5 inches.

6. For bank demand position at or above 200 steps, **PERFORM** CHANNEL CHECK by comparing ERFIS Individual Rod Position indication and bank demand position indication. (The ERFIS individual rod position indication shall be within +/-15 inches of the bank demand position) ____ ____

INIT INIT
07-19 19-07

8.2 Instrumentation

8.2.1 **IF** MODE 1 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

> **NOTE:** The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement), it is unacceptable.

1. RCS Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 9.a and 9.b) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-414 FI-415 FI-416	0-120%	6%	RNP-I/INST-1036
FI-424 FI-425 FI-426	0-120%	6%	RNP-I/INST-1036
FI-434 FI-435 FI-436	0-120%	6%	RNP-I/INST-1036

8.2.1 (Continued)

INIT 07-19 INIT 19-07

2. Turbine Impulse Pressure
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 17.e) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-446 PI-447	0-900 psig	45 psig	RNP-I/INST-1045

8.2.2 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement, except for S/G Feed Flow when <10% rated thermal power), it is unacceptable. (ESR 97-00601)

1. Overtemperature ΔT Setpoint
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 5) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412C TI-422C TI-432C	0-75°F	4°F	WCAP 11889

2. Overpower ΔT Setpoint
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 6) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412B TI-422B TI-432B	0-75°F	4°F	WCAP 11889

8.2.2 (Continued)

INIT INIT
07-19 19-07

3. Loop Protection ΔT
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 5 and 6) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412A TI-422A TI-432A	0-75°F	4°F	WCAP 11889

4. S/G Feed Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 14)
(ESR 97-00601)

– **IF** ≥10% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-476 FI-477	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041
FI-486 FI-487	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041
FI-496 FI-497	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1041

– **IF** <10% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-476 FI-477	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041
FI-486 FI-487	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041
FI-496 FI-497	0-4x10^6 pph	0.4x10^6pph	RNP-I/INST-1041

8.2.2 (Continued)

INIT 07-19 | INIT 19-07

NOTE: Source Range Neutron Flux check is applicable in MODE 2.

Per Calculations RNP-I/INST-1134, RNP-I/INST -1135, and Engineering determination from NCR 00268640, the following Channel Check Acceptance Criteria has been deemed appropriate for the Reactor Protection Source Range, Intermediate Range, and Power Range:

Power Range (N-41, N-42, N-43 and N-44): The acceptable deviation for the power range indication **SHALL** be within 2% power.

Intermediate Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.78.

Source Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.48.

Due to the difficulty in reading a logarithmic meter with a fluctuating signal, the digital indication from ERFIS or NR-45 should be used to perform the Channel Checks whenever possible.

The LOG function of an available calculator or the scientific calculator on the Control Room PC may be used to determine the logarithmic values. (NCR 268640)

5. Power Range Neutron Flux
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 2.a and 2.b):

a. **PERFORM** the following:

RECORD NI-41 indication _______ % Power ____

RECORD NI-42 indication _______ % Power ____

RECORD NI-43 indication _______ % Power ____

RECORD NI-44 indication _______ % Power ____

8.2.2.5 (Continued)

INIT 07-19 INIT 19-07

b. **CALCULATE** maximum deviation:
Recorded (highest) minus Recorded (lowest) equals: ________ ____

c. **PEER CHECK** calculation. ____

d. **DOCUMENT** results (within 2% power):

SAT / UNSAT ____
(Circle One)

6. **PERFORM** the following:

RECORD NI-41 indication.________ % Power ____

RECORD NI-42 indication.________ % Power ____

RECORD NI-43 indication ________ % Power ____

RECORD NI-44 indication ________ % Power ____

a. **CALCULATE** maximum deviation
Recorded (highest) minus Recorded (lowest) equals: ________ ____

b. **PEER CHECK** calculation. ____

c. **DOCUMENT** results (within 2% power):
SAT / UNSAT ____
(Circle One)

8.2.2 (Continued)

		INIT 07-19	INIT 19-07
7.	Intermediate Range Neutron Flux (ITS SR 3.3.1.1, Table 3.3.1-1 Item 3)		
a.	**RECORD** NI-35 indication.	______	____
b.	**RECORD** N-36 indication.	______	____
c.	**CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals:	______	____
d.	**PEER CHECK** calculation.		____
e.	**DOCUMENT** results (≤ 1.78). SAT / UNSAT (Circle one)		____

8.2.2 (Continued)

INIT 07-19 INIT 19-07

8. Intermediate Range Neutron Flux
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 3)

a. **RECORD** NI-35 indication. ________ ____

b. **RECORD** N-36 indication. ________ ____

c. **CALCULATE** deviation:
LOG (highest) minus LOG
(lowest) equals: ________ ____

d. **PEER CHECK** calculation. ____

e. **DOCUMENT** results (≤ 1.78). SAT / UNSAT
(Circle one) ____

9. **IF** required, **THEN** perform Source Range Neutron Flux check (if below P-6 Interlock)
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)

a. **RECORD** NI-31 indication. ________ ____

b. **RECORD** N-32 indication. ________ ____

c. **CALCULATE** deviation:
LOG (highest) minus LOG
(lowest) equals: ________ ____

d. **PEER CHECK** calculation. ____

e. **DOCUMENT** results (≤ 1.48). SAT / UNSAT
(Circle one) ____

10. **IF** required, **THEN** perform Source Range Neutron Flux check (if below P-6 Interlock)
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)

a. **RECORD** NI-31 indication. ________ ____

b. **RECORD** N-32 indication. ________ ____

8.2.2.10 (Continued)

INIT 07-19 INIT 19-07

c. **CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals: ______ ____

d. **PEER CHECK** calculation. ____

e. **DOCUMENT** results (≤ 1.48). SAT / UNSAT (Circle one ____

8.2.3 **IF** MODE 1, 2, **OR** 3 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement, except for S/G Steam Flow when <20% rated thermal power), it is unacceptable. (ESR 97-00601)

1. PZR Level
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 8 and
ITS SR 3.3.3.1, Table 3.3.3-1 Item 12) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-459A LI-460 LI-461	0-100%	5%	RNP-I/INST-1060

8.2.3 (Continued)

INIT 07-19 | INIT 19-07

2. PZR Pressure
IF Pressurizer Pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A.
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 7.a, 7.b and ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.d and 6.a) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-455 PI-456 PI-457	1700-2500 psig	40 psig	RNP-I/INST-1042

3. S/G Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.e, 1.g and 4.e, ITS SR 3.3.3.1, Table 3.3.3-1 Item 20) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-474 PI-475 PI-476	0-1400 psig	70 psig	RNP-I/INST-1072
PI-484 PI-485 PI-486	0-1400 psig	70 psig	RNP-I/INST-1072
PI-494 PI-495 PI-496	0-1400 psig	70 psig	RNP-I/INST-1072

8.2.3 (Continued)

INIT 07-19 INIT 19-07

4. S/G Level
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 13 and 14,
ITS SR 3.3.3.1, Table 3.3.3-1 Item 13,
ITS SR 3.3.8.1, Table 3.3.8-1 Item 1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-474 LI-475 LI-476	0-100%	5%	RNP-I/INST-1070
LI-484 LI-485 LI-486	0-100%	5%	RNP-I/INST-1070
LI-494 LI-495 LI-496	0-100%	5%	RNP-I/INST-1070

5. Steam Header Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.e) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-464A PI-466 PI-468	0-1400 psig	70 psig	RNP-I/INST-1050

8.2.3 (Continued)

INIT 07-19 INIT 19-07

6. S/G Steam Flow
(ITS SR 3.3.1.1, Table 3.3.1-1 Item 14 and ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.f, 1.g, 4.d and 4.e) (ESR 97-00601)

– **IF** ≥20% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
FI-474 FI-475	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040
FI-484 FI-485	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040
FI-494 FI-495	0-4x10^6 pph	0.2x10^6pph	RNP-I/INST-1040

– **IF** <20% rated thermal power, **THEN** check the following: ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION
FI-474 FI-475	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-474 AND FI-475 *FI-474 AND FI-477 *FI-475 AND FI-476
FI-484 FI-485	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-484 AND FI-485 *FI-484 AND FI-487 *FI-485 AND FI-486
FI-494 FI-495	0-4x10^6 pph	0.4x10^6pph between the following combinations: FI-494 AND FI-495 *FI-494 AND FI-497 *FI-495 AND FI-496

* The Steam Flow Channel is checked against the corresponding Feed Flow channel for acceptance.

8.2.3 (Continued)

INIT 07-19 INIT 19-07

7. Tavg
IF Tavg is outside the indicating range due to normal plant conditions, **THEN** mark N/A.
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.f, 4.d and 6.b) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
TI-412D TI-422D TI-432D	540-615°F	4°F	WCAP 11889

8. SI Accumulator Level
(TRMS TR 4.2.1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
LI-920 LI-922	0-100%	5%	RNP-I/INST-1052
LI-924 LI-926	0-100%	5%	RNP-I/INST-1052
LI-928 LI-930	0-100%	5%	RNP-I/INST-1052

9. SI Accumulator Pressure
(TRMS TR 4.2.1) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-921 PI-923	0-800 psig	40 psig	RNP-I/INST-1036
PI-925 PI-927	0-800 psig	40 psig	RNP-I/INST-1036
PI-929 PI-931	0-800 psig	40 psig	RNP-I/INST-1036

8.2 (Continued)

INIT 07-19 INIT 19-07

8.2.4 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** CHANNEL CHECK for the following:

NOTE: The following check is to determine the deviation between the highest and lowest channel of redundant indicators for the same parameter. The redundant indicators to be compared are grouped in blocks. If the actual deviation is greater than the maximum allowed deviation as shown (deviation of 5% of the full range of the indicator's movement), it is unacceptable.

1. CV Pressure
(ITS SR 3.3.2.1, Table 3.3.2-1 Item 1.c, 2.c, 3.b.3 and 4.c) ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-950A PI-951 PI-952 PI-953 PI-954 PI-955	-5 - 75 psig	4 psig	RNP-I/INST-1044

8.2.4 (Continued)

INIT 07-19 INIT 19-07

2. PZR Pressure
IF RCS pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A. ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-500 PI-501A	200-600 psig	20 psig	RNP-I/INST-1127

1) **IF** RCS pressure is outside the indicating range due to normal plant conditions, **THEN** mark N/A. ____ ____

INSTRUMENT	INSTRUMENT RANGE	MAXIMUM DEVIATION	CALCULATION NUMBER
PI-444 PI-445	1700-2500 psig	40 psig	RNP-I/INST-1042

NOTE: The following instrument does not have a redundant indicator; therefore Maximum Deviation values are not provided.

OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

3. Control Room Radiation Monitor - R-1
(ITS SR 3.3.7.1, Table 3.3.7-1 Item 2) ____ ____

8.2 (Continued)

NOTE: Per Calculation RNP-I/INST-1134 and Engineering determination from NCR 00268640, the following Channel Check Acceptance Criteria has been deemed appropriate for the Reactor Protection Source Range Instrumentation: – Source Range: The logarithmic value of the lowest indication subtracted from the logarithmic value of the highest indication **SHALL** be ≤ 1.48. Due to the difficulty in reading a logarithmic meter with a fluctuating signal, the digital indication from ERFIS or NR-45 should be used to perform the Channel Checks whenever possible. The LOG function of an available calculator or the scientific calculator on the Control Room PC may be used to determine the logarithmic values. (NCR 268640)

8.2.5 **IF** MODE 3, 4 **OR** 5 shiftly checks are required, **THEN** **PERFORM** CHANNEL CHECK on the Source Range Neutron Flux monitors. (ITS SR 3.3.1.1, Table 3.3.1-1 Item 4)

INIT
07-19

1. Day Shift (07-19)

   a. **RECORD** NI-31 indication. ________ ____

   b. **RECORD** N-32 indication. ________ ____

   c. **CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals: ________ ____

   d. **PEER CHECK** calculation. ____

   e. **DOCUMENT** results: SAT / UNSAT (Circle one) ____

8.2.5 (continued)

INIT
19-07

2. Night Shift (19-07)

   a. **RECORD** NI-31 indication. ______ ____

   b. **RECORD** NI-32 indication. ______ ____

   c. **CALCULATE** deviation: LOG (highest) minus LOG (lowest) equals: ______ ____

   d. **PEER CHECK** calculation. ____

   e. **DOCUMENT** results. SAT / UNSAT ____

8.2 (Continued)

	INIT 07-19	INIT 19-07
8.2.6 **IF** movement of irradiated fuel assemblies in Spent Fuel Building **OR** Containment is occurring **OR** will occur, **THEN PERFORM** CHANNEL CHECK on the Control Room Radiation Monitor - R-1. (ITS SR 3.3.7.1, Table 3.3.7-1 Item 2)	____	____
8.2.7 **IF** the DSC is loaded **OR** being loaded **AND** is NOT sealed IAW ISFS-014, **THEN PERFORM** CHANNEL CHECK on the Control Room Radiation Monitor - R-1 until notified by maintenance that the sealing operation is complete. (ITS SR 3.3.7.1, Table 3.3.7-1 Item 2)	____	____

> **NOTE:** ITS 3.3.6.1 and Table 3.3.6-1, Containment Ventilation Isolation Instrumentation, is applicable in modes 1, 2, 3, 4 **OR** during movement of **RECENTLY** irradiated fuel (decay time of less than 56 hours). Fuel is no longer recently irradiated if greater than 56 hours have elapsed since reactor shutdown.
>
> OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

8.2.8 **IF** MODE 1, 2, 3, **OR** 4 shift checks are required, **OR** movement of **RECENTLY** irradiated fuel assemblies in Containment is occurring **OR** will occur, **THEN PERFORM** a CHANNEL CHECK on the Containment Radiation monitors. (ITS SR 3.3.6.1, Table 3.3.6-1 Item 3.a and 3.b)

– R-11, CV AIR & PLANT VENT PARTICULATE	____	____
– R-12, CV AIR & PLANT VENT RADIOACTIVE GAS	____	____

	INIT 07-19	INIT 19-07

8.3 Reactor Coolant System

8.3.1 **IF** MODE 1 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** PZR Pressure is greater than or equal to 2205 psig. (ITS SR 3.4.1.1)

   (07-19)_____ psig ____

   (19-07)_____ psig ____

2. **VERIFY** RCS Average Temperature is less than or equal to 579.4°F. (ITS SR 3.4.1.2)

   (07-19)_____ °F ____

   (19-07)_____°F ____

8.3.1 (Continued)

INIT 07-19 INIT 19-07

NOTE: ITS SR 3.4.1.3 requires that the RCS Total Flow be verified to be greater than or equal to 97.3×10^6 lbm/hr every 12 hours. RCS flow is not indicated in lbm/hr. Therefore, EST-047 was performed and provided the following values for performing this SR.

LOOP "A"	
Transmitter	Min Flow
FT-414	98.81
FT-415	98.81
FT-416	98.76

LOOP "B"	
Transmitter	Min Flow
FT-424	97.72
FT-425	97.04
FT-426	95.61

LOOP "C"	
Transmitter	Min Flow
FT-434	101.94
FT-435	101.86
FT-436	102.26

3. **IF** ERFIS is available, **THEN VERIFY** RCS flow indicated on ERFIS is greater than the Min Flow values provided. (ITS SR 3.4.1.3) ____ ____

LOOP "A"		
Transmitter	Flow 07	Flow 19
RCF0400A (FT-414)		
RCF0401A (FT-415)		
RCF0402A (FT-416)		

LOOP "B"		
Transmitter	Flow 07	Flow 19
RCF0420A (FT-424)		
RCF0421A (FT-425)		
RCF0422A (FT-426)		

LOOP "C"		
Transmitter	Flow 07	Flow 19
RCF0440A (FT-434)		
RCF0441A (FT-435)		
RCF0442A (FT-436)		

8.3.1 (Continued)

INIT 07-19 | INIT 19-07

NOTE: ITS SR 3.4.1.3 requires that the RCS Total Flow be verified to be greater than or equal to 97.3×10^6 lbm/hr every 12 hours. RCS flow is not indicated in lbm/hr. Therefore, EST-047 was performed and provided the following values for performing this SR.

LOOP "A"	
Transmitter	Min Flow
FT-414	98.81
FT-415	98.81
FT-416	98.76

LOOP "B"	
Transmitter	Min Flow
FT-424	97.72
FT-425	97.04
FT-426	95.61

LOOP "C"	
Transmitter	Min Flow
FT-434	101.94
FT-435	101.86
FT-436	102.26

NOTE: The marked increments of the RCS flow indicators on the RTGB are 2%. This means they can not be read in less than 1% increments.

4. **IF** ERFIS is unavailable, **THEN VERIFY** RCS flow as follows: (ITS SR 3.4.1.3)

   a. **RECORD** RCS flow as indicated on the RTGB. ____ ____

LOOP "A"		
Transmitter	Flow	
	07	19
FT-414 (RCF0400A)		
FT-415 (RCF0401A)		
FT-416 (RCF0402A)		

LOOP "B"		
Transmitter	Flow	
	07	19
FT-424 (RCF0420A)		
FT-425 (RCF0421A)		
FT-426 (RCF0422A)		

LOOP "C"		
Transmitter	Flow	
	07	19
FT-434 (RCF0440A)		
FT-435 (RCF0441A)		
FT-436 (RCF0442A)		

INIT 07-19 INIT 19-07

8.3.1.4 (Continued)

b. **IF** any RTGB RCS flow indication for Loop 1 and Loop 2 is less than 100%, **OR IF** any RTGB RCS flow indication for Loop 3 is less than 101%, **THEN** contact RES for assistance in verifying RCS flow.

______________________ ____ ____
RESS Contact (Print name)

8.3.2 **IF** MODE 1 **OR** 2 shiftly checks are required, **THEN VERIFY** each RCS Loop is in operation. (ITS SR 3.4.4.1) ____ ____

8.3.3 **IF** MODE 1, 2 **OR** 3 shiftly checks are required, **THEN PERFORM** the following:

NOTE: PZR Level limits are ≤ 63.3% when in MODE 1 and ≤92% when in MODE 2 **OR** 3.

1. **VERIFY** PZR Level is within limits. (ITS SR 3.4.9.1) (07-19)_____ % ____

(19-07) _____ % ____

NOTE: OP-920, Radiation Monitoring System, provides instructions for performing radiation monitor channel checks.

8.3.4 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** the following:

1. CHANNEL CHECK of the required CV Atmosphere Radioactivity Monitor. (ITS SR 3.4.15.1)

(07-19) Required Monitor R-11 / R-12 (Circle one) ____

(07-19) CHANNEL CHECK Complete ____

(19-07) Required Monitor R-11 / R-12 (Circle one) ____

(19-07) CHANNEL CHECK Complete ____

8.3.4 (Continued)

INIT
07-19

2. **VERIFY** Seal Injection flow of greater than or equal to 6 gpm to each RCP. (ITS SR 3.4.17.1)

07-19

- FI-130, RCP "A" _____ gpm ____
- FI-127, RCP "B" _____ gpm ____
- FI-124, RCP "C" _____ gpm ____

> **NOTE:** **IF** FI-127, FI-124 OR FI-130 is OOS **THEN** manual calculation of Seal Injection Flow can be performed IAW OP-301-1 to satisfy ITS SR 3.4.17.1. (ESR 99-00220)

- **IF** FI-130 is OOS, **THEN** notify maintenance to **PERFORM** PM 57033. (ITS LCO 3.4.17) ____
- **IF** FI-127 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57032. (ITS LCO 3.4.17) ____
- **IF** FI-124 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57031. (ITS LCO 3.4.17) ____

8.3.4.2 (Continued)

INIT
19-07

19-07

– FI-130, RCP "A"	_____ gpm	____
– FI-127, RCP "B"	_____ gpm	____
– FI-124, RCP "C"	_____ gpm	____

NOTE: **IF** FI-127, FI-124 OR FI-130 is OOS **THEN** manual calculation of Seal Injection Flow can be performed IAW OP-301-1 to satisfy ITS SR 3.4.17.1. (ESR 99-00220)

– **IF** FI-130 is OOS, **THEN** notify maintenance to **PERFORM** PM 57033. (ITS LCO 3.4.17) ____

– **IF** FI-127 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57032. (ITS LCO 3.4.17) ____

– **IF** FI-124 is OOS, **THEN** notify Maintenance to **PERFORM** PM 57031. (ITS LCO 3.4.17) ____

INIT 07-19 | INIT 19-07

8.3.5 **IF** MODE 3 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** required RCS Loops are in operation. (ITS SR 3.4.5.1) ____ ____

2. **VERIFY** S/G secondary side water levels are greater than or equal to 16% NR for required RCS Loops. (ITS SR 3.4.5.2)

07-19

S/G "A" _____ % ____

S/G "B" _____ % ____

S/G "C" _____ % ____

19-07

S/G "A" _____ % ____

S/G "B" _____ % ____

S/G "C" _____ % ____

3. **IF** only one RCS loop is in operation, **THEN PERFORM** ONE of the following:

   a. **VERIFY** the Rod Control System is not capable of rod withdrawal. (ITS SR 3.4.5.3) ____ ____

   b. **VERIFY** the Reactor Trip Breakers are open. (ITS SR 3.4.5.4) ____ ____

   c. **VERIFY** the Lift Coil Disconnect Switches for all Control Rods not fully withdrawn are open. (ITS SR 3.4.5.5) ____ ____

INIT 07-19 INIT 19-07

8.3.6 **IF** MODE 4 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** one RHR train **OR** RCS Loop is in operation. (ITS SR 3.4.6.1)

   (07-19) RHR / RCS ____
   (Circle one)

   (19-07) RHR / RCS ____
   (Circle one)

2. **VERIFY** S/G secondary side water levels are greater than or equal to 16% NR for required RCS loops. (ITS SR 3.4.6.2)

   (07-19) "A"/ "B" / "C" _____ % ____
   (Circle one)

   (19-07) "A"/ "B" / "C" _____ % ____
   (Circle one)

INIT 07-19 | INIT 19-07

> **NOTE:** Steps 8.3.7 **OR** 8.3.8, along with step 8.3.9, are required to meet Low Temperature Overpressure Protection (LTOP) requirements of ITS LCO 3.4.12 in MODES 4 and 5.
>
> When in MODES 4 OR 5, an OPERABLE Power Operated Relief Valve (PORV) will have a nominal lift setting of 400 psig and an allowed value of ≤418 psig.

8.3.7 **IF** MODE 4 **OR** 5 shiftly checks are required, and use of OPERABLE Power Operated Relief Valves is desired to meet Low Temperature Overpressure Protection per ITS LCO 3.4.12.a, **THEN VERIFY** the following:

1. Two Power Operated Relief Valves (PORVs) are operable and each associated PORV block valve is OPEN.

   – PCV-456, PZR PORV (07-19) OPERABLE ____

   – RC-535, PORV BLOCK (07-19) OPEN ____

   – PCV-455C, PZR PORV (07-19) OPERABLE ____

   – RC-536, PORV BLOCK (07-19) OPEN ____

   – PCV-456, PZR PORV (19-07) OPERABLE ____

   – RC-535, PORV BLOCK (19-07) OPEN ____

   – PCV-455C, PZR PORV (19-07) OPERABLE ____

   – RC-536, PORV BLOCK (19-07) OPEN ____

2. A maximum of one Safety Injection (SI) pump capable of injecting into the RCS when all cold leg temperatures are ≥175°F. ____ ____

3. No SI pump capable of injecting into the RCS when any cold leg temperature is <175°F. ____ ____

NOTE: ITS Bases for LCO 3.4.12 states for an RCS Vent to meet the flow capacity requirement, it requires removing a pressurizer safety valve, removing a PORV's internals or physically blocking the valve stem of the PORV in the open position, and disabling its block valve in the open position. ITS LCO 3.4.12.b identifies that the required vent size for the RCS to be considered vented is greater than or equal to 4.4 square inches. One safety valve removed provides an opening greater than 10 square inches. Both PORVs Blocked Open with the Block Valves Open are required to meet the 4.4 square inches. The required frequency for ITS SR 3.4.12.5 is 72 hours. This SR is performed shiftly for ease of tracking, since there is no OST which is performed on a 72 hour frequency.

INIT INIT
07-19 19-07

8.3.8 **IF** MODE 4 **OR** 5 shiftly checks are required, and use of a depressurized RCS with a vent path of ≥4.4 square inches, is desired to meet Low Temperature Overpressure Protection per ITS LCO 3.4.12.b, **THEN VERIFY** the following:

1. **IF** using Safety Valve Removed to comply with ITS LCO 3.4.12.b, **THEN VERIFY** at least ONE Safety Valve removed and FME cover not restricting flow.

   a. RC-551A / RC-551B / RC-551C
      Circle One Removed (07-19) ____

   b. RC-551A / RC-551B / RC-551C
      Circle One Removed (19-07) ____

8.3.8 (continued)

	INIT 07-19	INIT 19-07

2. **IF** using PORVs to comply with ITS LCO 3.4.12.b, **THEN VERIFY** both PZR PORVs are BLOCKED OPEN IAW OP-006 **AND** the associated Block Valves are OPEN.

– PCV-456, PZR PORV	(07-19) BLOCKED OPEN	____	
– RC-535, PORV BLOCK	(07-19) OPEN	____	
– PCV-455C, PZR PORV	(07-19) BLOCKED OPEN	____	
– RC-536, PORV BLOCK	(07-19) OPEN	____	
– PCV-456, PZR PORV	(19-07) BLOCKED OPEN		____
– RC-535, PORV BLOCK	(19-07) OPEN		____
– PCV-455C, PZR PORV	(19-07) BLOCKED OPEN		____
– RC-536, PORV BLOCK	(19-07) OPEN		____

INIT 07-19 | INIT 19-07

> **NOTE:** ITS LCO 3.4.12 contains a Note which amplifies when SI Accumulators are required to be isolated. The following step is a simplified method to ensure compliance and eliminates the need to use ITS LCO 3.4.3 curves.

8.3.9 **IF** MODE 4 **OR** 5 shiftly checks are required and any SI Accumulator is pressurized, **THEN VERIFY** each SI Accumulator isolation valve is closed **AND** deenergized for Low Temperature Overpressure Protection. (ITS SR 3.4.12.3)

1. SI Accumulator "A"

   – SI-865A, ACCUMULATOR "A" DISCHARGE
     (07-19) CLOSED ____
     (19-07) CLOSED ____

   – SI-865A, ACCUMULATOR "A" DISCHARGE breaker on MCC-5, CMPT 14F
     (07-19) OPEN ____
     (19-07) OPEN ____

2. SI Accumulator "B"

   – SI-865B, ACCUMULATOR "B" DISCHARGE
     (07-19) CLOSED ____
     (19-07) CLOSED ____

   – SI-865B, ACCUMULATOR "B" DISCHARGE breaker on MCC-6, CMPT 10J
     (07-19) OPEN ____
     (19-07) OPEN ____

8.3.9 (Continued)

	INIT 07-19	INIT 19-07
3. SI Accumulator "C"		
– SI-865C, ACCUMULATOR "C" DISCHARGE (07-19) CLOSED	____	
(19-07) CLOSED		____
– SI-865C, ACCUMULATOR "C" DISCHARGE breaker on MCC-5, CMPT 9F (07-19) OPEN	____	
(19-07) OPEN		____

8.3.10 **IF** MODE 5 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** one RHR Train is in operation. (ITS SR 3.4.7.1 and 3.4.8.1)

   (07-19) "A" / "B" (Circle one) ____

   (19-07) "A" / "B" (Circle one) ____

2. **IF** RCS loops are filled **AND** only one RHR train is operable, **THEN VERIFY** S/G secondary side water level is greater than or equal to 16% NR in the <u>required</u> S/G. (ITS SR 3.4.7.2)

   (07-19) "A" / "B" / "C" _____ % (Circle one) ____

   (19-07) "A" / "B" / "C" _____ % (Circle one) ____

INIT 07-19 INIT 19-07

8.4 Emergency Core Cooling Systems

8.4.1 **IF** MODE 1, 2 **OR** 3 shiftly checks are required, **THEN PERFORM** the following:

1. **IF** RCS pressure is greater than 1000 psig, **THEN PERFORM** the following:

   a. **VERIFY** Borated Water Volume in each SI Accumulator is greater than or equal to 825 ft^3 (61.5%) and less than or equal to 841 ft^3 (80.4%). (ITS SR 3.5.1.2)

– SI Accumulator "A"	(07-19) _____ %	____	
– SI Accumulator "B"	(07-19) _____ %	____	
– SI Accumulator "C"	(07-19) _____ %	____	
– SI Accumulator "A"	(19-07) _____ %		____
– SI Accumulator "B"	(19-07) _____ %		____
– SI Accumulator "C"	(19-07) _____ %		____

8.4.1.1 (Continued)

					INIT 07-19	INIT 19-07
b.	**VERIFY** Nitrogen Cover pressure in each SI Accumulator is greater than or equal to 600 psig and less than or equal to 660 psig. (ITS SR 3.5.1.3)					
	– SI Accumulator "A"	(07-19)	_____	psig	____	
	– SI Accumulator "B"	(07-19)	_____	psig	____	
	– SI Accumulator "C"	(07-19)	_____	psig	____	
	– SI Accumulator "A"	(19-07)	_____	psig		____
	– SI Accumulator "B"	(19-07)	_____	psig		____
	– SI Accumulator "C"	(19-07)	_____	psig		____

8.4.1 (Continued)

		INIT 07-19	INIT 19-07
2. **VERIFY** the following valves are in the listed positions with Control Power to the valve operator removed. (ITS SR 3.5.2.1)			
– SI-862A, RWST to RHR	OPEN	____	____
– SI-862B, RWST to RHR	OPEN	____	____
– SI-863A, RHR LOOP RECIRC	CLOSED	____	____
– SI-863B, RHR LOOP RECIRC	CLOSED	____	____
– SI-864A, RWST DISCH	OPEN	____	____
– SI-864B, RWST DISCH	OPEN	____	____
– SI-866A, LOOP 3 HOT LEG INJ	CLOSED	____	____
– SI-866B, LOOP 2 HOT LEG INJ	CLOSED	____	____
– SI-878A, SI DISCH CROSS CONN	OPEN	____	____
– SI-878B, SI DISCH CROSS CONN	OPEN	____	____
– SI-862A AC Control Power Defeat Switch	Defeated	____	____
– SI-862B AC Control Power Defeat Switch	Defeated	____	____

8.4.1.2 (Continued)

		INIT 07-19	INIT 19-07
– SI-863A AC Control Power Defeat Switch	Defeated	____	____
– SI-863B AC Control Power Defeat Switch	Defeated	____	____
– SI-864A AC Control Power Defeat Switch	Defeated	____	____
– SI-864B AC Control Power Defeat Switch	Defeated	____	____
– SI-866A AC Control Power Defeat Switch	Defeated	____	____
– SI-866B AC Control Power Defeat Switch	Defeated	____	____
– SI-878A breaker on MCC-5 in CMPT No. 2C	OPEN	____	____
– SI-878B breaker on MCC-6 in CMPT NO. 15C	OPEN	____	____

INIT 07-19 INIT 19-07

8.5 Containment Systems

8.5.1 **IF** MODE 1, 2, 3 **OR** 4 shiftly checks are required, **THEN PERFORM** the following:

1. **VERIFY** CV Pressure is greater than or equal to -0.8 psig and less than or equal to 1.0 psig. (ITS SR 3.6.4.1)

   (07-19) _____ psig ____

   (19-07) _____ psig ____

2. **VERIFY** IVSW Tank Pressure is greater than or equal to 49 psig (includes instrument uncertainties) (NCR 188409) indicated locally on PI-1910 **OR** as indicated on a locally installed temporary gage with an accuracy equal to or less than ±2 psig. (ITS SR 3.6.8.1)

   (07-19)_____ psig ____

   (19-07) _____ psig ____

INIT 07-19 | INIT 19-07

8.6 Plant Systems

8.6.1 **IF** MODE 1, 2, 3 shiftly checks are required **OR** mode 4 shiftly checks are required when any S/G is being used for heat removal, **THEN PERFORM** the following:

> **NOTE:** 8S19-P-101 allows 24 hours of operation with CST level between 50% and 26%.
>
> If LI-1454A or LI-1454B is unavailable, LI-1454C may be used to check CST level.
>
> CST level indications used should be within 5% of one another to satisfy OST-023 and OST-918 requirements. (ITS 3.3.3 Table 3.3.3-1 item 14.)

1. **VERIFY** CST Level is greater than or equal to 50%. (Admin. limit per 8S19-P-101 & Appendix R Separation Analysis) (ITS SR 3.7.5.1 limit of 35,000 gallons (≥26%)).

   – LI-1454A (07-19) _____% ____

   – LI-1454B (07-19) _____% ____

   – LI-1454A (19-07) _____% ____

   – LI-1454B (19-07) _____% ____

8.6.2 **IF** MODE 1, 2, 3, 4, **OR** 5 shiftly checks are required, **OR** during movement of irradiated fuel assemblies, **THEN PERFORM** the following:

1. **VERIFY** Control Room temperature is less than or equal to 85°F using TIC-6513 if available **OR** a calibrated thermometer placed near the return duct inlet. (TRMS TR 4.7.1)

   (07-19) TIC-6513 _____°F ____

   (19-07) TIC-6513 _____°F ____

   Calibrated Thermometer (07-19) _____°F ____

   Calibrated Thermometer (19-07) _____°F ____

	INIT 07-19	INIT 19-07

8.7 Other

8.7.1 **IF** MODE 1, 2, 3, 4 OR 5 shiftly checks are required, **THEN VERIFY** the following Dedicated Shutdown/SBO Equipment:

1. DS Diesel Fuel Oil Storage Tank level greater than or equal to 2500 gallons. (07-19) ______ gal ____

   (19-07) ______ gal ____

INIT 07-19 INIT 19-07

NOTE: This section should be performed during dayshift when Unit 1 Chemistry personnel will be available.

8.7.2 **IF** Mode 1, 2, 3, **OR** 4 daily checks are required, **THEN PERFORM** the following:

1. **RECORD** the ERFIS reading for CWT9021A, Black Creek Temperature. _______ °F ____ N/A

NOTE: Reviewing the Circulating Water Effluent Monitoring Log hourly print out will aid in performance of this step.

2. **RECORD** ERFIS reading for CWT2400A, TE-3091A, COND "A" CW Inlet Temp

   _______ °F ____ N/A

3. **COMPARE** ERFIS point CWT9021A, Black Creek Temperature, to the temperature in 8.7.2.2 **AND RECORD** the difference. [CAPR, NCR 00290724] _______ °F ____ N/A

NOTE: Temperature indication will not be reliable if there is no circulating water flow (i.e. water box not in service). Additionally a margin of 3°F **OR** greater could be caused by wind direction, lake level, and stratification due to rainfall, or other possible causes. No additional checks required when differences can be explained and no instrument failures suspected.

4. **IF** CWT9021A varies from ERFIS point CWT2400A by 3°F **OR** greater **AND** cannot be explained, **THEN PERFORM** the following:

   a. **REQUEST** Unit 1 Control Room to have Unit 1 Chemistry personnel **CHECK** local temperature using a calibrated temperature instrument for comparison. ____ N/A

8.7.2.4 (Continued)

INIT 07-19 | INIT 19-07

NOTE: The following step requires that a WR be initiated for the "suspect instrument" when the margin is 2°F or greater between ERFIS point CWT9021A and the calibrated temperature instrument. However, latitude should be given to reflect that the two instruments may not take temperatures in the same location in the flow stream and as such are affected by stratification caused by a rise in tail flow and associated rainfall. A work request is not needed when the difference can be explained and no instrument failure is suspect.

b. **IF** a delta of 2°F **OR** more is observed between ERFIS point CWT9021A **AND** the calibrated temperature instrument, **THEN** **INITIATE** a work request for the suspect temperature instrument **AND** perform all applicable actions of PLP-023. W/R# ________ ____ N/A

5. **RECORD** the ERFIS reading for CWT9022A, Discharge Canal Weir temperature. ________ °F ____ N/A

NOTE: Step 8.7.2.6 may be performed by contacting the Unit 1 Control Room.

6. From Unit 1 Control Board Indication for Discharge Canal Weir temperature, **RECORD** the temperature.

________ °F ____ N/A

INIT INIT
07-19 19-07

8.7.2 (Continued)

7. **PERFORM** a "channel check" on ERFIS point CWT9022A, Discharge Canal Weir temperature, by comparing to the reading from the Unit 1 Control Board Indication for Discharge Canal Weir temperature **AND RECORD** the difference. [CAPR NCR 290724] _______ °F____ N/A

8. **IF** CWT9022A varies from the Unit 1 Control Board Indication by 3 degrees **OR** greater **AND** the delta cannot be explained, **THEN PERFORM** the following:

   a. **REQUEST** Unit 1 Control Room to have Unit 1 Chemistry personnel **CHECK** local temperature using a calibrated temperature instrument for comparison. ____ N/A

NOTE: The following step requires that a WR be initiated for the "suspect instrument" when the margin is 2°F or greater between ERFIS point CWT9022A and the calibrated temperature instrument. However, latitude should be given to reflect that the two instruments may not take temperatures in the same location in the flow stream and as such are affected by stratification caused by a rise in tail flow and associated rainfall. A work request is not needed when the difference can be explained and no instrument failure is suspect.

   b. **IF** a delta of 2 degrees **OR** more is observed between ERFIS point CWT9022A **AND** the calibrated temperature instrument, **THEN INITIATE** a work request for the suspect temperature instrument.

      W/R# _____________ ____ N/A

INIT INIT

> **NOTE**: When the SI accumulators are pressurized **AND** Boron Injection to RCS Check Valve leakage is present this section should be performed to maintain the BIT header pressure above 650 psig. (SI-873C/SI-873F, SI-873B/SI-873E, OR SI-873A/SI-873D)
>
> APP-002-C3, BIT HDR HI PRESS, provides guidance for draining the BIT line via an SI pump(s) to relieve the BIT Header pressure.
>
> OP-202-1, SI System Venting, provides guidance to re-pressurize the BIT header if it becomes necessary.
>
> PT-943 and PT-940 can be used to trend pressure changes which would indicate potential leakage into and out of the piping sections.

8.7.3 **IF** Accumulator to SI check valves leakage is present, **THEN PERFORM** the following:

1. **CHECK AND RECORD** BIT Header Pressure (PI-934).
   (07-19) _____ psig ____
   (19-07) _____ psig ____
2. **IF** BIT Header Pressure (PI-934) is less than 650 psig, **THEN PERFORM** OP-202-1, Section 8.15.
   (07-19) ____
   (19-07)____

9.0 RECORDS

9.1 The completed procedure and any partials are forwarded to Plant Records.

10.0 ATTACHMENTS

10.1 Surveillance Test Procedure Certification and Review Form (Shift 07-19)

10.2 Surveillance Test Procedure Certification and Review Form (Shift 19-07)

ATTACHMENT 10.1

Page 1 of 1

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

SHIFT 07-19

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____
____
____

	Initials	Name (Print)	Date
Test Performed By:	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________

Test Complete: Date:____________ Time:____________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ______________________________ ____________
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)

____
____
____
____

Approved by: ______________________________ ____________
Shift Manager Date

ATTACHMENT 10.2
Page 1 of 1

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

SHIFT 19-07

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

____
____
____

	Initials	Name (Print)	Date
Test Performed By:	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________
	________	____________________	________

Test Complete: Date:__________ Time:__________

Test Satisfactory: Yes / No (Circle one)

Reviewed by: ________________________ __________
Shift Technical Advisor Date

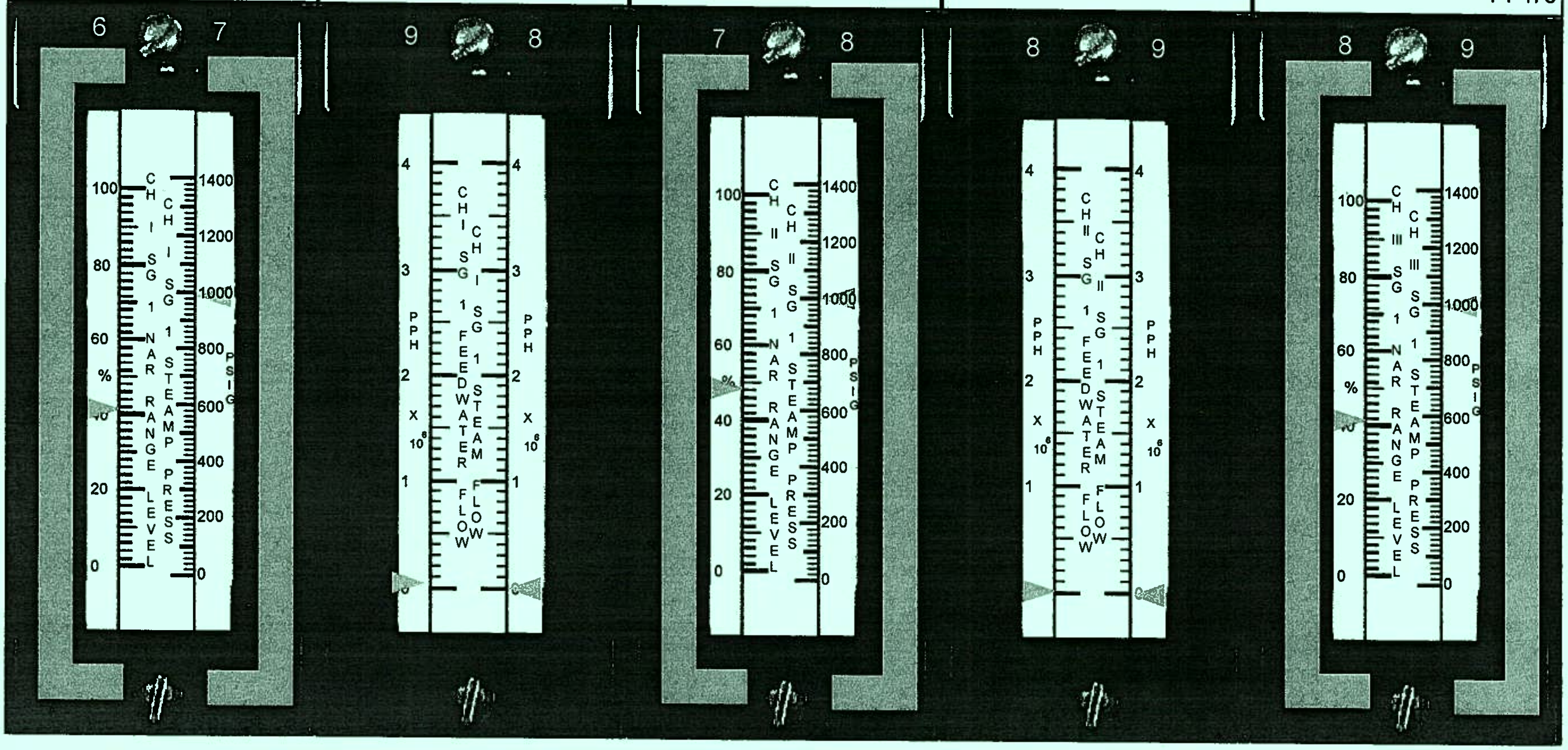
Comments: (Required if results were unsatisfactory)

____
____
____
____

Approved by: ________________________ __________
Shift Manager Date

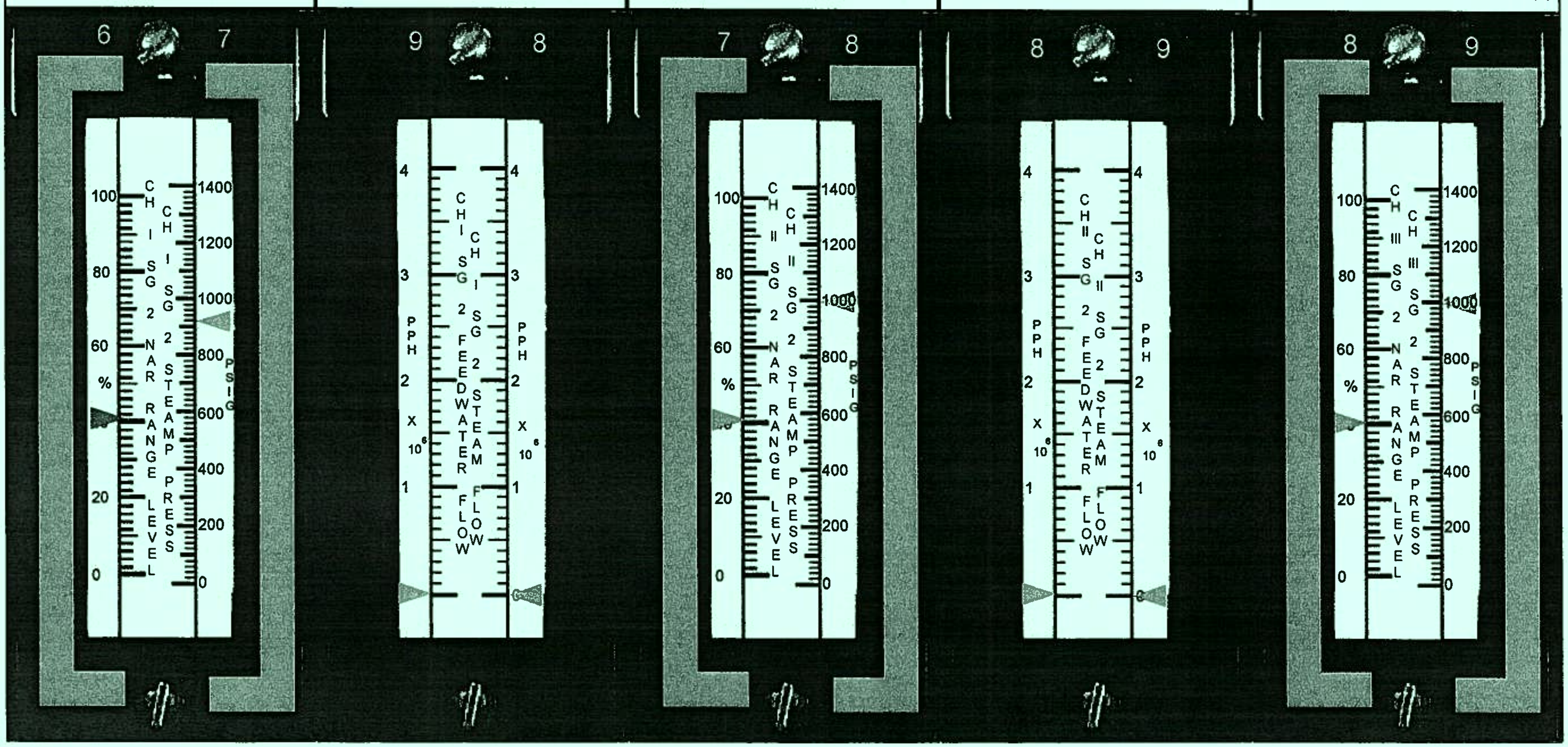
A STEAM GENERATOR

LI-474	FI-476	LI-475	FI-477	LI-476
PI-474	FI-474	PI-475	FI-475	PI-476



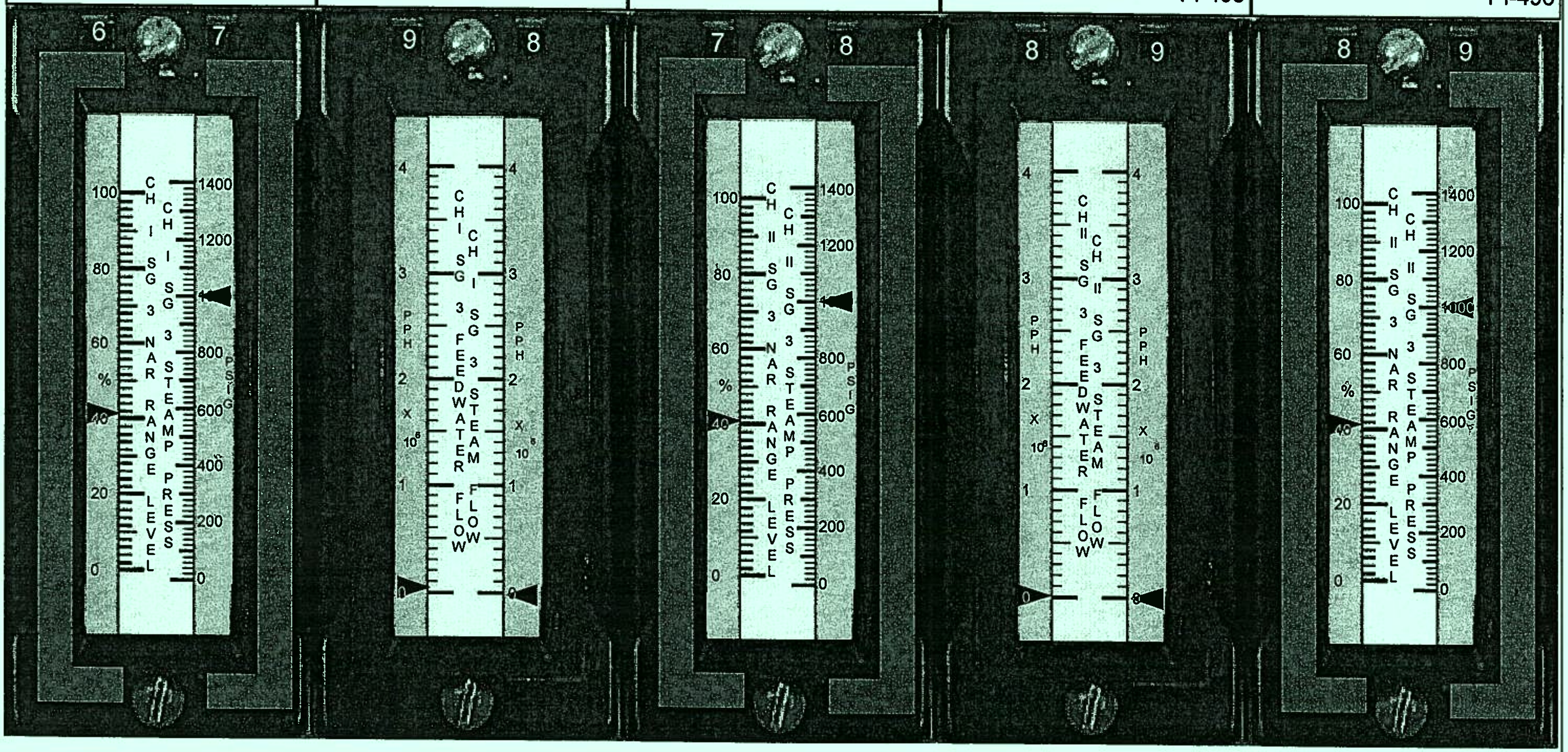
B STEAM GENERATOR

LI-484	FI-486	LI-485	FI-487	LI-486
PI-484	FI-484	PI-485	FI-485	PI-486



C STEAM GENERATOR

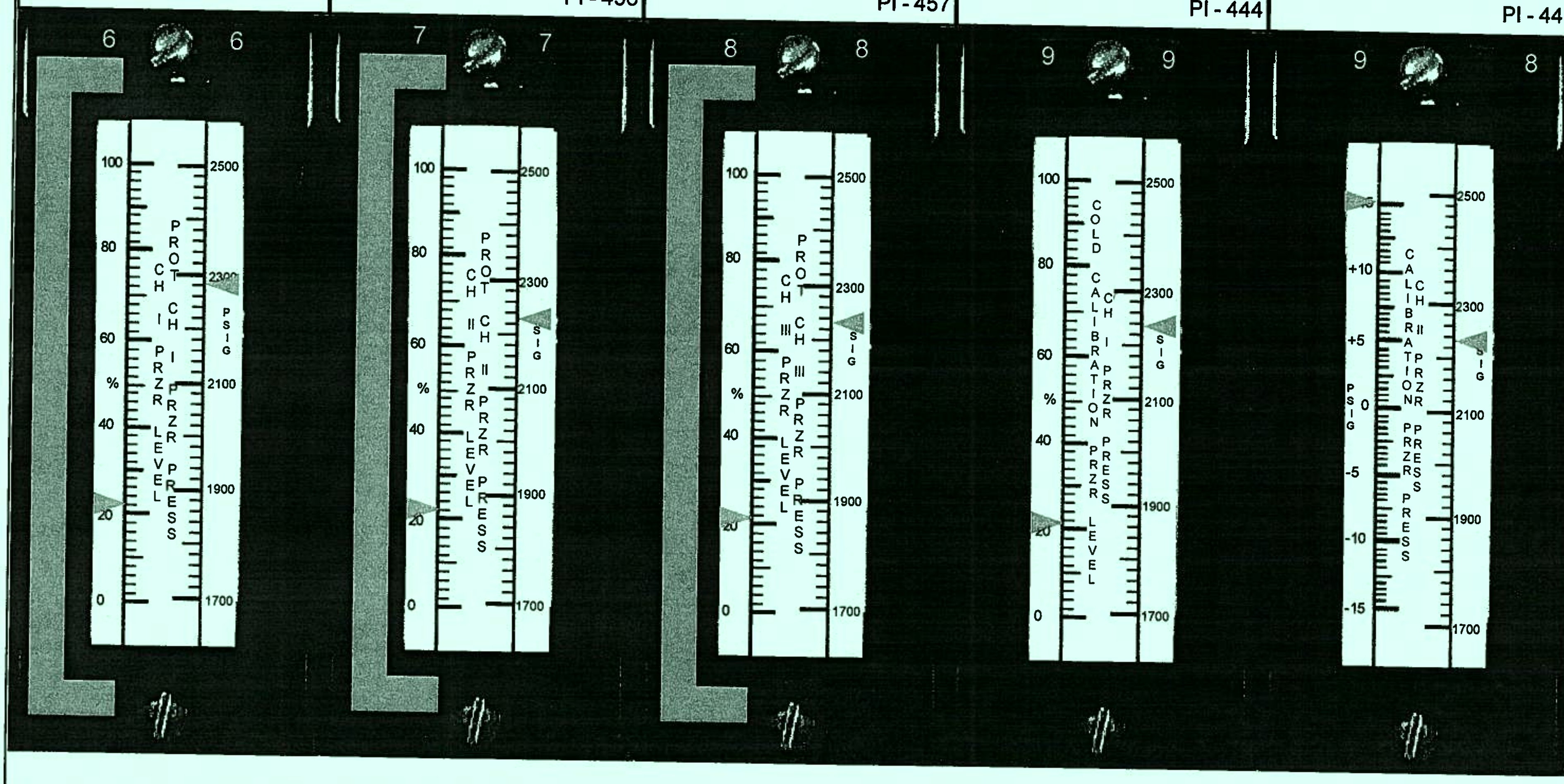
LI-494	FI-496	LI-495	FI-497	LI-496
PI-494	FI-494	PI-495	FI-495	PI-496



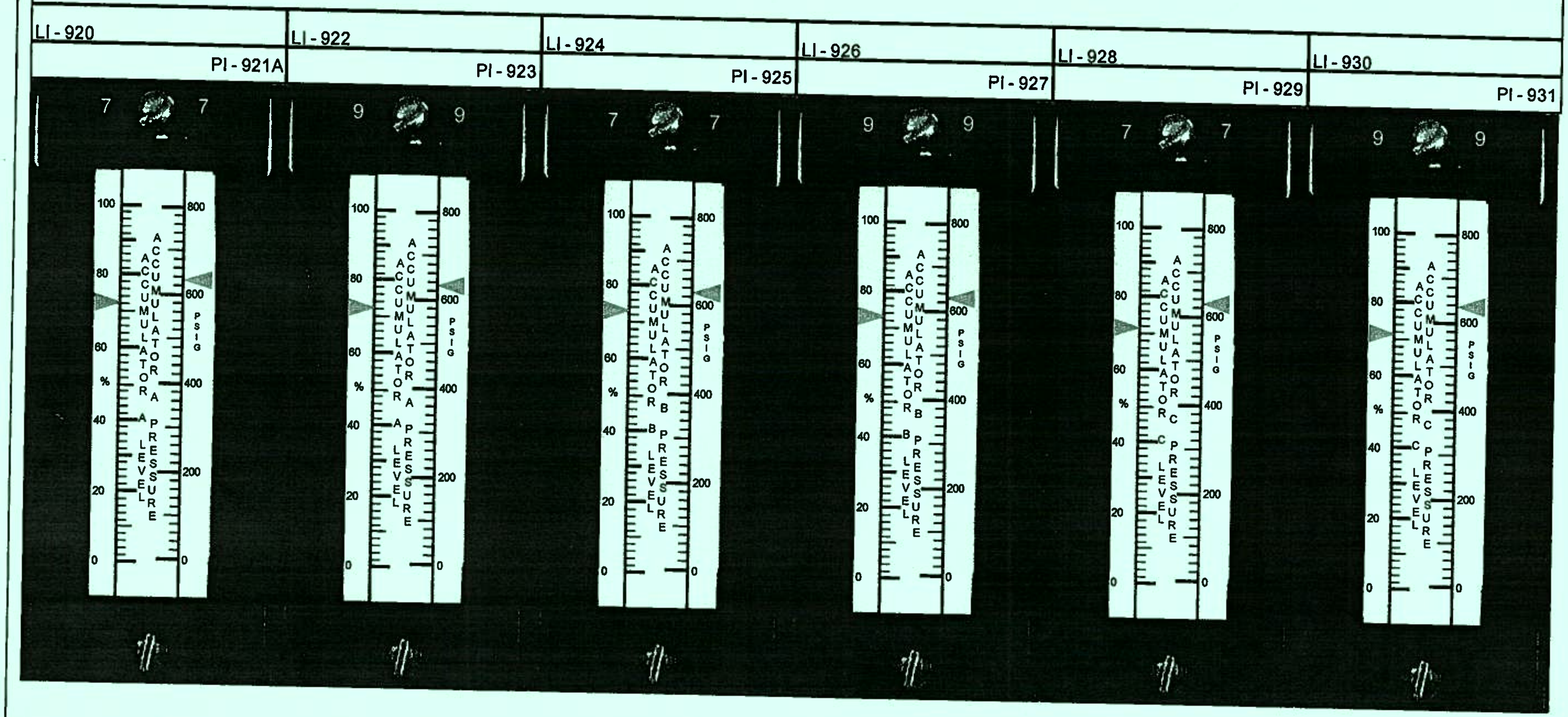
Project: Exam, Drawing: Books\SoftPanels\Panel3, part

PZR PRESSURES AND LEVELS

LI - 459A	LI - 460	LI - 461	LI - 462	PI - 458
PI - 455	PI - 456	PI - 457	PI - 444	PI - 445

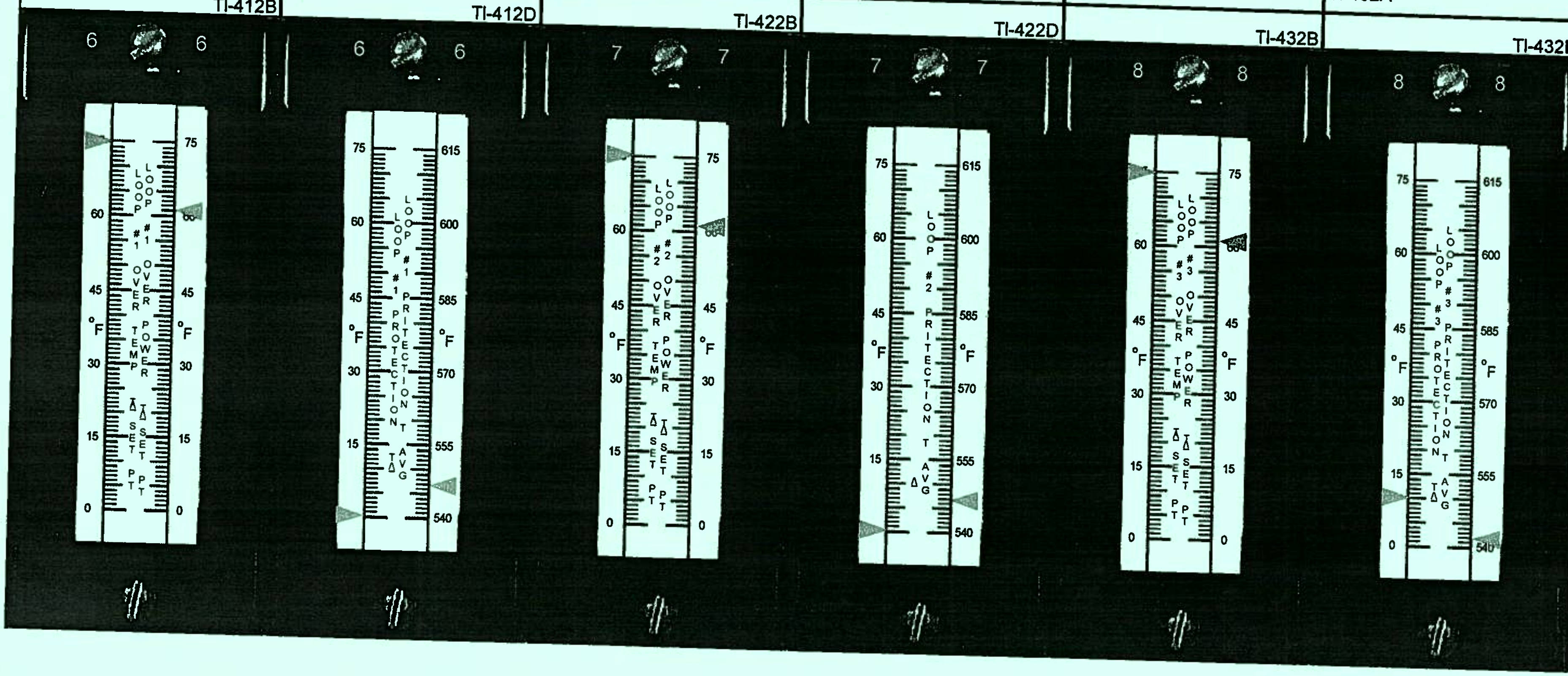


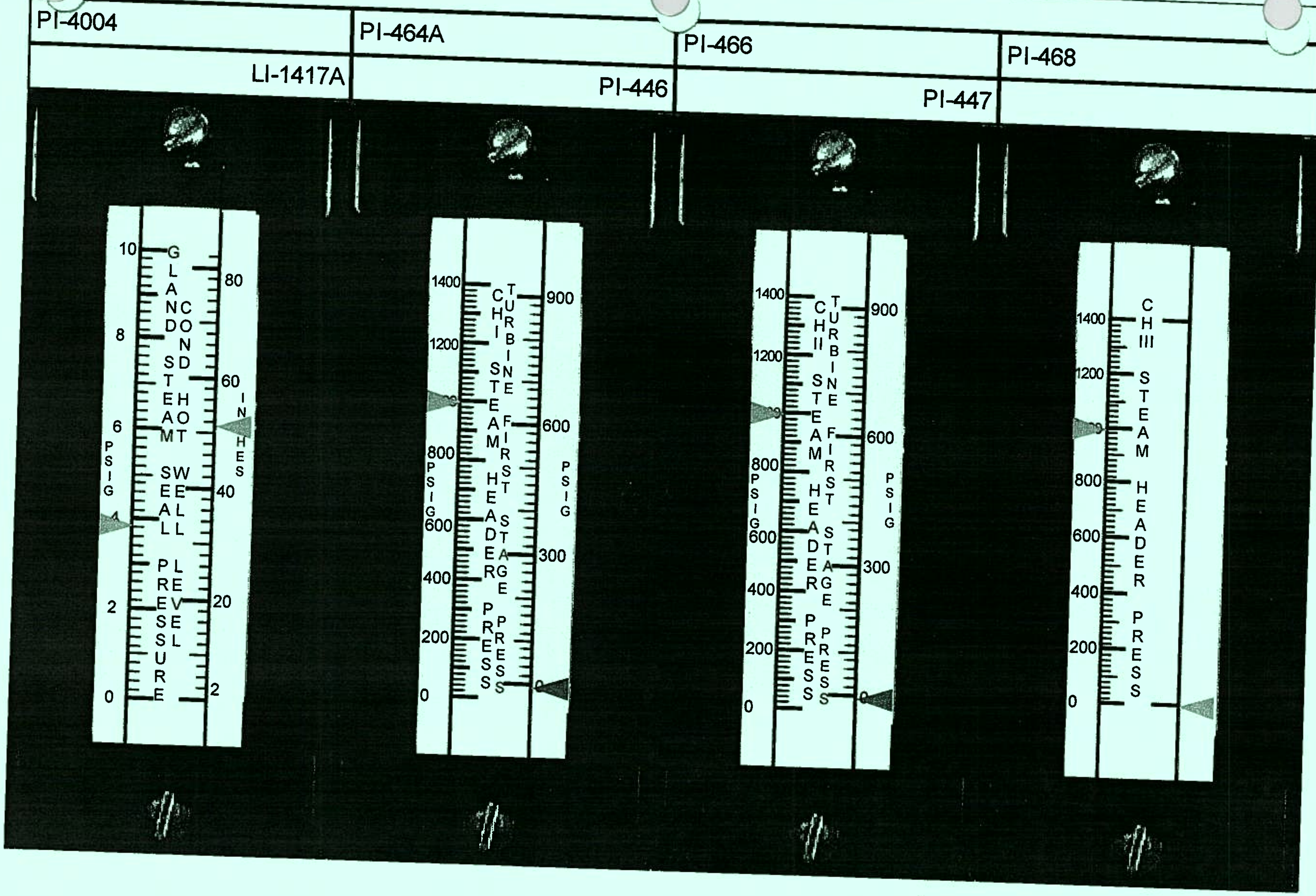
ACCUMULATORS



PROTECTION TAVG AND ΔT

TI-412C	TI-412A	TI-422C	TI-422A	TI-432C	TI-432A
TI-412B	TI-412D	TI-422B	TI-422D	TI-432B	TI-432D




PI-4004
LI-1417A
PI-464A
PI-446
PI-466
PI-447
PI-468
GLAND STEAM SEAL PRESSURE
PSIG
COND HOT WELL LEVEL
INCHES
CH I STEAM HEADER PRESS
TURBINE FIRST STAGE PRESS
PSIG
CH II STEAM HEADER PRESS
TURBINE FIRST STAGE PRESS
PSIG
CH III STEAM HEADER PRESS

Facility:	HB ROBINSON	Task No.:	02344100403
Task Title:	Calculate Emergency Dose Exposure Time Limits	JPM No.:	2011-2 NRC Admin JPM SRO A3
K/A Reference:	G2.3.4 3.2/3.7		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- An Emergency Event has been declared.
- Re-entry individual has received 1240 mR TEDE dose this year at RNP.
- There are 2 jobs that must be performed to stabilize the plant and protect the equipment:
  - Valve LCV-115B, RWST to Charging Pump Suction, air line needs to be re-attached to the valve operator.
  - Seal Injection Filter B must be placed in service due to Filter A clogged.
- All valves are located in a 48 R/hr field.

Task Standard: Determines Stay Time

Required Materials: Calculator
EPOSC-04, EMERGENCY WORK CONTROL

General References: EPOSC-04, EMERGENCY WORK CONTROL

Handouts: NONE

Initiating Cue: Calculate how long the individual can remain in the radiation area without exceeding the applicable emergency exposure limits.

Time Critical Task: NO

Validation Time: 8 minutes

(Denote Critical Steps with an asterisk*)

Start Time: ________

EPOSC-04, EMERGENCY WORK CONTROL

* **Performance Step: 1**

The table shown below identifies the emergency worker dose limits. In addition to the categories listed in the table, doses should be limited as follows:

1. The lens of the eye should be limited to three (3) times the stated TEDE value.
2. Any other organ (including skin and body extremities) should be limited to ten (10) times the stated TEDE value. (Step 8.7.2)

Dose Limit	Activity	Condition
5 REM	All	
10 REM	Repair and reentry efforts	Lower dose not practical
25 REM	Lifesaving or protection of large populations	Lower dose not practical
>25 REM	Lifesaving or protection of large populations	Only on a voluntary basis to persons fully aware of the risks involved

Standard: Candidate selects 10 REM Dose Limit for Repair efforts

Examiner's Cue:

Examiner's Note:

Comment:

*** Performance Step: 2**

10R	HR	60 Min		
	48 R	HR	=	12.5 Minutes
Dose Limit	Dose Rate	Conversion		Time Limit

Standard: Candidate calculates 12.5 minutes total stay time.

Examiner's Cue:

Comment:

<u>END OF TASK</u>

Terminating Cue: **Candidate calculates Stay Time**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC Admin JPM SRO A3

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT ______ UNSAT ______

Examiner's Signature: ______________________________ Date: ____________________

INITIAL CONDITIONS:

- An Emergency Event has been declared.
- Re-entry individual has received 1240 mR TEDE dose this year at RNP.
- There are 2 jobs that must be performed to stabilize the plant and protect the equipment:
  - Valve LCV-115B, RWST to Charging Pump Suction, air line needs to be re-attached to the valve operator.
  - Seal Injection Filter B must be placed in service due to Filter A clogged.
- All valves are located in a 48 R/hr field.

Initiating Cue: Calculate how long the individual can remain in the radiation area without exceeding the applicable emergency exposure limits.

INITIAL CONDITIONS:

- An Emergency Event has been declared.
- Re-entry individual has received 1240 mR TEDE dose this year at RNP.
- There are 2 jobs that must be performed to stabilize the plant and protect the equipment:
  - Valve LCV-115B, RWST to Charging Pump Suction, air line needs to be re-attached to the valve operator.
  - Seal Injection Filter B must be placed in service due to Filter A clogged.
- All valves are located in a 48 R/hr field.

Initiating Cue: Calculate how long the individual can remain in the radiation area without exceeding the applicable emergency exposure limits.

Facility:	HB ROBINSON	Task No.:	02344101203
Task Title:	Classify an Emergency Event	JPM No.:	2011-2 NRC JPM Admin SRO A4
K/A Reference:	G2.4.41 (2.9/4.6)		

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: ______ Actual Performance: X

Classroom X Simulator ______ Plant ______

READ TO THE EXAMINEE

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

Initial Conditions:

- This is a DRILL.
- Unit at 30% RTP with a shutdown in progress IAW GP-006.
- CV Purge is in progress to support upcoming maintenance activities inside the CV.
- CV Spray Pump A is inoperable due to a grounded motor.
- Subsequently, a LOCA and loss of offsite power occurred at 1021 hours on 11/28/2011.
- Emergency Diesel Generator B trips while starting.
- CV pressure peaked at 37 psig.
- Core exit thermocouples are currently reading 304°F.
- R-32A is reading 8 Rem/hr.
- RVLIS indication reads 45%.
- S/G NR levels are currently at A-12%, B-15%, C-32%.
- Weather conditions: Wind direction is from 145 degrees, Wind speed is 4 mph, Stability Class is D, Precipitation is Zero.
- You are the Shift Manager.

Task Standard: Identifies event as an SITE AREA EMERGENCY per FS1.1

Required Materials: EPCLA-01, EPCLA-04, EAL Matrixes, EPNOT-01.

General References: EPCLA-01, EPCLA-04, EAL Matrixes, EPNOT-01.

Handouts:	EPCLA-01, EPCLA-04, EAL Matrixes, EPNOT-01.
Initiating Cue:	Classify the event IAW the EAL matrixes. Upon completion of the event classification, inform the examiner. **This Task is TIME CRITICAL**
Time Critical Task:	YES (15 minutes for classification AND 15 minutes for notification)
Validation Time:	24 minutes

(Denote Critical Steps with an asterisk*)

Start Time: ________ **Time Critical Start Time:**__________

Performance Step: 1 Obtain the EAL ALL Conditions and COLD Conditions Matrix

Standard: Candidate states where to obtain the EALs.

Examiner's NOTE: **Provide copies of the EAL Matrix to the candidate.**

Comment:

Performance Step: 2 EVALUATE ALL Conditions EAL Matrix under all conditions. (Step 8.3.1)

Standard: Candidate reviews EAL ALL Conditions Matrix and does not identify any classification.

Examiner's NOTE:

Comment:

*** Performance Step: 3** IF Reactor Coolant temperature is > 200°F, THEN EVALUATE HOT Conditions EAL Matrix (Step 8.3.2)

Standard: Candidate reviews EAL HOT Conditions Matrix and identifies the following classification: **Site Area Emergency**

FS1.1 – Loss or potential loss of any two barriers (Table F-1)

Reactor Coolant System Barrier –

- **Loss 1 – Containment High Range Monitor R-32A or R-32B > 5 Rem/hr.**

OR

- **Loss 2 - RCS leak rate > available makeup capacity as indicated by a loss of RCS subcooling less than 35°F [55°F]**

OR

- **Potential Loss 2 - Unisolable RCS leak exceeding the capacity of one charging pump (77 gpm)**

Containment Barrier –

- **Potential Loss 7 – Containment pressure > 10 psig with < one full train of depressurization equipment operating. (Note: One Containment Spray System train and one Containment Cooling System train comprise one full train of depressurization equipment.)**

Examiner's NOTE: **Candidate will declare a Site Area Emergency and present his classification to you. This will stop the 15 minute clock for the declaration portion of the JPM.**

Comment:

Time Critical Stop Time for EAL Classification: ______________ (15 Minutes)

Examiner's CUE: **Present the candidate with the second cue sheet for the JPM task of completing the Emergency Notification Form and a copy of procedure EPNOT-01.**

Time Critical Start Time for EAL Notification: ________________

Performance Step: 4 Candidate will proceed to Attachment 10.7 for a Site Area Emergency and direct the Emergency Communicator to report to the Control Room to assume the duties of the Emergency Communicator.

Standard: Candidate informs the Emergency Communicator to prepare for communication activities.

Examiner's NOTE:

Examiner's CUE: **When the candidate has completed the EAL classification, CUE the candidate that he will manually complete an Emergency Notification Form and submit it to the SEC.**

Comment:

Performance Step: 5 Obtain EPNOT-01, Attachment 10.5, Nuclear Power Plant Emergency Notification Form.

Standard: Copies Attachment from procedure or pulls it from a file.

Examiner's NOTE:

Examiner's CUE: **The Examiner will provide a copy of EPNOT-01 to the candidate.**

Comment:

* **Performance Step: 6** Enter Line 1 information.

Standard: Marks **DRILL** and Message # **1**.

Examiner's NOTE: **Ensure that DRILL is marked. ACTUAL EVENT is only used during a real emergency.**

Comment:

* **Performance Step: 7** Enter Line 2 information.

Standard: Marks **INITIAL**.

Examiner's NOTE:

Comment:

* **Performance Step: 8**	Enter Line 3 information.
Standard:	Enters **H.B. Robinson** as the Site and enters CONFIRMATION PHONE NUMBER.
Examiner's NOTE:	**Identifying the site as H.B. Robinson is critical. Listing the proper confirmation telephone number is NOT critical.**
Examiner's CUE:	**When candidate requests the ERO phone list, tell him the Confirmation Phone Number is 843-383-3685.**
Comment:	

* **Performance Step: 9**	Enter Line 4 information.
Standard:	Marks **SITE AREA EMERGENCY** as the Emergency Classification. Based on EAL # **FS1.1** EAL Description - **Loss or potential loss of any two barriers (Table F-1)**
Examiner's NOTE:	
Comment:	

* **Performance Step: 10**	Enter Line 5, Protective Action Recommendation information.
Standard:	Marks **NONE**.
Examiner's NOTE:	
Comment:	

* **Performance Step: 11** Enter Line 6, EMERGENCY RELEASE, information.

Standard: Marks **NONE**.

Examiner's NOTE:

Comment:

Performance Step: 12 Enter Line 7, RELEASE SIGNIFICANCE, information.

Standard: Marks **NOT APPLICABLE**.

Examiner's NOTE:

Examiner's CUE:

Comment:

Performance Step: 13 Enter Line 8, EVENT PROGNOSIS, information.

Standard: Marks **Degrading**.

Examiner's NOTE:

Comment:

*** Performance Step: 14** Enter Line 9, METEROLOGICAL DATA, information.

Standard: Enters data that was given in the initial conditions:
Wind Direction **145** degrees,
Wind Speed 4 mph,
Precipitation **0**,
Stability Class "**D**".

Examiner's NOTE:

Comment:

*** Performance Step: 15** Enter Line 10 INFORMATION.

Standard: Marks Block A, DECLARATION: Enters applicable **Date** and **Time.**

Examiner's NOTE:

Examiner's CUE: **Date and time should reflect present date and time.**

Comment:

Performance Step: 16 Enter Line 11 information, AFFECTED UNITS.

Standard: Marks **Unit 2.**

Examiner's NOTE:

Comment:

Performance Step: 17 Enter Line 12 information UNIT STATUS.

Standard: Enters Shutdown Time: **1021 hours on 11/28/2011**

Examiner's NOTE: **Reactor shutdown DATE and TIME was given in the initial conditions on the cue sheet.**

Examiner's CUE:

Comment:

Performance Step: 18 Enter Line 13 Remarks information.

Standard: Enters information describing accident from EAL matrix.

Examiner's NOTE: **May leave LINE 13, Remarks blank or enter EAL information.**

Comment:

* **Performance Step: 19** Line 17 APPROVAL by SEC.

Standard: Completes Line 17 with **Signature, Title, Time, and Date.**

Examiner's NOTE:

Comment:

Time Critical Stop Time for EAL Notification: ______________ (15 Minutes)

END OF TASK

Termination Cue: **EAL classification has been determined and notification has been made.**

STOP TIME: ____________

VERIFICATION OF COMPLETION

Job Performance Measure No.: 2011-2 NRC JPM Admin SRO A4

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT _____ UNSAT _____

Examiner's Signature: ______________________ Date: ______________

ANSWER KEY

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. ~~A~~ DRILL   B ACTUAL EVENT   MESSAGE # 1

2. ~~A~~ INITIAL   B FOLLOW-UP   NOTIFICATION: TIME_______ DATE___/___/___ AUTHENTICATION #______

3. SITE: H.B Robinson   Confirmation Phone # 843 383-3685

4. EMERGENCY CLASSIFICATION: A UNUSUAL EVENT EMERGENCY   B ALERT   ~~C~~ SITE AREA EMERGENCY   D GENERAL
BASED ON EAL # FS1   EAL DESCRIPTION: Loss or Potential Loss of Any Two Barriers (Table F-1)

5. PROTECTIVE ACTION RECOMMENDATIONS: ~~A~~ NONE
B EVACUATE ________
C SHELTER ________
D CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.
E OTHER ________

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: (*May not be available for Initial Notifications)
Wind Direction* from 145 degrees   Wind Speed* 4 mph
Precipitation* 0   Stability Class* A B C ~~D~~ E F G

10. ~~A~~ DECLARATION   B TERMINATION   Time Now   Date Today

11. AFFECTED UNIT(S): 1 ~~2~~ 3 All

12. UNIT STATUS:
(Unaffected Unit(s) Status Not Required for Initial Notifications)
U1 _____% Power Shutdown at Time ________ Date ___/___/___
U2 0 % Power Shutdown at Time 1021 Date 11/28/11
U3 _____% Power Shutdown at Time ________ Date ___/___/___

13. REMARKS: ________

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6 A IS SELECTED.

14. RELEASE CHARACTERIZATION: TYPE: A Elevated B Mixed C Ground   UNITS: A Ci B Ci/sec C µCi/sec
MAGNITUDE: Noble Gases:______ Iodines:______ Particulates:______ Other:______
FORM: A Airborne Start Time ______ Date ___/___/___ Stop Time ______ Date ___/___/___
B Liquid Start Time ______ Date ___/___/___ Stop Time ______ Date ___/___/___

15. PROJECTION PARAMETERS: Projection period: ______ Hours   Estimated Release Duration ______ Hours
Projection performed: Time ______ Date ___/___/___

16. PROJECTED DOSE:

DISTANCE	TEDE (mRem)	Adult Thyroid CDE (mRem)
Site boundary		
2 Miles		
5 Miles		
10 Miles		

17. APPROVED BY: [signature]   Title CR-SEC   Time Now   Date Today
NOTIFIED BY: ________   RECEIVED BY: ________   Time ______ Date ___/___/___

INITIAL CONDITIONS:

- This is a DRILL.
- Unit at 30% RTP with a shutdown in progress IAW GP-006.
- CV Purge is in progress to support upcoming maintenance activities inside the CV.
- CV Spray Pump A is inoperable due to a grounded motor.
- Subsequently, a LOCA and loss of offsite power occurred at 1021 hours on 11/28/2011.
- Emergency Diesel Generator B trips while starting.
- CV pressure peaked at 37 psig.
- Core exit thermocouples are currently reading 304°F.
- R-32A is reading 8 Rem/hr.
- RVLIS indication reads 45%.
- S/G NR levels are currently at A-12%, B-15%, C-32%.
- Weather conditions: Wind direction is from 145 degrees, Wind speed is 4 mph, Stability Class is D, Precipitation is Zero.
- You are the Shift Manager.

INITIATING CUE:

Classify the event IAW the EAL matrixes. Upon completion of the event classification, inform the examiner.

This Task is TIME CRITICAL

INITIAL CONDITIONS: Emergency event has just been declared by the Control Room Site Emergency Coordinator (SEC).

INITIATING CUE: The Emergency Communicator is NOT available. You, as the Control Room Site Emergency Coordinator (SEC), must manually complete the Emergency Notification Form (ENF) from procedure EPNOT-01, CR/EOF Emergency Communicator.

This task is TIME CRITICAL.