Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

January 7, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2
NRC Docket No. 50-391

Subject: **Watts Bar Nuclear Plant (WBN) Unit 2 - Submittal of Pre-op Test Instructions**

The following approved WBN Unit 2 Pre-op Test Instructions (PTIs) are enclosed:

PTI NUMBER	Rev.	TITLE
2-PTI-001-02	0	Main Steam PORVs and Turbine Bypass Valves Functional Test
2-PTI-03B-05	0	Auxiliary Feedwater System Dynamic Test
2-PTI-062-02	0	Boric Acid Subsystem Logic Testing
2-PTI-68-12	0	Reactor Coolant Pressure Boundary Leakage Detection
2-PTI-079-01	0	Fuel Transfer System
2-PTI-099-01	0	RPS & ESFAS Response Times

If you have any questions, please contact Nick Welch at (423) 365-7820.

Respectfully,

R. A. Hruby Jr.

Raymond A. Hruby, Jr.
General Manager, Technical Services
Watts Bar Unit 2

Enclosures

D030
NRR

cc (Enclosures):

U. S. Nuclear Regulatory Commission
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Watts Bar Nuclear Plant
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WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

Bypass VALVES WJD 8/22/13

TITLE: MAIN STEAM PORVs AND TURBINE ~~BYPASS VALVE~~ FUNCTIONAL TEST

Instruction No: 2-PTI-001-02
Revision No: 0000

PREPARED BY: James Klein / James Klein DATE 6/25/13
PRINT NAME / SIGNATURE

REVIEWED BY: Joseph Wooten / [signature] DATE 6/25/13
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No 2-13-018

JTG CHAIRMAN [signature] DATE: 8/22/13

APPROVED BY [signature] DATE: 8/22/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No ________

JTG CHAIRMAN ________ DATE ________

APPROVED BY ________ DATE ________
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	8/22/13	ALL	Initial Issue.

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Purpose

Demonstrate proper operation of each of the following pressure/temperature control subsystems of the Main Steam System (MSS):

- Atmospheric Steam Dump System, comprised of the (4) Steam Generator (SG) Power Operated Relief Valves (PORVs) and supporting instrumentation/controls.
- Turbine Bypass System (Condenser Steam Dump Valves), comprised of the (12) Steam Dump Valves and supporting instrumentation/controls.

1.2 Scope

This test demonstrates the following for the SG PORVS & Condenser Steam Dump Valves:

A. Valve Logic verification without Steam Discharge (prior to or during Hot Functional Testing - HFT, with goal being just prior to HFT).

   1. Proper operation of SG PORVs:

      a. Valves operate from their respective Main Control Room (MCR) and Auxiliary Control Room (ACR) Handswitches/Controllers.

      b. MCR indications correctly reflect valve position.

      c. Valves respond correctly to interlocks and controls (simulated or actual).

      d. Stroking of PORVs using the Backup N_2 Supply System.

   2. Proper operation of Condenser Steam Dump Valves:

      a. Valves operate from their respective Main Control Room (MCR) Handswitches/Controllers.

      b. MCR indications correctly reflect valve position.

      c. Valves respond correctly to interlocks and controls (simulated or actual).

1.2 Scope (continued)

B. Valve Operation/Performance verification with, steam discharge, at 557°F Reactor Coolant System temperature during HFT.

1. SG PORV performance:

    a. Stroke Open times are within acceptable limits.

    b. Valves respond correctly to controller demand.

    c. Valves can be manually opened (via handwheel) allowing for steam discharge to atmosphere.

2. Condenser Steam Dump Valves performance

    a. Stroke times are within acceptable limits.

    b. Valves respond correctly to controller setpoint.

2.0 REFERENCES

2.1 Performance References

A. SMP-7.0, Control of System Cleanliness Layup and Flushing

B. SMP-9.0, Test Conduct

C. SMP-14.0, Test Deficiency Notices

D. 2-PTI-068-01, HFT - Heatup and Cooldown

E. 2-PTI-999-01, Operational Vibration Testing

F. N3C-945, Procedure for Evaluation and Qualification of Piping System Vibrations.

2.2 Developmental References

A. Final Safety Analysis Report Amendment 110

1. Table 14.2-1 Sheet 63 of 89, Main Steam System Summary

2. Table 14.2-1 Sheet 64 of 89, Steam Generator Safety & Atmospheric Relief Valves Test Summary

3. Chapter 10.4.4, Turbine Bypass System

4. Chapter 10.3, Main Steam Supply System

B. Drawings

1. Flow Diagrams

a. 2-47W801-1, Rev 12, Flow Diagram Main & Reheat Steam

b. 2-47W848-3, Rev 14, Mechanical Flow Diagram Control Air

c. 2-47W848-10, Rev 11, Mechanical Flow Diagram Control Air

2. Control Logic

a. 2-47W610-1-1, Rev 10, Electrical Control Diagram Main Steam System

2.2 Developmental References (continued)

b. 2-47W610-1-1A, Rev 10, Electrical Control Diagram Main Steam System

c. 2-47W610-1-2, Rev 11, Electrical Control Diagram Main Steam System

d. 2-47W610-1-2A, Rev 10, Electrical Control Diagram Main Steam System

e. 2-47W610-1-3, Rev 3, Electrical Control Diagram Main Steam System

f. 2-47W610-1-3A, Rev 5, Electrical Control Diagram Main Steam System

g. 2-47W611-1-1, Rev 4, Electrical Logic Diagram Main and Reheat Steam

h. 2-47W611-1-2, Rev 3, Electrical Logic Diagram Main and Reheat Steam

i. 2-47W600-151, Rev 1, Electrical Instruments And Controls

j. 2-47W600-221A, Rev 0, Electrical Instruments And Controls

k. 2-47W600-221B, Rev 0, Electrical Instruments And Controls

l. 2-69247-08F802403-FD-2300-1, Rev 0, Electrical-Steam Dump SG1 PORV Control Signal Input/Validation

m. 2-69247-08F802403-FD-2300-6, Rev 0, Electrical-Steam Dump SG1 PORV Control

n. 2-69247-08F802403-FD-2301-1, Rev 0, Electrical-Steam Dump SG2 PORV Control Signal Input/Validation

o. 2-69247-08F802403-FD-2301-6, Rev 0, Electrical-Steam Dump SG2 PORV Control

p. 2-69247-08F802403-FD-2302-1, Rev 0, Electrical-Steam Dump SG3 PORV Control Signal Input/Validation

q. 2-69247-08F802403-FD-2302-6, Rev 0, Electrical-Steam Dump SG3 PORV Control

2.2 Developmental References (continued)

r. 2-69247-08F802403-FD-2303-1, Rev 0, Electrical-Steam Dump SG4 PORV Control Signal Input/Validation

s. 2-69247-08F802403-FD-2303-6, Rev 0, Electrical-Steam Dump SG4 PORV Control

t. 2-69247-08F802403-FD-2304-1, Rev 1, Electrical-Steam Dump Cont Main Steam Pressure Signal Input/Validation

u. 2-69247-08F802403-FD-2304-8, Rev 0, Electrical-Steam Dump Validated Highest TAVG

v. 2-69247-08F802403-FD-2304-9,Rev 0, Electrical-Steam Dump Validated Turbine Impulse Pressure

w. 2-69247-08F802403-FD-2304-10, Rev 0, Electrical-Steam Dump Turb Trip Mode Controller Load Rejection Steam Dump Cont

x. 2-69247-08F802403-FD-2801-1, Rev 0, Electrical BOP Condenser Zone A

y. 2-69247-08F802403-FD-2810-1, Rev 1, Electrical BOP Condenser B Pressure

3. Electrical

a. 2-45W600-1-1, Rev 2, Wiring Diagram Main Steam System Schematic Diagrams

b. 2-45W600-1-2, Rev 1, Wiring Diagram Main Steam System Schematic Diagram

c. 2-45W600-1-3, Rev 4, Wiring Diagram Main Steam System Schematic Diagrams

d. 2-45W600-1-4, Rev 1, Wiring Diagram Main Steam System Schematic Diagrams
ADMIN T93130327001

e. 2-45W600-1-8, Rev 1, Wiring Diagram Main Steam System Schematic Diagrams SH 8

f. 2-45W600-57-1, Rev 3, Wiring Diagram Separation & Misc Aux Relays Schematic Diagrams SH-1

2.2 Developmental References (continued)

g. 2-45W600-57-2, Rev 5, Wiring Diagram Separation & Misc Aux Relays Schematic Diagrams SH-2

h. 2-45W600-57-3, Rev 4, Wiring Diagram Separation & Misc Aux Relays Schematic Diagrams

i. 2-45W600-57-16, Rev 1, Wiring Diagram Separation & Misc Aux Relays Schematic Diagrams

j. 2-45W600-99-1, Rev 2, Wiring Diagram Reactor Protection System Schematic Diagrams

k. 1-45W703-3, Rev 46, Wiring Diagrams 125V Vital Battery Board III Single Line-Sheet 3

l. 1-45W703-4, Rev 39, Wiring Diagrams 125V Vital Battery Board IV Single Line-Sheet 4

m. 1-45W703-5, Rev 36, WIRING DIAGRAMS 125V Vital Btry Board I PNL 4 Connection Diagram SHT 5

n. 1-45W703-6A, Rev 26, WIRING DIAGRAMS 125V Vital Btry Board II PNL 4 Connection Diagram SHT 6A

o. 1-45W703-7, Rev 14, WIRING DIAGRAMS 125V Vital Btry Board III PNL 4 Connection Diagram SHT 7

p. 1-45W703-8, Rev 15, WIRING DIAGRAMS 125V Vital Btry Board IV PNL 4 Connection Diagram SHT 8

q. 1-45W706-1, Rev 76, Wiring Diagram 120V AC Vital INST PWR BDS 1-I & 2-I Connection Diagram Sheet 1

r. 1-45W706-2, Rev 67, Wiring Diagram 120V AC Vital INST PWR BDS 1-II & 2-II Connection Diagram Sheet 2

s. 1-45W706-3, Rev 52, Wiring Diagram 120V AC Vital INST PWR BDS 1-III & 2-III Connection Diagram SH 3

t. 1-45W706-4, Rev 55, Wiring Diagram 120V AC Vital INST PWR BDS 1-IV & 2-IV Connection Diagrams

u. 1-45W708-4. Rev 20, Wiring Diagram Misc 120V AC Distribution PNLS Connection Diagrams

2.2 Developmental References (continued)

v. 45N2643-3, Rev K, Wiring Diagrams Unit Control Board-Panel 2-M-4 Connection Diagrams SH. 3

w. 45N2680-2, Rev 7, NSSS AUX REL PNL 2-R-54 CONN DIAG SH 2

x. 45N2681-2, Rev 7, NSSS AUX REL PNL 2-R-55 CONN DIAG SH 2

y. 45N2684-2, Rev 1, NSSS AUX REL PNL 2-R-58 CONN DIAG SH 2

z. 2-45N2688-2, Rev 1, Wiring Diagram Separation AUX Relay Panel 2-R-73 Connection Diagram Sheet 2

aa. 45N2693-2, Rev 11, Separations AUX REL PNL 2-R-78 CD SH 2

bb. 0126D4614, Rev G, Metalclad Switchgear Connection Diagram

cc. 0126D4606, Rev F, Metalclad Switchgear Connection Diagram

dd. 0126D4664, Rev F, Metalclad Switchgear Connection Diagram

ee. 0126D4656, Rev G, Metalclad Switchgear Connection Diagram

4. Other

a. 2-45B655-4A, Rev 0, Main Control Room Annunciator Inputs Window Box XA-55-4A
DRA 52315-260, Rev 0

b. 2-45B655-E4A, Rev 0, Electrical Annunciator Window Box XA-55-4A Engraving
DRA 52315-262, Rev 0

c. 2-45B655-6F, Rev 2, Main Control Room Annunciator Inputs Window Box XA-55-6F
DRA 52343-236, Rev 1

d. 2-45B655-E6F, Rev 0, Electrical Annunciator Window Box XA-55-6F Engraving
DCA 52630-101, Rev 1
DRA 52343-237, Rev 0

e. 2-47A615-0, Rev 0, Integrated Computer System Terminations and I/O List

2.2 Developmental References (continued)

C. Documents

1. WBN2-1-4002, Rev 3, Main Steam System
2. 2-TSD-1-2, Rev 0, Main Steam PORVs and Turbine Bypass Valve Functional Test - Test Scoping Document
3. 2-IMI-98.000, Rev 0, Foxboro I/A DCS User Guide
4. 25402-011-V1A-MG00-04164-001, Watts Bar Unit 2 Precautions, Limitations and Setpoints (PLS), Rev 0 (Located in EDMS)

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.

B. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.

C. Discrepancies between component ID tags and the description in a procedure/instruction do not require a Test Deficiency Notice (TDN) in accordance with SMP-14.0, if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

D. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

E. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

F. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

G. Observe all Radiation Protection (RP) requirements when working in or near radiological areas.

H. Ensure there are no adverse effects to the operation of Unit 1 structures, systems, or components.

I. During the performance of this procedure visual observation of piping and components is required. This includes steady state and transient operations with visual confirmation that vibration is not excessive.

J. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN).

3.0 PRECAUTIONS AND LIMITATIONS (continued)

K. When installing fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation and visual indication.

L. Portions of this test will be conducted around steam. Use caution when in those areas.

M. Ensure the steam pressure does not exceed the setting of the steam generator safety valves lowest setting. [1185 PSIG (1173-1197)]

N. Safety-related valves will be stroke timed locally at the valve and remotely using the control switch in both open and close directions. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement. Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.

O. During the Steam Generator PORV operation with backup nitrogen supply, do not exceed 100 PSIG nitrogen pressure to avoid damage to the valve actuators. Local pressure indicators are provided.

P. A loud noise will occur anytime a Steam Generator PORV is exercised (if the MSS is pressurized). Double hearing protection shall be used in the U2 Valve Vault rooms during the portions of this test performed while the MSS is pressurized.

Q. Caution signs should be posted at entrances to the U2 Valve Vault rooms while testing is in progress.

R. When performing those sections of the procedure where steam is dumped, either to the condenser or to the atmosphere, limit steam pressure changes to 50 PSIG. Initiate corrective action if the pressure change approaches this value. This limit bounds the test transient to prevent unexpected actuations of Safety Injection on low steam line pressure (setpoint 675 PSIG with lead/lag anticipatory unit) and steam dump closure on Lo-Lo T_{AVG} (setpoint 550°F)

S. Sections 6.4 and 6.5 involve SG PORV/Steam Dump valve stroking with steam discharge during Hot Functional Test (HFT). Valve stoking steps should be coordinated with other systems' activities that affect Reactor Coolant System (RCS) T_{AVG} and Main Steam System (MSS) pressure (e.g. Steam Generator Blowdown flowrates, SG level).

3.0 PRECAUTIONS AND LIMITATIONS (continued)

T. Consider the following prior to performing valve stroking in Sections 6.4 and 6.5 (if required perform any of the following in accordance with the applicable HFT operating instruction for the associated system):

1. Allow RCS to warm up to SG PORV controller setpoint (approximately 1131 PSIG, 561°F) prior to valve stroking.

2. Increase SG level towards the top of the allowable band.

3. Minimize Steam Generator Blowdown (SGBD) flow.

U. Low-Low T_{AVG} will cause Engineered Safety Features Actuation System (ESFAS) isolation of the Steam Dump Valves. Monitor 2-TR-68-2B for T_{AVG} approaching 550°F. If setpoint is approached, then testing should be paused until the applicable HFT operating instruction(s) restores RCS T_{AVG} to approximately 557°F.

V. This test places multiple Foxboro points in Manual with output values/states manipulated to simulate various field pressure/temperature measurements. These activities are performed at a Foxboro Application Workstation in the MCR (Operator Workstation) or in the Aux Instrument Room (Maintenance/Engineering Workstation) by operation/maintenance/engineering personnel with specific training. A FoxView login is required for the actions performed in this test.

W. Steam Dump operation (with steam discharge) to the Main Condenser should not be used with a waterbox out of service.

Date ________

4.0 PREREQUISITES

NOTES
1) Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction subsection to which they apply.
2) Prerequisites applicable only to specific performance sections are annotated as such. Prerequisites with no specific performance section annotation are required prior to starting Section 6.0

4.1 Preliminary Actions

[1] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL), and

ENSURE they will **NOT** adversely affect the test performance and results. ________

[2] **ENSURE** changes to the references listed on Appendix A, have been reviewed, and determined **NOT** to adversely affect the test performance. ________

[3] **VERIFY** current revisions and change paper for referenced drawings has been reviewed and determined **NOT** to adversely affect the test performance, and

ATTACH documentation of current drawing revision numbers and change paper that were reviewed to the data package. ________

[4] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. ________

[5] **ENSURE** Component Test Matrix Generic Tracking Report has been evaluated and outstanding component test exceptions will **NOT** impact test start. ________

Date ________

4.1 Preliminary Actions (continued)

[6] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modification (T-Mods) do **NOT** adversely impact testing, and

ATTACH documentation of DCN's, EDCR's and T-Mods that were reviewed to the data package. ________

[7] **ENSURE** required Component Testing has been completed prior to start of test. ________

[8] **VERIFY** System cleanness as required for the performance of this test has been completed in accordance with SMP-7.0 for piping systems.

Subsection 6.4 or 6.5 (whichever is performed first) ________

[9] **ENSURE** all piping supports required for testing are installed and adjusted as required. ________

[10] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0. ________

[11] **ENSURE** communications are available for areas where testing is to be conducted. ________

[12] **VERIFY** plant instruments, listed on Appendix C, Permanent Plant Instrumentation Log, are placed in service and are within their calibration interval. ________

[13] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) and/or Plant Operations. ________

[14] **ENSURE** a review of outstanding Clearances has been coordinated with Operations for impact to the test performance, and

RECORD in Appendix B, Temporary Condition Log, if required. ________

Date ________

4.1 Preliminary Actions (continued)

NOTE
Any Annunciator points associated with 2-MUX-55-12 and 2-MUX-55-13 ONLY have master switches at the bottom of each terminal strip. All points associated with 2-TBK-55-25, 2-TBK-55-26, 2-TBK-55-27, and 2-TBK-55-28 will not have individual switches or a master switch.

[15] **ENSURE** System 55, Annunciator and Sequential Events Recording System applicable TBK switches are ON, the applicable Master Switches are ON, and window software input (s) are ENABLED for the following Annunciator windows .

A. 2-XA-55-4A-65E (Subsection 6.2) ________

B. 2-XA-55-4A-66E (Subsection 6.2) ________

C. 2-XA-55-4A-67E (Subsection 6.2) ________

D. 2-XA-55-4A-68E (Subsection 6.2) ________

E. 2-XA-55-6F-148B (Subsection 6.3) ________

F. 2-XA-55-6F-148C (Subsection 6.3) ________

[16] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, and

ATTACH to this PTI for use during the performance of this PTI. ________

[17] **PERFORM** a pretest walkdown on equipment to be tested to ensure **NO** conditions exist that will impact test performance. ________

[18] **OBSERVE** all Radiation Protection (RP) requirements when working in or near radiological areas. Failure to contact RP prior to any work in a Radiological Controlled Area (RCA) may result in noncompliance with applicable radiological requirements. ________

[19] **REVIEW** preventive maintenance for system/components covered by this test, and

VERIFY NO conditions exist that will impact test performance. ________

Date ________

4.1 Preliminary Actions (continued)

[20] **ENSURE** the following Integrated Computer System (ICS) points are in scan:

A. ZD1000 (Subsection 6.2) ________

B. ZD1002 (Subsection 6.2) ________

C. ZD1004 (Subsection 6.2) ________

D. ZD1006 (Subsection 6.2) ________

E. ZD1008 (Subsection 6.2) ________

F. ZD1010 (Subsection 6.2) ________

G. ZD1012 (Subsection 6.2) ________

H. ZD1014 (Subsection 6.2) ________

I. ZD1016 (Subsection 6.2) ________

J. ZD1018 (Subsection 6.2) ________

K. ZD1020 (Subsection 6.2) ________

L. ZD1022 (Subsection 6.2) ________

M. PD2002 (Subsection 6.3) ________

N. F2905A (Subsection 6.3) ________

O. PD2003 (Subsection 6.3) ________

P. F2906A (Subsection 6.3) ________

Q. PD2004 (Subsection 6.3) ________

R. F2907A (Subsection 6.3) ________

S. PD2005 (Subsection 6.3) ________

T. F2908A (Subsection 6.3) ________

Date ________

4.2 Test Equipment

[1] **ENSURE** the following test equipment/special tools are available:

- [4] Switched Jumpers (Grabber Type with Insulated Boots and in-line switch). ________

[2] **ENSURE** the following M&TE or equivalent is available and within their calibration due dates, and

RECORD the M&TE data on SMP-9.0, Measuring and Test equipment (M&TE) Log.

- [minimum of 2] Digital Stopwatch, accuracy $\pm$ 0.1 sec (Recommend Micronta). ________

Date ________

4.3 Field Preparations

[1] **ENSURE** scaffolding and platforms have been erected, as needed. ________

[2] **VERIFY** the following systems are operational and have been placed in service to the extent necessary to perform this test:

A. System 235, 120V AC Vital Power System ________

B. System 236, 125V DC Vital Power System ________

C. System 237, 120V AC Instrument Power System ________

D. System 032, Control Air ________

E. System 098, Foxboro I/A ________

F. System 099, Reactor Protection System ________

G. System 027, Condenser Circulating Water System (Section 6.5) ________

H. System 002, Condensate System (Section 6.5) ________

[3] **VERIFY** the Backup Nitrogen Supply for the Steam Generator PORVs is available (Section 6.3). ________

Date ________

4.3 Field Preparations (continued)

NOTES

1) Each 52STA contact assembly has two separate dust covers. The one furthest to the right will need to be removed to access each set of terminal points below. A small flathead screwdriver is required.
2) Steps 4.3[4] & 4.3[5] may be performed concurrently.

[4] **REMOVE** 52STA switch covers in the following breaker compartments to facilitate jumper installation in Step 4.3[5] (Section 6.2):

LOCATION Breaker / Board	INITIAL	CV
2-BKR-27-9 / 2-BD-201-A, CMPT 9		
2-BKR-27-19 / 2-BD-201-B, CMPT 5		
2-BKR-27-29 / 2-BD-201-C, CMPT 9		
2-BKR-27-39 / 2-BD-201-D, CMPT 5		

[5] **ENSURE** each switched jumper below is OPEN (OFF), **AND**

INSTALL across 52STA Contacts 5 & 6 (wires HH1 & HH2) at each of the following breaker compartments. (Section 6.2):

LABELED	LOCATION Breaker/Board	Ref Drawing	Across Terminal Points/Wire #s	POSITION	Initial	CV (initial)
TS-CCWA	2-BKR-27-9 / 2-BD-201-A, CMPT 9	0126D4614	52STA Contacts 5&6/ wires HH1&HH2	Installed & OFF		
TS-CCWB	2-BKR-27-19 / 2-BD-201-B, CMPT 5	0126D4606	52STA Contacts 5&6/ wires HH1&HH2	Installed & OFF		
TS-CCWC	2-BKR-27-29 / 2-BD-201-C, CMPT 9	0126D4664	52STA Contacts 5&6/ wires HH1&HH2	Installed & OFF		
TS-CCWD	2-BKR-27-39 / 2-BD-201-D, CMPT 5	0126D4656	52STA Contacts 5&6/ wires HH1&HH2	Installed & OFF		

Date ________

4.3 Field Preparations (continued)

NOTES

1) Each appendix below has a column designating whether the alignment change/verification is required for Performance Section 6.2 or 6.3.

2) The entire checklist may be performed at once or individually for Sections 6.2 and 6.3 at Test Directors discretion.

[6] **PERFORM** the Switch Lineup listed in Appendix D.

- Section 6.2 ________
- Section 6.3 ________

[7] **PERFORM** the Breaker Lineup listed in Appendix E.

- Section 6.2 ________
- Section 6.3 ________

[8] **PERFORM** the Valve Lineup listed in Appendix F.

- Section 6.2 ________
- Section 6.3 ________

Date ________

4.4 Approvals and Notifications

[1] **OBTAIN** permission of the Preoperational Startup Manager to start the test.

______________________________	__________
Preoperational Startup Manager Signature	Date

[2] **OBTAIN** Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

______________________________	__________
U2 US/SRO/SM Signature	Date

[3] **OBTAIN** the Unit 1 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

______________________________	__________
U1 US/SRO/SM Signature	Date

5.0 ACCEPTANCE CRITERIA

A. Each SG PORV can be operated from the Main Control Room (MCR), Auxiliary Control Room (ACR) or locally.

VALVE	MCR	ACR	LOCAL
2-PCV-1-5	6.3.2[4], 6.3.2[5], 6.3.2[12], 6.3.2[14]	6.3.2[27], 6.3.2[29]	6.4.2[19], 6.4.2[20]
2-PCV-1-12	6.3.3[4], 6.3.3[5], 6.3.3[12], 6.3.3[14]	6.3.3[27], 6.3.3[29]	6.4.3[19], 6.4.3[20]
2-PCV-1-23	6.3.4[4], 6.3.4[5], 6.3.4[12], 6.3.4[14]	6.3.4[27], 6.3.4[29]	6.4.4[19], 6.4.4[20]
2-PCV-1-30	6.3.5[4], 6.3.5[5], 6.3.5[12], 6.3.5[14]	6.3.5[27], 6.3.5[29]	6.4.5[19], 6.4.5[20]

B. SG PORV position indication correctly reflects valve position:

VALVE	HANDSWITCH INDICATION	PORV MONITORING SYSTEM INDICATION
2-PCV-1-5	6.3.2[3], 6.3.2[4], 6.3.2[13]	6.3.2[3], 6.3.2[4], 6.3.2[13]
2-PCV-1-12	6.3.3[3], 6.3.3[4], 6.3.3[13]	6.3.3[3], 6.3.3[4], 6.3.3[13]
2-PCV-1-23	6.3.4[3], 6.3.4[4], 6.3.4[13]	6.3.4[3], 6.3.4[4], 6.3.4[13]
2-PCV-1-30	6.3.5[3], 6.3.5[4] 6.3.5[13]	6.3.5[3], 6.3.5[4], 6.3.5[13]

C. SG PORV can be modulating from the ACR after its associated "D" transfer switch is placed in the "AUX" position.

VALVE	STEP
2-PCV-1-5	6.3.2[19]
2-PCV-1-12	6.3.3[19]
2-PCV-1-23	6.3.4[19]
2-PCV-1-30	6.3.5[19]

D. Annunciator will be in alarm when any SG PORV transfer switch, on a given ACR panel, is in AUX and will clear when all transfer switches are returned to normal.

VALVE	XS(s) on 2-L-11A	XS(s) on 2-L-11B
2-PCV-1-5	6.3.2[17], 6.3.2[33], 6.3.2[34]	6.3.2[23], 6.3.2[33]
2-PCV-1-12	6.3.3[23], 6.3.3[33]	6.3.3[17], 6.3.3[33], 6.3.3[34]
2-PCV-1-23	6.3.4[17], 6.3.4[33], 6.3.4[34]	6.3.4[23], 6.3.4[33]
2-PCV-1-30	6.3.5[23], 6.3.5[33]	6.3.5[17], 6.3.5[33], 6.3.5[34]

5.0 ACCEPTANCE CRITERIA (continued)

E. With control air supply unavailable, each SG PORV can be fully OPENED/CLOSED with the Backup N_2 supply system.

VALVE	OPENED	CLOSED
2-PCV-1-5	6.3.2[52]	6.3.2[57]
2-PCV-1-12	6.3.3[52]	6.3.3[57]
2-PCV-1-23	6.3.4[52]	6.3.4[57]
2-PCV-1-30	6.3.5[52]	6.3.5[57]

F. SG PORVs stroke open time is less than or equal to 32 seconds at Normal Operating Pressure (NOP).

VALVE	STEP
2-PCV-1-5	6.4.2[5]
2-PCV-1-12	6.4.3[5]
2-PCV-1-23	6.4.4[5]
2-PCV-1-30	6.4.5[5]

G. SG PORVs will trip open with pressure above the setpoint pressure.

VALVE	STEP
2-PCV-1-5	6.3.2[9]
2-PCV-1-12	6.3.3[9]
2-PCV-1-23	6.3.4[9]
2-PCV-1-30	6.3.5[9]

H. SG PORVs reseat properly after opening and do not chatter.

VALVE	STEP
2-PCV-1-5	6.4.2[21]
2-PCV-1-12	6.4.3[21]
2-PCV-1-23	6.4.4[21]
2-PCV-1-30	6.4.5[21]

5.0 ACCEPTANCE CRITERIA (continued)

I. Turbine Bypass System's Mode of operation (T_{AVG} or Steam Pressure) can be correctly selected using 2-HS-1-103D.

1. T_{AVG}: Step 6.2.2[68]
2. Steam Pressure: Step 6.2.2[44]

J. Condenser Steam Dump valves position indication correctly reflects valve position. Steps 6.2.2[32],6.2.2[35]

K. A given bank of Condenser Steam Dump Valves (group of 3) will not open until the previous bank has opened fully. Step 6.2.2[45]

L. A given bank of Condenser Steam Dump Valves (group of 3) will not close until the previous bank has closed fully. Step 6.2.2[44]

M. The following Condenser Steam Dump valves Trip OPEN on HI T_{AVG}.

VALVES	Load Rejection Bistable 2-TS-1-33A	Plant Tripped Bistable 2-TS-1-33D
2-FCV-1-103 2-FCV-1-104 2-FCV-1-107 2-FCV-1-108 2-FCV-1-111 2-FCV-1-112	6.2.2[72]	6.2.2[94]

N. The following Condenser Steam Dump valves Trip OPEN on HI-HI T_{AVG}.

VALVES	Load Rejection Bistable 2-TS-1-33B	Plant Tripped Bistable 2-TS-1-33E
2-FCV-1-105 2-FCV-1-106 2-FCV-1-109 2-FCV-1-110 2-FCV-1-113 2-FCV-1-114	6.2.2[74]	6.2.2[96]

5.0 ACCEPTANCE CRITERIA (continued)

O. Condenser Steam Dump valves MODULATE OPEN, TRIP CLOSED & TRIP OPEN stroke times are within acceptable limits.

VALVE	MODULATE OPEN ≤ 20 sec	TRIP CLOSE ≤ 5 sec	TRIP OPEN ≤ 3 sec
2-FCV-1-103	6.5.2[10.3]	6.5.2[10.5]	6.5.2[10.8]
2-FCV-1-104	6.5.2[11.3]	6.5.2[11.5]	6.5.2[11.8]
2-FCV-1-105	6.5.2[12.3]	6.5.2[12.5]	6.5.2[12.8]
2-FCV-1-106	6.5.2[13.3]	6.5.2[13.5]	6.5.2[13.8]
2-FCV-1-107	6.5.2[14.3]	6.5.2[14.5]	6.5.2[14.8]
2-FCV-1-108	6.5.2[15.3]	6.5.2[15.5]	6.5.2[15.8]
2-FCV-1-109	6.5.2[16.3]	6.5.2[16.5]	6.5.2[16.8]
2-FCV-1-110	6.5.2[17.3]	6.5.2[17.5]	6.5.2[17.8]
2-FCV-1-111	6.5.2[18.3]	6.5.2[18.5]	6.5.2[18.8]
2-FCV-1-112	6.5.2[19.3]	6.5.2[19.5]	6.5.2[19.8]
2-FCV-1-113	6.5.2[20.3]	6.5.2[20.5]	6.5.2[20.8]
2-FCV-1-114	6.5.2[21.3]	6.5.2[21.5]	6.5.2[21.8]

P. Condenser Steam Dump Valves are not available (C-9 not armed) unless each of the following conditions are satisfied:

1. At least 1 Condenser Circulating Water (CCW) Pump is running

CCW PUMP	STEP
2-PMP-27-9	6.2.2[3]
2-PMP-27-19	6.2.2[20]
2-PMP-27-29	6.2.2[22]
2-PMP-27-39	6.2.2[24]

AND

2. Each of Zone A and B Condenser Hotwell absolute pressure is lower than setpoint.

LOSS of CONDENSER VACUUM in:	STEP
ZONE A	6.2.2[28]
ZONE B	6.2.2[30]

5.0 ACCEPTANCE CRITERIA (continued)

Q. Condenser Steam Dump Valves will all close (if open) on loss of CCW pump interlock: Step 6.2.2[40].

R. Condenser Steam Dump Valves will all close (if open) on loss of Condenser Vacuum interlock: Step 6.2.2[42].

S. Condenser Steam Dump Valves will all close (if open) on RCS LO-LO T_{AVG} from either train of SSPS.

1. Train A: Step 6.2.2[47]
2. Train B: Step 6.2.2[53]

T. The RCS LO-LO T_{AVG} interlock can be bypassed allowing 2-FCV-1-103, 2-FCV-1-107, 2-FCV-1-111 to open.

1. Train A: Step 6.2.2[50]
2. Train B: Step 6.2.2[56]

Date ________

6.0 TEST PERFORMANCE

6.1 Initial Conditions

NOTES

1) Performance Sections 6.2 and 6.3 may be performed out of order. A section may be started prior to completion of another section; provided the sections are NOT performed simultaneously (e.g. 6.3 may be started if 6.2 is paused for TDN resolution).

2) Performance Sections 6.2 and 6.3 are prerequisite sections to Performance Sections 6.4 & 6.5.

3) Performance Sections 6.4 & 6.5 may be performed out of order.

VERIFY all Precautions and Limitations in Section 3.0 have been reviewed. ________

Date ________

6.2 Functional Test of Steam Dump Valves to Condenser (w/o Steam Discharge)

6.2.1 Preliminary Steps

[1] **VERIFY** Prerequisite Actions required for Performance Section 6.2 are complete. ________

> **NOTE**
>
> If MSS is to be pressurized during the performance of Section 6.2 and the system alignment/mode doesn't match that listed in 6.2.1[2], then the alignment changes should be performed utilizing the Sys 001 Operating Instruction (TOP, SOI, etc) that is currently operating the system.

[2] **IF** Section 6.2 is to be performed with the Main Steam System Pressurized, **THEN**

VERIFY the following

A. SG PORVs and/or SG Blowdown are available for pressure control (at U2 UO/SRO discretion) ________

B. Main Steam Isolation Valves (MSIVs)/MSIV warming valves Closed ________

[3] **ENSURE** manual output of 2-PIC-1-33, STM DUMP PRESS CONTROL [2-M-4] is set to 0% output. ________

[4] **PLACE** the following Foxboro Analog Input (AIN) points in Manual, with values as listed (W211CP, W2STMDUMP):

A. MNSTMPRESS - value set to 1092 PSIG ________

B. STM_TAVG - value set to 588.2°F ________

C. STM_TURBIMP - value set to 583.2°F ________

Date ________

6.2.1 Preliminary Steps (continued)

NOTES

1) Steps 6.2.1[5]A & 6.2.1[5]B simulate loss of main condenser vacuum.
2) Step 6.2.1[5]C simulates normal turbine load (ie not LOSS of LOAD).
3) Steps 6.2.1[5]D through 6.2.1[5]G simulate normal temperature error being calculated in the T_{AVG} steam dump controller (ie not HI or HI-HI error).

[5] **PLACE** the following Foxboro Contact Output (COUT) points in Manual, with COUT state set to, "contact open" ("1" COUT box GREY and "0" box WHITE):

A. 2PS0020001B (W207CP, W2BOP_002) ________

B. 2PS0020007D (W207CP, W2BOP_002) ________

C. 2PS0010072E (W205CP, W2TLLILK) ________

D. 2TS0010033A (W211CP, W2STMDUMP) ________

E. 2TS0010033B (W211CP, W2STMDUMP) ________

F. 2TS0010033D (W211CP, W2STMDUMP) ________

G. 2TS0010033E (W211CP, W2STMDUMP) ________

Date ________

6.2.1 Preliminary Steps (continued)

[6] **ENSURE** Rx trip/bypass BKRs are OPEN/OFF with control fuse holders positioned to OFF [2-L-116, A11V/782]:

Description	UNID	As Found	Position Required	Initial
RTA	2-BKR-99-L116/1B-A		OFF	
BYA	2-BKR-99-L116/2B-A		OFF	
Fuse Block Holder For Fuses at right	2-FU-99-L116/RTAP 2-FU-99-L116/RTAN		OFF	
Fuse Block Holder For Fuses at right	2-FU-99-L116/BYAP 2-FU-99-L116/BYAN		OFF	
RTB	2-BKR-99-L116/1C-B		OFF	
BYB	2-BKR-99-L116/2C-B		OFF	
Fuse Block Holder For Fuses at right	2-FU-99-L116/RTBP 2-FU-99-L116/RTBN		OFF	
Fuse Block Holder For Fuse at right	2-FU-99-L116/BYBP 2-FU-99-L116/BYBN		OFF	

Date ________

6.2.2 Steam Dump Valves to Condenser Logic

[1] **PLACE** the following Foxboro COUT points in "contacts closed" state ("1" COUT box WHITE and "0" box GREY):

A. 2PS0020001B (W207CP, W2BOP_002) ________

B. 2PS0020007D (W207CP, W2BOP_002) ________

[2] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B [2-M-4], STEAM DUMPS ARMED, white light is **NOT** LIT ________

[3] **PLACE** TS-CCWA [2-BD-201-A, CMPT 9] to ON, and

VERIFY the following (**Acc Crit 5.0P.1**):

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

C. Unit 2 Alarm Events Display Screen indicates 65-E C-9 CONDENSER AVAILABLE is in ALARM (Red) ________

[4] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

C. 2-XA-55-4A-66E, C-7 LOSS OF LOAD STM DUMP INTERLOCK is **NOT** LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[5] **PLACE** Foxboro COUT point 2PS0010072E (W205CP, W2TLLILK) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER INTERLOCK, is LIT ________

B. 2-XA-55-4A-66E, C-7 LOSS OF LOAD STM DUMP INTERLOCK, is LIT ________

C. Unit 2 Alarm Events Display Screen indicates 66-E C-7 LOSS OF LOAD STM DUMP INTERLOCK is in ALARM (Red) ________

D. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[6] **PLACE** Foxboro point 2PS0010072E (W205CP, W2TLLILK) in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER INTERLOCK, is LIT ________

B. 2-XA-55-4A-66E, C-7 LOSS OF LOAD STM DUMP INTERLOCK, is LIT ________

C. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[7] **MOMENTARILY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to RESET, and

RETURN to TAVG ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[8] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XA-55-4A-66E, C-7 LOSS OF LOAD STM DUMP INTERLOCK, is **NOT** LIT ________

C. Unit 2 Alarm Events Display Screen indicates 66-E C-7 LOSS OF LOAD STM DUMP INTERLOCK is NORMAL (Green) ________

D. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

NOTE
Step 6.2.2[9] simulates TR A Reactor Trip Breaker being OPEN.

[9] **PRESS** and **HOLD** the relay armature bar on relay X1A [2-L-116, CAB 2, CUBICLE D]. ________

[10] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[11] **RELEASE** the relay armature bar on X1A. ________

NOTES
1) Step 6.2.2[12] simulates TR A Reactor Trip Bypass Breaker being OPEN. 2) Maintain relay armature bar pressed until step 6.2.2[16]

[12] **PRESS** and **HOLD** the relay armature bar on relay X4A [2-L-116, CAB 2, CUBICLE D]. ________

[13] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[14] **PRESS** and **HOLD** the relay armature bar on relay X1A. ________

[15] **VERIFY** the following:

A. 2-XA-55-4A-66E, C-9 CONDENSER INTERLOCK, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[16] **RELEASE** the relay armature bars of the following relays:

A. X1A ________

B. X4A ________

[17] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[18] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[19] **PLACE** TS-CCWA [2-BD-201-A, CMPT 9] to OFF, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. Unit 2 Alarm Events Display Screen indicates 65-E C-9 CONDENSER AVAILABLE is NORMAL (Green). ________

C. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[20] **PLACE** TS-CCWB [2-BD-201-B, CMPT 5] to ON, and

VERIFY the following (**Acc Crit 5.0P.1**):

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[21] **PLACE** TS-CCWB to OFF, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[22] **PLACE** TS-CCWC [2-BD-201-C, CMPT 9] to ON, and

VERIFY the following (**Acc Crit 5.0P.1**):

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[23] **PLACE** TS-CCWC to OFF, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

Date ________

6.2.2 **Steam Dump Valves to Condenser Logic (continued)**

[24] **PLACE** TS-CCWD [2-BD-201-D, CMPT 5] to ON, and

VERIFY the following (**Acc Crit 5.0P.1**):

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[25] **PLACE** TS-CCWD to OFF, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[26] **PLACE** TS-CCWD to ON, and

VERIFY the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[27] **PLACE** Foxboro point 2PS0020001B (W207CP, W2BOP_002) in “contact open” state (“1” COUT box GREY and “0” box WHITE), and

VERIFY the following:

A. 2-XA-55-4A-66E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[28] **PLACE** Foxboro point 2PS0020001B (W207CP, W2BOP_002) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following (**Acc Crit 5.0P.2**):

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[29] **PLACE** Foxboro point 2PS0020007D (W207CP, W2BOP_002) in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY the following:

A. 2-XA-55-4A-66E, C-9 CONDENSER AVAILABLE, is **NOT** LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[30] **PLACE** Foxboro point 2PS0020007D (W207CP, W2BOP_002) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following: (**Acc Crit 5.0P.2**)

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

[31] **VERIFY** the following:

A. % DEVIATION, on 2-PIC-1-33 indicates 0 ________

B. 2-XI-1-33, STEAM DUMP DEMAND, [2-M-4] indicates 0% ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[32] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

VERIFY all steam dump valves are CLOSED: (**Acc Crit 5.0J**)

UNID	2-XX-55-4A OPEN/CLOSE LIGHTS		LOCAL	COMPUTER POINT INDICATES CLOSED	INITIAL
	(window #) RED	(window #) GREEN			
2-FCV-1-103	(1) **NOT** LIT ☐	(7) LIT ☐	CLOSED ☐	ZD1000 ☐	
2-FCV-1-104	(13) **NOT** LIT ☐	(19) LIT ☐	CLOSED ☐	ZD1002 ☐	
2-FCV-1-105	(2) **NOT** LIT ☐	(8) LIT ☐	CLOSED ☐	ZD1004 ☐	
2-FCV-1-106	(14) **NOT** LIT ☐	(20) LIT ☐	CLOSED ☐	ZD1006 ☐	
2-FCV-1-107	(3) **NOT** LIT ☐	(9) LIT ☐	CLOSED ☐	ZD1008 ☐	
2-FCV-1-108	(15) **NOT** LIT ☐	(21) LIT ☐	CLOSED ☐	ZD1010 ☐	
2-FCV-1-109	(4) **NOT** LIT ☐	(10) LIT ☐	CLOSED ☐	ZD1012 ☐	
2-FCV-1-110	(16) **NOT** LIT ☐	(22) LIT ☐	CLOSED ☐	ZD1014 ☐	
2-FCV-1-111	(5) **NOT** LIT ☐	(11) LIT ☐	CLOSED ☐	ZD1016 ☐	
2-FCV-1-112	(17) **NOT** LIT ☐	(23) LIT ☐	CLOSED ☐	ZD1018 ☐	
2-FCV-1-113	(6) **NOT** LIT ☐	(12) LIT ☐	CLOSED ☐	ZD1020 ☐	
2-FCV-1-114	(18) **NOT** LIT ☐	(24) LIT ☐	CLOSED ☐	ZD1022 ☐	

[33] **VERIFY** 2-XI-1-33, STEAM DUMP DEMAND indicates 100%. ________

[34] **PLACE** the following handswitches to ON:

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[35] **VERIFY** all steam dump valves OPEN: (**Acc Crit 5.0J**)

UNID	2-XX-55-4A OPEN/CLOSE LIGHTS		LOCAL	COMPUTER POINT INDICATES NOT CLOSED	INITIAL
	(window #) RED	(window #) GREEN			
2-FCV-1-103	(1) LIT ☐	(7) **NOT** LIT ☐	OPEN ☐	ZD1000 ☐	
2-FCV-1-104	(13) LIT ☐	(19) **NOT** LIT ☐	OPEN ☐	ZD1002 ☐	
2-FCV-1-105	(2) LIT ☐	(8) **NOT** LIT ☐	OPEN ☐	ZD1004 ☐	
2-FCV-1-106	(14) LIT ☐	(20) **NOT** LIT ☐	OPEN ☐	ZD1006 ☐	
2-FCV-1-107	(3) LIT ☐	(9) **NOT** LIT ☐	OPEN ☐	ZD1008 ☐	
2-FCV-1-108	(15) LIT ☐	(21) **NOT** LIT ☐	OPEN ☐	ZD1010 ☐	
2-FCV-1-109	(4) LIT ☐	(10) **NOT** LIT ☐	OPEN ☐	ZD1012 ☐	
2-FCV-1-110	(16) LIT ☐	(22) **NOT** LIT ☐	OPEN ☐	ZD1014 ☐	
2-FCV-1-111	(5) LIT ☐	(11) **NOT** LIT ☐	OPEN ☐	ZD1016 ☐	
2-FCV-1-112	(17) LIT ☐	(23) **NOT** LIT ☐	OPEN ☐	ZD1018 ☐	
2-FCV-1-113	(6) LIT ☐	(12) **NOT** LIT ☐	OPEN ☐	ZD1020 ☐	
2-FCV-1-114	(18) LIT ☐	(24) **NOT** LIT ☐	OPEN ☐	ZD1022 ☐	

[36] **PLACE** 2-HS-1-103A, STEAM DUMP FSV "A", to OFF RESET, and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

[37] **PLACE** 2-HS-1-103A, STEAM DUMP FSV "A", to ON, and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). ________

[38] **PLACE** 2-HS-1-103B, STEAM DUMP FSV "B", to OFF RESET, and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[39] **PLACE** 2-HS-1-103B, STEAM DUMP FSV “B”, to ON, and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). ________

[40] **PLACE** TS-CCWD to OFF, and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). (**Acc Crit 5.0Q**) ________

[41] **PLACE** TS-CCWD to ON, and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). ________

[42] **PLACE** Foxboro point 2PS0020001B (W207CP, W2BOP_002) in “contact open” state (“1” COUT box GREY and “0” box WHITE), and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). (**Acc Crit 5.0R**) ________

[43] **PLACE** Foxboro point 2PS0020001B (W207CP, W2BOP_002) in “contact closed” state (“1” COUT box WHITE and “0” box GREY), and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

NOTES

1) REQUIRED 2-PIC-1-33 OUTPUT % is approximate, as much as +/-2% is acceptable.
2) Valve position is determined from each valve's pair of OPEN/CLOSED windows on 2-XX-55-4A, as follows: "OPEN" for RED window ONLY LIT, "MODULATED" for both windows LIT, and "CLOSED" for GREEN window ONLY LIT.

[44] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % from 100% to 0%, stopping at 88%, 75%, 63%, 50%, 38%, 25% & 13%, and

VERIFY valve position matches the table:(**Acc Crit 5.0I.2, 5.0L**)

2-PIC-1-33 OUTPUT%	2-XI-1-33	Group 1 2-FCV-1-103 2-FCV-1-107 2-FCV-1-111	Group 2 2-FCV-1-104 2-FCV-1-108 2-FCV-1-112	Group 3 2-FCV-1-105 2-FCV-1-109 2-FCV-1-113	Group 4 2-FCV-1-106 2-FCV-1-110 2-FCV-1-114	INITIAL
88%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	MODULATED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
75%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
63%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	MODULATED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
50%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
38%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	MODULATED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
25%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
13%	____%	MODULATED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
0%	____%	CLOSED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[45] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % from 0% to 100%, stopping at 13%, 25%, 38%, 50%, 63%, 75% & 88% and

VERIFY valve position matches the table:(**Acc Crit 5.0K**)

2-PIC-1-33 OUTPUT %	2-XI-1-33	Group 1 2-FCV-1-103 2-FCV-1-107 2-FCV-1-111	Group 2 2-FCV-1-104 2-FCV-1-108 2-FCV-1-112	Group 3 2-FCV-1-105 2-FCV-1-109 2-FCV-1-113	Group 4 2-FCV-1-106 2-FCV-1-110 2-FCV-1-114	INITIAL
13%	____%	MODULATED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
25%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
38%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	MODULATED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
50%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
63%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	MODULATED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
75%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
88%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	MODULATED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
100%	____%	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	OPEN 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	

[46] **PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A [2-R-48]. ________

[47] **VERIFY** ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). (**Acc Crit 5.0S.1**) ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[48] **VERIFY** 2-XA-55-4A-67E, STM DUMP TR-A INTLK BYPASSED, is **NOT** LIT. ________

[49] **PLACE** 2-HS-1-103A, STEAM DUMP FSV "A", to BYPASS INTLK, and

RELEASE to ON. ________

[50] **VERIFY** the following: (**Acc Crit 5.0T.1**)

A. RED light ONLY LIT at 2-XX-55-4A for the following valves (COOLDOWN dump valves OPEN):

- 2-FCV-1-103 ________
- 2-FCV-1-107 ________
- 2-FCV-1-111 ________

B. 2-XA-55-4A-67E, STM DUMP TR-A INTLK BYPASSED, is LIT ________

C. Unit 2 Alarm Events Display Screen indicates 67-E STM DUMP TR-A COOLDOWN INTLK BYPASSED is in ALARM (Red) ________

[51] **RELEASE** the relay armature bar on WBN-2-RLY-099-K631A, and

VERIFY the following:

A. ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN) ________

B. 2-XA-55-4A-67E, STEAM DUMP TR-A INTLK BYPASSED, is **NOT** LIT ________

C. Unit 2 Alarm Events Display Screen indicates 67-E STM DUMP TR-A COOLDOWN INTLK BYPASSED is NORMAL (Green) ________

[52] **PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631B [2-R-51]. ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[53] **VERIFY** ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). (**Acc Crit 5.0S.2**) ________

[54] **VERIFY** 2-XA-55-4A-68E, STEAM DUMP TR-B INTLK BYPASSED, is **NOT** LIT. ________

[55] **PLACE** 2-HS-1-103B, STEAM DUMP FSV "B", to BYPASS INTLK, and

RELEASE to ON. ________

[56] **VERIFY** the following: (**Acc 5.0T.2**)

A. RED light ONLY LIT at 2-XX-55-4A for the following valves (COOLDOWN dump valves OPEN):

- 2-FCV-1-103 ________
- 2-FCV-1-107 ________
- 2-FCV-1-111 ________

B. 2-XA-55-4A-68E, STEAM DUMP TR-B INTLK BYPASSED, is LIT ________

C. Unit 2 Alarm Events Display Screen indicates 68-E STM DUMP TR-B COOLDOWN INTLK BYPASSED is in ALARM (Red) ________

[57] **RELEASE** the relay armature bar on WBN-2-RLY-099-K631B, and

VERIFY the following:

A. ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN) ________

B. 2-XA-55-4A-68E, STEAM DUMP TR-B INTLK BYPASSED, is **NOT** LIT ________

C. Unit 2 Alarm Events Display Screen indicates 68-E STM DUMP TR-B COOLDOWN INTLK BYPASSED is NORMAL (Green) ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[58] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

[59] **PLACE** 2-PIC-1-33, STM DUMP PRESS CONTROL, in AUTO. ________

[60] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT % to 75%, and

VERIFY the following:

A. % DEVIATION, on 2-PIC-1-33 indicates (-)9 ________

B. OUTPUT %, on 2-PIC-1-33 increases towards 100% ________

C. 2-XI-1-33, STEAM DUMP DEMAND, indication increases towards 100% ________

D. STEAM DUMPS begin to OPEN (as indicated on 2-XX-55-4A) ________

[61] **WHEN** OUTPUT %, on 2-PIC-1-33 indicates 100%, **THEN**

VERIFY the following :

A. % DEVIATION, on 2-PIC-1-33 indicates (-)9 ________

B. 2-XI-1-33, STEAM DUMP DEMAND, indicates 100% ________

C. ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN) ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[62] **ADJUST** the Foxboro AIN point, MNSTMPRESS (W211CP, W2STMDUMP), to a value of 975 PSIG, and

VERIFY the following:

A. % DEVIATION, on 2-PIC-1-33 indicates 0 ________

B. OUTPUT %, on 2-PIC-1-33 decreases towards 0% ________

C. 2-XI-1-33, STEAM DUMP DEMAND, indication decreases towards 0% ________

D. STEAM DUMPS begin to CLOSE (as indicated on 2-XX-55-4A) ________

[63] **WHEN** OUTPUT %, on 2-PIC-1-33 indicates 0%, **THEN**

VERIFY the following:

A. % DEVIATION, on 2-PIC-1-33 indicates 0 ________

B. 2-XI-1-33, STEAM DUMP DEMAND, indicates 0% ________

C. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

[64] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT % to 84%, and

VERIFY the following:

A. % DEVIATION, on 2-PIC-1-33 indicates 9 ________

B. 2-XI-1-33, STEAM DUMP DEMAND, indicates 0% ________

C. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

[65] **ADJUST** the Foxboro AIN point, MNSTMPRESS (W211CP, W2STMDUMP), to a value of 1092 PSIG, and

VERIFY % DEVIATION, on 2-PIC-1-33 indicates 0. ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[66] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

VERIFY the following:

A. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[67] **PLACE** Foxboro point 2PS0010072E (W205CP, W2TLLILK) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following:

A. 2-XA-55-4A-66E, C-7 LOSS OF LOAD STM DUMP INTERLOCK, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[68] **ADJUST** the Foxboro AIN point, STM_TURBIMP (W211CP, W2STMDUMP) value from 583.2°F to 572.6°F, stopping at 582°F, 579°F, 577°F & 574°F, and

VERIFY valve position/demand matches that in the table below: (**Acc Crit 5.0I.1**)

STM_TURBIMP VALUE	2-XI-1-33 Indication	Group 1 2-FCV-1-103 2-FCV-1-107 2-FCV-1-111	Group 2 2-FCV-1-104 2-FCV-1-108 2-FCV-1-112	Group 3 2-FCV-1-105 2-FCV-1-109 2-FCV-1-113	Group 4 2-FCV-1-106 2-FCV-1-110 2-FCV-1-114	INITIAL
582°F	~11%☐	MODULATED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
579°F	~40%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	MODULATED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
577°F	~58%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	MODULATED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
574°F	~86%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	MODULATED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
572.6°F	100%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	OPEN 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	

[69] **PLACE** 2PS0010072E (W205CP, W2TLLILK) in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY ALL RED lights and **NO** GREEN lights are **LIT** at 2-XX-55-4A (all STEAM DUMPS OPEN). ________

[70] **ADJUST** the Foxboro AIN point, STM_TURBIMP (W211CP, W2STMDUMP) value to 583.2°F, and

VERIFY all STEAM DUMPS CLOSE (ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A). ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[71] **VERIFY** 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is **NOT** LIT. ________

[72] **PLACE** Foxboro point 2TS0010033A (W211CP, W2STMDUMP) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following: (**Acc Crit 5.0M**)

UNID	POSITION (expected)	2-XX-55-4A OPEN/CLOSE LIGHTS		INITIAL
		(window #) RED	(window #) GREEN	
2-FCV-1-103	OPEN	(1) LIT ☐	(7) **NOT** LIT ☐	
2-FCV-1-104	OPEN	(13) LIT ☐	(19) **NOT** LIT ☐	
2-FCV-1-107	OPEN	(3) LIT ☐	(9) **NOT** LIT ☐	
2-FCV-1-108	OPEN	(15) LIT ☐	(21) **NOT** LIT ☐	
2-FCV-1-111	OPEN	(5) LIT ☐	(11) **NOT** LIT ☐	
2-FCV-1-112	OPEN	(17) LIT ☐	(23) **NOT** LIT ☐	
2-FCV-1-109	CLOSED	(4) **NOT** LIT ☐	(10) LIT ☐	
2-FCV-1-110	CLOSED	(16) **NOT** LIT ☐	(22) LIT ☐	
2-FCV-1-113	CLOSED	(6) **NOT** LIT ☐	(12) LIT ☐	
2-FCV-1-114	CLOSED	(18) **NOT** LIT ☐	(24) LIT ☐	
2-FCV-1-105	CLOSED	(2) **NOT** LIT ☐	(8) LIT ☐	
2-FCV-1-106	CLOSED	(14) **NOT** LIT ☐	(20) LIT ☐	

[73] **VERIFY** 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is LIT. ________

[74] **PLACE** 2TS0010033B (W211CP, W2STMDUMP) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). (**Acc Crit 5.0N**) ________

[75] **PLACE** the following Foxboro points in "contact open" state ("1" COUT box GREY and "0" box WHITE):

A. 2TS0010033A (W211CP, W2STMDUMP) ________

B. 2TS0010033B (W211CP, W2STMDUMP) ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[76] **VERIFY** the following:

A. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

B. 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is **NOT** LIT ________

[77] **PLACE** 2-PIC-1-33, STM DUMP PRESS CONTROL, in MAN. ________

[78] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100% and

VERIFY the following:

A. 2-XI-1-33, STEAM DUMP DEMAND, indicates 0% ________

B. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

[79] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0 %. ________

[80] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to RESET, and

RELEASE to TAVG. ________

[81] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is **NOT** LIT ________

[82] **PLACE** the Fuse Block Holders for the following set of fuses to ON:

A. 2-FU-99-L116/RTAP & 2-FU-99-L116/RTAN ________

B. 2-FU-99-L116/BYAP & 2-FU-99-L116/BYAN ________

[83] **VERIFY** the following:

A. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

B. 2-XI-1-103A/B, STEAM DUMPS ARMED, white light is LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[84] **ADJUST** the Foxboro AIN point, STM_TAVG (W211CP, W2STMDUMP) to 588.3°F, and

VERIFY ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

NOTE

Step 6.2.2[85] simulates TR B Reactor Trip Breaker being OPEN.

[85] **PRESS** and **HOLD** the relay armature bar on relay X1B [2-L-116, CAB 1, CUBICLE D]. ________

[86] **VERIFY** ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

[87] **RELEASE** the relay armature bar on X1B. ________

NOTES

1) Step 6.2.2[88] simulates TR B Reactor Trip Bypass Breaker being OPEN.
2) Maintain relay armature bar pressed until step 6.2.2[99]

[88] **PRESS** and **HOLD** the relay armature bar on relay X4B [2-L-116, CAB 1, CUBICLE D]. ________

[89] **VERIFY** ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

[90] **PRESS** and **HOLD** the relay armature bar on relay X1B. ________

[91] **VERIFY** the following:

A. ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN) ________

B. 2-XI-1-33, STEAM DUMP DEMAND, indicates 100% DEMAND ________

C. 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is LIT ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

NOTE

Allow ~20 seconds between STM_TAVG adjustment and valve position/indication verification. The immediate gain applied to the step change adjustment may result in additional valves, initially starting to OPEN (before returning to CLOSE).

[92] **ADJUST** the Foxboro AIN point, STM_TAVG (W211CP, W2STMDUMP) from a value of 588.3°F to 557°F, pausing at 584°F, 577°F, 569°F & 561°F, and

VERIFY valve position/demand matches that in the table below:

STM_TAVG VALUE	2-XI-1-33 Indication	Group 1 2-FCV-1-103 2-FCV-1-107 2-FCV-1-111	Group 2 2-FCV-1-104 2-FCV-1-108 2-FCV-1-112	Group 3 2-FCV-1-105 2-FCV-1-109 2-FCV-1-113	Group 4 2-FCV-1-106 2-FCV-1-110 2-FCV-1-114	INITIAL
584°F	~86%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	OPEN 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	MODULATED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
577°F	~64%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	OPEN 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	MODULATED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
569°F	~38%☐	OPEN 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	MODULATED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
561°F	~13%☐	MODULATED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	
557°F	0%☐	CLOSED 2-FCV-1-103 ☐ 2-FCV-1-107 ☐ 2-FCV-1-111 ☐	CLOSED 2-FCV-1-104 ☐ 2-FCV-1-108 ☐ 2-FCV-1-112 ☐	CLOSED 2-FCV-1-105 ☐ 2-FCV-1-109 ☐ 2-FCV-1-113 ☐	CLOSED 2-FCV-1-106 ☐ 2-FCV-1-110 ☐ 2-FCV-1-114 ☐	

[93] **VERIFY** 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is **NOT** LIT. ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[94] **PLACE** Foxboro point 2TS0010033D (W211CP, W2STMDUMP) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY the following: (**Acc Crit 5.0M**)

UNID	POSITION (expected)	2-XX-55-4A OPEN/CLOSE LIGHTS		INITIAL
		(window #) RED	(window #) GREEN	
2-FCV-1-103	OPEN	(1) LIT ☐	(7) **NOT** LIT ☐	
2-FCV-1-104	OPEN	(13) LIT ☐	(19) **NOT** LIT ☐	
2-FCV-1-107	OPEN	(3) LIT ☐	(9) **NOT** LIT ☐	
2-FCV-1-108	OPEN	(15) LIT ☐	(21) **NOT** LIT ☐	
2-FCV-1-111	OPEN	(5) LIT ☐	(11) **NOT** LIT ☐	
2-FCV-1-112	OPEN	(17) LIT ☐	(23) **NOT** LIT ☐	
2-FCV-1-109	CLOSED	(4) **NOT** LIT ☐	(10) LIT ☐	
2-FCV-1-110	CLOSED	(16) **NOT** LIT ☐	(22) LIT ☐	
2-FCV-1-113	CLOSED	(6) **NOT** LIT ☐	(12) LIT ☐	
2-FCV-1-114	CLOSED	(18) **NOT** LIT ☐	(24) LIT ☐	
2-FCV-1-105	CLOSED	(1) **NOT** LIT ☐	(8) LIT ☐	
2-FCV-1-106	CLOSED	(14) **NOT** LIT ☐	(20) LIT ☐	

[95] **VERIFY** 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is LIT. ________

[96] **PLACE** Foxboro point 2TS0010033E (W211CP, W2STMDUMP) in "contact closed" state ("1" COUT box WHITE and "0" box GREY), and

VERIFY ALL RED lights and **NO** GREEN lights are LIT at 2-XX-55-4A (all STEAM DUMPS OPEN). (**Acc Crit 5.0N**) ________

Date ________

6.2.2 Steam Dump Valves to Condenser Logic (continued)

[97] **PLACE** the following Foxboro points in "contact open" state ("1" COUT box GREY and "0" box WHITE):

A. 2TS0010033A (W211CP, W2STMDUMP) ________

B. 2TS0010033B (W211CP, W2STMDUMP) ________

[98] **VERIFY** the following:

A. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

B. 2-XI-1-103D, STM DUMPS ACT 'D' FSV'S ON, is **NOT** LIT ________

[99] **RELEASE** the relay armature bars of the following relays:

A. X1B ________

B. X4B ________

[100] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100% and

VERIFY the following:

A. 2-XI-1-33, STEAM DUMP DEMAND, indicates 0% ________

B. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

[101] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0 %, and

PLACE 2-PIC-1-33 in AUTO. ________

Date ________

6.2.3 Section Restoration

NOTE
Restoration steps may be performed out of order as directed by Test Director.

[1] **ENSURE** Rx trip/bypass BKRs and control fuse holders are RESTORED to the "As-Found" position recorded in Step 6.2.1[6]:

Description	UNID	As Found (from 6.2.1[6])	Initial
RTA	2-BKR-99-L116/1B-A		
BYA	2-BKR-99-L116/2B-A		
Fuse Block Holder For Fuses at right	2-FU-99-L116/RTAP 2-FU-99-L116/RTAN		
Fuse Block Holder For Fuses at right	2-FU-99-L116/BYAP 2-FU-99-L116/BYAN		
RTB	2-BKR-99-L116/1C-B		
BYB	2-BKR-99-L116/2C-B		
Fuse Block Holder For Fuses at right	2-FU-99-L116/RTBP 2-FU-99-L116/RTBN		
Fuse Block Holder For Fuse at right	2-FU-99-L116/BYBP 2-FU-99-L116/BYBN		

Date ________

6.2.3 Section Restoration (continued)

[2] **REMOVE** the switched jumpers from 52STA Contacts 5 & 6 (wires HH1 & HH2) at each of the following breaker compartments:

LABELED	LOCATION Breaker / Board	Ref Drawing	Across Terminal Points/Wire #s	POSITION	Initial	CV (initial)
TS-CCWA	2-BKR-27-9 / 2-BD-201-A, CMPT 9	0126D4614	52STA Contacts 5&6/ wires HH1&HH2	Removed		
TS-CCWB	2-BKR-27-19 / 2-BD-201-B, CMPT 5	0126D4606	52STA Contacts 5&6/ wires HH1&HH2	Removed		
TS-CCWC	2-BKR-27-29 / 2-BD-201-C, CMPT 9	0126D4664	52STA Contacts 5&6/ wires HH1&HH2	Removed		
TS-CCWD	2-BKR-27-39 / 2-BD-201-D, CMPT 5	0126D4656	52STA Contacts 5&6/ wires HH1&HH2	Removed		

[3] **INSTALL** 52STA switch covers in the following breaker compartments after jumper removal in Step 6.2.3[2]

LOCATION Breaker / Board	INITIAL	CV
2-BKR-27-9 / 2-BD-201-A, CMPT 9		
2-BKR-27-19 / 2-BD-201-B, CMPT 5		
2-BKR-27-29 / 2-BD-201-C, CMPT 9		
2-BKR-27-39 / 2-BD-201-D, CMPT 5		

Date ________

6.2.3 Section Restoration (continued)

[4] **RETURN** the following Foxboro points to AUTO:

A. MNSTMPRESS (W211CP, W2STMDUMP) ________

B. STM_TAVG (W211CP, W2STMDUMP) ________

C. STM_TREF (W211CP, W2STMDUMP) ________

D. 2PS0020001B (W207CP, W2BOP_002) ________

E. 2PS0020007D (W207CP, W2BOP_002) ________

F. 2PS0010072E (W205CP, W2TLLILK) ________

G. 2TS0010033A (W211CP, W2STMDUMP) ________

H. 2TS0010033B (W211CP, W2STMDUMP) ________

I. 2TS0010033D (W211CP, W2STMDUMP) ________

J. 2TS0010033E (W211CP, W2STMDUMP) ________

Date ________

6.3 Functional Test of SG PORVs (No Steam Discharge)

6.3.1 Preliminary Actions

NOTE

Performance Subsections: 6.3.2, 6.3.3, 6.3.4 & 6.3.5 may be performed in any order. A subsection may be started prior to completion of another subsection; provided the sections are NOT performed simultaneously (e.g. 6.3.3 may be started if 6.3.2 is paused for TDN resolution).

[1] **VERIFY** Prerequisite Actions required for Performance Section 6.3 are complete. ________

NOTES

1) If the MSS is pressurized the Steam Dump System must be in-service for pressure/temperature control.
2) If Steam Dump System isn't currently in-service, the alignment change should be made utilizing the Sys 001 Operating Instruction (TOP, SOI, etc) that is currently operating the system.

[2] **IF** Section 6.3 is to be performed with the Main Steam System Pressurized, **THEN**

ENSURE the following

A. Steam Dump System is in-service for pressure control. ________

B. 2-ISV-1-619, MAIN STEAM LOOP 1 PORV ISOLATION, [761/SVVR] is CLOSED ________

C. 2-ISV-1-622, MAIN STEAM LOOP 4 PORV ISOLATION, [761/SVVR] is CLOSED ________

D. 2-ISV-1-620, MAIN STEAM LOOP 2 PORV ISOLATION, [761/NVVR] is CLOSED ________

E. 2-ISV-1-621, MAIN STEAM LOOP 3 PORV ISOLATION, [761/NVVR] is CLOSED ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic

[1] **PLACE** Foxboro Analog Input (AIN) point 2STMPRS (W207CP, W2SG1PORV) in Manual, with value set to 1125 PSIG. ________

[2] **PLACE** Foxboro point 2PS0010006 in Manual, with COUT state set to, "contact open" ("1" COUT box GREY and "0" box WHITE). ________

[3] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, [2-M-4] to P AUTO, and

VERIFY the following: (**Acc Crit 5.0B**)

A. 2-PCV-1-5 [SVVR/761] is CLOSED (locally). ________

B. ON 2-HS-1-6:

- Red Light OFF ________
- Green light ON ________

C. Computer Point PD2002 indicates CLOSED ________

D. Computer Point F2905A indicates 0% valve lift ________

[4] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to OPEN, and

VERIFY the following: (**Acc Crit 5.0A, 5.0B**)

A. 2-PCV-1-5 is OPEN (locally) ________

B. ON 2-HS-1-6:

- Red Light ON ________
- Green light OFF ________

C. Computer Point PD2002 indicates OPEN ________

D. Computer Point F2905A indicates 100% valve lift ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

> **NOTE**
>
> For the remainder of this section, unless otherwise indicated: 2-PCV-1-5 OPEN/CLOSED position verification will be based on 2-HS-1-6 indicating lights, as follows:
>
> - OPEN for RED light ON and GREEN light OFF.
> - CLOSED for GREEN light ON and RED light OFF.

[5] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to CLOSE, and

VERIFY 2-PCV-1-5 CLOSES. (**Acc Crit 5.0A**) ________

[6] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to P AUTO. ________

[7] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, [2-M-4] SETPOINT % to 77%, and

VERIFY the following:

A. 2-PCV-1-5 OPENS ________

B. 2-PIC-1-6A % DEVIATION indicates (-)10 ________

C. 2-PIC-1-6A OUTPUT % indicates 100% ________

[8] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 95%, and

VERIFY the following:

A. 2-PCV-1-5 CLOSES ________

B. 2-PIC-1-6A % DEVIATION indicates +8 ________

C. 2-PIC-1-6A OUTPUT % indicates 0% ________

[9] **PLACE** Foxboro point 2PS0010006 in “contact closed” state (“1” COUT box WHITE and “0” box GREY), and

VERIFY 2-PCV-1-5 OPENS. (**Acc Crit 5.0G**) ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[10] **PLACE** Foxboro point 2PS0010006 in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY 2-PCV-1-5 CLOSES. ________

[11] **PLACE** 2-PIC-1-6A, SG 1 PORV PCV-1-5, in MAN. ________

[12] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, OUTPUT % to 100% and

VERIFY 2-PCV-1-5 OPENS. (**Acc Crit 5.0A**) ________

[13] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, OUTPUT % to 50%, and

VERIFY/RECORD the following: (**Acc Crit 5.0B**)

A. Dual Red/Green Light Indication at 2-HS-1-6 (2-PCV-1-5 MODULATED) ________

B. Computer Point PD2002 indicates OPEN ________

C. 2-PCV-1-5 % LIFT (Log Point F2905A) = ________% (50% expected value) ________

[14] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, OUTPUT % to 0%, and

VERIFY 2-PCV-1-5 CLOSES. (**Acc Crit 5.0A**) ________

[15] **PLACE** 2-PIC-1-6A, SG 1 PORV PCV-1-5, in AUTO ________

[16] **ENSURE** 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR. ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

NOTES

1) Steps 6.3.2[17] through 6.3.2[34] prove proper operation of 2-PCV-1-5 transfer switches.
2) Each PORV has 3 transfer switches. Their functions are described below:
   - 2-XS-1-6A, de-energizes (permits modulation by PIC) the TR A solenoid valve(s).
   - 2-XS-1-6B, de-energizes (permits modulation by PIC) the TR B solenoid valve(s).
   - 2-XS-1-6D, transfers control from the MCR PIC to the Aux Control Room.

[17] **PLACE** 2-XS-1-6D, SG 1 PORV PCV-1-5 CONTROLLER, [2-L-11A] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-5 remains CLOSED ________

B. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red) ________

[18] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 75%, and

VERIFY 2-PCV-1-5 remains CLOSED. ________

[19] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, SETPOINT % to 75%, and

VERIFY 2-PCV-1-5 OPENS (**Acc Crit 5.0C**). ________

[20] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 95%, and

VERIFY 2-PCV-1-5 remains OPEN. ________

[21] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to CLOSE, and

VERIFY 2-PCV-1-5 CLOSES. ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[22] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR. ________

[23] **PLACE** 2-XS-1-6B, SG 1 PORV AUX CONTROL SOLENOID, [2-L-11B] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-5 remains CLOSED ________

B. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red) ________

[24] **PLACE** 2-XS-1-6A, SG 1 PORV LIFT SOL (AUX POS BLOCKS LIFT), [2-L-11A] to AUX, and

VERIFY 2-PCV-1-5 OPENS. ________

[25] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, SETPOINT % to 95%, and

VERIFY 2-PCV-1-5 CLOSES. ________

[26] **PLACE** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, in MAN. ________

[27] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, OUTPUT % to 100%, and

VERIFY 2-PCV-1-5 OPENS. (**Acc Crit 5.0A**) ________

[28] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5, OUTPUT % to 50%, and

VERIFY/RECORD the following:

A. Dual Red/Green Light Indication at 2-HS-1-6 (2-PCV-1-5 MODULATED) ________

B. Computer Point PD2002 indicates OPEN ________

C. 2-PCV-1-5 % LIFT (Log Point F2905A) = ________% (50% expected value) ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[29] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, OUTPUT % to 0%, and

VERIFY 2-PCV-1-5 CLOSES. (**Acc Crit 5.0A**) ________

[30] **PLACE** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, in AUTO, and

VERIFY 2-PCV-1-5 remains CLOSED. ________

[31] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to OPEN, and

VERIFY 2-PCV-1-5 remains CLOSED. ________

[32] **PLACE** the following transfer switches to NOR:

A. 2-XS-1-6B, SG 1 PORV AUX CONTROL SOLENOID ________

B. 2-XS-1-6D, SG 1 PORV PCV-1-5 CONTROLLER ________

[33] **VERIFY** the following: (**Acc Crit 5.0D**)

A. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR ________

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green) ________

C. 2-XA-55-6F–148B, ACR PNL 2-L-11A, remains in ALARM ________

D. 2-PCV-1-5 remains CLOSED ________

[34] **PLACE** 2-XS-1-6A, SG 1 PORV LIFT SOL (AUX POS BLOCKS LIFT), to NOR, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-5 OPENS ________

B. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is Normal (Green) ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[35] **REMOVE** Fuse 0-FU-236-4/C17 [0-BD-236-4/4, A12Q/757] ________

________ CV

[36] **VERIFY** 2-PCV-1-5 remains OPEN. ________

[37] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to CLOSE, and

VERIFY 2-PCV-1-5 CLOSES. ________

[38] **REMOVE** Fuse 0-FU-236-1/C13 [0-BD-236-1/4, A4R/757] ________

________ CV

[39] **VERIFY** Computer Point PD2002 indicates 2-PCV-1-5 is CLOSED. ________

[40] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 75%, and

VERIFY Computer Point PD2002 indicates 2-PCV-1-5 is **NOT** CLOSED. ________

[41] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to CLOSE, and

VERIFY Computer Point PD2002 indicates 2-PCV-1-5 is **NOT** CLOSED. ________

[42] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 95%, and

VERIFY Computer Point PD2002 indicates 2-PCV-1-5 is CLOSED. ________

[43] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to OPEN, and

VERIFY Computer Point PD2002 indicates 2-PCV-1-5 is CLOSED. ________

[44] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to P AUTO. ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[45] **INSTALL** the following fuses:

A. 0-FU-236-1/C13 ________

____
CV

B. 0-FU-236-4/C17 ________

____
CV

[46] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 75%, and

VERIFY 2-PCV-1-5 OPENS. ________

NOTEs
1) Steps 6.3.2[47] through 6.3.2[57] perform local stroking of 2-PCV-1-5 utilizing the backup nitrogen gas system.
2) Unless otherwise specified all equipment associated with the backup nitrogen gas system for 2-PCV-1-5 is located on or near 2-L-737 [A13V/737].

[47] **CLOSE** 0-ISV-32-384, ESSENT CNTL AIR BRANCH HDR ISOL, [SVVR/761]. ________

[48] **OPEN** the drain cock on 2-PREG-1-5, PRESSURE REG FOR 2-PCV-1-5, [SVVR/761], and

VERIFY 2-PCV-1-5 CLOSES. ________

[49] **CLOSE** the drain cock on 2-PREG-1-5, PRESSURE REG FOR 2-PCV-1-5. ________

[50] **OPEN** the following valves:

A. N_2 cylinder valve on 2-TANK-1-404A, SG 1 TANK A ________

B. 2-ISIV-1-404A, N2 SUPPLY VALVE FOR 2-TANK-1-404A ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[51] **ADJUST** 2-PREG-1-404, MAIN STEAM LOOP 1 PORV N2 TANK PREG, output to within 85-95 PSIG. ________

[52] **SLOWLY ADJUST** 2-PREG-1-5B, MAIN STEAM LOOP 1 PORV N2 SUP PREG, clockwise until 2-PCV-1-5 OPENS. (**Acc Crit 5.0E**) ________

[53] **OPEN** N_2 cylinder valve on 2-TANK-1-404B, SG 1 TANK B. ________

[54] **OPEN** 2-ISIV-1-404B, N2 SUPPLY VALVE FOR 2-TANK-1-404B. ________

[55] **ROTATE** 2-SPV-1-404, N2 XFR VALVE FOR 2-TANK-001-0404A&B, selector knob until it points to 2-TANK-1-404B. ________

[56] **CLOSE** 2-ISIV-1-404A, N2 SUPPLY VALVE FOR 2-TANK-1-404A, and

VERIFY 2-PCV-1-5 remains OPEN. ________

[57] **SLOWLY ADJUST** 2-PREG-1-5B, MAIN STEAM LOOP 1 PORV N2 SUP PREG, CCW to zero PSIG output, and

VERIFY 2-PCV-1-5 CLOSES. (**Acc Crit 5.0E**) ________

[58] **TIGHTEN** lock screw on top of 2-PREG-1-5B to finger tight. ________

[59] **CLOSE** the following valves:

A. 2-ISIV-1-404B, N2 SUPPLY VALVE FOR 2-TANK-1-404B ________

B. N_2 cylinder valve on 2-TANK-1-404A, SG 1 TANK A ________

C. N_2 cylinder valve on 2-TANK-1-404B, SG 1 TANK B ________

D. 2-ISIV-1-404E1, N2 SUPPLY ISOLATION FOR SG 1 (2-PCV-1-5) ________

E. 2-ISIV-1-404E2, N2 SUPPLY ISOLATION FOR SG 1 (2-PCV-1-5) ________

[60] **SLOWLY OPEN** 2-VTIV-1-5D, VENT ISOLATION VALVE FOR SG 1 (2-PCV-1-5). ________

Date ________

6.3.2 2-PCV-1-5 SG Loop 1 PORV Logic (continued)

[61] **OPEN** 0-ISV-32-384, ESSENT CNTL AIR BRANCH HDR ISOL, and

VERIFY 2-PCV-1-5 OPENS. ________

[62] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 87%, and

VERIFY 2-PCV-1-5 CLOSES. ________

[63] **ENSURE** 2-ISV-1-619, MAIN STEAM LOOP 1 PORV ISOLATION, is OPEN. ________

[64] **VERIFY** by visual/audible inspection that 2-PCV-1-5 is properly seated with **NO** leakage or valve chatter. ________

[65] **RESTORE** the Foxboro AIN point 2STMPRS (W207CP, W2SG1PORV) to AUTO. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic

[1] **PLACE** Foxboro Analog Input (AIN) point 2STMPRS (W208CP, W2SG2PORV) in Manual, with value set to 1125 PSIG. ________

[2] **PLACE** Foxboro point 2PS0010013 in Manual, with COUT state set to, "contact open" ("1" COUT box GREY and "0" box WHITE). ________

[3] **PLACE** 2-HS-1-13, [2-M-4] SG 2 PORV PCV-1-12, to P AUTO, and

VERIFY the following:(**Acc Crit 5.0B**)

A. 2-PCV-1-12 [NVVR/761] is CLOSED (locally) ________

B. ON 2-HS-1-13:

- Red Light OFF ________
- Green light ON ________

C. Computer Point PD2003 indicates CLOSED ________

D. Computer Point F2906A indicates 0% valve lift ________

[4] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to OPEN, and

VERIFY the following: (**Acc Crit 5.0A, 5.0B**)

A. 2-PCV-1-12 is OPEN (locally). ________

B. ON 2-HS-1-13:

- Red Light ON ________
- Green light OFF ________

C. Computer Point PD2003 indicates OPEN ________

D. Computer Point F2906A indicates 100% valve lift ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

> **NOTE**
>
> For the remainder of this section, unless otherwise indicated: 2-PCV-1-12 OPEN/CLOSED position verification will be based on 2-HS-1-13 indicating lights, as follows:
>
> - OPEN for RED light ON and GREEN light OFF.
> - CLOSED for GREEN light ON and RED light OFF.

[5] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to CLOSE, and

VERIFY 2-PCV-1-12 CLOSES. (**Acc Crit 5.0A**) ________

[6] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to P AUTO. ________

[7] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, [2-M-4] SETPOINT % to 77%, and

VERIFY the following:

A. 2-PCV-1-12 OPENS ________

B. 2-PIC-1-13A % DEVIATION indicates (-)10 ________

C. 2-PIC-1-13A OUTPUT % indicates 100% ________

[8] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 95%, and

VERIFY the following:

A. 2-PCV-1-12 CLOSES ________

B. 2-PIC-1-13A % DEVIATION indicates +8 ________

C. 2-PIC-1-13A OUTPUT % indicates 0% ________

[9] **PLACE** Foxboro point 2PS0010013 in “contact closed” state (“1” COUT box WHITE and “0” box GREY), and

VERIFY 2-PCV-1-12 OPENS. (**Acc Crit 5.0G**) ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[10] **PLACE** Foxboro point 2PS0010013 in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY 2-PCV-1-12 CLOSES. ________

[11] **PLACE** 2-PIC-1-13A, SG 2 PORV PCV-1-12, in MAN. ________

[12] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, OUTPUT % to 100% and

VERIFY 2-PCV-1-12 OPENS. (**Acc Crit 5.0A**) ________

[13] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, OUTPUT % to 50%, and

VERIFY/RECORD the following: (**Acc Crit 5.0B**)

A. Dual Red/Green Light Indication at 2-HS-1-13 (2-PCV-1-12 MODULATED) ________

B. Computer Point PD2003 indicates OPEN ________

C. 2-PCV-1-12 % LIFT (Log Point F2906A) = ________% (50% expected value) ________

[14] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, OUTPUT % to 0%, and

VERIFY 2-PCV-1-12 CLOSES. (**Acc Crit 5.0A**) ________

[15] **PLACE** 2-PIC-1-13A, SG 2 PORV PCV-1-12, in AUTO. ________

[16] **ENSURE** 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

NOTES

1) Steps 6.3.3[17] through 6.3.3[34] prove proper operation of 2-PCV-1-12 transfer switches.
2) Each PORV has 3 transfer switches. Their functions are described below:
   - 2-XS-1-13B, de-energizes (permits modulation by PIC) the TR A solenoid valve(s).
   - 2-XS-1-13A, de-energizes (permits modulation by PIC) the TR B solenoid valve(s).
   - 2-XS-1-13D, transfers control from the MCR PIC to the Aux Control Room.

[17] **PLACE** 2-XS-1-13D, SG 2 PORV PCV-1-12 CONTROLLER, [2-L-11B] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-12 remains CLOSED ________

B. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red) ________

[18] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 75%, and

VERIFY 2-PCV-1-12 remains CLOSED. ________

[19] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, SETPOINT % to 75%, and

VERIFY 2-PCV-1-12 OPENS. (**Acc Crit 5.0C**) ________

[20] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 95%, and

VERIFY 2-PCV-1-12 remains OPEN. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[21] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to CLOSE, and

VERIFY 2-PCV-1-12 CLOSES. ________

[22] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR ________

[23] **PLACE** 2-XS-1-13B, SG 2 PORV AUX CONTROL SOLENOID, [2-L-11A] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-12 remains CLOSED ________

B. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red) ________

[24] **PLACE** 2-XS-1-13A, SG 2 PORV LIFT SOL (AUX POS BLOCKS LIFT), [2-L-11B] to AUX, and

VERIFY 2-PCV-1-12 OPENS ________

[25] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, SETPOINT % to 95%, and

VERIFY 2-PCV-1-12 CLOSES ________

[26] **PLACE** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, in MAN. ________

[27] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, OUTPUT % to 100%, and

VERIFY 2-PCV-1-12 OPENS. (**Acc Crit 5.0A**) ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[28] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12, OUTPUT % to 50%, and

VERIFY/RECORD the following:

A. Dual Red/Green Light Indication at 2-HS-1-13 (2-PCV-1-12 MODULATED) ________

B. Computer Point PD2003 indicates OPEN ________

C. 2-PCV-1-12 % LIFT (Log Point F2906A) = ________% (50% expected value) ________

[29] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, OUTPUT % to 0%, and

VERIFY 2-PCV-1-12 CLOSES. (**Acc Crit 5.0A**) ________

[30] **PLACE** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, in AUTO, and

VERIFY 2-PCV-1-12 remains CLOSED. ________

[31] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to OPEN, and

VERIFY 2-PCV-1-12 remains CLOSED. ________

[32] **PLACE** the following transfer switches to NOR:

A. 2-XS-1-13B, SG 2 PORV AUX CONTROL SOLENOID ________

B. 2-XS-1-13D, SG 2 PORV PCV-1-12 CONTROLLER ________

[33] **VERIFY** the following: (**Acc Crit 5.0D**)

A. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR ________

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green) ________

C. 2-XA-55-6F-148C, ACR PNL 2-L-11B, remains in ALARM. ________

D. 2-PCV-1-12 remains CLOSED ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[34] **PLACE** 2-XS-1-13A, SG 2 PORV LIFT SOL (AUX POS BLOCKS LIFT), to NOR, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-12 OPENS ________

B. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is Normal (Green) ________

[35] **REMOVE** Fuse 0-FU-236-3/C22 [0-BD-236-3/4, A11Q/757] ________

____
CV

[36] **VERIFY** 2-PCV-1-12 remains OPEN. ________

[37] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to CLOSE, and

VERIFY 2-PCV-1-12 CLOSES. ________

[38] **REMOVE** Fuse 0-FU-236-4/C38 [0-BD-236-4/4, A12Q/757] ________

____
CV

[39] **VERIFY** Computer Point PD2003 indicates 2-PCV-1-12 is CLOSED. ________

[40] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 75%, and

VERIFY Computer Point PD2003 indicates 2-PCV-1-12 is **NOT** CLOSED. ________

[41] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to CLOSE, and

VERIFY Computer Point PD2003 indicates 2-PCV-1-12 is **NOT** CLOSED. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[42] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 95%, and

VERIFY Computer Point PD2003indicates 2-PCV-1-12 is CLOSED. ________

[43] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to OPEN, and

VERIFY Computer Point PD2003 indicates 2-PCV-1-12 is CLOSED. ________

[44] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to P AUTO. ________

[45] **INSTALL** the following fuses:

A. 0-FU-236-3/C22 ________

________ CV

B. 0-FU-236-4/C38 ________

________ CV

[46] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 75%, and

VERIFY 2-PCV-1-12 OPENS. ________

NOTES

1) Steps 6.3.3[47] through 6.3.3[57] perform local stroking of 2-PCV-1-12 utilizing the backup nitrogen gas system.
2) Unless otherwise specified all equipment associated with the backup nitrogen gas system for 2-PCV-1-12 is located on or near 2-L-738 [A13V/737].

[47] **CLOSE** 2-ISV-32-465, ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-12 [NVVR/761]. ________

[48] **OPEN** the drain cock on 2-PREG-1-12, PRESSURE REG FOR 2-PCV-1-12, [NVVR/761] and

VERIFY 2-PCV-1-12 CLOSES. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[49] **CLOSE** the drain cock on 2-PREG-1-12, PRESSURE REG FOR 2-PCV-1-12. ________

[50] **OPEN** the following valves:

A. N_2 cylinder valve on 2-TANK-1-400A, SG 2 TANK A ________

B. 2-ISIV-1-400A, N2 SUPPLY VALVE FOR 2-TANK-1-400A ________

[51] **ADJUST** 2-PREG-1-400, MAIN STEAM LOOP 2 PORV N2 TANK PREG, setpoint to within 85-95 PSIG. ________

[52] **SLOWLY ADJUST** 2-PREG-1-12B, MAIN STEAM LOOP 2 PORV N2 SUP PREG, clockwise until 2-PCV-1-12 OPENS. (**Acc Crit 5.0E**) ________

[53] **OPEN** N_2 cylinder valve on 2-TANK-1-400B, SG 2 TANK B. ________

[54] **OPEN** 2-ISIV-1-400B, N2 SUPPLY VALVE FOR 2-TANK-1-400B. ________

[55] **ROTATE** 2-SPV-1-400, N2 XFR VALVE FOR 2-TANK-001-0400A&B, selector knob until it points to 2-TANK-1-400B. ________

[56] **CLOSE** 2-ISIV-1-400A, N2 SUPPLY VALVE FOR 2-TANK-1-400A, and

VERIFY 2-PCV-1-12 remains OPEN. ________

[57] **SLOWLY ADJUST** 2-PREG-1-12B, MAIN STEAM LOOP 2 PORV N2 SUP PREG, CCW to zero PSIG output, and

VERIFY 2-PCV-1-12 CLOSES. (**Acc Crit 5.0E**) ________

[58] **TIGHTEN** lock screw on top of 2-PREG-1-12B to finger tight. ________

Date ________

6.3.3 2-PCV-1-12 SG Loop 2 PORV Logic (continued)

[59] **CLOSE** the following valves:

A. 2-ISIV-1-400B, N2 SUPPLY VALVE FOR 2-TANK-1-400B ________

B. N_2 cylinder valve on 2-TANK-1-400A, SG 2 TANK A ________

C. N_2 cylinder valve on 2-TANK-1-400B, SG 2 TANK B ________

D. 2-ISIV-1-400E1, N2 SUPPLY ISOLATION FOR SG 2 (2-PCV-1-12) ________

E. 2-ISIV-1-400E2, N2 SUPPLY ISOLATION FOR SG 2 (2-PCV-1-12) ________

[60] **SLOWLY OPEN** 2-VTIV-1-12D, VENT ISOLATION VALVE FOR SG 2 (2-PCV-1-12). ________

[61] **OPEN** 2-ISV-32-465, ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-12, and

VERIFY 2-PCV-1-12 OPENS. ________

[62] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 87%, and

VERIFY 2-PCV-1-12 CLOSES. ________

[63] **ENSURE** 2-ISV-1-620, MAIN STEAM LOOP 2 PORV ISOLATION, is OPEN. ________

[64] **VERIFY** by visual/audible inspection that 2-PCV-1-12 is properly seated with **NO** leakage or valve chatter. ________

[65] **RESTORE** the Foxboro AIN point 2STMPRS (W208CP, W2SG2PORV) to AUTO. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic

[1] **PLACE** Foxboro Analog Input (AIN) point 2STMPRS (W209CP, W2SG3PORV) in Manual, with value set to 1125 PSIG. ________

[2] **PLACE** Foxboro point 2PS0010024 in Manual, with COUT state set to, "contact open" ("1" COUT box GREY and "0" box WHITE). ________

[3] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, [2-M-4] to P AUTO, and

VERIFY the following: (**Acc Crit 5.0B**)

A. 2-PCV-1-23 [NVVR/761] is CLOSED (locally) ________

B. ON 2-HS-1-24:

- Red Light OFF ________
- Green light ON ________

C. Computer Point PD2004 indicates CLOSED ________

D. Computer Point F2907A indicates 0% valve lift ________

[4] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to OPEN, and

VERIFY the following: (**Acc Crit 5.0A, 5.0B**)

A. 2-PCV-1-23 is OPEN (locally) ________

B. ON 2-HS-1-24:

- Red Light ON ________
- Green light OFF ________

C. Computer Point PD2004 indicates OPEN ________

D. Computer Point F2907A indicates 100% valve lift ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

> **NOTE**
>
> For the remainder of this section, unless otherwise indicated: 2-PCV-1-23 OPEN/CLOSED position verification will be based on 2-HS-1-24 indicating lights, as follows:
>
> - OPEN for RED light ON and GREEN light OFF.
> - CLOSED for GREEN light ON and RED light OFF.

[5] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to CLOSE, and

VERIFY 2-PCV-1-23 CLOSES. (**Acc Crit 5.0A**) ________

[6] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to P AUTO. ________

[7] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, [2-M-4] SETPOINT % to 77%, and

VERIFY the following:

A. 2-PCV-1-23 OPENS ________

B. 2-PIC-1-24A % DEVIATION indicates (-)10 ________

C. 2-PIC-1-24A OUTPUT % indicates 100% ________

[8] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 95%, and

VERIFY the following:

A. 2-PCV-1-23 CLOSES ________

B. 2-PIC-1-24A % DEVIATION indicates +8 ________

C. 2-PIC-1-24A OUTPUT % indicates 0% ________

[9] **PLACE** Foxboro point 2PS0010024 in “contact closed” state (“1” COUT box WHITE and “0” box GREY), and

VERIFY 2-PCV-1-23 OPENS. (**Acc Crit 5.0G**) ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[10] **PLACE** Foxboro point 2PS0010024 in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY 2-PCV-1-23 CLOSES. ________

[11] **PLACE** 2-PIC-1-24A, SG 3 PORV PCV-1-23, in MAN. ________

[12] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, OUTPUT % to 100% and

VERIFY 2-PCV-1-23 OPENS. (**Acc Crit 5.0A**) ________

[13] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, OUTPUT % to 50%, and

VERIFY/RECORD the following: (**Acc Crit 5.0B**)

A. Dual Red/Green Light Indication at 2-HS-1-24 (2-PCV-1-23 MODULATED) ________

B. Computer Point PD2004 indicates OPEN ________

C. 2-PCV-1-23 % LIFT (Log Point F2907A) = ________% (50% expected value) ________

[14] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, OUTPUT % to 0%, and

VERIFY 2-PCV-1-23 CLOSES. (**Acc Crit 5.0A**) ________

[15] **PLACE** 2-PIC-1-24A, SG 3 PORV PCV-1-23, in AUTO. ________

[16] **ENSURE** 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

NOTES

1) Steps 6.3.4[17] through 6.3.4[34] prove proper operation of 2-PCV-1-23 transfer switches.
2) Each PORV has 3 transfer switches. Their functions are described below:
   - 2-XS-1-24A, de-energizes (permits modulation by PIC) the TR A solenoid valve(s).
   - 2-XS-1-24B, de-energizes (permits modulation by PIC) the TR B solenoid valve(s).
   - 2-XS-1-24D, transfers control from the MCR PIC to the Aux Control Room.

[17] **PLACE** 2-XS-1-24D, SG 3 PORV PCV-1-23 CONTROLLER, [2-L-11A] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-23 remains CLOSED ________

B. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red) ________

[18] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 75%, and

VERIFY 2-PCV-1-23 remains CLOSED. ________

[19] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, SETPOINT % to 75%, and

VERIFY 2-PCV-1-23 OPENS. (**Acc Crit 5.0C**) ________

[20] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 95%, and

VERIFY 2-PCV-1-23 remains OPEN. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[21] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to CLOSE, and

VERIFY 2-PCV-1-23 CLOSES. ________

[22] **ENSURE** 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR ________

[23] **PLACE** 2-XS-1-24B, SG 3 PORV AUX CONTROL SOLENOID, [2-L-11B] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-23 remains CLOSED ________

B. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red) ________

[24] **PLACE** 2-XS-1-24A, SG 3 PORV LIFT SOL (AUX POS BLOCKS LIFT), [2-L-11A] to AUX, and

VERIFY 2-PCV-1-23 OPENS. ________

[25] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, SETPOINT % to 95%, and

VERIFY 2-PCV-1-23 CLOSES. ________

[26] **PLACE** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, in MAN. ________

[27] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, OUTPUT % to 100%, and

VERIFY 2-PCV-1-23 OPENS. (**Acc Crit 5.0A**) ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[28] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23, OUTPUT % to 50%, and

VERIFY/RECORD the following:

A. Dual Red/Green Light Indication at 2-HS-1-24 (2-PCV-1-23 MODULATED) ________

B. Computer Point PD2004 indicates OPEN ________

C. 2-PCV-1-23 % LIFT (Log Point F2907A) = ________% (50% expected value) ________

[29] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, OUTPUT % to 0%, and

VERIFY 2-PCV-1-23 CLOSES. (**Acc Crit 5.0A**) ________

[30] **PLACE** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, in AUTO, and

VERIFY 2-PCV-1-23 remains CLOSED. ________

[31] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to OPEN, and

VERIFY 2-PCV-1-23 remains CLOSED. ________

[32] **PLACE** the following transfer switches to NOR:

A. 2-XS-1-24B, SG 3 PORV AUX CONTROL SOLENOID ________

B. 2-XS-1-24D, SG 3 PORV PCV-1-23 CONTROLLER ________

[33] **VERIFY** the following: (**Acc Crit 5.0D**)

A. 2-XA-55-6F–148C, ACR PNL 2-L-11B, is CLEAR ________

B. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is NORMAL (Green) ________

C. 2-XA-55-6F-148B, ACR PNL 2-L-11A, remains in ALARM ________

D. 2-PCV-1-23 remains CLOSED ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[34] **PLACE** 2-XS-1-24A, SG 3 PORV LIFT SOL (AUX POS BLOCKS LIFT), to NOR, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-23 OPENS ________

B. 2-XA-55-6F-148B, ACR PNL 2-L-11A, is CLEAR ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is Normal (Green) ________

[35] **REMOVE** Fuse 0-FU-236-4/C47 [0-BD-236-4/4, A12Q/757] ________

____
CV

[36] **VERIFY** 2-PCV-1-23 remains OPEN. ________

[37] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to CLOSE, and

VERIFY 2-PCV-1-23 CLOSES. ________

[38] **REMOVE** Fuse 0-FU-236-3/C15 [0-BD-236-3/4, A11Q/757] ________

____
CV

[39] **VERIFY** Computer Point PD2004 indicates 2-PCV-1-23 is CLOSED. ________

[40] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 75%, and

VERIFY Computer Point PD2004 indicates 2-PCV-1-23 is **NOT** CLOSED. ________

[41] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to CLOSE, and

VERIFY Computer Point PD2004 indicates 2-PCV-1-23 is **NOT** CLOSED. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[42] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 95%, and

VERIFY Computer Point PD2004 indicates 2-PCV-1-23 is CLOSED. ________

[43] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to OPEN, and

VERIFY Computer Point PD2004 indicates 2-PCV-1-23 is CLOSED. ________

[44] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to P AUTO. ________

[45] **INSTALL** the following fuses:

A. 0-FU-236-4/C47 ________

____
CV

B. 0-FU-236-3/C15 ________

____
CV

[46] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 75%, and

VERIFY 2-PCV-1-23 OPENS. ________

NOTES

1) Steps 6.3.4[47] through 6.3.4[57] perform local stroking of 2-PCV-1-23 utilizing the backup nitrogen gas system.

2) Unless otherwise specified all equipment associated with the backup nitrogen gas system for 2-PCV-1-23 is located on or near 2-L-256 [A12X/729].

[47] **CLOSE** 2-ISV-32-456, ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-23 [NVVR/761]. ________

[48] **OPEN** the drain cock on 2-PREG-1-23, PRESSURE REG FOR 2-PCV-1-23, [NVVR/761] and

VERIFY 2-PCV-1-23 CLOSES. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[49] **CLOSE** the drain cock on 2-PREG-1-23, PRESSURE REG FOR 2-PCV-1-23. ________

[50] **OPEN** the following valves:

A. N_2 cylinder valve on 2-TANK-1-403A, SG 3 TANK A ________

B. 2-ISIV-1-403A, N2 SUPPLY VALVE FOR 2-TANK-1-403 ________

[51] **ADJUST** 2-PREG-1-403, MAIN STEAM LOOP 3 PORV N2 TANK PREG, setpoint to within 85-95 PSIG. ________

[52] **SLOWLY ADJUST** 2-PREG-1-23B, MAIN STEAM LOOP 3 PORV N2 SUP PREG, clockwise until 2-PCV-1-23 OPENS. (**Acc Crit 5.0E**) ________

[53] **OPEN** N_2 cylinder valve on 2-TANK-1-403B, SG 3 TANK B. ________

[54] **OPEN** 2-ISIV-1-403B, N2 SUPPLY VALVE FOR 2-TANK-1-403B. ________

[55] **ROTATE** 2-SPV-1-403, N2 XFR VALVE FOR 2-TANK-001-0403A&B, selector knob until it points to 2-TANK-1-403B. ________

[56] **CLOSE** 2-ISIV-1-403A, N2 SUPPLY VALVE FOR 2-TANK-1-403A, and

VERIFY 2-PCV-1-23 remains OPEN. ________

[57] **SLOWLY ADJUST** 2-PREG-1-23B, MAIN STEAM LOOP 3 PORV N2 SUP PREG, CCW to zero PSIG output, and

VERIFY 2-PCV-1-23 CLOSES. (**Acc Crit 5.0E**) ________

[58] **TIGHTEN** lock screw on top of 2-PREG-1-23B to finger tight. ________

Date ________

6.3.4 2-PCV-1-23 SG Loop 3 PORV Logic (continued)

[59] **CLOSE** the following valves:

A. 2-ISIV-1-403B, N2 SUPPLY VALVE FOR 2-TANK-1-403B ________

B. N_2 cylinder valve on 2-TANK-1-403A, SG 3 TANK A ________

C. N_2 cylinder valve on 2-TANK-1-403B, SG 3 TANK B ________

D. 2-ISIV-1-403E1, N2 SUPPLY ISOLATION FOR SG 3 (2-PCV-1-23) ________

E. 2-ISIV-1-403E2, N2 SUPPLY ISOLATION FOR SG 3 (2-PCV-1-23) ________

[60] **SLOWLY OPEN** 2-VTIV-1-23D, VENT ISOLATION VALVE FOR SG 3 (2-PCV-1-23). ________

[61] **OPEN** 2-ISV-32-456, ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-23, and

VERIFY 2-PCV-1-23 OPENS. ________

[62] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 87%, and

VERIFY 2-PCV-1-23 CLOSES. ________

[63] **ENSURE** 2-ISV-1-621, MAIN STEAM LOOP 3 PORV ISOLATION, is OPEN. ________

[64] **VERIFY** by visual/audible inspection that 2-PCV-1-23 is properly seated with **NO** leakage or valve chatter. ________

[65] **RESTORE** the Foxboro AIN point 2STMPRS (W209CP, W2SG3PORV) to AUTO. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic

[1] **PLACE** Foxboro Analog Input (AIN) point 2STMPRS (W210CP, W2SG4PORV) in Manual, with value set to 1125 PSIG. ________

[2] **PLACE** Foxboro point 2PS0010031 in Manual, with COUT state set to, "contact open" ("1" COUT box GREY and "0" box WHITE). ________

[3] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, [2-M-4] to P AUTO, and

VERIFY the following: (**Acc Crit 5.0B**)

A. 2-PCV-1-30 [SVVR/761] is CLOSED (locally). ________

B. ON 2-HS-1-31:

- Red Light OFF ________
- Green light ON ________

C. Computer Point PD2005 indicates CLOSED ________

D. Computer Point F2908A indicates 0% valve lift ________

[4] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to OPEN, and

VERIFY the following: (**Acc Crit 5.0A, 5.0B**)

A. 2-PCV-1-30 is OPEN (locally) ________

B. ON 2-HS-1-31:

- Red Light ON ________
- Green light OFF ________

C. Computer Point PD2005 indicates OPEN ________

D. Computer Point F2908A indicates 100% valve lift ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

NOTE

For the remainder of this section, unless otherwise indicated: 2-PCV-1-30 OPEN/CLOSED position verification will be based on 2-HS-1-31 indicating lights, as follows:

- OPEN for RED light ON and GREE light OFF.
- CLOSED for GREEN light ON and RED light OFF.

[5] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to CLOSE, and

VERIFY 2-PCV-1-30 CLOSES. (**Acc Crit 5.0A**) ________

[6] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to P AUTO. ________

[7] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, [2-M-4] SETPOINT % to 77%, and

VERIFY the following:

A. 2-PCV-1-30 OPENS ________

B. 2-PIC-1-31A % DEVIATION indicates (-)10 ________

C. 2-PIC-1-31A OUTPUT % indicates 100% ________

[8] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 95%, and

VERIFY the following:

A. 2-PCV-1-30 CLOSES ________

B. 2-PIC-1-31A % DEVIATION indicates +8 ________

C. 2-PIC-1-31A OUTPUT % indicates 0% ________

[9] **PLACE** Foxboro point 2PS0010031 in “contact closed” state (“1” COUT box WHITE and “0” box GREY), and

VERIFY 2-PCV-1-30 OPENS. (**Acc Crit 5.0G**) ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[10] **PLACE** Foxboro point 2PS0010031 in "contact open" state ("1" COUT box GREY and "0" box WHITE), and

VERIFY 2-PCV-1-30 CLOSES. ________

[11] **PLACE** 2-PIC-1-31A, SG 4 PORV PCV-1-30, in MAN. ________

[12] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, OUTPUT % to 100% and

VERIFY 2-PCV-1-30 OPENS. (**Acc Crit 5.0A**) ________

[13] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, OUTPUT % to 50%, and

VERIFY/RECORD the following: (**Acc Crit 5.0B**)

A. Dual Red/Green Light Indication at 2-HS-1-31 (2-PCV-1-30 MODULATED) ________

B. Computer Point PD2005 indicates OPEN ________

C. 2-PCV-1-30 % LIFT (Log Point F2908A) = ________% (50% expected value) ________

[14] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, OUTPUT % to 0%, and

VERIFY 2-PCV-1-30 CLOSES. (**Acc Crit 5.0A**) ________

[15] **PLACE** 2-PIC-1-31A, SG 4 PORV PCV-1-30, in AUTO. ________

[16] **ENSURE** 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

NOTES

1) Steps 6.3.5[17] through 6.3.5[34] prove proper operation of 2-PCV-1-30 transfer switches.
2) Each PORV has 3 transfer switches. Their functions are described below:
   - 2-XS-1-31B, de-energizes (permits modulation by PIC) the TR A solenoid valve(s).
   - 2-XS-1-31A, de-energizes (permits modulation by PIC) the TR B solenoid valve(s).
   - 2-XS-1-31D, transfers control from the MCR PIC to the Aux Control Room.

[17] **PLACE** 2-XS-1-31D, SG 4 PORV PCV-1-30 CONTROLLER, [2-L-11B] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-30 remains CLOSED ________

B. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is in ALARM (Red) ________

[18] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 75%, and

VERIFY 2-PCV-1-30 remains CLOSED. ________

[19] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, SETPOINT % to 75%, and

VERIFY 2-PCV-1-30 OPENS. (**Acc Crit 5.0C**) ________

[20] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 95%, and

VERIFY 2-PCV-1-30 remains OPEN. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[21] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to CLOSE, and

VERIFY 2-PCV-1-30 CLOSES. ________

[22] **ENSURE** 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR ________

[23] **PLACE** 2-XS-1-31B, SG 4 PORV AUX CONTROL SOLENOID, [2-L-11A] to AUX, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-30 remains CLOSED ________

B. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is in ALARM ________

C. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is in ALARM (Red) ________

[24] **PLACE** 2-XS-1-31A, SG 4 PORV LIFT SOL (AUX POS BLOCKS LIFT), [2-L-11B] to AUX, and

VERIFY 2-PCV-1-30 OPENS. ________

[25] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, SETPOINT % to 95%, and

VERIFY 2-PCV-1-30 CLOSES. ________

[26] **PLACE** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, in MAN. ________

[27] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, OUTPUT % to 100%, and

VERIFY 2-PCV-1-30 OPENS. (**Acc Crit 5.0A**) ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[28] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30, OUTPUT % to 50%, and

VERIFY/RECORD the following:

A. Dual Red/Green Light Indication at 2-HS-1-31 (2-PCV-1-30 MODULATED) ________

B. Computer Point PD2005 indicates OPEN ________

C. 2-PCV-1-30 % LIFT (Log Point F2908A) = ________% (50% expected value) ________

[29] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, OUTPUT % to 0%, and

VERIFY 2-PCV-1-30 CLOSES. (**Acc Crit 5.0A**) ________

[30] **PLACE** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, in AUTO, and

VERIFY 2-PCV-1-30 remains CLOSED. ________

[31] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to OPEN, and

VERIFY 2-PCV-1-30 remains CLOSED. ________

[32] **PLACE** the following transfer switches to NOR:

A. 2-XS-1-31B, SG 4 PORV AUX CONTROL SOLENOID ________

B. 2-XS-1-31D, SG 4 PORV PCV-1-30 CONTROLLER ________

[33] **VERIFY** the following: (**Acc Crit 5.0D**)

A. 2-XA-55-6F–148B, ACR PNL 2-L-11A, is CLEAR ________

B. Unit 2 Alarm Events Display Screen indicates 148-B ACR PNL 2-L-11A XS IN AUX, is NORMAL (Green) ________

C. 2-XA-55-6F-148C, ACR PNL 2-L-11B, remains in ALARM ________

D. 2-PCV-1-30 remains CLOSED ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[34] **PLACE** 2-XS-1-31A, SG 4 PORV LIFT SOL (AUX POS BLOCKS LIFT), to NOR, and

VERIFY the following: (**Acc Crit 5.0D**)

A. 2-PCV-1-30 OPENS ________

B. 2-XA-55-6F-148C, ACR PNL 2-L-11B, is CLEAR ________

C. Unit 2 Alarm Events Display Screen indicates 148-C ACR PNL 2-L-11B XS IN AUX, is Normal (Green) ________

[35] **REMOVE** Fuse 0-FU-236-3/C38 [0-BD-236-3/4, A11Q/757]. ________

____
CV

[36] **VERIFY** 2-PCV-1-30 remains OPEN. ________

[37] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to CLOSE, and

VERIFY 2-PCV-1-30 CLOSES. ________

[38] **REMOVE** Fuse 0-FU-236-2/B32 [0-BD-236-2/4, A5Q/757]. ________

____
CV

[39] **VERIFY** Computer Point PD2005 indicates 2-PCV-1-30 is CLOSED. ________

[40] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 75%, and

VERIFY Computer Point PD2005 indicates 2-PCV-1-30 is NOT CLOSED. ________

[41] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to CLOSE, and

VERIFY Computer Point PD2005 indicates 2-PCV-1-30 is NOT CLOSED. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[42] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 95%, and

VERIFY Computer Point PD2005 indicates 2-PCV-1-30 is CLOSED. ________

[43] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to OPEN, and

VERIFY Computer Point PD2005 indicates 2-PCV-1-30 is CLOSED. ________

[44] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to P AUTO. ________

[45] **INSTALL** the following fuses:

A. 0-FU-236-3/C38 ________

________ CV

B. 0-FU-236-2/B32 ________

________ CV

[46] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 75%, and

VERIFY 2-PCV-1-30 OPENS. ________

NOTES

1) Steps 6.3.5[47] through 6.3.5[57] perform local stroking of 2-PCV-1-30 utilizing the backup nitrogen gas system.
2) Unless otherwise specified all equipment associated with the backup nitrogen gas system for 2-PCV-1-30 is located on or near 2-L-256 [A12X/729].

[47] **CLOSE** 0-ISV-32-412, ESSENT CNTL AIR BRANCH HDR ISOL [SVVR/761]. ________

[48] **OPEN** the drain cock on 2-PREG-1-30, PRESSURE REG FOR 2-PCV-1-30, [SVVR/761] and

VERIFY 2-PCV-1-30 CLOSES. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[49] **CLOSE** the drain cock on 2-PREG-1-30, PRESSURE REG FOR 2-PCV-1-30. ________

[50] **OPEN** the following valves:

A. N_2 cylinder valve on 2-TANK-1-402A, SG 4 TANK A ________

B. 2-ISIV-1-402A, N2 SUPPLY VALVE FOR 2-TANK-1-402A ________

[51] **ADJUST** 2-PREG-1-402, MAIN STEAM LOOP 4 PORV N2 TANK PREG, setpoint to within 85-95 PSIG. ________

[52] **SLOWLY ADJUST** 2-PREG-1-30B, MAIN STEAM LOOP 4 PORV N2 SUP PREG, clockwise until 2-PCV-1-30 OPENS. (**Acc Crit 5.0E**) ________

[53] **OPEN** N_2 cylinder valve on 2-TANK-1-402B, SG 4 TANK B. ________

[54] **OPEN** 2-ISIV-1-402B, N2 SUPPLY VALVE FOR 2-TANK-1-402B. ________

[55] **ROTATE** 2-SPV-1-402, N2 XFR VALVE FOR 2-TANK-001-0402A&B, selector knob until it points to 2-TANK-1-402B. ________

[56] **CLOSE** 2-ISIV-1-402A, N2 SUPPLY VALVE FOR 2-TANK-1-402A, and

VERIFY 2-PCV-1-30 remains OPEN. ________

[57] **SLOWLY ADJUST** 2-PREG-1-30B, MAIN STEAM LOOP 4 PORV N2 SUP PREG, CCW to zero PSIG output, and

VERIFY 2-PCV-1-30 CLOSES. (**Acc Crit 5.0E**) ________

[58] **TIGHTEN** lock screw on top of 2-PREG-1-30B to finger tight. ________

Date ________

6.3.5 2-PCV-1-30 SG Loop 4 PORV Logic (continued)

[59] **CLOSE** the following valves:

A. 2-ISIV-1-402B, N2 SUPPLY VALVE FOR 2-TANK-1-402B ________

B. N_2 cylinder valve on 2-TANK-1-402A, SG 4 TANK A ________

C. N_2 cylinder valve on 2-TANK-1-402B, SG 4 TANK B ________

D. 2-ISIV-1-402E1, N2 SUPPLY ISOLATION FOR SG 4 (2-PCV-1-30) ________

E. 2-ISIV-1-402E2, N2 SUPPLY ISOLATION FOR SG 4 (2-PCV-1-30) ________

[60] **SLOWLY OPEN** 2-VTIV-1-30D, VENT ISOLATION VALVE FOR SG 4 (2-PCV-1-30). ________

[61] **OPEN** 0-ISV-32-412, ESSENT CNTL AIR BRANCH HDR ISOL, and

VERIFY 2-PCV-1-30 OPENS. ________

[62] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 87%, and

VERIFY 2-PCV-1-30 CLOSES. ________

[63] **ENSURE** 2-ISV-1-622, MAIN STEAM LOOP 4 PORV ISOLATION, is OPEN. ________

[64] **VERIFY** by visual/audible inspection that 2-PCV-1-30 is properly seated with **NO** leakage or valve chatter. ________

[65] **RESTORE** the Foxboro AIN point 2STMPRS (W210CP, W2SG4PORV) to AUTO. ________

Date ________

6.4 Operational Test of SG PORVs (With Steam Discharge)

6.4.1 Preliminary Steps

NOTES

1) Subsections 6.4.2 through 6.4.5 may be performed in any order. Steps in one subsection may be started prior to completion of another subsection provided:
   - The subsections aren't performed simultaneously (e.g. steps in 6.4.3 may begin if performance of 6.4.2 is paused for a TDN resolution).
   - At least one SG PORV is in P AUTO and available for pressure control.
2) Testing in this subsection is performed at Normal Operating Pressure/Normal Operating Temperature (NOP/NOT) and involves steam discharge.
3) Pressure changes should be limited to 50 PSIG during steam discharge.
4) Vibration testing will be performed concurrently with valve operation.

[1] **VERIFY** U2 Reactor Coolant System is at the 557°F Plateau, in accordance with 2-PTI-068-01. ________

[2] **DISCUSS** PRECAUTION AND LIMITIATIONS 3.0R, 3.0S, 3.0T & 3.0U with U2 US / UO. ________

[3] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.4 have been completed. ________

[4] **ENSURE** the following handswitches are placed to P AUTO: [2-M-4]

UNID	NOMENCLATURE	POSITION	INITIAL
2-HS-1-6	SG 1 PORV PCV-1-5	P AUTO	
2-HS-1-13	SG 2 PORV PCV-1-12	P AUTO	
2-HS-1-24	SG 3 PORV PCV-1-23	P AUTO	
2-HS-1-31	SG 4 PORV PCV-1-30	P AUTO	

Date ________

6.4.1 Preliminary Steps (continued)

[5] **ENSURE** PORV controllers are in AUTO with setpoint set to approximately 87%:

UNID	NOMENCLATURE	PLACED in AUTO	SETPOINT %	INITIAL
2-PIC-1-6A	SG 1 PORV PCV-1-5 [2-M-4]	☐	set to 87% ☐	
2-PIC-1-6C	SG 1 PORV PCV-1-5 CONTROL [2-L-10]	☐	set to 87% ☐	
2-PIC-1-13A	SG 2 PORV PCV-1-12 [2-M-4]	☐	set to 87% ☐	
2-PIC-1-13C	SG 2 PORV PCV-1-12 CONTROL [2-L-10]	☐	set to 87% ☐	
2-PIC-1-24A	SG 3 PORV PCV-1-23 [2-M-4]	☐	set to 87% ☐	
2-PIC-1-24C	SG 3 PORV PCV-1-23 CONTROL [2-L-10]	☐	set to 87% ☐	
2-PIC-1-31A	SG 4 PORV PCV-1-30 [2-M-4]	☐	set to 87% ☐	
2-PIC-1-31C	SG 4 PORV PCV-1-30 CONTROL [2-L-10]	☐	set to 87% ☐	

NOTE

If MSIVs are closed, they should be opened by utilizing the HFT operating instruction (TOP, SOI, etc) for the Main Steam System.

[6] **ENSURE** all U2 MSIVs are OPEN. ________

[7] **RECORD** the As-Found position of the following handswitches, and

ENSURE they are placed to OFF RESET: [2-M-4]

UNID	NOMENCLATURE	AS FOUND	REQUIRED	INITIAL
2-HS-1-103A	STEAM DUMP FSV “A”		OFF RESET	
2-HS-1-103B	STEAM DUMP FSV “B”		OFF RESET	

Date ________

6.4.1 Preliminary Steps (continued)

[8] **ENSURE** PRECAUTION AND LIMITIATIONS 3.0L, 3.0P & 3.0Q have been specifically discussed with personnel to be stationed in step 6.4.1[9]. ________

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.
2) Accessible portions of the MSS system piping upstream of the MSIV for the loop being tested will be observed concurrent with steam discharge.
3) Any portions of the system that are impractical to observe during steam discharge should be inspected after steam discharge to verify no damage has occurred.

[9] **STATION** personnel in the valve vaults and containment, as practical, to observe MSS piping vibration during SG PORV operation. ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5

[1] **VERIFY** Steam Generator 1 pressure is approximately 1130 PSIG as read at 2-PI-1-5, SG 1 PRESS LOW PRESS SI [2-M-4], and

RECORD the value: ____________ PSIG ________

[2] **ENSURE** 2-HS-1-6, SG 1 PORV PCV-1-5, SG 1 PORV PCV-1-5, is in P AUTO. ________

[3] **NOTIFY** the Test Engineer responsible for 2-PTI-999-01 of impending PORV Stroke timing/steam discharge. ________

CAUTIONS

1) Steps 6.4.2[4] and 6.4.2[6] will open and close atmospheric relief valve 2-PCV-1-5, potentially impacting SG pressure and RCS T_{AVG}. Steps are to be performed in quick succession with only a brief pause to record opening time.
2) Steam Generator 1 pressure drop should be limited to 50 PSIG.
3) Test personnel should be positioned as-required to assure rapid data acquisition.

NOTES

1) Steps 6.4.2[4] and 6.4.2[6] require valve stroke timing locally and remotely. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement.
2) Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.
3) In the event of a stroke time measurement error (e.g. stop watch fails to start or stop, stop/starts prematurely), it should be annotated in the CTL and the valve stroke timed again. Retiming shall NOT be performed due to failure to meet acceptance criteria (with no measurement error causing the failure) without generating a TDN.

[4] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5, to OPEN and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5 (continued)

[5] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0F**)

A. Local Stroke OPEN time:

__________ seconds M&TE: ________

Acc Crit: Time $\leq$ 32.0 seconds

____

B. Remote stroke OPEN time:

__________ seconds M&TE: ________

Acc Crit: Time $\leq$ 32.0 seconds

____

[6] **PLACE** 2-HS-1-6, SG 1 PORV PCV-1-5**,** to CLOSE, and

MEASURE the stroke CLOSED time:

- Locally ________
- Remotely ________

[7] **RECORD** the stroke CLOSE times

A. Local Stroke CLOSED time:

__________ seconds M&TE: ________ ________

B. Remote stroke CLOSED time:

__________ seconds M&TE: ________ ________

[8] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5, SETPOINT % to 84%. ________

[9] **WHEN** 2-PI-1-5, SG 1 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**

PLACE 2-HS-1-6, SG 1 PORV PCV-1-5, to P AUTO. ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5 (continued)

[10] **VERIFY** the following as the 2-PCV-1-5 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-6A indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-6A trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-6 indicating 2-PCV-1-5 OPEN/MODULATING in response to 2-PIC-1-6A demand ________

D. 2-PI-1-5, SG 1 PRESS LOW PRESS SI, decreases towards 1080 PSIG ________

[11] **VERIFY** the following after 2-PI-1-5, SG 1 PRESS LOW PRESS SI, indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-6A indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-6A indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-HS-1-6 indicating 2-PCV-1-5 CLOSED/MODULATING ________

[12] **ADJUST** 2-PIC-1-6A, SG 1 PORV PCV-1-5 SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-6A indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-6A is 0% ________

C. Green Light ONLY is LIT on 2-HS-1-6 indicating 2-PCV-1-5 is CLOSED ________

D. 2-PI-1-5, SG 1 PRESS LOW PRESS SI, increases towards 1130 PSIG ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5 (continued)

[13] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, SETPOINT % to 84%. ________

[14] **WHEN** 2-PI-1-1C, SG 1 MAIN STM HDR, [2-L-10] indicates approximately 1130 PSIG, **THEN**

PLACE 2-XS-1-6D, SG 1 PORV PCV-1-5 CONTROLLER, to AUX. ________

[15] **VERIFY** the following as the 2-PCV-1-5 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-6C indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-6C trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-6 indicating 2-PCV-1-5 OPEN/MODULATING in response to 2-PIC-1-6C demand ________

D. 2-PI-1-1C decreases towards 1080 PSIG ________

[16] **VERIFY** the following after 2-PI-1-1C indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-6C indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-6C indicates approximately 0% DEMAND. ________

C. Green Light is ON at 2-PCV-1-5 MODULATES/CLOSES as required to maintain pressure setpoint ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5 (continued)

[17] **ADJUST** 2-PIC-1-6C, SG 1 PORV PCV-1-5 CONTROL, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-6C indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-6C is 0% ________

C. Green Light ONLY is ON at 2-HS-1-6 indicating 2-PCV-1-5 is CLOSED ________

D. 2-PI-1-1C increases towards 1130 PSIG ________

[18] **PLACE** 2-XS-1-6D, SG 1 PORV PCV-1-5 CONTROLLER, to NOR. ________

NOTES

1) Steps 6.4.2[19] and 6.4.2[20] partially open and then close the atmospheric power relief valve using the valve's handwheel. SG Pressure changes should be observed and limited to 50 PSIG.
2) Step 6.4.2[19] may be considered completed once visual/audible steam discharge is observed and/or Dual Red/Green indication is observed at 2-HS-1-6.
3) Clockwise (CW) rotation opens and counter clockwise (CCW) rotation closes the valve.

[19] **WHEN** 2-PI-1-5, SG 1 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**,

TURN the handwheel on 2-PCV-1-5, MAIN STEAM LOOP 1 PORV, CW, and

VERIFY 2-PCV-1-5 OPENS. (**Acc Crit 5.0A**) ________

[20] **TURN** the handwheel on 2-PCV-1-5, MAIN STEAM LOOP 1 PORV, CCW, and

VERIFY 2-PCV-1-5 CLOSES. (**Acc Crit 5.0A**) ________

Date ________

6.4.2 Operational Test of 2-PCV-1-5 (continued)

[21] **VERIFY** by visual/audible inspection that 2-PCV-1-5 is properly seated with **NO** leakage or valve chatter. (**Acc Crit 5.0H**) ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12

[1] **VERIFY** Steam Generator 2 pressure is approximately 1130 PSIG as read at 2-PI-1-12, SG 2 PRESS LOW PRESS SI [2-M-4], and

RECORD the value: __________ PSIG ________

[2] **ENSURE** 2-HS-1-13, SG 2 PORV PCV-1-12, is in P AUTO. ________

[3] **NOTIFY** the Test Engineer responsible for 2-PTI-999-01 of impending PORV Stroke timing/steam discharge. ________

CAUTIONS

1) Steps 6.4.3[4] and 6.4.3[6] will open and close atmospheric relief valve 2-PCV-1-12, potentially impacting SG pressure and RCS T_{AVG}. Steps are to be performed in quick succession with only a brief pause to record opening time.
2) Steam Generator 2 pressure drop should be limited to 50 PSIG.
3) Test personnel should be positioned as-required to assure rapid data acquisition.

NOTES

1) Steps 6.4.3[4] and 6.4.3[6] require valve stroke timing locally and remotely. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement.
2) Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.
3) In the event of a stroke time measurement error (e.g. stop watch fails to start or stop, stop/starts prematurely), it should be annotated in the CTL and the valve stroke timed again. Retiming shall NOT be performed due to failure to meet acceptance criteria (with no measurement error causing the failure) without generating a TDN.

[4] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to OPEN and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12 (continued)

[5] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0F**)

A. Local Stroke OPEN time:

__________ seconds M&TE: ________

Acc Crit: Time $\leq$ 32.0 seconds

____

B. Remote stroke OPEN time:

__________ seconds M&TE: ________

Acc Crit: Time $\leq$ 32.0 seconds

____

[6] **PLACE** 2-HS-1-13, SG 2 PORV PCV-1-12, to CLOSE, and

MEASURE the stroke CLOSED time:

- Locally ________
- Remotely ________

[7] **RECORD** the stroke CLOSE times

A. Local Stroke CLOSED time:

__________ seconds M&TE: ________ ________

B. Remote stroke CLOSED time:

__________ seconds M&TE: ________ ________

[8] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT % to 84%. ________

[9] **WHEN** 2-PI-1-12, SG 2 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**

PLACE 2-HS-1-13, SG 2 PORV PCV-1-12, to P AUTO. ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12 (continued)

[10] **VERIFY** the following as the 2-PCV-1-12 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-13A indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-13A trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-13 indicating 2-PCV-1-12 OPEN/MODULATING in response to 2-PIC-1-13A demand ________

D. 2-PI-1-12, SG 2 PRESS LOW PRESS SI, decreases towards 1080 PSIG ________

[11] **VERIFY** the following after 2-PI-1-12, SG 2 PRESS LOW PRESS SI, indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-13A indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-13A indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-HS-1-13 indicating 2-PCV-1-12 CLOSED/MODULATING ________

[12] **ADJUST** 2-PIC-1-13A, SG 2 PORV PCV-1-12, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-13A indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-13A is 0% ________

C. Green Light ONLY is ON at 2-HS-1-13 indicating 2-PCV-1-12 is CLOSED ________

D. 2-PI-1-12, SG 2 PRESS LOW PRESS SI, increases towards 1130 PSIG ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12 (continued)

[13] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, SETPOINT % to 84%. ________

[14] **WHEN** 2-PI-1-8C, SG 2 MAIN STM HDR, [2-L-10] indicates approximately 1130 PSIG, **THEN**

PLACE 2-XS-1-13D, SG 2 PORV PCV-1-12 CONTROLLER, to AUX. ________

[15] **VERIFY** the following as the 2-PCV-1-12 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-13C indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-13C trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-13 indicating 2-PCV-1-12 OPEN/MODULATING in response to 2-PIC-1-13C demand ________

D. 2-PI-1-8C decreases towards 1080 PSIG ________

[16] **VERIFY** the following after 2-PI-1-8C indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-13C indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-13C indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-PCV-1-12 MODULATES/CLOSES as required to maintain pressure setpoint ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12 (continued)

[17] **ADJUST** 2-PIC-1-13C, SG 2 PORV PCV-1-12 CONTROL, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-13C indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-13C is 0% ________

C. Green Light ONLY is ON at 2-HS-1-13 indicating 2-PCV-1-12 is CLOSED ________

D. 2-PI-1-8C increases towards 1130 PSIG ________

[18] **PLACE** 2-XS-1-13D, SG 2 PORV PCV-1-12 CONTROLLER, to NOR. ________

NOTES

1) Steps 6.4.3[19] and 6.4.3[20] partially open and then close the atmospheric power relief valve using the valve's handwheel. SG Pressure changes should be observed and limited to 50 PSIG.

2) Step 6.4.3[19] may be considered completed once visual/audible steam discharge is observed and/or Dual Red/Green indication is observed at 2-HS-1-6.

3) Clockwise (CW) rotation opens and counter clockwise (CCW) rotation closes the valve.

[19] **WHEN** 2-PI-1-12, SG 2 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**,

TURN the handwheel on 2-PCV-1-12, MAIN STEAM LOOP 2 PORV, CW and

VERIFY 2-PCV-1-12 OPENS. (**Acc Crit 5.0A**) ________

[20] **TURN** the handwheel on 2-PCV-1-12, MAIN STEAM LOOP 2 PORV, CCW and

VERIFY 2-PCV-1-12 CLOSES. (**Acc Crit 5.0A**) ________

Date ________

6.4.3 Operational Test of 2-PCV-1-12 (continued)

[21] **VERIFY** by visual/audible inspection that 2-PCV-1-12 is properly seated with **NO** leakage or valve chatter. (**Acc Crit 5.0H**) ________

Date ________

6.4.4 Operational Test of 2-PCV-1-23

[1] **VERIFY** Steam Generator 3 pressure is approximately 1130 PSIG as read at 2-PI-1-23, SG 3 PRESS LOW PRESS SI [2-M-4], and

RECORD the value: __________ PSIG __________

[2] **ENSURE** 2-HS-1-24, SG 3 PORV PCV-1-23, is in P AUTO. __________

[3] **NOTIFY** the Test Engineer responsible for 2-PTI-999-01 of impending PORV Stroke timing/steam discharge. __________

CAUTIONS

1) Steps 6.4.4[4] and 6.4.4[6] will open and close atmospheric relief valve 2-PCV-1-23 potentially impacting SG pressure and RCS T_{AVG}. Steps are to be performed in quick succession with only a brief pause to record opening time.
2) Steam Generator 3 pressure drop should be limited to 50 PSIG.
3) Test personnel should be positioned as-required to assure rapid data acquisition.

NOTES

1) Steps 6.4.4[4] and 6.4.4[6] require valve stroke timing locally and remotely. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement.
2) Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.
3) In the event of a stroke time measurement error (e.g. stop watch fails to start or stop, stop/starts prematurely), it should be annotated in the CTL and the valve stroke timed again. Retiming shall NOT be performed due to failure to meet acceptance criteria (with no measurement error causing the failure) without generating a TDN.

[4] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to OPEN and

MEASURE the stroke OPEN time:

- Locally __________
- Remotely __________

Date ________

6.4.4 Operational Test of 2-PCV-1-23 (continued)

[5] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0F**)

A. Local Stroke OPEN time:

__________ seconds M&TE: __________

Acc Crit: Time ≤ 32.0 seconds

____

B. Remote stroke OPEN time:

__________ seconds M&TE: __________

Acc Crit: Time ≤ 32.0 seconds

____

[6] **PLACE** 2-HS-1-24, SG 3 PORV PCV-1-23, to CLOSE, and

MEASURE the stroke CLOSED time:

- Locally ________
- Remotely ________

[7] **RECORD** the stroke CLOSE times

A. Local Stroke CLOSED time:

__________ seconds M&TE: __________ ________

B. Remote stroke CLOSED time:

__________ seconds M&TE: __________ ________

[8] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT % to 84%. ________

[9] **WHEN** 2-PI-1-23, SG 3 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**

PLACE 2-HS-1-24, SG 3 PORV PCV-1-23, to P AUTO. ________

Date ________

6.4.4 Operational Test of 2-PCV-1-23 (continued)

[10] **VERIFY** the following as the 2-PCV-1-23 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-24A indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-24A trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-24 indicating 2-PCV-1-23 OPEN/MODULATING in response to 2-PIC-1-24A demand ________

D. 2-PI-1-23, SG 3 PRESS LOW PRESS SI, decreases towards 1080 PSIG. ________

[11] **VERIFY** the following after 2-PI-1-23, SG 3 PRESS LOW PRESS SI, indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-24A indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-24A indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-HS-1-24 indicating 2-PCV-1-23 CLOSED/MODULATING ________

[12] **ADJUST** 2-PIC-1-24A, SG 3 PORV PCV-1-23, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-24A indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-24A is 0% ________

C. Green Light ONLY is LIT on 2-HS-1-24 indicating 2-PCV-1-23 is CLOSED ________

D. 2-PI-1-23, SG 3 PRESS LOW PRESS SI, increases towards 1130 PSIG ________

Date ________

6.4.4 Operational Test of 2-PCV-1-23 (continued)

[13] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, SETPOINT % to 84%. ________

[14] **WHEN** 2-PI-1-19C, SG 3 MAIN STM HDR, [2-L-10] indicates approximately 1130 PSIG, **THEN**

PLACE 2-XS-1-24D, SG 3 PORV PCV-1-23 CONTROLLER to AUX. ________

[15] **VERIFY** the following as the 2-PCV-1-23 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-24C indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-24C trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-24 indicating 2-PCV-1-23 OPEN/MODULATING in response to 2-PIC-1-24C demand ________

D. 2-PI-1-19C decreases towards 1080 PSIG ________

[16] **VERIFY** the following after 2-PI-1-19C indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-24C indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-24C indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-PCV-1-23 MODULATES/CLOSES as required to maintain pressure setpoint ________

Date ________

6.4.4 Operational Test of 2-PCV-1-23 (continued)

[17] **ADJUST** 2-PIC-1-24C, SG 3 PORV PCV-1-23 CONTROL, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-24C indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-24C is 0% ________

C. Green Light ONLY is ON at 2-HS-1-24 indicating 2-PCV-1-23 is CLOSED ________

D. 2-PI-1-19C increases towards 1130 PSIG ________

[18] **PLACE** 2-XS-1-24D, SG 3 PORV PCV-1-23 CONTROLLER to NOR. ________

NOTES

1) Steps 6.4.4[19] and 6.4.4[20] partially open and then close the atmospheric power relief valve using the valve's handwheel. SG Pressure changes should be observed and limited to 50 PSIG.

2) Step 6.4.4[19] may be considered completed once visual/audible steam discharge is observed and/or Dual Red/Green indication is observed at 2-HS-1-6.

3) Clockwise (CW) rotation opens and counter clockwise (CCW) rotation closes the valve.

[19] **WHEN** 2-PI-1-23, SG 3 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**,

TURN the handwheel on 2-PCV-1-23, MAIN STEAM LOOP 3 PORV, CW and

VERIFY 2-PCV-1-23 OPENS. (**Acc Crit 5.0A**) ________

[20] **TURN** the handwheel on 2-PCV-1-23, MAIN STEAM LOOP 3 PORV, CCW and

VERIFY 2-PCV-1-23 CLOSES. (**Acc Crit 5.0A**) ________

Date ________

6.4.4 Operational Test of 2-PCV-1-23 (continued)

[21] **VERIFY** by visual/audible inspection that 2-PCV-1-23 is properly seated with **NO** leakage or valve chatter. (**Acc Crit 5.0H**) ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30

[1] **VERIFY** Steam Generator 4 pressure is approximately 1130 PSIG as read at 2-PI-1-30, SG 4 PRESS LOW PRESS SI [2-M-4], and

RECORD the value: ________ PSIG ________

[2] **ENSURE** 2-HS-1-31, SG 4 PORV PCV-1-30, is in P AUTO. ________

[3] **NOTIFY** the Test Engineer responsible for 2-PTI-999-01 of impending PORV Stroke timing/steam discharge. ________

CAUTIONS

1) Steps 6.4.5[4] and 6.4.5[6] will open and close atmospheric relief valve 2-PCV-1-30 potentially impacting SG pressure and RCS T_{AVG}. Steps are to be performed in quick succession with only a brief pause to record opening time.
2) Steam Generator 4 pressure drop should be limited to 50 PSIG.
3) Test personnel should be positioned as-required to assure rapid data acquisition.

NOTES

1) Steps 6.4.5[4] and 6.4.5[6] require valve stroke timing locally and remotely. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement.
2) Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.
3) In the event of a stroke time measurement error (e.g. stop watch fails to start or stop, stop/starts prematurely), it should be annotated in the CTL and the valve stroke timed again. Retiming shall NOT be performed due to failure to meet acceptance criteria (with no measurement error causing the failure) without generating a TDN.

[4] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to OPEN and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30 (continued)

[5] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0F**)

A. Local Stroke OPEN time:

__________ seconds M&TE: _________

Acc Crit: Time ≤ 32.0 seconds

____

B. Remote stroke OPEN time:

__________ seconds M&TE: _________

Acc Crit: Time ≤ 32.0 seconds

____

[6] **PLACE** 2-HS-1-31, SG 4 PORV PCV-1-30, to CLOSE, and

MEASURE the stroke CLOSED time:

- Locally ________
- Remotely ________

[7] **RECORD** the stroke CLOSE times

A. Local Stroke CLOSED time:

__________ seconds M&TE: _________ ________

B. Remote stroke CLOSED time:

__________ seconds M&TE: _________ ________

[8] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT % to 84% ________

[9] **WHEN** 2-PI-1-30, SG 4 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**

PLACE 2-HS-1-31, SG 4 PORV PCV-1-30, to P AUTO. ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30 (continued)

[10] **VERIFY** the following as the 2-PCV-1-30 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-31A indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-31A trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-31 indicating 2-PCV-1-30 OPEN/MODULATING in response to 2-PIC-1-31A demand ________

D. 2-PI-1-30, SG 4 PRESS LOW PRESS SI, decreases towards 1080 PSIG ________

[11] **VERIFY** the following after 2-PI-1-30, SG 4 PRESS LOW PRESS SI, indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-31A indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-31A indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-HS-1-31 indicating 2-PCV-1-30 CLOSED/MODULATING ________

[12] **ADJUST** 2-PIC-1-31A, SG 4 PORV PCV-1-30, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-31A indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-31A is 0% ________

C. Green Light ONLY is LIT on 2-HS-1-31 indicating 2-PCV-1-30 is CLOSED ________

D. 2-PI-1-30, SG 4 PRESS LOW PRESS SI, increases towards 1130 PSIG ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30 (continued)

[13] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, SETPOINT % to 84%. ________

[14] **WHEN** 2-PI-1-26C, SG 4 MAIN STM HDR, [2-L-10] indicates approximately 1130 PSIG, **THEN**

PLACE 2-XS-1-31D, SG 4 PORV PCV-1-30 CONTROLLER, to AUX. ________

[15] **VERIFY** the following as the 2-PCV-1-30 responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-31C indicates negative deviation, initially showing approximately (-)2 to (-)3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-31C trends up from 0%, levels off and begins to trend back down to 0% ________

C. Red Light is ON at 2-HS-1-31 indicating 2-PCV-1-30 OPEN/MODULATING in response to 2-PIC-1-31C demand ________

D. 2-PI-1-26C decreases towards 1080 PSIG ________

[16] **VERIFY** the following after 2-PI-1-26C indicates approximately 1080 PSIG:

A. % DEVIATION on 2-PIC-1-31C indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-31C indicates approximately 0% DEMAND ________

C. Green Light is ON at 2-PCV-1-30 MODULATES/CLOSES as required to maintain pressure setpoint ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30 (continued)

[17] **ADJUST** 2-PIC-1-31C, SG 4 PORV PCV-1-30 CONTROL, SETPOINT to approximately 87%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-31C indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-31C is 0% ________

C. Green Light ONLY is ON at 2-HS-1-31 indicating 2-PCV-1-30 is CLOSE ________

D. 2-PI-1-26C increases towards 1130 PSIG ________

[18] **PLACE** 2-XS-1-31D, SG 4 PORV PCV-1-30 CONTROLLER, to NOR. ________

NOTES

1) Step 6.4.5[19] and 6.4.5[20] partially open and then close the atmospheric power relief valve using the valve's handwheel. SG Pressure changes should be observed and limited to 50 PSIG.
2) Step 6.4.5[19] may be considered completed once visual/audible steam discharge is observed and/or Dual Red/Green indication is observed at 2-HS-1-6.
3) Clockwise (CW) rotation opens and counter clockwise (CCW) rotation closes the valve.

[19] **WHEN** 2-PI-1-30, SG 4 PRESS LOW PRESS SI, indicates approximately 1130 PSIG, **THEN**,

TURN the handwheel on 2-PCV-1-30, MAIN STEAM LOOP 4 PORV, CW and

VERIFY 2-PCV-1-30 OPENS. (**Acc Crit 5.0A**) ________

[20] **TURN** the handwheel on 2-PCV-1-30, MAIN STEAM LOOP 4 PORV, CCW and

VERIFY 2-PCV-1-30 CLOSES. (**Acc Crit 5.0A**) ________

Date ________

6.4.5 Operational Test of 2-PCV-1-30 (continued)

[21] **VERIFY** by visual/audible inspection that 2-PCV-1-30 is properly seated with **NO** leakage or valve chatter. (**Acc Crit 5.0H**) ________

Date ________

6.4.6 Section Restoration

[1] **RETURN** the following handswitches to the AS FOUND position recorded in Step 6.4.1[7]:

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

[2] **VERIFY NO** excessive vibration of piping and components was observed or Engineering has evaluated the vibration and found it acceptable or has initiated corrective actions. ________

Date ________

6.5 Functional Test of Steam Dump Valves (with Steam Discharge)

6.5.1 Preliminary Steps

[1] **VERIFY** U2 Reactor Coolant System is at the 557°F Plateau, in accordance with 2-PTI-068-01. ________

[2] **ENSURE** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. ________

[3] **DISCUSS** PRECAUTION AND LIMITIATIONS 3.0R, 3.0S, 3.0T & 3.0U with U2 US / UO. ________

[4] **VERIFY** the following:

A. At least one U2 Condenser Circulating Water Pump A, B, C, or D is running ________

B. Condenser vacuum is established ________

C. 2-XA-55-4A-65E, C-9 CONDENSER AVAILABLE, is LIT ________

[5] **ENSURE** 2-HS-1-103D, STEAM DUMP MODE, [2-M-4] is in the STEAM PRESS position. ________

NOTES

1) Piping vibration is to be visually monitored in accordance with N3C-945, during steady state and transient conditions.

2) Accessible portions of the Main Steam System (MSS) piping will be observed concurrent with steam discharge. Any portions of the system that are impractical to observe during steam discharge should be inspected after steam discharge to verify no damage has occurred.

[6] **STATION** personnel in the Turbine Building, valve vaults and/or containment, as practical, to observe MSS piping vibration during Steam Dump Valve operation. ________

Date ________

6.5.2 Stroke Time / Controller Validation

NOTES

1) Testing in this section is performed at NOP/NOT. Pressure changes should be limited to 50 PSIG during steam discharge.
2) Vibration testing will be performed concurrent with valve operation.
3) At least one MSS SG PORV should be available.

[1] **ENSURE** MSS PORVs are available for pressure control with PICs in AUTO and set to approximately 87%. ________

NOTE

If MSIVs are closed, they should be opened by utilizing the HFT operating Instruction (TOP, SOI, etc) for the Main Steam System.

[2] **ENSURE** all U2 MSIVs are OPEN. ________

[3] **PLACE** the following handswitches to OFF RESET: [2-M-4]

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

[4] **ENSURE** 2-PIC-1-33, STEAM DUMP PRESS CONTROL, [2-M-4] is in MAN with OUTPUT % set to 0. ________

[5] **VERIFY** ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED). ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[6] **CLOSE** the following Steam Dump Control Air Isolation Valves:

UNID	NOMENCLATURE	LOCATION	POSTION	INITIAL
2-ISV-32-2138	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-103	T10H/724	CLOSED	
2-ISV-32-2139	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-104	T10H/724	CLOSED	
2-ISV-32-2140	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-105	T10H/724	CLOSED	
2-ISV-32-2141	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-106	T10H/724	CLOSED	
2-ISV-32-2142	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-107	T10G/724	CLOSED	
2-ISV-32-2143	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-108	T10G/724	CLOSED	
2-ISV-32-2144	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-109	T10G/724	CLOSED	
2-ISV-32-2145	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-110	T10G/724	CLOSED	
2-ISV-32-2146	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-111	T10G/724	CLOSED	
2-ISV-32-2147	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-112	T10G/724	CLOSED	
2-ISV-32-2148	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-113	T10F/724	CLOSED	
2-ISV-32-2149	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-114	T10F/724	CLOSED	

[7] **PLACE** the following handswitches to ON:

A. 2-HS-1-103A, STEAM DUMP FSV “A” ________

B. 2-HS-1-103B, STEAM DUMP FSV “B” ________

[8] **PLACE** the following Contact Output (COUT) points in Manual, with COUT state set to, “contact closed” (“1” COUT box WHITE and “0” box GREY):

A. 2TS0010033A (W211CP, W2STMDUMP) ________

B. 2TS0010033B (W211CP, W2STMDUMP) ________

C. 2TS0010033D (W211CP, W2STMDUMP) ________

D. 2TS0010033E (W211CP, W2STMDUMP) ________

E. 2PS0010072E (W205CP, W2TLLILK) ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[9] **NOTIFY** the Test Engineer responsible for 2-PTI-999-01 of impending Steam Dump Stroke timing/steam discharge. ________

NOTES

1) Steps 6.5.2[10] through 6.5.2[21] involve local and remote stroke timing of the Steam Dump valves. Each valve will be timed for:
   - Modulate OPEN (≤20secs)
   - Trip CLOSE (≤5secs)
   - Trip OPEN (≤3secs)
2) Local stroke time begins on initiating event (2-PIC-1-33 output change, SSPS slave relay actuation or 2-HS-1-103D operation) and concludes with completion of valve stem movement.
3) Remote stroke timing begins on initiating event and concludes when 2-XX-55-4A indicates completion of valve travel:
   - For open timing: RED light only LIT
   - For stroke close timing GREEN light only LIT.
4) In the event of a stroke time measurement error (e.g. stop watch fails to start or stop, stop/starts prematurely), it should be annotated in the CTL and the valve stroke timed again. Retiming shall NOT be performed due to failure to meet acceptance criteria (with no measurement error causing the failure) without generating a TDN.

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[10] **PERFORM** steps 6.5.2[10.1] thru 6.5.2[10.10] to stroke time 2-FCV-1-103:

[10.1] **OPEN** 2-ISV-32-2138, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-103. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[10.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT %, to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[10.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 20 seconds	
Remote		 **Acc Crit:** Time ≤ 20 seconds	

[10.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A [2-R-48], and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[10.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 5 seconds	
Remote		**Acc Crit:** Time ≤ 5 seconds	

[10.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[10.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[10.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 3 seconds	
Remote		**Acc Crit:** Time ≤ 3 seconds	

[10.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-103 CLOSES. ________

[10.10] **CLOSE** 2-ISV-32-2138, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-103. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[11] **PERFORM** steps 6.5.2[11.1] thru 6.5.2[11.10] to stroke time 2-FCV-1-104:

[11.1] **OPEN** 2-ISV-32-2139, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-104. ________

NOTE

2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[11.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[11.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria: (**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 20 seconds	
Remote		 **Acc Crit:** Time ≤ 20 seconds	

[11.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[11.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 5 seconds	
Remote			
		Acc Crit: Time ≤ 5 seconds	

[11.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[11.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[11.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 3 seconds	
Remote			
		Acc Crit: Time ≤ 3 seconds	

[11.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-104 CLOSES. ________

[11.10] **CLOSE** 2-ISV-32-2139, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-104. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[12] **PERFORM** steps 6.5.2[12.1] thru 6.5.2[12.10] to stroke time 2-FCV-1-105:

[12.1] **OPEN** 2-ISV-32-2140, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-105. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[12.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[12.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[12.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[12.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 5 seconds	
Remote		 **Acc Crit:** Time ≤ 5 seconds	

[12.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[12.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[12.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 3 seconds	
Remote		 **Acc Crit:** Time ≤ 3 seconds	

[12.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-105 CLOSES. ________

[12.10] **CLOSE** 2-ISV-32-2140, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-105. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[13] **PERFORM** steps 6.5.2[13.1] thru 6.5.2[13.10] to stroke time 2-FCV-1-106:

[13.1] **OPEN** 2-ISV-32-2141, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-106. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[13.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[13.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 20 seconds	
Remote		 **Acc Crit:** Time ≤ 20 seconds	

[13.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[13.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 5 seconds	
Remote		**Acc Crit:** Time ≤ 5 seconds	

[13.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[13.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[13.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 3 seconds	
Remote		**Acc Crit:** Time ≤ 3 seconds	

[13.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-106 CLOSES. ________

[13.10] **CLOSE** 2-ISV-32-2141, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-106. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[14] **PERFORM** steps 6.5.2[14.1] thru 6.5.2[14.10] to stroke time 2-FCV-1-107:

[14.1] **OPEN** 2-ISV-32-2142, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-107. ________

NOTE

2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[14.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[14.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[14.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[14.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 5 seconds	
Remote		 **Acc Crit:** Time ≤ 5 seconds	

[14.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[14.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[14.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 3 seconds	
Remote		 **Acc Crit:** Time ≤ 3 seconds	

[14.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-107 CLOSES. ________

[14.10] **CLOSE** 2-ISV-32-2142, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-107. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[15] **PERFORM** steps 6.5.2[15.1] thru 6.5.2[15.10] to stroke time 2-FCV-1-108:

[15.1] **OPEN** 2-ISV-32-2143, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-108. ________

> **NOTE**
>
> 2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[15.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[15.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 20 seconds	
Remote			
		Acc Crit: Time ≤ 20 seconds	

[15.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[15.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 5 seconds	
Remote		 **Acc Crit:** Time ≤ 5 seconds	

[15.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[15.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[15.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 3 seconds	
Remote		 **Acc Crit:** Time ≤ 3 seconds	

[15.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-108 CLOSES. ________

[15.10] **CLOSE** 2-ISV-32-2143, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-108. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[16] **PERFORM** steps 6.5.2[16.1] thru 6.5.2[16.10] to stroke time 2-FCV-1-109:

[16.1] **OPEN** 2-ISV-32-2144, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-109. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[16.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[16.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[16.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[16.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 5 seconds	
Remote		 **Acc Crit:** Time ≤ 5 seconds	

[16.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[16.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[16.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		 **Acc Crit:** Time ≤ 3 seconds	
Remote		 **Acc Crit:** Time ≤ 3 seconds	

[16.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-109 CLOSES. ________

[16.10] **CLOSE** 2-ISV-32-2144, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-109. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[17] **PERFORM** steps 6.5.2[17.1] thru 6.5.2[17.10] to stroke time 2-FCV-1-110:

[17.1] **OPEN** 2-ISV-32-2145, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-110. ________

NOTE

2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[17.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[17.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 20 seconds	
Remote			
		Acc Crit: Time ≤ 20 seconds	

[17.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[17.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 5 seconds	
Remote			
		Acc Crit: Time ≤ 5 seconds	

[17.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[17.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[17.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 3 seconds	
Remote			
		Acc Crit: Time ≤ 3 seconds	

[17.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-110 CLOSES. ________

[17.10] **CLOSE** 2-ISV-32-2145, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-110. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[18] **PERFORM** steps 6.5.2[18.1] thru 6.5.2[18.10] to stroke time 2-FCV-1-111:

[18.1] **OPEN** 2-ISV-32-2146, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-111. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[18.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[18.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[18.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[18.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 5 seconds	
Remote			
		Acc Crit: Time ≤ 5 seconds	

[18.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[18.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[18.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 3 seconds	
Remote			
		Acc Crit: Time ≤ 3 seconds	

[18.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-111 CLOSES. ________

[18.10] **CLOSE** 2-ISV-32-2146, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-111. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[19] **PERFORM** steps 6.5.2[19.1] thru 6.5.2[19.10] to stroke time 2-FCV-1-112:

[19.1] **OPEN** 2-ISV-32-2147, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-112. ________

NOTE

2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[19.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[19.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[19.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[19.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 5 seconds	
Remote		**Acc Crit:** Time ≤ 5 seconds	

[19.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[19.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[19.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 3 seconds	
Remote		**Acc Crit:** Time ≤ 3 seconds	

[19.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-112 CLOSES. ________

[19.10] **CLOSE** 2-ISV-32-2147, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-112. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[20] **PERFORM** steps 6.5.2[20.1] thru 6.5.2[20.10] to stroke time 2-FCV-1-113:

[20.1] **OPEN** 2-ISV-32-2148, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-113. ________

NOTE
2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[20.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[20.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[20.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[20.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 5 seconds	
Remote			
		Acc Crit: Time ≤ 5 seconds	

[20.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[20.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[20.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 3 seconds	
Remote			
		Acc Crit: Time ≤ 3 seconds	

[20.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-113 CLOSES. ________

[20.10] **CLOSE** 2-ISV-32-2148, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-113. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[21] **PERFORM** steps 6.5.2[21.1] thru 6.5.2[21.10] to stroke time 2-FCV-1-114:

[21.1] **OPEN** 2-ISV-32-2149, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-114. ________

NOTE

2-PIC-1-33 RAMP & >> buttons may be released when valve travel stops or OUTPUT % indicates 100%.

[21.2] **SIMULTANEOUSLY RAMP** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 100%, and

MEASURE the stroke OPEN time:

- Locally ________
- Remotely ________

[21.3] **RECORD** the stroke OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local		**Acc Crit:** Time ≤ 20 seconds	
Remote		**Acc Crit:** Time ≤ 20 seconds	

[21.4] **SIMULTANEOUSLY PRESS** and **HOLD** the relay armature bar on WBN-2-RLY-099-K631A, and

MEASURE the trip CLOSE stroke time:

- Locally ________
- Remotely ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[21.5] **RECORD** the trip CLOSE times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 5 seconds	
Remote			
		Acc Crit: Time ≤ 5 seconds	

[21.6] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, OUTPUT % to 0%, and

RELEASE the relay armature bar on WBN-2-RLY-099-K631A. ________

[21.7] **SIMULTANEOUSLY PLACE** 2-HS-1-103D, STEAM DUMP MODE, to TAVG, and

MEASURE the TRIP OPEN stroke time:

- Locally ________
- Remotely ________

[21.8] **RECORD** the trip OPEN times, and

VERIFY they meet acceptance criteria:(**Acc Crit 5.0O**)

Location	M&TE ID	Stroke Time (sec)	Initial
Local			
		Acc Crit: Time ≤ 3 seconds	
Remote			
		Acc Crit: Time ≤ 3 seconds	

[21.9] **PLACE** 2-HS-1-103D, STEAM DUMP MODE, to STEAM PRESS, and

VERIFY 2-FCV-1-114 CLOSES. ________

[21.10] **CLOSE** 2-ISV-32-2149, CONTROL AIR ISOLATION VALVE TO 2-FCV-1-114. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[22] **RETURN** the following points to AUTO:

A. 2TS0010033A (W211CP, W2STMDUMP) ________

B. 2TS0010033B (W211CP, W2STMDUMP) ________

C. 2TS0010033D (W211CP, W2STMDUMP) ________

D. 2TS0010033E (W211CP, W2STMDUMP) ________

E. 2PS0010072E (W205CP, W2TLLILK) ________

[23] **PLACE** the following handswitches to OFF RESET:

A. 2-HS-1-103A, STEAM DUMP FSV “A” ________

B. 2-HS-1-103B, STEAM DUMP FSV “B” ________

[24] **OPEN** the following Steam Dump Control Air Isolation Valves:

UNID	NOMENCLATURE	Location	POSTION	INITIAL
2-ISV-32-2138	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-103	T10H/724	OPEN	
2-ISV-32-2139	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-104	T10H/724	OPEN	
2-ISV-32-2140	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-105	T10H/724	OPEN	
2-ISV-32-2141	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-106	T10H/724	OPEN	
2-ISV-32-2142	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-107	T10G/724	OPEN	
2-ISV-32-2143	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-108	T10G/724	OPEN	
2-ISV-32-2144	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-109	T10G/724	OPEN	
2-ISV-32-2145	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-110	T10G/724	OPEN	
2-ISV-32-2146	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-111	T10G/724	OPEN	
2-ISV-32-2147	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-112	T10G/724	OPEN	
2-ISV-32-2148	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-113	T10F/724	OPEN	
2-ISV-32-2149	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-114	T10F/724	OPEN	

[25] **PLACE** 2-PIC-1-33, STM DUMP PRESS CONTROL, to AUTO. ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[26] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT % to approximately 86.5%. ________

[27] **PLACE** the following handswitches to ON:

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

[28] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT %, to 84%. ________

[29] **VERIFY** the following as the STEAM DUMP system responds to the setpoint adjustment:

A. % DEVIATION on 2-PIC-1-33 indicates positive deviation, initially showing approximately +2 to +3, and trending down to 0 ________

B. OUTPUT % on 2-PIC-1-33 trends up from 0%, levels off and begins to trend back down to 0% ________

C. 2-XX-55-4A shows STEAM DUMP valves OPENING/MODULATING in response to 2-PIC-1-33 demand ________

D. 2-PI-1-33, MAIN STEAM PRESS, decreases towards 1080 PSIG ________

[30] **VERIFY** the following after 2-XI-1-33, STEAM DUMP DEMAND, show approximately 0% DEMAND:

A. % DEVIATION on 2-PIC-1-33 indicates approximately 0% ________

B. OUTPUT % on 2-PIC-1-33 indicates approximately 0% ________

C. 2-PI-1-33, MAIN STEAM PRESS, indicates approximately 1080 PSIG ________

D. STEAM DUMP valves OPEN/CLOSE as required to maintain pressure setpoint ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[31] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT to 86.5%, and

VERIFY the following:

A. % DEVIATION on 2-PIC-1-33 indicates negative deviation, initially showing approximately (-)3, and trending towards 0 ________

B. OUTPUT % on 2-PIC-1-33 indicates 0% ________

C. 2-PI-1-33, MAIN STEAM PRESS, indication increases towards 1130 PSIG ________

D. ALL GREEN lights and **NO** RED lights are LIT at 2-XX-55-4A (all STEAM DUMPS CLOSED) ________

[32] **WHEN** 2-PI-1-33, MAIN STEAM PRESS, indication is between 1120-1130 PSIG OR any MSS PORVs OPEN, **THEN**

PLACE 2-HS-1-103D, STEAM DUMP MODE, to TAVG. ________

[33] **VERIFY** the following as the STEAM DUMP system responds to the T_{AVG} - $T_{NO\ LOAD}$ deviation:

A. 2-XI-1-33, STEAM DUMP DEMAND, indication trends up from 0%, levels off and begins to trend back down to 0% ________

B. 2-TR-68-2B Auctioneered T_{AVG} decreases towards 557°F ________

C. 2-XX-55-4A shows STEAM DUMP valves OPENING/MODULATING in response to T_{AVG} - $T_{NO\ LOAD}$ deviation ________

[34] **VERIFY** the following after 2-XI-1-33, STEAM DUMP DEMAND, indicates approximately 0% DEMAND:

A. 2-TR-68-2B Auctioneered T_{AVG} indicates approximately 557°F ________

B. 2-PI-1-33, MAIN STEAM PRESS, indicates approximately 1080 PSIG ________

C. STEAM DUMP valves OPEN/CLOSE as required to maintain $T_{NO\ LOAD}$ setpoint ________

Date ________

6.5.2 Stroke Time / Controller Validation (continued)

[35] **PLACE** the following handswitches to OFF RESET:

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

[36] **PLACE** 2-PIC-1-33, STM DUMP PRESS CONTROL, to AUTO. ________

[37] **ADJUST** 2-PIC-1-33, STM DUMP PRESS CONTROL, SETPOINT % to approximately 84%. ________

[38] **PLACE** the following handswitches to ON:

A. 2-HS-1-103A, STEAM DUMP FSV "A" ________

B. 2-HS-1-103B, STEAM DUMP FSV "B" ________

[39] **VERIFY NO** excessive vibration of piping and components was observed **OR** Engineering has evaluated the vibration and found it acceptable or has initiated corrective actions. ________

Date ________

7.0 POST PERFORMANCE ACTIVITY

NOTE

Post-performance steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the end of the instruction performance

[1] **NOTIFY** the Unit 2 US/SRO of the test completion and system alignment. ________

[2] **VERIFY** that Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed, and

RECORD the results on Measuring and Test Equipment (M&TE) Log. ________

[3] **ENSURE** any temporary condition recorded in Appendix B, Temporary Conditions Log, are addressed for necessary restoration as applicable (**N/A** if **NO** conditions recorded). ________

8.0 RECORDS

A. QA Records

The following documents are QA records and are handled in accordance with the approved Document Control Records Management (DCRM) Program:

Completed Test Package

B. Non-QA Records

None

Appendix A
(Page 1 of 1)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

Date ________

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact -N/A this signoff if reference hasn't been revised

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL/ DATE
Unit 2 FSAR - Amendment 110 Section 10.3 Section 10.4.4 Chapter14 Table 14.2-1 Sheets 63-64 of 89			
WBN2-1-4002, Rev 3, Main Steam System			
2-TSD-1-2, Main Steam PORVs and Bypass Valve Functional Test - Test Scoping Document, Rev 0			
2-IMI-98.000, Foxboro I/A DCS User Guide, Rev 0			
25402-011-V1A-MG00-04164-001 , Watts Bar Unit 2 Precautions, Limitations and Setpoints (PLS), Rev 0			

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

Date ________

NOTES

1) These steps will be N/A'd if no temporary condition existed.
2) Additional copies of this table may be made as necessary.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
(Page 1 of 2)

PERMANENT PLANT INSTRUMENTATION LOG

Date ________

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LPF-1-103					☒	N/A	N/A
2-LPT-1-33					☒	N/A	N/A
2-LPP-1-33					☒	N/A	N/A
2-PT-1-74					☒	N/A	N/A
2-PT-1-81					☒	N/A	N/A
2-LPP-1-72					☒	N/A	N/A
2-LPP-1-73					☒	N/A	N/A
2-LPP-1-1C					☒	N/A	N/A
2-LPP-1-5					☒	N/A	N/A
2-LPP-1-6					☒	N/A	N/A
2-LPZ-1-5					☒	N/A	N/A
2-LPP-1-8C					☒	N/A	N/A
2-LPP-1-12					☒	N/A	N/A

Appendix C
(Page 2 of 2)

PERMANENT PLANT INSTRUMENTATION LOG

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LPP-1-13					☒	N/A	N/A
2-LPZ-1-12					☒	N/A	N/A
2-LPP-1-19C					☒	N/A	N/A
2-LPP-1-23					☒	N/A	N/A
2-LPP-1-24					☒	N/A	N/A
2-LPZ-1-23					☒	N/A	N/A
2-LPP-1-26C					☒	N/A	N/A
2-LPP-1-30					☒	N/A	N/A
2-LPP-1-31					☒	N/A	N/A
2-LPZ-1-30					☒	N/A	N/A

1 These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (N/A)

2 May be identified as Not Applicable (N/A) if instrument was not used to verify/record quantitative acceptance criteria data.

Appendix D
(Page 1 of 2)

HAND SWITCH & CONTROLLER LINEUP

Date ________

UNID	LOCATION	NOMENCLATURE	POSITION	SECTION REQ'D	INITIALS/DATE
2-PIC-1-33	2-M-4	STM DUMP PRESS CONTROL	S.P. 84% MAN	6.2	
2-HS-1-103A	2-M-4	STEAM DUMP FSV "A"	OFF RESET	6.2	
2-HS-1-103B	2-M-4	STEAM DUMP FSV "B"	OFF RESET	6.2	
2-HS-1-103D	2-M-4	STEAM DUMP MODE	RESET then STEAM PRESS	6.3	
2-HS-1-6	2-M-4	SG 1 PORV PCV-1-5	CLOSE	6.3	
2-HS-1-13	2-M-4	SG 2 PORV PCV-1-12	CLOSE	6.3	
2-HS-1-24	2-M-4	SG 3 PORV PCV-1-23	CLOSE	6.3	
2-HS-1-31	2-M-4	SG 4 PORV PCV-1-30	CLOSE	6.3	
2-PIC-1-6A	2-M-4	SG 1 PORV PCV-1-5	S.P. 87% AUTO	6.3	
2-PIC-1-13A	2-M-4	SG 2 PORV PCV-1-12	S.P. 87% AUTO	6.3	
2-PIC-1-24A	2-M-4	SG 3 PORV PCV-1-23	S.P. 87% AUTO	6.3	
2-PIC-1-31A	2-M-4	SG 4 PORV PCV-1-30	S.P. 87% AUTO	6.3	
2-XS-1-6A	2-L-11A	SG 1 PORV LIFT SOL(AUX POS BLOCKS LIFT)	NOR	6.3	
2-XS-1-6D	2-L-11A	SG 1 PORV PCV-1-5 CONTROLLER	NOR	6.3	
2-XS-1-13B	2-L-11A	SG 2 PORV AUX CONTROL SOLENOID	NOR	6.3	

Appendix D
(Page 2 of 2)

HAND SWITCH & CONTROLLER LINEUP

UNID	LOCATION	NOMENCLATURE	POSITION	SECTION REQ'D	INITIALS/DATE
2-XS-1-24A	2-L-11A	SG 3 PORV LIFT SOL (AUX POS BLOCKS LIFT)	NOR	6.3	
2-XS-1-24D	2-L-11A	SG 3 PORV PCV-1-23 CONTROLLER	NOR	6.3	
2-XS-1-31B	2-L-11A	SG4 PORV AUX CONTROL SOLENOID	NOR	6.3	
2-XS-1-6B	2-L-11B	SG 1 PORV AUX CONTROL SOLENOID	NOR	6.3	
2-XS-1-13A	2-L-11B	SG 2 PORV LIFT SOL (AUX POS BLOCKS LIFT)	NOR	6.3	
2-XS-1-13D	2-L-11B	SG 2 PORV PCV-1-12 CONTROLLER	NOR	6.3	
2-XS-1-24B	2-L-11B	SG 3 PORV AUX CONTROL SOLENOID	NOR	6.3	
2-XS-1-31A	2-L-11B	SG 4 PORV LIFT SOL (AUX POS BLOCKS LIFT)	NOR	6.3	
2-XS-1-31D	2-L-11B	SG4 PORV PCV-1-30 CONTROLLER	NOR	6.3	

Appendix E
(Page 1 of 6)

BREAKER & FUSE LINEUP

Date ________

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-FU-278-M4/1 2-FU-278-M4/2	2-XX-55-4A	2-M-4 Fuses 1 & 2	INSTALLED[1]	6.2	
2-FU-278-M4/5 2-FU-278-M4/6	2-XI-1-103A&B	2-M-4 Fuses 5 & 6	INSTALLED[1]	6.2	
2-FU-278-M4/7 2-FU-278-M4/8	2-XI-1-103D	2-M-4 Fuses 7 & 8	INSTALLED[1]	6.2	
0-BKR-236-3/313	NSSS AUXILIARY RELAY RACK 2-R-54	0-BD-236-3, 125V Battery BD 3, PNL 3 BKR 313 [A11Q/757]	ON	6.2	
0-BKR-236-4/313	NSSS AUXILIARY RELAY RACK 2-R-55	0-BD-236-4, 125V Battery BD 4, PNL 3 BKR 313 [A12Q/757]	ON	6.2	
2-BKR-235-3/29	NSSS AUX RELAY RACH RELAY BUS A TO PNL 2-R-54	2-BD-235-3, 120V AC VITAL BD 2-III, BKR 29 [A11R/757]	ON	6.2	
2-BKR-235-4/37	NSSS RELAY RACK B BUS TO PNL 2-R-55	2-BD-235-4, 120V AC VITAL BD 2-IV, BKR 37 [A11R/757]	ON	6.2	
2-BKR-235-1/9	NSSS AUX RELAY RACK A BUS TO PNL 2-R-58	2-BD-235-1, 120V AC VITAL BD 2-I, BKR 9 [A5R/757]	ON	6.2	
2-BKR-235-2/7	NSSS AUX RELAY RACK C BUS TO PNL 2-R-58	2-BD-235-2, 120V AC VITAL BD 2-II, BKR 7 [A6R/757]	ON	6.2	
2-BKR-235-2/8	NSSS AUX RELAY RACK B BUS TO PNL 2-R-58	2-BD-235-2, 120V AC VITAL BD 2-II, BKR 8 [A6R/757]	ON	6.2	
2-BKR-235-4/2	INST BUS 4 TO PNL 2-M-4	2-BD-235-4, 120V AC VITAL BD 2-IV, BKR 2 [A11R/757]	ON	6.2	
2-FU-99-R54/L1 2-FU-99-R54/L2	STEAM DUMP TR A BUFFER CIRCUIT	2-R-54 Row L, Fuses 1 & 2	INSTALLED[1]	6.2	

Appendix E
(Page 2 of 6)

BREAKER & FUSE LINEUP

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-FU-99-R54/L3 2-FU-99-R54/L4	STEAM DUMP TRAIN A AUX RELAYS	2-R-54 Row L, Fuses 3 & 4	INSTALLED[1]	6.2	
2-FU-99-R54/M1 2-FU-99-R54/M2	2-FCV-1-103 MAIN STEAM COOLDOWN VALVE TR A POWER	2-R-54 Row M, Fuses 1 & 2	INSTALLED[1]	6.2	
2-FU-99-R54/M11 2-FU-99-R54/M12	MAIN STEAM DUMP VALVE 2-FCV-1-108 TR A	2-R-54 Row M, Fuses 11 & 12	INSTALLED[1]	6.2	
2-FU-99-R54/M13 2-FU-99-R54/M14	MAIN STEAM DUMP VALVE 2-FCV-1-109 TR A	2-R-54 Row M, Fuses 13 & 14	INSTALLED[1]	6.2	
2-FU-99-R54/M15 2-FU-99-R54/M16	MAIN STEAM DUMP VALVE 2-FCV-1-110 TR A	2-R-54 Row M, Fuses 15 & 16	INSTALLED[1]	6.2	
2-FU-99-R54/M17 2-FU-99-R54/M18	2-FCV-1-111 MAIN STEAM COOLDOWN VALVE TR A	2-R-54 Row M, Fuses 17 & 18	INSTALLED[1]	6.2	
2-FU-99-R54/M19 2-FU-99-R54/M20	MAIN STEAM DUMP VALVE 2-FCV-1-112 TR A	2-R-54 Row M, Fuses 19 & 20	INSTALLED[1]	6.2	
2-FU-99-R54/M21 2-FU-99-R54/M22	MAIN STEAM DUMP VALVE 2-FCV-1-113 TR A	2-R-54 Row M, Fuses 21 & 22	INSTALLED[1]	6.2	
2-FU-99-R54/M23 2-FU-99-R54/M24	MAIN STEAM DUMP VALVE 2-FCV-1-114 TR A	2-R-54 Row M, Fuses 23 & 24	INSTALLED[1]	6.2	
2-FU-99-R54/M3 2-FU-99-R54/M4	MAIN STEAM DUMP VALVE 2-FCV-1-104 TR A	2-R-54 Row M, Fuses 3 & 4	INSTALLED[1]	6.2	
2-FU-99-R54/M5 2-FU-99-R54/M6	MAIN STEAM DUMP VALVE 2-FCV-1-105 TR A	2-R-54 Row M, Fuses 5 & 6	INSTALLED[1]	6.2	

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BREAKER & FUSE LINEUP

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-FU-99-R54/M7 2-FU-99-R54/M8	MAIN STEAM DUMP VALVE 2-FCV-1-106 TR A	2-R-54 Row M, Fuses 7 & 8	INSTALLED[1]	6.2	
2-FU-99-R54/M9 2-FU-99-R54/M10	2-FCV-1-107 MAIN STEAM COOLDOWN VALVE TR A POWER	2-R-54 Row M, Fuses 9 & 10	INSTALLED[1]	6.2	
2-FU-99-R55/L1 2-FU-99-R55/L2	STEAM DUMP TR B BUFFER CIRCUIT	2-R-55 Row L, Fuses 1 & 2	INSTALLED[1]	6.2	
2-FU-99-R55/L3 2-FU-99-R55/L4	STEAM DUMP TRAIN B AUX RELAYS	2-R-55 Row L, Fuses 3 & 4	INSTALLED[1]	6.2	
2-FU-99-R55/M1 2-FU-99-R55/M2	2-FCV-1-103 MAIN STEAM COOLDOWN VALVE TR B POWER	2-R-55 Row M, Fuses 1 & 2	INSTALLED[1]	6.2	
2-FU-99-R55/M11 2-FU-99-R55/M12	MAIN STEAM DUMP VALVE 2-FCV-1-108 TR B	2-R-55 Row M, Fuses 11 & 12	INSTALLED[1]	6.2	
2-FU-99-R55/M13 2-FU-99-R55/M14	MAIN STEAM DUMP VALVE 2-FCV-1-109 TR B	2-R-55 Row M, Fuses 13 & 14	INSTALLED[1]	6.2	
2-FU-99-R55/M15 2-FU-99-R55/M16	MAIN STEAM DUMP VALVE 2-FCV-1-110 TR B	2-R-55 Row M, Fuses 15 & 16	INSTALLED[1]	6.2	
2-FU-99-R55/M17 2-FU-99-R55/M18	2-FCV-1-111 MAIN STEAM COOLDOWN VALVE TR B	2-R-55 Row M, Fuses 17 & 18	INSTALLED[1]	6.2	

Appendix E
(Page 4 of 6)

BREAKER & FUSE LINEUP

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-FU-99-R55/M19 2-FU-99-R55/M20	MAIN STEAM DUMP VALVE 2-FCV-1-112 TR B	2-R-55 Row M, Fuses 19 & 20	INSTALLED[1]	6.2	
2-FU-99-R55/M21 2-FU-99-R55/M22	MAIN STEAM DUMP VALVE 2-FCV-1-113 TR B	2-R-55 Row M, Fuses 21 & 22	INSTALLED[1]	6.2	
2-FU-99-R55/M23 2-FU-99-R55/M24	MAIN STEAM DUMP VALVE 2-FCV-1-114 TR B	2-R-55 Row M, Fuses 23 & 24	INSTALLED[1]	6.2	
2-FU-99-R55/M3 2-FU-99-R55/M4	MAIN STEAM DUMP VALVE 2-FCV-1-104 TR B	2-R-55 Row M, Fuses 3 & 4	INSTALLED[1]	6.2	
2-FU-99-R55/M5 2-FU-99-R55/M6	MAIN STEAM DUMP VALVE 2-FCV-1-105 TR B	2-R-55 Row M, Fuses 5 & 6	INSTALLED[1]	6.2	
2-FU-99-R55/M7 2-FU-99-R55/M8	MAIN STEAM DUMP VALVE 2-FCV-1-106 TR B	2-R-55 Row M, Fuses 7 & 8	INSTALLED[1]	6.2	
2-FU-99-R55/M9 2-FU-99-R55/M10	2-FCV-1-107 MAIN STEAM COOLDOWN VALVE TR B POWER	2-R-55 Row M, Fuses 9 & 10	INSTALLED[1]	6.2	
2-FU-99-R58/L1 2-FU-99-R58/L2	STEAM DUMP BUFFER RELAY CKT	2-R-58 Row L, Fuses 1 & 2	INSTALLED[1]	6.2	
2-FU-99-R58/L19 2-FU-99-R58/L20	STEAM DUMP BUFFER RELAY CKT	2-R-58 Row L, Fuses 19 & 20	INSTALLED[1]	6.2	
2-FU-99-R58/M1 2-FU-99-R58/M2	STEAM DUMP COMMON CIRCUIT	2-R-58 Row M, Fuses 1 & 2	INSTALLED[1]	6.2	
2-BKR-235-3/30	SEPARATION AUX RELAY PANELS 2-R-73/2-R-74	2-BD-235-3, 120V AC VITAL BD 2-III, BKR 30 [A11R/757]	ON	6.3	

Appendix E
(Page 5 of 6)

BREAKER & FUSE LINEUP

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-BKR-235-4/39	SEPARATION AUX RELAY PANELS 2-R-77-/2-R-78	2-BD-235-4, 120V AC VITAL BD 2-IV, BKR 39 [A11R/757]	ON	6.3	
2-BKR-90-L405	MISC 120V AC DPL BKR 18 TO 2-PNL-090-L405	2-BD-242-1 Radiation Monitor & Sampling Power Dist PNL 2, BKR 18 [A15R/757]	ON	6.3	
2-BKR-90-L404	MISC 120V AC DPL BKR 19 TO 2-PNL-090-L404	2-BD-242-1 Radiation Monitor & Sampling Power Dist PNL 2, BKR 19 [A15R/757]	ON	6.3	
0-FU-236-1/C13	2-PCV-1-5 POWER RELIEF VALVE TR A	0-BD-236-1/4, 125V Battery BD 1, PNL 4 [A4Q/757]	INSTALLED[1]	6.3	
0-FU-236-2/B32	2-PCV-1-30 POWER RELIEF VALVE TR B	0-BD-236-2/4, 125V Battery BD 2, PNL 4 [A5Q/757]	INSTALLED[1]	6.3	
0-FU-236-3/C15	2-PCV-1-23 POWER RELIEF VALVE TR A	0-BD-236-3/4, 125V Battery BD 3, PNL 4 [A11Q/757]	INSTALLED[1]	6.3	
0-FU-236-3/C22	2-PCV-1-12 POWER RELIEF VALVE TR A	0-BD-236-3/4, 125V Battery BD 3, PNL 4 [A11Q/757]	INSTALLED[1]	6.3	
0-FU-236-3/C38	2-PCV-1-30 POWER RELIEF VALVE TR A	0-BD-236-3/4, 125V Battery BD 3, PNL 4 [A11Q/757]	INSTALLED[1]	6.3	
0-FU-236-4/C17	2-PCV-1-5 POWER RELIEF VALVE TR B	0-BD-236-4/4, 125V Battery BD 4, PNL 4 [A12Q/757]	INSTALLED[1]	6.3	

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(Page 6 of 6)

BREAKER & FUSE LINEUP

UNID	DESCRIPTION	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
0-FU-236-4/C38	2-PCV-1-12 POWER RELIEF VALVE TR B	0-BD-236-4/4, 125V Battery BD 4, PNL 4 [A12Q/757]	INSTALLED[1]	6.3	
0-FU-236-4/C47	2-PCV-1-23 POWER RELIEF VALVE TR B	0-BD-236-4/4, 125V Battery BD 4, PNL 4 [A12Q/757]	INSTALLED[1]	6.3	
2-FU-275-R73/K1 2-FU-275-R73/K2	STEAM GEN 1 POWER RELIEF VALVE SEP RELAY	2-R-73 Row K, Fuses 1 & 2	INSTALLED[1]	6.3	
2-FU-275-R73/K5 2-FU-275-R73/K6	STEAM GEN 2 POWER RELIEF VALVE SEP RELAY	2-R-73 Row K, Fuses 5 & 6	INSTALLED[1]	6.3	
2-FU-275-R78/K3 2-FU-275-R78/K4	STEAM GEN 3 POWER RELIEF VALVE SEP RELAY	2-R-78 Row K, Fuses 3 & 4	INSTALLED[1]	6.3	
2-FU-275-R78/K7 2-FU-275-R78/K8	STEAM GEN 4 POWER RELIEF VALVE SEP RELAY	2-R-78 Row K, Fuses 7 & 8	INSTALLED[1]	6.3	

1 When installing fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation or visual indication.

Appendix F
(Page 1 of 6)

VALVE LINEUP

Date ________

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-ISV-32-2138	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-103	T10H/724	OPEN	6.2	
2-ISV-32-2139	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-104	T10H/724	OPEN	6.2	
2-ISV-32-2140	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-105	T10H/724	OPEN	6.2	
2-ISV-32-2141	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-106	T10H/724	OPEN	6.2	
2-ISV-32-2142	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-107	T10G/724	OPEN	6.2	
2-ISV-32-2143	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-108	T10G/724	OPEN	6.2	
2-ISV-32-2144	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-109	T10G/724	OPEN	6.2	
2-ISV-32-2145	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-110	T10G/724	OPEN	6.2	
2-ISV-32-2146	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-111	T10G/724	OPEN	6.2	
2-ISV-32-2147	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-112	T10G/724	OPEN	6.2	
2-ISV-32-2148	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-113	T10F/724	OPEN	6.2	
2-ISV-32-2149	CONTROL AIR ISOLATION VALVE TO 2-FCV-1-114	T10F/725	OPEN	6.2	
2-FCV-1-103	CONDENSER A MAIN STEAM DUMP VLV	T10H/725	CLOSED[1]	6.2	
2-FCV-1-104	CONDENSER A MAIN STEAM DUMP VLV	T10H/725	CLOSED[1]	6.2	
2-FCV-1-105	CONDENSER A MAIN STEAM DUMP VLV	T10H/725	CLOSED[1]	6.2	
2-FCV-1-106	CONDENSER A MAIN STEAM DUMP VLV	T10H/725	CLOSED[1]	6.2	
2-FCV-1-107	CONDENSER A MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	
2-FCV-1-108	CONDENSER A MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	
2-FCV-1-109	CONDENSER A MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	

Appendix F
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VALVE LINEUP

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-FCV-1-110	CONDENSER A MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	
2-FCV-1-111	CONDENSER B MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	
2-FCV-1-112	CONDENSER B MAIN STEAM DUMP VLV	T10G/725	CLOSED[1]	6.2	
2-FCV-1-113	CONDENSER B MAIN STEAM DUMP VLV	T10F/725	CLOSED[1]	6.2	
2-FCV-1-114	CONDENSER C MAIN STEAM DUMP VLV	T10F/725	CLOSED[1]	6.2	
2-ISV-32-4021	CONTROL AIR ISOLATION VALVE TO 2-L-65	2-L-65 [T11H/708]	OPEN	6.2	
2-ISIV-1-103/A	CONTROL AIR TO 2-FM-1-103	2-L-65 [T11H/708]	OPEN	6.2	
2-ISIV-1-103A	CONTROL AIR TO 2-FC-1-103A	2-L-65 [T11H/708]	OPEN	6.2	
2-ISIV-1-103B	CONTROL AIR TO 2-FC-1-103B	2-L-65 [T11H/708]	OPEN	6.2	
2-ISIV-1-103D	CONTROL AIR TO 2-FC-1-103D	2-L-65 [T11H/708]	OPEN	6.2	
2-ISIV-1-103E	CONTROL AIR TO 2-FC-1-103E	2-L-65 [T11H/708]	OPEN	6.2	
2-SPV-1-404	N2 XFR VALVE FOR 2-TANK-001-0404A&B	A13U/737	2-TANK-1-404A[3]	6.3	
Cylinder Valve on 2-TANK-1-404A	SG 1 TANK A	A13U/737	CLOSED	6.3	
2-ISIV-1-404A	N2 SUPPLY VALVE FOR 2-TANK-1-404A	A13U/737	CLOSED	6.3	
Cylinder Valve on 2-TANK-1-404B	SG 1 TANK B	A13U/737	CLOSED	6.3	
2-ISIV-1-404B	N2 SUPPLY VALVE FOR 2-TANK-1-404B	A13U/737	CLOSED	6.3	

Appendix F
(Page 3 of 6)

VALVE LINEUP

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-PREG-1-404	MAIN STEAM LOOP 1 PORV N2 TANK PREG	A13U/737	SET to 0 PSIG[2]	6.3	
2-ISIV-1-404C	ISOLATION VLV TO 2-PI-001-0404D	A13U/737	OPEN	6.3	
2-VTIV-1-404D	CONTROL N2 SUPPLY VENT VLV	A13U/737	CLOSED	6.3	
2-ISIV-1-404E1	N2 SUPPLY ISOLATION FOR SG 1 (2-PCV-1-5)	A13U/737	OPEN	6.3	
2-ISIV-1-404E2	N2 SUPPLY ISOLATION FOR SG 1 (2-PCV-1-5)	2-L-737 [A13V/737]	OPEN	6.3	
2-PREG-1-5B	MAIN STEAM LOOP 1 PORV N2 SUP PREG	2-L-737 [A13V/737]	SET to 0 PSIG[2]	6.3	
2-ISIV-1-5C	ISOLATION VALVE TO 2-PI-1-5A	2-L-737 [A13V/737]	OPEN	6.3	
2-VTIV-1-5D	VENT ISOLATION VALVE FOR SG 1 (2-PCV-1-5)	2-L-737 [A13V/737]	CLOSED	6.3	
2-SPV-1-400	N2 XFR VALVE FOR 2-TANK-001-0400A&B	A13U/737	2-TANK-1-400A[3]	6.3	
Cylinder Valve on 2-TANK-1-400A	SG 2 TANK A	A13U/737	CLOSED	6.3	
2-ISIV-1-400A	N2 SUPPLY VALVE FOR 2-TANK-1-400A	A13U/737	CLOSED	6.3	
Cylinder Valve on 2-TANK-1-400B	SG 2 TANK B	A13U/737	CLOSED	6.3	
2-ISIV-1-400B	N2 SUPPLY VALVE FOR 2-TANK-1-400B	A13U/737	CLOSED	6.3	
2-PREG-1-400	MAIN STEAM LOOP 2 PORV N2 TANK PREG	A13U/737	SET to 0 PSIG[2]	6.3	
2-ISIV-1-400C	ISOLATION VLV TO 2-PI-001-0400D	A13U/737	OPEN	6.3	
2-VTIV-1-400D	CONTROL N2 SUPPLY VENT VLV	A13U/737	CLOSED	6.3	

Appendix F
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VALVE LINEUP

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-ISIV-1-400E1	N2 SUPPLY ISOLATION FOR SG 2 (2-PCV-1-12)	A13U/737	OPEN	6.3	
2-ISIV-1-400E2	N2 SUPPLY ISOLATION FOR SG 2 (2-PCV-1-12)	2-L-738 [A13V/737]	OPEN	6.3	
2-PREG-1-12B	MAIN STEAM LOOP 2 PORV N2 SUP PREG	2-L-738 [A13V/737]	SET to 0 PSIG[2]	6.3	
2-ISIV-1-12C	SOLATION VALVE TO 2-PI-1-12A	2-L-738 [A13V/737]	OPEN	6.3	
2-VTIV-1-12D	VENT ISOLATION VALVE FOR SG 2 (2-PCV-1-12)	2-L-738 [A13V/737]	CLOSED	6.3	
2-SPV-1-402	N2 XFR VALVE FOR 2-TANK-001-0402A&B	A12X/729	2-TANK-1-400A[3]	6.3	
Cylinder Valve on 2-TANK-1-402A	SG 4 TANK A	A12X/729	CLOSED	6.3	
2-ISIV-1-402A	N2 SUPPLY VALVE FOR 2-TANK-1-402A	A12X/729	CLOSED	6.3	
Cylinder Valve on 2-TANK-1-402B	SG 4 TANK B	A12X/729	CLOSED	6.3	
2-ISIV-1-402B	N2 SUPPLY VALVE FOR 2-TANK-1-402B	A12X/729	CLOSED	6.3	
2-PREG-1-402	MAIN STEAM LOOP 4 PORV N2 TANK PREG	A12X/729	SET to 0 PSIG[2]	6.3	
2-ISIV-1-402C	ISOLATION VLV TO 2-PI-001-0402D	A12X/729	OPEN	6.3	
2-VTIV-1-402D	CONTROL N2 SUPPLY VENT VLV	A12X/729	CLOSED	6.3	
2-ISIV-1-402E1	N2 SUPPLY ISOLATION FOR SG 4 (2-PCV-1-30)	A12X/729	OPEN	6.3	
2-ISIV-1-402E2	N2 SUPPLY ISOLATION FOR SG 4 (2-PCV-1-30)	2-L-256 [A12X/729]	OPEN	6.3	
2-PREG-1-30B	MAIN STEAM LOOP 4 PORV N2 SUP PREG	2-L-256 [A12X/729]	SET to 0 PSIG[2]	6.3	

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VALVE LINEUP

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-ISIV-1-30C	SOLATION VALVE TO 2-PI-1-30A	2-L-256 [A12X/729]	OPEN	6.3	
2-VTIV-1-30D	VENT ISOLATION VALVE FOR SG 4 (2-PCV-1-30)	2-L-256 [A12X/729]	CLOSED	6.3	
2-SPV-1-403	N2 XFR VALVE FOR 2-TANK-001-0403A&B	A12X/729	2-TANK-1-403A[3]	6.3	
Cylinder Valve on 2-TANK-1-403A,	SG 3 TANK A	A12X/729	CLOSED	6.3	
2-ISIV-1-403A	N2 SUPPLY VALVE FOR 2-TANK-1-403A	A12X/729	CLOSED	6.3	
Cylinder Valve on 2-TANK-1-403B	SG 3 TANK B	A12X/729	CLOSED	6.3	
2-ISIV-1-403B	N2 SUPPLY VALVE FOR 2-TANK-1-403B	A12X/729	CLOSED	6.3	
2-PREG-1-403	MAIN STEAM LOOP 3 PORV N2 TANK PREG	A12X/729	SET to 0 PSIG[2]	6.3	
2-ISIV-1-403C	ISOLATION VLV TO 2-PI-001-0403D	A12X/729	OPEN	6.3	
2-VTIV-1-403D	CONTROL N2 SUPPLY VENT VLV	A12X/729	CLOSED	6.3	
2-ISIV-1-403E1	N2 SUPPLY ISOLATION FOR SG 3 (2-PCV-1-23)	A12X/729	OPEN	6.3	
2-ISIV-1-403E2	N2 SUPPLY ISOLATION FOR SG 3 (2-PCV-1-23)	2-L-256 [A12X/729]	OPEN	6.3	
2-PREG-1-23B	MAIN STEAM LOOP 3 PORV N2 SUP PREG	2-L-256 [A12X/729]	SET to 0 PSIG[2]	6.3	
2-ISIV-1-23C	SOLATION VALVE TO 2-PI-1-23A	2-L-256 [A12X/729]	OPEN	6.3	
2-VTIV-1-23D	VENT ISOLATION VALVE FOR SG 3 (2-PCV-1-23),	2-L-256 [A12X/729]	CLOSED	6.3	
2-PCV-1-5	MAIN STEAM LOOP 1 PORV	U2 SVVR/765	CLOSED[1]	6.3	

Appendix F
(Page 6 of 6)

VALVE LINEUP

UNID	NOMENCLATURE	LOCATION	POSITION	SECTION REQ'D	INITIALS/DATE
2-PCV-1-30	MAIN STEAM LOOP 4 PORV	U2 SVVR/765	CLOSED[1]	6.3	
0-ISV-32-384	ESSENT CNTL AIR BRANCH HDR ISOL	U2 SVVR/765	OPEN	6.3	
2-ISV-32-3749	CONTROL AIR HDR ISOL VALVE TO 2-FCV-1-5	U2 SVVR/765	OPEN	6.3	
2-ISV-32-3750	ESSENT CONTROL AIR ISOL VALVE TO 2-L-423	U2 SVVR/765	OPEN	6.3	
0-ISV-32-412	ESSENT CNTL AIR BRANCH HDR ISOL	U2 SVVR/765	OPEN	6.3	
2-ISV-32-3726	CONTROL AIR ISOLATION VALVE TO 2-PCV-1-30	U2 SVVR/765	OPEN	6.3	
2-ISV-32-3727	ESSENT CONTROL AIR ISOL VALVE TO 2-L-422	U2 SVVR/765	OPEN	6.3	
2-PCV-1-12	MAIN STEAM LOOP 2 PORV	U2 NVVR/765	CLOSED[1]	6.3	
2-PCV-1-23	MAIN STEAM LOOP 3 PORV	U2 NVVR/765	CLOSED[1]	6.3	
2-ISV-32-456	ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-23	U2 NVVR/765	OPEN	6.3	
2-ISV-32-454	ESSENT CNTL AIR HDR ISOL TO 2-L-420	U2 NVVR/765	OPEN	6.3	
2-ISV-32-3795	ESSENT CONTROL AIR ISOL VALVE TO 2-L-420	U2 NVVR/765	OPEN	6.3	
2-ISV-32-465	ESSENT CNTL AIR HDR ISOL TO 2-PCV-1-12	U2 NVVR/765	OPEN	6.3	
2-ISV-32-464	ESSENT CONTROL AIR ISOL VALVE TO 2-L-421	U2 NVVR/765	OPEN	6.3	
2-ISV-32-3781	NT CONTROL AIR ISOL VALVE TO 2-L-421	U2 NVVR/765	OPEN	6.3	

[1] Handwheel Turned Fully CCW allowing spring tension to CLOSE Valve.
[2] Turn regulator knob fully CCW to zero output.
[3] SPV knob turned such that arrow on knob points to tank listed.

Appendix G
(Page 1 of 1)

BACKGROUND CALCULATIONS

Date ________

Measurement uncertainties for parameters measured in this test must be incorporated into the test acceptance criteria.

1.0 STOPWATCH USE

Handheld digital stopwatches are used in several places in this instruction. Digital stopwatches have an accuracy of $\pm$0.1sec. This instrument error is negligible compared to the inherent human error involved in using a handheld stopwatch. Stopwatch timing uncertainties will not be calculated in this instruction under the assumption that any instrument uncertainty will be insignificant compared to the human uncertainty.

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: Boric Acid Subsystem Logic Testing

Instruction No: 2-PTI-062-02
Revision No: 0000

PREPARED BY: Ross Horvat Ross Horvat DATE: 11/12/2012
PRINT NAME / SIGNATURE

REVIEWED BY: Kurt McCormack Kurt McCormack DATE: 11/12/2012
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-014

JTG CHAIRMAN: Nick A Welch DATE: 7/9/13

APPROVED BY : Neil A Welch DATE: 7/9/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: ______

JTG CHAIRMAN: ______ DATE: ______

APPROVED BY : ______ DATE: ______
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	7/9/13	All	Initial Issue based on Unit 1 PTI-062-02 Rev 0, CN-1 through CN-26.

Table of Contents

Table of Contents (continued)

Date _______

1.0 INTRODUCTION

1.1 Test Objectives

This Preoperational Test Instruction (PTI) demonstrates that the Reactor Coolant Make-Up Control Portion of the Chemical Volume and Control (CVCS) system meets design function requirements. Testing verifies that Reactor Coolant Make-Up Control valves meet their required stroke times, properly respond to automatic reactor makeup signals, modulate in response to input signals and respond properly to Volume Control Tank (VCT) level control signals.

1.2 Scope

This PTI places CVCS in multiple configurations using various switch and valve lineups to test the function and logic of Unit 2 CVCS control valves related to Volume Control Tank level and Reactor Makeup Control function. Verify valve logic for 2-FCV-62-128 (BA Blender Makeup to VCT), 2-FCV-62-144 (BA Blender Makeup to CHG PMP SUCT Flow CNTL), 2-FCV-62-143 (Boric Acid Blender PRI WTR Flow CNTL), 2-FCV-62-140 (Boric Acid to Blender Flow CONT). The VCT Level controls will be verified by manipulating the level in the VCT. The ability of CVCS to provide Primary Water and Boric Acid at predetermined flow rates via Automatic Reactor Makeup signals is also verified.

Date ________

2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, CONDUCT OF TEST

B. SMP-15.0, STATUS AND CONTROL OF ISOLATION DEVICES

C. GOI-7.0, GENERIC EQUIPMENT OPERATING GUIDELINES

D. TI-12.14, REPLACEMENT AND UPGRADE OF PLANT COMPONENT IDENTIFICATION TAGGING AND LABELING

E. SMP-14.0, TEST DEFICIENCY NOTICES

F. 2-TOP-62-02, CVCS - CHARGING AND LETDOWN

2.2 Developmental References

A. Final Safety Analysis Report

FSAR-Amendment 109

1. Section 9.3.4, Chemical and Volume Control System.

2. Table 14.2-1 Sheets 18 and 19 of 89, Chemical and Volume Control System.

B. Test Scoping Documents.

1. 2-TSD-62-1 Rev 2, Chemical and Volume Control System: Charging and Letdown Logic Test.

2. 2-TSD-62-2 Rev 2, Boric Acid System Logic Test.

C. Drawings

1. Flow Drawings

a. 2-47W809-1 Rev 12, Flow Diagram, Chemical & Volume Control System.

b. 2-47W809-2 Rev 8, Flow Diagram Chemical And Volume Control System And Boron Recovery System.

Date ________

2.2 Developmental References (continued)

c. 1-47W809-5 Rev 29, Flow Diagram, Chemical & Volume Control System (Boric Acid).

d. 2-47W809-5 Rev 5, Flow Diagram Chemical and Volume Control System And Boron Recovery System.

e. 2-47W819-1 Rev 10, Flow Diagram, Primary Water.

f. 2-47W848-5 Rev 7, Mechanical Flow Diagram Control Air.

2. Electrical Drawings

a. 2-45W600-62-1 Rev 3, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams.

b. 2-45W600-62-2 Rev 3, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams]

c. 2-45W600-62-3 Rev 2, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams

DRA 52378-246 Rev 1

DRA 52378-249 Rev 0

DRA 52378-245 Rev 2

DRA 52378-194 Rev 1

DRA 52378-175 Rev 2

d. 2-45B655-6A Rev 0, Main Control Room Annunciator Inputs Window Box XA-55-6A.

DRA 52378-227 Rev 1

e. 2-45B601-55-65 Rev 0, Electrical Instrument Tabulation.

f. 2-45W600-57-2 Rev 4, Wiring Diagram, Separation & Misc Aux Relays Schematic Diagram SH-2

g. 2-45W600-57-4 Rev 4 , Wiring Diagram, Separation & Misc Aux Relays Schematic Diagram SH-4

DRA 52671-072 Rev 1

Date ________

2.2 Developmental References (continued)

h. 2-45W600-57-7 Rev 4, Wiring Diagram, Separation & Misc Aux Relays Schematic Diagram SH-7.

DRA 52671-073 Rev 1

i. 2-45W760-62-4 Rev 0, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams

j. 2-45W760-62-6 Rev 2, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams

k. 2-45W760-62-7 Rev 2, Wiring Diagrams, Chemical & Volume Control Sys Schematic Diagrams

l. 2-45B640-109 Rev 0, Contact Development of Selector Switches and Pushbuttons

m. 2-45B640-108 Rev 0, Contact Development of Selector Switches and Pushbuttons

n. 2-45B640-31 Rev 0, Contact Development of Selector Switches and Pushbuttons

o. 2-45B640-48 Rev 0, Contact Development of Selector Switches and Pushbuttons

p. 2-45B640-49 Rev 0, Contact Development Of Control And Instrument Switches.

q. 45W703-7 Rev 19, 125V VTL BTTRY BD III PNL 4 SH. 7

r. 1-45W703-3 Rev 46, Wiring Diagrams 125V Vital Battery Board III Single Line - Sheet 3

s. 2-45W706-2 Rev 1, Wiring Diagram, 120VAC Vital Inst Pwr Bds 1-II & 2-II Connection Diagram Sheet 2

t. 2-45W706-3 Rev 0, Wiring Diagram 120V Vital INST PWR BDS 1-III & 2-III Connection Diagram - SH-3

u. 2-45W706-4, Rev 0 Wiring Diagram, 120VAC Vital Inst Pwr Bds 1-IV & 2-IV Connection Diagrams

v. 2-45N2676-4 Rev 0, Wiring Diagram Solid State Protection System Train A Connection Diagram SH-4

Date ________

2.2 Developmental References (continued)

3. Logic/Control Drawings

   a. 2-47W610-62-3 Rev 3, Electrical Control Diagram, Chemical & Volume Control System

      DRA 52671-032 Rev 2

      DRA 52671-031 Rev 1

      DRA 52671-023 Rev 1

      DRA 52378-462 Rev 2

      DRA 52378-461 Rev 2

      DRA 52378-460 Rev 1

   b. 2-47W610-62-6 Rev 3, Electrical Control Diagram, Chemical & Volume Control System

4. Vendor Drawings

   a. 2-69247-08F802403-FD-2503-1 Rev 0, ELECTRICAL BORIC ACID TO BLENDER BATCHING AND FLOW CONTROL.

   b. 2-69247-08F802403-FD-2503-2 Rev 0, BORIC ACID INPUT VALIDATION & BATCHING LOGIC.

   c. 2-69247-08F802403-FD-2503-3 Rev 0, BORIC ACID 2-FC-62-139 (2-M-6) HAND STATION INTERFACE.

   d. 2-69247-08F802403-FD-2503-4 Rev 0, ELECTRICAL - BORIC ACID 2-FC-62-139 HAND STATION INTERFACE.

   e. 2-69247-08F802403-FD-2503-5 Rev 0, ELECTRICAL - BORIC ACID 2-FC-62-139 HAND STATION INTERFACE FACEPLATE LAYOUT.

   f. 2-69247-08F802403-FD-2503-6 Rev 0, ELECTRICAL - BORIC ACID 2-FQ-62-139 BATCHER HAND STATION INTERFACE.

   g. 2-69247-08F802403-FD-2503-7 Rev 0, ELECTRICAL - BORIC ACID BLENDER 2-FQ-62-139 BATCHER HAND STA INTERFACE.

   h. 2-69247-08F802403-FD-2503-8 Rev 0, ELECTRICAL - BORIC ACID BLENDER 2-FQ-62-139 BATCHER HAND STA INTERFACE FACEPLATE LAYOUT.

Date ________

2.2 Developmental References (continued)

i. 2-69247-08F802403-FD-2501-1 Rev 0, ELECTRICAL-VOL CONT TANK PRIMARY WATER & BORIC ACID MAKE-UP MODE SELECTION LOGIC.

j. 2-69247-08F802403-FD-2501-2 Rev 0, ELECTRICAL PRIMARY MAKE-UP WATER BATCHING & FLOW CONTROL.

k. 2-69247-08F802403-FD-2501-3 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER INPUT VALIDATION & BATCHING LOGIC.

l. 2-69247-08F802403-FD-2501-4 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER 2-FC-62-142 HAND STATION INTERFACE.

m. 2-69247-08F802403-FD-2501-5 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER 2-FC-62-142 HAND STATION INTERFACE.

n. 2-69247-08F802403-FD-2501-6 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER 2-FC-62-142 HAND STA INTERFACE FACEPLATE LAYOUT.

o. 2-69247-08F802403-FD-2501-7 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER 2-FQ-62-142 BATCHER HAND STA INTERFACE.

p. 2-69247-08F802403-FD-2501-8 Rev 0, ELECTRICAL-PRIMARY MAKE-UP WATER 2-FQ-62-142 BATCHER HAND STA INTERFACE.

q. 2-69247-08F802403-FD-2501-9 Rev 0, ELECTRICAL-PRI MAKE-UP WTR 2-FQ-62-142 BATCHER HAND STA INTERFACE FACEPLATE LAYOUT.

r. 2-69247-08F802403-FD-2603-1 Rev 1, ELECTRICAL CVCS SIGNAL VALIDATION VOLUME CONTROL TANK.

s. 2-69247-08F802403-FD-2603-2 Rev 0, ELECTRICAL CVCS SIGNAL VALIDATION VOLUME CONTROL TANK

Date ________

2.2 Developmental References (continued)

5. Documents

   a. SSD-1-LPF-62-139/140, Boric Acid Flow to Blender, Rev 8

      To be verified against SSD-2-LPF-62-139/140, Boric Acid to Blender [Later] in Appendix A.

   b. SSD-1-LPF-62-142/143, Primary Water Pump to Boric Acid Blender, Rev 4

      To be verified against SSD-2-LPF-62-142/143, Primary Water Pump to Boric Acid Blender [Later] in Appendix A.

   c. SSD-1-LPL-62-129A, Volume Control Tank Level, Rev 6.

      To be verified against SSD-2-LPL-62-129A, Volume Control Tank Level [Later] in Appendix A

   d. SSD-1-LPL-62-130A, Volume Control Tank Level, Rev 5.

      To be verified against SSD-2-LPL-62-130A, Volume Control Tank Level [Later] in Appendix A

   e. SSD-1-LPL-62-129C, Volume Control Tank Level, Rev 3.

      To be verified against SSD-2-LPL-62-129C, Volume Control Tank Level [Later] in Appendix A

   f. SSD-1-LPL-62-130C, Volume Control Tank Level, Rev 3.

      To be verified against SSD-2-LPL-62-130C, Volume Control Tank Level [Later] in Appendix A

Date ________

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.

B. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.

C. Discrepancies between component ID tags and the description in a procedure/instruction do not require a Test Deficiency Notice, TDN, in accordance with SMP-14.0, if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

D. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

E. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

F. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

G. Observe all Radiation Protection (RP) requirements when working in or near radiological areas.

H. Ensure there are no adverse effects to the operation of Unit 1 structures, systems, or components.

I. Test personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.

J. System water chemistry is within system specifiable parameters especially for fluids supplied from external sources.

Date ________

3.0 PRECAUTIONS AND LIMITATIONS (continued)

K. The 2A and 2B Boric acid Transfer Pumps and the 2B Boric Acid Tank are controlled by Unit 1 Operations. Unit 1 Supervisor (US/SRO) or Shift Manager will be notified prior to their use for Unit 2 testing.

L. Exercise caution when manually actuating relays to avoid contact with control circuit power.

M. Safety Related Valves will be stroke timed locally at the valve and remotely at the control switch in both the open and close directions. Local timing begins with the initiating signal and is concluded with the completion of valve stem movement. Remote timing begins with the initiating signal and is concluded with the position indication lights status change. Stroke time acceptance criteria will be based on the movement to the safety function final position of the valve.

N. Separation relays are to be verified energized/deenergized by visual observation of the coil indicator (bar) physically located on the front of the relay.

O. The Test Engineer may direct the opening and closing of 2-DRV-62-695, VOLUME CONTROL TANK DISCHARGE DRAIN, and/or 2-VTV-62-699, CVCS CHARGING PMP SUCT HEADER VENT, in order to control Volume Control Tank (VCT) level throughout this test.

P. Operating Boric Acid Tank Heaters with less than 9.5% (2222 gallons) level in the Boric Acid Tanks, will result in heater damage.

Q. During the performance of this procedure visual observation of piping and components is required. This includes steady state and transient operations with visual confirmation that vibration is not excessive.

R. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN).

S. Do NOT allow required Net Positive Suction Head (NPSH) to be lost to Boric Acid Transfer Pumps.

T. Do NOT operate Boric Acid Transfer Pumps in Fast speed when the recirculation flow control valve is closed.

U. Throttle the appropriate air operated modulating valve on the boric acid transfer pump discharge lines as necessary to prevent the operating pump from reaching a run out condition.

V. While recirculating Boric Acid Tanks, operate Boric Acid Pumps at Slow speed only.

Date ________

3.0 PRECAUTIONS AND LIMITATIONS (continued)

W. When inserting fuses with actuators, ensure that the actuating rod/pin is oriented correctly to provide proper alarm initiation and visual indication.

X. When inserting fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation and visual indication.

Y. When draining water from the VCT ensure there is adequate drain capacity in the Waste Disposal System (WDS) Tritiated Drain Collector Tank

Z. Refer to GOI-7.0 for instructions on operating Generic Equipment.

Date ________

4.0 PREREQUISITE ACTIONS

NOTE

Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction subsection to which they apply.

4.1 Preliminary Actions

[1] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL), **AND**

ENSURE they will NOT adversely affect the test performance and results. ________

[2] **ENSURE** changes to the references listed on Appendix A, have been reviewed, and determined NOT to adversely affect the test performance. ________

[3] **VERIFY** current revisions and change paper for referenced drawings has been reviewed and determined NOT to adversely affect the test performance, **AND**

ATTACH documentation of current drawing revision numbers and change paper that were reviewed to the data package. ________

[4] **VERIFY** the test/performance copy of this PTI is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. ________

[5] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modifications (T-Mods) do NOT adversely impact testing, and

ATTACH documentation of DCN's, EDCR's and T-Mods that were reviewed to the data package. ________

Date ________

4.1 Preliminary Actions (continued)

[6] **ENSURE** required Component Testing has been completed prior to start of test. ________

[7] **VERIFY** System cleanness as required for the performance of this test has been completed in accordance with SMP-7.0 for piping systems. ________

[8] **ENSURE** all piping supports required for testing are installed and adjusted as required. ________

[9] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0. ________

[10] **ENSURE** communications are available for areas where testing is to be conducted. ________

[11] **ENSURE** System 55, Annunciator and Sequential Events Recording System applicable TBK switches are ON, the applicable Master Switches are ON, and window software input (s) are ENABLED for the following Annunciator windows.

A. 2-XA-55-5B/101-E ________

B. 2-XA-55-6A/109-A ________

C. 2-XA-55-6A/111-D ________

D. 2-XA-55-6A/111-E ________

E. 2-XA-55-6A/112-E ________

F. 2-XA-55-L10/306-A ________

G. 2-XA-55-L10/306-B ________

[12] **ENSURE** the following Unit 2 Integrated Computer System (ICS) points are in scan:

A. Y0104D, BLENDER TO VOL CONT TANK VALVE. ________

B. Y0103D, BLENDER TO CHARG PMP VALVE. ________

[13] **ENSURE** water chemistry for systems/components with water sources other than normal water sources is appropriate for testing. ________

Date ________

4.1 Preliminary Actions (continued)

[14] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) and/or Plant Operations. ________

[15] **ENSURE** a review of outstanding Clearances has been coordinated with Operations for impact to the test performance, **AND**

RECORD in Appendix B, Temporary Condition Log if required. ________

[16] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, **AND**

ATTACH to this PTI for use during the performance of this PTI. ________

[17] **VERIFY** Measuring and Test Equipment (M&TE) required for test performance has been (as required) filled, vented, place in service and recorded on Measuring and Test Equipment Log.

Subsection 6.1 ________

Subsection 6.2 ________

Subsection 6.3 ________

Subsection 6.4 ________

Subsection 6.5 ________

Subsection 6.8 ________

Subsection 6.10 ________

Date ________

4.1 Preliminary Actions (continued)

[18] **VERIFY** Measuring and Test Equipment (M&TE) calibration due dates will support the completion of this test performance.

Subsection 6.1 ________

Subsection 6.2 ________

Subsection 6.3 ________

Subsection 6.4 ________

Subsection 6.5 ________

Subsection 6.8 ________

Subsection 6.10 ________

[19] **PERFORM** a pretest walkdown on equipment to be tested to ensure no conditions exist that will impact test performance. ________

[20] **REVIEW** preventive maintenance for system/components covered by this test, **AND**

VERIFY no conditions exist that will impact test performance. ________

Date ________

4.1 Preliminary Actions (continued)

[21] **ENSURE** the following systems are operational and have been placed in service to the extent necessary to perform this test:

A. System 032, Control Air - Provides control air to all Air Operated Valves (AOVs) ________

B. System 077, Waste Disposal - Provides Nitrogen cover gas for the Volume Control Tank ________

C. System 081, Primary Makeup Water - Provides demineralized water to Boric Acid Transfer Pump suction, Boric Acid Batching Tank and Boric Acid Blender ________

D. System 235, 120VAC Vital Power - Provides power for instrumentation ________

E. System 236, 125VDC Vital Power - Provides power for solenoids ________

F. System 213, Reactor MOV Power - Provides power for motor operated valves and system motors ________

G. System 98, Foxboro I/A. ________

[22] **VERIFY** plant instruments, listed on Appendix C, Permanent Plant Instrumentation Log, are placed in service and are within their calibration interval.

Subsection 6.1 ________

Subsection 6.2 ________

Subsection 6.3 ________

Subsection 6.4 ________

Subsection 6.5 ________

Subsection 6.8 ________

Subsection 6.10 ________

Date ________

4.2 Special Tools, Measuring and Test Equipment, Parts and Supplies

Digital Stopwatch, accuracy ± 0.1 sec (Recommend Micronta)

4.3 Field Preparations

[1] **ENSURE** the following component alignment:

UNID	LOCATION	DESCRIPTION	POSITION	INITIAL
2-BKR-235-1/10	120V AC VITAL INST POWER BD 2-I, BKR 10	AUX CONTROL BOARD PANEL2-L-10 RELAY BUS A	CLOSED	
2-BKR-235-1/06	120V AC VITAL INST POWER BD 2-I, BKR 6	PROCESS CONTROL GROUP 12.	CLOSED	
2-BKR-235-2/07	120V AC VITAL INST POWER BD 2-II, BKR 7	NSSS AUX RELAY RACK C BUS TO PNL 2-R-58	CLOSED	
2-BKR-235-2/11	120V AC VITAL INST POWER BD 2-II, BKR 11	AUX CONTROL BOARD PANEL2-L-10 RELAY BUS B	CLOSED	
2-BKR-235-2/12	120V AC VITAL INST POWER BD 2-II, BKR 12	AUX CONTROL BOARD PANEL2-L-10 RELAY BUS C	CLOSED	
2-BKR-235-3/29	120V AC VITAL INST POWER BD 2-III, BKR 29	NSSS AUX RELAY RACH RELAY BUS A TO PNL 2-R-54	CLOSED	
2-BKR-235-3/31	120V AC VITAL INST POWER BD 2-III, BKR 31	AUX CONTROL BOARD PANEL 2-L-11A RELAY BUS A	CLOSED	
2-BKR-235-4/37	120V AC VITAL INST POWER BD 2-IV, BKR 37	NSSS RELAY RACK B BUS TO PNL 2-R-55	CLOSED	
2-BKR-235-4/40	120V AC VITAL INST POWER BD 2-IV, BKR 40	AUX CONTROL BOARD PANEL 2-L-11-B RELAY BUS B	CLOSED	
2-FUDS-98-R014 C	FUSED DISCONNECT FOR WBN-2-PX -098-R014C	FOR WBN-2-PX -098-R014C	CLOSED	
2-FUDS-98-R014 D	FUSED DISCONNECT FOR WBN-2-PX -098-R014D	FOR WBN-2-PX -098-R014D	CLOSED	

Date ________

4.3 Field Preparations (continued)

(4.3 Step [1] Continued)

UNID	LOCATION	DESCRIPTION	POSITION	INITIAL
2-FUDS-98-R015 A	FUSED DISCONNECT FOR WBN-2-PX -098-R015A	FOR WBN-2-PX -098-R015A	CLOSED	
0-BKR-236-3/310	125V DC VITAL BAT BD III breaker 310	PANEL 4 COLUMN A FUSE ASSEMBLY	CLOSED	
0-BKR-236-3/311	125V DC VITAL BAT BD III breaker 311	PANEL 4 COLUMN B FUSE ASSEMBLY	CLOSED	
2-FU-99-R58/M3	PNL 2-R-58 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	
2-FU-99-R58/M4	PNL 2-R-58 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	
2-FU-99-R54/L5	PNL 2-R-54 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	
2-FU-99-R54/L6	PNL 2-R-54 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	
2-FU-99-R55/L5	PNL 2-R-55 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	
2-FU-99-R55/L6	PNL 2-R-55 U2 Aux Instr Rm	REACTOR COOLANT MAKE-UP CONTROL	INSTALLED	

[2] **ENSURE** the following Fuses 125V DC VITAL BAT BD III fuses(2), 0-FU-236-3/A28 are installed: ________

Subsection 6.1

[3] **ENSURE** the following Fuses 125V DC VITAL BAT BD III fuses(2), 0-FU-236-3/A29 are installed: ________

Subsection 6.2

[4] **ENSURE** the following Fuses 125V DC VITAL BAT BD III fuses(2), 0-FU-236-3/B38 are installed: ________

Subsection 6.3

[5] **ENSURE** the following Fuses 125V DC VITAL BAT BD III fuses(2), 0-FU-236-3/A26 are installed: ________

Date ________

4.3 Field Preparations (continued)

Subsection 6.4

[6] **ENSURE** adequate drain capacity (< 80% on 0-LI-77-31, TDCT LEVEL) in the WDS Tritiated Drain Collector Tank for the water to be drained from the Volume Control Tank or an alternate drain path is available.

Sub-Subsection 6.5.1 ________

Sub-Subsection 6.5.2 ________

Sub-Subsection 6.5.3 ________

Subsection 6.6 ________

Subsection 6.7 ________

Subsection 6.8 ________

Subsection 6.9 ________

Subsection 6.10 ________

[7] **VERIFY** 2-TANK-62-239, Boric Acid Tank B, has greater than or equal to 3000 gal, as indicated on 2-LI-62-238, BA Tank B Level, Panel 2-M-6. ________

[8] **ALIGN** system according to 2-TOP-62-02.

Subsection 6.6 ________

Subsection 6.7 ________

Subsection 6.8 ________

Subsection 6.9 ________

Subsection 6.10 ________

Date ________

4.3 Field Preparations (continued)

[9] **ENSURE** the following component alignment for Subsection 6.5:

UNID	LOCATION	DESCRIPTION	POSITION	INITIAL
2-BKR-62-132	RX MOV BD 2A1-A Breaker in Compt. 8B	VCT OUTLET ISOL (2-LCV-62-132)	CLOSED	
2-XS-62-132	RX MOV BD 2A1-A Breaker in Compt. 8B	VCT OUTLET ISO VLV XFER SWITCH	NORMAL	
2-BKR-62-135	RX MOV BD 2A1-A Breaker in Compt. 9A	RWST CVCS SUPPLY HEADER ISOL (2-LCV-62-135)	CLOSED	
2-XS-62-135	RX MOV BD 2A1-A Breaker in Compt. 9A	RWST TO CHARGING PUMPS XFER SWITCH	NORMAL	
2-XS-62-230	RX MOV BD 2A1-A Breaker in Compt 2B	BA TRANS PUMP 2A-A SPEED	NORMAL	
2-BKR-62-133	RX MOV BD 2B1-B Breaker in Compt. 8A	VCT OUTLET ISOL (2-LCV-62-133)	CLOSED	
2-XS-62-133	RX MOV BD 2B1-B Breaker in Compt. 8A	VCT OUTLET ISO VLV XFER SWITCH	NORMAL	
2-XS-62-232	RX MOV BD 2B1-B Breaker in Compt. 2B	BA TRANS PUMP 2B-B SPEED	NORMAL	
2-BKR-62-136	RX MOV BD 2B1-B Breaker in Compt. 8B	RWST CVCS SUPPLY HEADER ISOL (2-LCV-62-136)	CLOSED	
2-XS-62-136	RX MOV BD 2B1-B Breaker in Compt. 8B	RWST TO CHARGING PUMPS XFER SWITCH	NORMAL	
0-BKR-236-3/310	125V DC VITAL BAT BD III breaker 310	PANEL 4 COLUMN A FUSE ASSEMBLY	CLOSED	
2-XS-62-130	2-L-11A	VOLUME CONTROL TANK TRANSFER	NORMAL	
2-XS-62-143	2-L-11A	PMW TO BA BLENDER XFER SWITCH	NORMAL	
2-HS-62-128	2-M-6	BORIC ACID BLENDER TO VCT INLET	CLOSE	
2-HS-62-143	2-M-6	PMW TO BA BLENDER	CLOSE	
2-HS-62-144	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	CLOSE	
2-HS-62-140A	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	STOP	

Date ________

4.3 Field Preparations (continued)

(4.3 Step [9] Continued)				
UNID	UNID	UNID	UNID	UNID
2-HS-62-140B	2-M-6	CVCS MAKEUP MODE SELECTOR	AUTO	
2-HS-62-140D	2-M-6	BORIC ACID TO BLENDER FLOW CONT	CLOSE	
2-HS-62-104A	2-M-5	CHARGING PUMP B-B CONT	STOP PULL TO LOCK	
2-HS-62-108A	2-M-5	CHARGING PUMP A-A CONT	STOP PULL TO LOCK	

[10] **ENSURE** the following component alignment for Subsection 6.8, 6.9:

UNID	LOCATION	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	2-M-6	BORIC ACID BLENDER TO VCT INLET	P AUTO	
2-HS-62-143	2-M-6	PMW TO BA BLENDER	P AUTO	
2-HS-62-144	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	VCTK	
2-HS-62-140A	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	STOP	
2-HS-62-140D	2-M-6	BORIC ACID TO BLENDER FLOW CONT	P AUTO	
2-HS-62-230A	2-M-6	BA TRANS PUMP 2A-A CONTROL	START	
2-HS-62-232A	2-M-6	BA TRANS PUMP 2B-B CONTROL	START	
2-HS-62-230D	RX MOV BD 2A1-A Breaker in Compt 2B	BA TRANS PUMP 2A-A SPEED	SLOW	
2-HS-62-232D	RX MOV BD 2B1-B Breaker in Compt. 2B	BA TRANS PUMP 2B-B SPEED	SLOW	

Date ________

4.3 Field Preparations (continued)

[11] **ENSURE** the following component alignment for Subsection 6.10:

UNID	LOCATION	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	2-M-6	BORIC ACID BLENDER TO VCT INLET	P AUTO	
2-HS-62-143	2-M-6	PMW TO BA BLENDER	P AUTO	
2-HS-62-144	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	VCTK	
2-HS-62-140A	2-M-6	VCT MAKEUP OUTLET VLV CONTROL	STOP	
2-HS-62-140D	2-M-6	BORIC ACID TO BLENDER FLOW CONT	P AUTO	
2-HS-62-230A	2-M-6	BA TRANS PUMP 2A-A CONTROL	START	
2-HS-62-232A	2-M-6	BA TRANS PUMP 2B-B CONTROL	START	
2-HS-62-230D	RX MOV BD 2A1-A Breaker in Compt 2B	BA TRANS PUMP 2A-A SPEED	SLOW	
2-HS-62-232D	RX MOV BD 2B1-B Breaker in Compt. 2B	BA TRANS PUMP 2B-B SPEED	SLOW	

Date ________

4.4 Approvals and Notifications

[1] **OBTAIN** permission from the Preoperational Startup Manager to begin testing.

______________________________	__________
Preoperational Startup Manager	Date

[2] **OBTAIN** the Unit 1 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

______________________________	__________
US/SRO/SM Signature	Date

[3] **OBTAIN** the Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

______________________________	__________
U2 US/SRO/SM Signature	Date

Date ________

5.0 ACCEPTANCE CRITERIA

[1] **VERIFY** the following the following valves can be operated from the Main Control Room (MCR):

Valve	**DESCRIPTION**	**VERIFICATION STEP**
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	6.1[11]
2-FCV-62-144	BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL	6.2[10]
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	6.3[8]
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	6.4[13]

[2] **VERIFY** Main Control Room indicating lights indicate correct valve position:

Valve	**DESCRIPTION**	**VERIFICATION STEP**
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	6.1[9], 6.1[12]
2-FCV-62-144	BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL	6.2[7], 6.2[9]
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	6.3[5.2], 6.3[7]
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	6.4[5], 6.4[19]

[3] **VERIFY** Main Control Room lights correctly indicate the status of the Reactor Coolant Makeup System (6.1[5], 6.1[7]).

[4] **VERIFY** Status Monitoring System reflect correct valve position:

VALVE	**DESCRIPTION**	**VERIFICATION STEP**
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	6.1[12], 6.1[15]
2-FCV-62-144	BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL	6.2[7], 6.2[9]

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[5] **VERIFY** Valve fails closed on loss of air or electrical power:

VALVE	DESCRIPTION	VERIFICATION STEP
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	6.1[50], 6.1[54]
2-FCV-62-144	BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL	6.2[56], 6.2[60]
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	6.3[42], 6.3[46]

[6] **VERIFY** 2-FCV-62-140, BORIC ACID BLENDER ACID SUP FLOW CNTL, Valve fails open on loss of air or electrical power (6.4[52], 6.4[56]).

[7] **VERIFY** 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, Main Control Room (MCR) annunciator alarms when transfer switch placed in Auxiliary position (6.3[32]).

[8] **VERIFY** Pumps correctly respond to Reactor Coolant Makeup Control signals for Automatic Makeup, Borate and Manual modes:

PUMP	DESCRIPTION	VERIFICATION STEP
2-PMP-62-230	BORIC ACID TRANSFER PUMP 2A-A	6.5.2[34], 6.5.2[64], 6.5.2[96]
2-PMP-62-232	BORIC ACID TRANSFER PUMP 2B-B	6.5.2[35], 6.5.2[65], 6.5.2[97]

[9] **VERIFY** the following valves meet stroke time requirements.

VALVE	DESCRIPTION	STROKE TIME	VERIFICATION STEP
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	5 Seconds < Closure Time ≤ 10 Seconds	6.1[58]
2-FCV-62-144	BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL	5 Seconds < Closure Time ≤ 10 Seconds	6.2[52]
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	5 Seconds < Open Time ≤ 10 Seconds	6.4[60]

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	5 Seconds < Closure Time ≤ 10 Seconds	6.4[62]

[10] **VERIFY** 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, correctly responds to Reactor Coolant Make-Up Control for Various Modes including Dilute, Alternate Dilute, and Manual (6.1[65], 6.5.2[158]).

[11] **VERIFY** 2-FCV-62-140, BORIC ACID BLENDER ACID SUP FLOW CNTL, correctly responds to Reactor Coolant Make-Up Control for Various Modes including Automatic Makeup, Dilute, Alternate Dilute, Borate, and Manual (6.4[65], 6.5.2[158], 6.10.1[16], 6.10.2[16], 6.10.3[16], 6.10.4[16]).

[12] **VERIFY** 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, correctly responds to Reactor Coolant Make-Up Control for Various Modes including Automatic Makeup, Dilute, Alternate Dilute, and Manual (6.3[55], 6.5.2[158], 6.8.1[16], 6.8.2[16], 6.8.3[16]).

[13] **VERIFY** 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, correctly responds to Reactor Coolant Make-Up Control for Various Modes including Automatic Makeup, Alternate Dilute, and Borate(6.1[65], 6.5.2[158]).

[14] **VERIFY** Reactor Coolant Make-Up operates properly in Automatic Makeup Mode (6.6[16]).

[15] **VERIFY** Reactor Coolant Make-Up operates properly in Manual Mode (6.7[19]).

[16] **VERIFY** system operates properly in Dilute mode with the following settings.

FLOW RATE (2-FC-62-142)	MAKEUP VOLUME (2-FQ-62-142)	VERIFICATION SUB-SUBSECTION
10 GPM	20 Gallons	6.8.1[16]
50 GPM	100 Gallons	6.8.2[16]
100 GPM	200 Gallons	6.8.3[16]

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[17] **VERIFY** system operates properly in Alt-Dilute mode with the following settings.

FLOW RATE (2-FC-62-142)	MAKEUP VOLUME (2-FQ-62-142)	VERIFICATION SUB-SUBSECTION
10 GPM	20 Gallons	6.9.1[16]
50 GPM	100 Gallons	6.9.2[16]
100 GPM	200 Gallons	6.9.3[16]

[18] **VERIFY** system operates properly in Borate mode with the following settings.

FLOW RATE (2-FC-62-139)	MAKEUP VOLUME (2-FQ-62-139)	VERIFICATION SUB-SUBSECTION
2 GPM	4 Gallons	6.10.1[16]
5 GPM	10 Gallons	6.10.2[16]
7.5 GPM	15 Gallons	6.10.3[16]
10 GPM	20 Gallons	6.10.4[16]

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[19] **VERIFY** the VCT Level Instrumentation performs the following functions.

COMPONENT	FUNCTION	VERIFICATION STEP
2-LS-62-129B	MCR annunciator alarms on low VCT Level	6.5.1[11]
2-LS-62-129D	MCR annunciator alarms on high VCT Level	6.5.3[14]
2-LS-62-130A	MCR annunciator alarms on high VCT Level	6.5.3[14]
2-LS-62-130D	Auto Makeup Stop	6.5.2[156]
2-LS-62-130E	MCR Annunciator alarms on Low VCT Level when 2-HS-62-140B is not in Auto.	6.5.2[23]
2-LS-62-130F	MCR annunciator alarms on low VCT Level	6.5.1[11]
2-LS-62-129CA	Auxiliary Control Room annunciator alarms on low VCT level	6.5.1[32]
2-LS-62-130CA	Auxiliary Control Room annunciator alarms on high VCT level	6.5.3[31]

[20] **VERIFY** valve 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, modulates to control Volume Control Tank level (6.5.3[11], 6.5.3[18]).

[21] **VERIFY** 2-LCV-62-135 or 2-LCV-62-136 open in response to VCT Low-Low Level (6.5.1[15], 6.5.1[34]).

[22] **VERIFY** 2-LCV-62-132 and 2-LCV-62-133 Close in response to a VCT Low-Low level subsequent to the full Opening of either valve 2-LCV-62-135 or 2-LCV-62-136 (6.5.1[17], 6.5.1[36]).

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[23] **VERIFY** MCR Annunciator alarms on a Boric Acid or Primary Water flow Deviation from established flow rate after a 30 second time delay.

FLOW SWITCH	FLOW DEVIATION	VERIFICATION STEP
2-FS-62-139A	Boric Acid High Flow Deviation	6.5.2[82]
2-FS-62-139B	Boric Acid Low Flow Deviation	6.5.2[72]
2-FS-62-142A	Primary Water High Flow Deviation	6.5.2[109]
2-FS-62-142B	Primary Water Low Flow Deviation	6.5.2[41]

Date ________

6.0 PERFORMANCE

NOTES

1) Sections 6.1 - 6.4 may be performed in any order.
2) Sections 6.1 - 6.4 must be performed before Sections 6.5 - 6.10.
3) For all Subsections and Sub-Subsections valve positions will be verified locally and in the MCR unless a specific location is given.

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.1 have been completed. ________

[2] **ENSURE** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	CLOSE	
2-HS-62-143	PW TO BLENDER (2-M-6)	CLOSE	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	CLOSE	
2-HS-62-140B	VCT MAKEUP MODE (2-M-6)	DIL	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	CLOSE	
2-BKR-62-230	BORIC ACID TRANSFER PMP 2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	OPEN	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	OPEN	

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

NOTE
Foxboro I/A workstation will be used to help perform some of the following steps. Ensure Foxboro I/A System Engineer or a qualified individual is available to perform this portion of the test.

[3] **ENSURE** The following Control Elements are in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FS0620142A	
W212CP	W2PRIWTR	2FS0620142B	
W212CP	W2BORIC	2FS0620139A	
W212CP	W2BORIC	2FS0620139B	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[4] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	1	
W212CP	W2PRIWTR	2FS0620142B	1	
W212CP	W2BORIC	2FS0620139A	1	
W212CP	W2BORIC	2FS0620139B	1	
W212CP	W2PRIWTR	2FQS0620142	1	
W212CP	W2BORIC	2FQS0620139	1	

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[5] **VERIFY** the following lights on Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL (**Acc Crit**):

A. Red Light OFF ________

B. Green Light ON ________

[6] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[7] **VERIFY** the following lights on Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL (**Acc Crit**):

A. Red Light ON ________

B. Green Light OFF ________

[8] **VERIFY** locally, Valve 2-FCV-62-128 (Aux, 713 Pen. RM), BA BLENDER MAKEUP TO VCT, is CLOSED. ________

[9] **VERIFY** the following lights on Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET (**Acc Crit**):

A. Green Light ON ________

B. Red Light OFF ________

[10] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in P AUTO. ________

[11] **VERIFY** locally, valve 2-FCV-62-128 (AUX, 713 PENN RM), BA BLENDER MAKEUP TO VCT, is OPEN. (**Acc Crit**) ________

[12] **VERIFY** the following (**Acc Crit**):

A. Green Light OFF at 2-HS-62-128 (2-M-6) ________

B. Red Light ON at 2-HS-62-128 (2-M-6) ________

C. Computer point Y0104D indicates NOT CL ________

[13] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in CLOSE. ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[14] **VERIFY** locally, valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, is CLOSED ________

[15] **VERIFY** the following (**Acc Crit**):

A. Green Light ON at 2-HS-62-128 (2-M-6) ________

B. Red Light OFF at 2-HS-62-128 (2-M-6) ________

C. Computer point Y0104D indicates CLOSED ________

[16] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP**, AND**

VERIFY the following:

A. Green Light ON at 2-HS-62-140A (2-M-6) ________

B. Red Light OFF at 2-HS-62-140A (2-M-6) ________

[17] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, 2-M-6, in MAN. ________

[18] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in P AUTO. ________

[19] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[20] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, remains CLOSED ________

[21] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in OPEN, **THEN** while the valve is in mid-position,

VERIFY the following indicator light conditions at the designated location:

A. Green Light ON at 2-HS-62-128A (2-M-6) ________

B. Red Light ON at 2-HS-62-128A (2-M-6) ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[22] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPENS. ________

[23] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[24] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, remains OPEN. ________

[25] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in CLOSE. ________

[26] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSES. ________

[27] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE in ALT DIL. ________

[28] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in P- AUTO. ________

[29] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[30] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPEN. ________

[31] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[32] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSES. ________

[33] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in OPEN. ________

[34] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPEN. ________

[35] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[36] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in P- AUTO. ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[37] **ENSURE** The following Control Element status to simulate Primary Water Flow High Deviation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	0	

[38] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSES after approximately 30 seconds. ________

[39] **ENSURE** The following Control Element status to simulate signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	1	

[40] **VERIFY** Valve 2-FCV-62-128 OPENS. ________

[41] **MANUALLY ACTUATE AND HOLD** relay FB110A on 2-R-54 to simulate Boric Acid Flow High Deviation. ________

____
CV

[42] **VERIFY** Valve 2-FCV-62-128 CLOSES after approximately 30 seconds. ________

[43] **RELEASE** relay FB110A on 2-R-54. ________

[44] **VERIFY** Valve 2-FCV-62-128 OPENS. ________

[45] **MANUALLY ACTUATE AND HOLD** relay FB110B on 2-R-54 to simulate Boric Acid Flow Low Deviation. ________

____
CV

[46] **VERIFY** Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSES after approximately 30 seconds. ________

[47] **RELEASE** relay FB110B on 2-R-54. ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[48] **VERIFY** Valve 2-FCV-62-128 OPENS. ________

[49] **CLOSE** the air supply valve, 2-ISV-32-3108, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-128, **AND**

VENT the diaphragm for valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT. ________

[50] **VERIFY** valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT CLOSES (**Acc Crit**). ________

[51] **CLOSE** the vent **AND**

OPEN the air supply valve, 2-ISV-32-3108, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-128. ________

[52] **VERIFY** valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPENS. ________

[53] **REMOVE** fuse 0-FU-236-3/A28, 2-FCV-62-128, (125V VIT BATT BD III). ________

________ CV

[54] **VERIFY** valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT CLOSES (**Acc Crit**). ________

[55] **REINSTALL** fuse 0-FU-236-3/A28, 2-FCV-62-128, (125V VIT BATT BD III), ________

________ CV

[56] **VERIFY** valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPENS. ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

NOTE
Timing in the MCR begins as soon as the switch is positioned and continues until the Red light goes OFF in the following step. Timing locally is from the beginning to end of motion.

[57] **PLACE** handswitch 2-HS-62-128 (2-M-6) in the CLOSE position **AND**

TIME 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSE ________

[58] **RECORD** 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, CLOSE stroke time.

A. 2-M-6 ______________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

B. LOCAL ______________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[59] **PLACE** handswitch 2-HS-62-128 (2-M-6) in the OPEN position **AND**

TIME 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPEN ________

[60] **RECORD** 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, OPEN stroke time.

A. 2-M-6 ____________ seconds

M&TE ________________ ________

B. LOCAL ____________ seconds

M&TE ________________ ________

[61] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[62] **PLACE** Handswitch 2-HS-62-128 (2-M-6), MAKEUP TO VCT INLET, in P AUTO. ________

[63] **VERIFY** valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT, is CLOSED. ________

Date ________

6.1 Valve 2-FCV-62-128, BA BLENDER MAKEUP TO VCT LOGIC (continued)

[64] **ENSURE** The following Control Elements are in AUTO.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FS0620142A	
W212CP	W2PRIWTR	2FS0620142B	
W212CP	W2BORIC	2FS0620139A	
W212CP	W2BORIC	2FS0620139B	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[65] **VERIFY** successful completion of Subsection 6.1 (**Acc Crit**) ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.2 have been completed. ________

[2] **ENSURE** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	CLOSE	
2-HS-62-143	PW TO BLENDER (2-M-6)	CLOSE	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	CLOSE	
2-HS-62-140B	VCT MAKEUP MODE (2-M-6)	BOR	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	CLOSE	
2-XS-62-143	PMW TO BA BLENDER XFER SWITCH (2-L-11A)	NOR	
2-BKR-62-230	BORIC ACID TRANSFER PMP2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	OPEN	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	OPEN	
0-BKR-236-3/310	125V DC VITAL BAT BD III breaker 310	CLOSE	

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

NOTE

Foxboro I/A workstation will be used to help perform some of the following steps. Ensure Foxboro I/A System Engineer or a qualified individual is available to perform this portion of the test.

[3] **ENSURE** The following Control Elements are in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FS0620142A	
W212CP	W2PRIWTR	2FS0620142B	
W212CP	W2BORIC	2FS0620139A	
W212CP	W2BORIC	2FS0620139B	
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[4] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	1	
W212CP	W2PRIWTR	2FS0620142B	1	
W212CP	W2BORIC	2FS0620139A	1	
W212CP	W2BORIC	2FS0620139B	1	
W213CP	W2VCTANK	2LS0620130D	1	
W213CP	W2VCTANK	2LS0620130E	1	
W212CP	W2PRIWTR	2FQS0620142	1	
W212CP	W2BORIC	2FQS0620139	1	

[5] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, 2-M-6, in START. ________

[6] **VERIFY** locally, valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, is CLOSED. ________

[7] **VERIFY** the following lights on Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET (**Acc Crit**):

A. Green Light ON ________

B. Red Light OFF ________

C. ICS point Y0103D displays "CLOSED" ________

[8] **PLACE** Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET, in P AUTO. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[9] **VERIFY** the following (**Acc Crit**):

A. Green Light OFF at 2-HS-62-144 (2-M-6) ________

B. Red Light ON at 2-HS-62-144 (2-M-6) ________

C. ICS point Y0103D displays "NOT CL" ________

[10] **VERIFY** locally, valve 2-FCV-62-144 (Aux, 713 Pen. Rm), BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, is OPEN. (**Acc Crit**) ________

[11] **PLACE** Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET, in CLOSE, **AND**

VERIFY the following:

A. Green Light ON at 2-HS-62-144 (2-M-6) ________

B. Red Light OFF at 2-HS-62-144 (2-M-6) ________

[12] **VERIFY** locally, valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, is CLOSED ________

[13] **VERIFY** Computer point Y0103D indicates CLOSED ________

[14] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP ________

[15] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, 2-M-6, in ALT DIL. ________

[16] **PLACE** Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET, in P AUTO. ________

[17] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[18] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, OPENS. ________

[19] **VERIFY** Computer Point Y0103D, indicates NOT CL. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[20] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[21] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, CLOSES. ________

[22] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, 2-M-6, in AUTO. ________

[23] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[24] **ENSURE** The following Control Element status to simulate VCT Low Level Start Boric Acid System:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130E	0	

[25] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, OPENS. ________

[26] **ENSURE** The following Control Element status to simulate signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130E	1	

[27] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, remains OPEN. ________

[28] **ENSURE** The following Control Element status to simulate Boric Acid Flow High Deviation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2BORIC	2FS0620139A	0	

[29] **VERIFY** Valve 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[30] **ENSURE** The following Control Element status to simulate signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2BORIC	2FS0620139A	1	

[31] **VERIFY** Valve 2-FCV-62-144 OPENS. ________

[32] **ENSURE** The following Control Element status to simulate Boric Acid Flow Low Deviation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2BORIC	2FS0620139B	0	

[33] **VERIFY** Valve 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

[34] **ENSURE** The following Control Element status to simulate Boric Acid Flow Low Deviation signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2BORIC	2FS0620139B	1	

[35] **VERIFY** Valve 2-FCV-62-144 OPENS. ________

[36] **ENSURE** The following Control Element status Primary Water Flow High Deviation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	0	

[37] **VERIFY** Valve 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[38] **ENSURE** The following Control Element status to simulate Primary Water Flow High Deviation signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142A	1	

[39] **VERIFY** Valve 2-FCV-62-144 OPENS. ________

[40] **ENSURE** The following Control Element status to simulate Primary Water Flow Low Deviation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142B	0	

[41] **VERIFY** Valve 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

[42] **ENSURE** The following Control Element status to simulate signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FS0620142B	1	

[43] **VERIFY** Valve 2-FCV-62-144 OPENS. ________

[44] **ENSURE** The following Control Element status to simulate High VCT Level:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130D	0	

[45] **VERIFY** Valve 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[46] **ENSURE** The following Control Element status to simulate signal Reset:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130D	1	

[47] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, remains CLOSED. ________

[48] **PLACE** Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET, in OPEN, **AND** while the valve is in mid-position,

VERIFY the following indicator light conditions at the designated location:

A. Green Light ON at 2-HS-62-144 (2-M-6) ________

B. Red Light ON at 2-HS-62-144 (2-M-6) ________

[49] **VERIFY** Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, OPENS. ________

[50] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP, **AND**

VERIFY 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, remains OPEN. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

NOTE

Timing in the MCR begins as soon as the switch is positioned and continues until the Red light goes OFF in the following step. Timing locally is from the beginning to end of motion.

[51] **PLACE** handswitch 2-HS-62-144 (2-M-6) in the CLOSE position **AND**

TIME 2-FCV-62-144, VCT MAKEUP CONTROL, CLOSE ________

[52] **RECORD** 2-FCV-62-144, VCT MAKEUP CONTROL, CLOSE stroke time.

A. 2-M-6 ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

B. LOCAL ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[53] **PLACE** handswitch 2-HS-62-144 (2-M-6) in the OPEN position **AND**

TIME 2-FCV-62-144, VCT MAKEUP CONTROL, OPEN ________

[54] **RECORD** 2-FCV-62-144, VCT MAKEUP CONTROL, OPEN stroke time.

A. 2-M-6 ____________ seconds

M&TE ________________ ________

B. LOCAL ____________ seconds

M&TE ________________ ________

[55] **CLOSE** the air supply valve, 2-ISV-32-3109, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-144, **AND**

VENT the diaphragm for valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL. ________

[56] **VERIFY** valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, CLOSES (**Acc Crit**). ________

[57] **CLOSE** the vent **AND**

OPEN the air supply valve, 2-ISV-32-3109, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-144. ________

[58] **VERIFY** valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, OPENS. ________

Date ________

6.2 Valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL LOGIC TESTING (continued)

[59] **REMOVE** fuse 0-FU-236-3/A29, 2-FCV-62-144, (125V DC VIT BATTERY BD III). ________

________ CV

[60] **VERIFY** valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, CLOSES (**Acc Crit**). ________

[61] **REINSTALL** fuse 0-FU-236-3/A29 2-FCV-62-144, (125V DC VIT BATTERY BD III). ________

________ CV

[62] **VERIFY** valve 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, OPENS. ________

[63] **PLACE** Handswitch 2-HS-62-144 (2-M-6), MAKEUP TO VCT OUTLET, in CLOSE. ________

[64] **VERIFY** 2-FCV-62-144, BA BLENDER MAKEUP TO CHG PMP SUCT FLOW CNTL, CLOSES. ________

[65] **ENSURE** The following Control Elements are in AUTO.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FS0620142A	
W212CP	W2PRIWTR	2FS0620142B	
W212CP	W2BORIC	2FS0620139A	
W212CP	W2BORIC	2FS0620139B	
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[66] **VERIFY** successful completion of Subsection 6.2 (**Acc Crit**) ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.3 have been satisfied. ________

[2] **ENSURE** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	CLOSE	
2-HS-62-143	PW TO BLENDER (2-M-6)	CLOSE	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	CLOSE	
2-HS-62-140B	CVCS MAKEUP MODE SELECTOR (2-M-6)	AUTO	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	CLOSE	
2-FC-62-142 (2-M-6)	PMW FLOW CONT TO BA BLENDER (2-M-6)	OUTPUT = 100	
2-XS-62-143	PMW TO BA BLENDER XFER SWITCH (2-L-11A)	NOR	
2-BKR-62-230	BORIC ACID TRANSFER PMP2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	OPEN	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	OPEN	
0-BKR-236-3/311	125V DC VITAL BAT BD III breaker 311	CLOSE	

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

NOTE

Foxboro I/A workstation will be used to help perform some of the following steps. Ensure Foxboro I/A System Engineer or a qualified individual is available to perform this portion of the test.

[3] **ENSURE** The following Control Elements are in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[4] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130D	1	
W213CP	W2VCTANK	2LS0620130E	0	
W212CP	W2PRIWTR	2FQS0620142	1	
W212CP	W2BORIC	2FQS0620139	1	

[5] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START on 2-M-6, ________

[5.1] **VERIFY**, locally, Valve 2-FCV-62-143 (Aux, 713 Pen. Rm), BORIC ACID BLENDER PRI WTR FLOW CTL, is CLOSED. ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[5.2] **VERIFY** the following lights on Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, 2-M-6 (**Acc Crit**):

A. Green Light ON ________

B. Red Light OFF ________

[6] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in P AUTO. ________

[7] **VERIFY** the following (**Acc Crit**):

A. Green Light OFF at 2-HS-62-143 (2-M-6) ________

B. Red Light ON at 2-HS-62-143 (2-M-6) ________

[8] **VERIFY** locally, valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, is OPEN. (**Acc Crit**) ________

[9] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in CLOSE. ________

[10] **VERIFY** locally, valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, is CLOSED. ________

[11] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[12] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130E	1	

[13] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, 2-M-6, in DIL. ________

[14] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in P- AUTO. ________

[15] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, 2-M-6, in START. ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[16] **VERIFY** Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

[17] **DEPRESS** RAMP and << pushbuttons at 2-FC-62-142 (2-M-6) until the output indicator reads approximately 0, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES. ________

[18] **MOMENTARILY DEPRESS** AUTO/MAN pushbutton at 2-FC-62-142 (2-M-6) **AND**,

A. **VERIFY** AUTO pushbutton lamp ON. ________

B. **VERIFY** MAN pushbutton lamp OFF. ________

[19] **MOMENTARILY DEPRESS** SETP pushbutton at 2-FC-62-142 (2-M-6) **AND**,

VERIFY SETP pushbutton lamp ON. ________

[20] **DEPRESS** RAMP and >> pushbuttons at 2-FC-62-142 (2-M-6) until the setpoint indicator reads approximately 50, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, moves toward OPEN. ________

[21] **VERIFY** the following lights on Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER:

A. Green Light ON ________

B. Red Light ON ________

[22] **DEPRESS** RAMP and << pushbuttons at 2-FC-62-142 (2-M-6) until the setpoint indicator reads approximately 0, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES. ________

[23] **MOMENTARILY** depress AUTO/MAN pushbutton at 2-FC-62-142 (2-M-6) **AND**,

A. **VERIFY** MAN pushbutton lamp ON. ________

B. **VERIFY** AUTO pushbutton lamp OFF. ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[24] **DEPRESS** RAMP and >> pushbuttons at 2-FC-62-142 (2-M-6) until the output indicator reads approximately 100, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

[25] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL in STOP. ________

[26] **VERIFY** Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES. ________

[27] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in OPEN, **AND** while the valve is in mid-position,

VERIFY the following indicator light conditions at the designated location:

A. Green Light ON at 2-HS-62-143(2-M-6) ________

B. Red Light ON at 2-HS-62-143 (2-M-6) ________

[28] **VERIFY** Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

[29] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in CLOSE, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES. ________

[30] **VERIFY** 2-XA-55-6F-148B (2-M-6), 148-B ACR PNL 2-L-11A XS IN AUX, is CLEAR. ________

[31] **PLACE** Transfer Switch 2-XS-62-143, PW TO BLENDER FCV, Panel 2-L-11A, in AUX. ________

[32] **VERIFY** 2-XA-55-6F-148B (2-M-6), 148-B ACR PNL 2-L-11A XS IN AUX, ALARMS (**Acc Crit**). ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[33] **VERIFY** the following lights on Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER:

A. Green Light OFF ________

B. Red Light OFF ________

[34] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in OPEN, **AND**

VERIFY, locally, Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, does NOT OPEN. ________

[35] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in P AUTO. ________

[36] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START, **AND**

VERIFY, locally, Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, does NOT OPEN. ________

[37] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[38] **PLACE** Transfer Switch 2-XS-62-143, PW TO BLENDER FCV, in NORMAL. ________

[39] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in OPEN. ________

[40] **VERIFY** Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

[41] **CLOSE** the air supply valve, 2-ISV-32-3107, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-143, **AND**

VENT the diaphragm for valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL. ________

[42] **VERIFY** valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES (**Acc Crit**). ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[43] **CLOSE** the diaphragm vent **AND**

OPEN the air supply valve, 2-ISV-32-3107, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-143. ________

[44] **VERIFY** valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

[45] **REMOVE** fuse **0-FU-236-3/B38**, 2-FCV-62-143, (125V VIT BATTERY BD III). ________

____
CV

[46] **VERIFY** valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES (**Acc Crit**). ________

[47] **REINSTALL** fuse 0-FU-236-3/B38, 2-FCV-62-143. ________

____
CV

[48] **VERIFY** valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPENS. ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

NOTE
Timing in the MCR begins as soon as the switch is positioned and continues until the Red light goes OFF in the following step. Timing locally is from the beginning to end of motion.

[49] **PLACE** handswitch 2-HS-62-143 (2-M-6) in the CLOSE position **AND**

TIME 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSE ________

[50] **RECORD** 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL stroke time.

A. MCR ____________ seconds ____________

M&TE ________________ ________

B. LOCAL ____________ seconds ____________

M&TE ________________ ________

Date ________

6.3 Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL (continued)

[51] **PLACE** handswitch 2-HS-62-143 (2-M-6) in the OPEN position **AND**

TIME 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPEN ________

[52] **RECORD** 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, OPEN stroke time.

A. 2-M-6 ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ________________ ________

B. LOCAL ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ________________ ________

[53] **PLACE** Handswitch 2-HS-62-143 (2-M-6), PW TO BLENDER, in CLOSE, **AND**

VERIFY Valve 2-FCV-62-143, BORIC ACID BLENDER PRI WTR FLOW CNTL, CLOSES. ________

[54] **ENSURE** The following Control Elements are in AUTO.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[55] **VERIFY** successful completion of Subsection 6.3 (**Acc Crit**) ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.4 have been satisfied. ________

[2] **ENSURE** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	CLOSE	
2-HS-62-143	PW TO BLENDER (2-M-6)	CLOSE	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	CLOSE	
2-HS-62-140B	VCT MAKEUP MODE (2-M-6)	AUTO	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	OPEN	
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	OUTPUT = 5 GPM	
2-XS-62-143	PW TO BLENDER FCV (AUX POS CLOSES) 2-L-11A	NORMAL	
2-BKR-62-230	BORIC ACID TRANSFER PMP2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	OPEN	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	OPEN	

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

NOTE

Foxboro I/A workstation will be used to help perform some of the following steps. Ensure Foxboro I/A System Engineer or a qualified individual is available to perform this portion of the test.

[3] **ENSURE** The following Control Elements are in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[4] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130D	1	
W213CP	W2VCTANK	2LS0620130E	0	
W212CP	W2PRIWTR	2FQS0620142	1	
W212CP	W2BORIC	2FQS0620139	1	

[5] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, is OPEN by the following indications (**Acc Crit**):

A. Green Light OFF at Handswitch 2-HS-62-140D (2-M-6) ________

B. Red Light ON at Handswitch 2-HS-62-140D (2-M-6) ________

[6] **VERIFY** locally, valve 2-FCV-62-140 (Aux, 713 Pen. Rm) is OPEN. ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

[7] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL in START, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, remains OPEN. ________

[8] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in P AUTO. ________

[9] **VERIFY** the following:

A. Green Light ON at 2-HS-62-140D (2-M-6) ________

B. Red Light ON at 2-HS-62-140D (2-M-6) ________

[10] **ENSURE** 2-FC-62-139 is in AUTO **AND**

A. **VERIFY** AUTO pushbutton lamp ON. ________

B. **VERIFY** MAN pushbutton lamp OFF. ________

[11] **MOMENTARILY DEPRESS** SETP pushbutton at 2-FC-62-139 (2-M-6) **AND**,

VERIFY SETP pushbutton lamp ON. ________

[12] **DEPRESS** RAMP and >> pushbuttons at 2-FC-62-139 (2-M-6) until the setpoint indicator reads approximately 5. ________

[13] **VERIFY** locally, valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, moves toward CLOSED. **(Acc Crit)** ________

[14] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[15] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, moves fully OPEN. ________

[16] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE in MAN ________

[17] **VERIFY** GPM lamp ON at 2-FC-62-139 (2-M-6). ________

[18] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, fully CLOSES. ________

Date ________

6.4 **Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)**

[19] **VERIFY** the following (**Acc Crit**):

A. Green Light ON at 2-HS-62-140D (2-M-6) ________

B. Red Light OFF at 2-HS-62-140D (2-M-6) ________

[20] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[21] **VERIFY** locally, valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, moves toward OPEN. ________

[22] **VERIFY** the following indicator light conditions at the designated location:

A. Green Light ON at 2-HS-62-140D (2-M-6) ________

B. Red Light ON at 2-HS-62-140D (2-M-6) ________

[23] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in OPEN. ________

[24] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, fully OPENS. ________

[25] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in STOP. ________

[26] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, in DIL. ________

[27] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in P AUTO. ________

[28] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES ________

[29] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in OPEN. ________

[30] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, fully OPENS. ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

[31] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, in ALT DIL. ________

[32] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in P AUTO. ________

[33] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES. ________

[34] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in OPEN. ________

[35] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, fully OPENS. ________

[36] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in P AUTO. ________

[37] **PLACE** Handswitch 2-HS-62-140B (2-M-6), VCT MAKEUP MODE, in AUTO. ________

[38] **VERIFY** PPM lamp ON at 2-FC-62-139 (2-M-6). ________

[39] **PLACE** Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[40] **MOMENTARILY DEPRESS** AUTO/MAN pushbutton at 2-FC-62-139 (2-M-6) **AND**,

A. **VERIFY** MAN pushbutton lamp ON. ________

B. **VERIFY** AUTO pushbutton lamp OFF. ________

[41] **DEPRESS** RAMP and << pushbuttons at 2-FC-62-139 (2-M-6) until the output indicator reads approximately 0, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES. ________

[42] **MOMENTARILY DEPRESS** SETP pushbutton at 2-FC-62-139 (2-M-6) **AND**,

VERIFY SETP pushbutton lamp ON. ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

[43] **DEPRESS** RAMP and >> pushbuttons at 2-FC-62-139 (2-M-6) until the setpoint indicator reads approximately 20, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, moves toward OPEN. ________

[44] **MOMENTARILY DEPRESS** SETP pushbutton at 2-FC-62-139 (2-M-6) **AND,**

VERIFY SETP pushbutton lamp ON. ________

[45] **DEPRESS** RAMP and << pushbuttons at 2-FC-62-139 (2-M-6) until the setpoint indicator reads approximately 0, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES. ________

[46] **MOMENTARILY** depress AUTO/MAN pushbutton at 2-FC-62-139 (2-M-6) **AND,**

A. **VERIFY** MAN pushbutton lamp ON. ________

B. **VERIFY** AUTO pushbutton lamp OFF. ________

[47] **DEPRESS** RAMP and >> pushbuttons at 2-FC-62-139 (2-M-6) until the output indicator reads approximately 100, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, OPENS. ________

[48] **ENSURE** The following Control Element status:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS0620130E	1	

[49] **PLACE** Handswitch 2-HS-62-140D (2-M-6), BA TO BLENDER, in CLOSE. ________

[50] **VERIFY** Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, fully CLOSES. ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

[51] **CLOSE** the air supply valve, 2-ISV-32-3110, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-140, **AND**

VENT the diaphragm for valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT. ________

[52] **VERIFY** valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, OPENS (**Acc Crit**). ________

[53] **CLOSE** the diaphragm vent **AND**

OPEN the air supply valve, 2-ISV-32-3110, CONTROL AIR ISOLATION VALVE TO 2-FCV-62-140. ________

[54] **VERIFY** valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES. ________

[55] **REMOVE** fuse 0-FU-236-3/A26, 2-FCV-62-140, (125V DC VIT BATTERY BD III). ________

____
CV

[56] **VERIFY** valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, OPENS (**Acc Crit**). ________

[57] **REINSTALL** fuse 0-FU-236-3/A26 (2-FCV-62-140), ________

____
CV

[58] **VERIFY** valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES. ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

NOTE

Timing in the MCR begins as soon as the switch is positioned and continues until the Red light goes OFF in the following step. Timing locally is from the beginning to end of motion.

[59] **PLACE** handswitch 2-HS-62-140D (2-M-6) in the OPEN position **AND**

TIME 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, OPEN. ________

[60] **RECORD** 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, stroke time.

A. 2-M-6 ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

B. LOCAL ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ____________________ ________

Date ________

6.4 Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT (continued)

[61] **PLACE** handswitch 2-HS-62-140D (2-M-6) in the CLOSE position, **AND**

TIME 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSES ________

[62] **RECORD** 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, CLOSE stroke time.

A. 2-M-6 ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ________________ ________

B. LOCAL ____________ seconds

Greater Than 5 sec. Less Than or Equal to 10 sec. (**Acc Crit**)

M&TE ________________ ________

[63] **PLACE** Handswitch 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, in OPEN, **AND**

VERIFY Valve 2-FCV-62-140, BORIC ACID TO BLENDER FLOW CONT, OPENS. ________

[64] **ENSURE** The following Control Elements are in AUTO.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS0620130D	
W213CP	W2VCTANK	2LS0620130E	
W212CP	W2PRIWTR	2FQS0620142	
W212CP	W2BORIC	2FQS0620139	

[65] **VERIFY** successful completion of Subsection 6.4 (**Acc Crit**) ________

Date ________

6.5 Automatic Reactor Makeup Signal and Volume Control Tank Level Control.

6.5.1 VCT LO-LO LEVEL TESTING

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. ________

[2] **ENSURE** the following:

UNID	POSITION	LOCATION	STATUS	INITIAL
2-HS-62-132A	A-P Auto	(2-M-5)	Red Light - ON	
			Green Light - OFF	
2-HS-62-133A	A-P Auto	(2-M-5)	Red Light - ON	
			Green Light - OFF	
2-HS-62-135A	A-P Auto	(2-M-5)	Red Light - OFF	
			Green Light - ON	
2-HS-62-136A	A-P Auto	(2-M-5)	Red Light - OFF	
			Green Light - ON	

[3] **RECORD** VCT level from Computer Pt L0112A, VOL CONT TK LEVEL.

________________ % ________

[4] **IF** VCT level is greater than 10%, **THEN**

MARK steps 6.5.1[5] through 6.5.1[8] N/A. ________

[5] **PLACE** 2-HS-62-128 (2-M-6) in OPEN. ________

[6] **PLACE** 2-HS-62-143 (2-M-6) in OPEN. ________

[7] **WHEN** Computer Pt L0112A, reads greater than 15% **THEN**

PLACE 2-HS-62-143 (2-M-6) in CLOSE ________

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[8] **PLACE** 2-HS-62-128 (2-M-6) in CLOSE. ________

[9] **VERIFY** 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, is CLEAR. ________

[10] **OPEN** 2-DRV-62-695, VCT DRAIN [AUX A11U 713]. ________

[11] **WHEN** Computer Pt L0112A reads Less Than 13%, **THEN**

VERIFY 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, ALARMS **(Acc Crit)**. ________

[12] **RECORD** VCT level.

______________ % ≤13% ________

[13] **VERIFY** Events Display Monitor, 109-A VCT LEVEL LO (LS-62-129B), is in ALARM. ________

[14] **VERIFY** Events Display Monitor, 109-A VCT LEVEL LO (LS-62-130F), is in ALARM. ________

[15] **WHEN** Computer Pt L0112A reads less than 8%, **THEN**

VERIFY 2-LCV-62-135 and 2-LCV-62-136 begin to OPEN **(Acc Crit)** ________

[16] **RECORD** VCT level.

______________ % ≤8% ________

[17] **WHEN** 2-LCV-62-135 **OR** 2-LCV-62-136 reaches full OPEN, **THEN**

VERIFY 2-LCV-62-132 and 2-LCV-62-133 begin to CLOSE **(Acc Crit)** ________

[18] **CLOSE** 2-DRV-62-695, VCT DRAIN. ________

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[19] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-132A	VCT OUTLET ISO VLV CONTROL (2-M-5)	OPEN	
2-HS-62-133A	VCT OUTLET ISO VLV CONTROL (2-M-5)	OPEN	
2-HS-62-135A	RWST TO CHARGING PUMPS VALVE CONTROL (2-M-5)	CLOSE	
2-HS-62-136A	RWST TO CHARGING PUMPS VALVE CONTROL (2-M-5)	CLOSE	

[20] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-132A	(2-M-5)	Red Light - ON	
		Green Light - OFF	
2-HS-62-133A	(2-M-5)	Red Light - ON	
		Green Light - OFF	
2-HS-62-135A	(2-M-5)	Red Light - OFF	
		Green Light - ON	
2-HS-62-136A	(2-M-5)	Red Light - OFF	
		Green Light - ON	

[21] **PLACE** 2-HS-62-128 (2-M-6), BORIC ACID BLENDER TO VCT INLET, in OPEN. ________

[22] **PLACE** 2-HS-62-143 (2-M-6), PMW TO BA BLENDER, in OPEN. ________

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[23] **WHEN** Computer Pt L0112A reads greater than 14%, **THEN**

VERIFY 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, CLEARS. ________

[24] **RECORD** VCT level.

____________ % ________

[25] **VERIFY** Events Display Monitor, 109-A VCT LEVEL LO (LS-62-129B), is CLEAR. ________

[26] **WHEN** Computer Pt L0112A, reads greater than 15% **THEN**

PLACE 2-HS-62-143 (2-M-6) in CLOSE ________

[27] **PLACE** 2-HS-62-128 (2-M-6) in CLOSE. ________

[28] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-132C	VCT OUTLET ISO VLV CONTROL (480v RX MOV BD 2A1-A)	AUTO	
2-HS-62-133C	VCT OUTLET ISO VLV CONTROL (480v RX MOV BD 2B1-B)	AUTO	
2-HS-62-135C	CHARGING PUMP FLOW RWST (480v RX MOV BD 2A1-A)	AUTO	
2-HS-62-136C	RWST TO CHARGING PUMPS VALVE CONTROL (480v RX MOV BD 2B1-B)	AUTO	

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[29] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-XS-62-132	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2A1-A)	AUX	
2-XS-62-133	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2B1-B)	AUX	
2-XS-62-135	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2A1-A)	AUX	
2-XS-62-136	RWST TO CHARGING PUMPS XFER (480v RX MOV BD 2B1-B)	AUX	

[30] **VERIFY** 2-XA-55-L10-306B (2-L-10), VCT LEVEL LO, is CLEAR. ________

[31] **OPEN** 2-DRV-62-695, VCT DRAIN. ________

[32] **WHEN** Computer Pt L0112A, reads less than 13%, **THEN**

VERIFY 2-XA-55-L10-306B (2-L-10), VCT LEVEL LO, ALARMS. **(Acc Crit)** ________

[33] **RECORD** VCT level.

______________ % ________

[34] **VERIFY** 2-LCV-62-135 and 2-LCV-62-136 begin to OPEN when Computer Pt L0112A reads less than 8%.**(Acc Crit)** ________

[35] **RECORD** VCT level.

______________ % ________

[36] **WHEN** 2-LCV-62-135 or 2-LCV-62-136 reaches full OPEN, **THEN**

VERIFY 2-LCV-62-132 **AND** 2-LCV-62-133 begin to CLOSE. **(Acc Crit)** ________

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[37] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-132C	VCT OUTLET ISO VLV CONTROL (480v RX MOV BD 2A1-A)	OPEN	
2-HS-62-133C	VCT OUTLET ISO VLV CONTROL (480v RX MOV BD 2B1-B)	OPEN	
2-HS-62-135C	CHARGING PUMP FLOW RWST (480v RX MOV BD 2A1-A)	CLOSE	
2-HS-62-136C	RWST TO CHARGING PUMPS VALVE CONTROL (480v RX MOV BD 2B1-B)	CLOSE	

[38] **VERIFY** the following:

UNID	DESCRIPTION	STATUS	INITIAL
2-HS-62-132C	VCT OUTLET ISO VLV CONTROL	Red - ON	
	(480v RX MOV BD 2A1-A)	Green - OFF	
2-HS-62-133C	VCT OUTLET ISO VLV CONTROL	Red - ON	
	(480v RX MOV BD 2B1-B)	Green - OFF	
2-HS-62-135C	CHARGING PUMP FLOW RWST	Red - OFF	
	(480v RX MOV BD 2A1-A)	Green - ON	
2-HS-62-136C	RWST TO CHARGING PUMPS VALVE CONTROL	Red - OFF	
	(480v RX MOV BD 2B1-B)	Green - ON	

[39] **PLACE** 2-HS-62-128 (2-M-6) in OPEN. ________

[40] **PLACE** 2-HS-62-143 (2-M-6) in OPEN. ________

Date ________

6.5.1 **VCT LO-LO LEVEL TESTING (continued)**

[41] **WHEN** Computer Pt L0112A reads greater than 14%, **THEN**

VERIFY 2-XA-55-L10-306B (2-L-10), VCT LEVEL LO, CLEARS. ________

[42] **RECORD** VCT level.

__________ % ________

[43] **WHEN** Computer Pt L0112A, reads greater than 15% **THEN**

A. **PLACE** 2-HS-62-143 (2-M-6) in CLOSE. ________

B. **PLACE** 2-HS-62-128 (2-M-6) in CLOSE. ________

[44] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-132C	VCT OUTLET ISO VLV CONTROL (RX MOV BD 2A1-A Breaker in Compt. 8B)	AUTO	
2-HS-62-133C	VCT OUTLET ISO VLV CONTROL (RX MOV BD 2A1-A Breaker in Compt. 8A)	AUTO	
2-HS-62-135C	CHARGING PUMP FLOW RWST (RX MOV BD 2A1-A Breaker in Compt. 9A)	AUTO	
2-HS-62-136C	RWST TO CHARGING PUMPS VALVE CONTROL (RX MOV BD 2B1-B Breaker in Compt. 8B)	AUTO	

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[45] **VERIFY** the following:

UNID	DESCRIPTION	STATUS	INITIAL
2-HS-62-132C	VCT OUTLET ISO VLV CONTROL	Red - ON	
	(480v RX MOV BD 2A1-A)	Green - OFF	
2-HS-62-133C	VCT OUTLET ISO VLV CONTROL	Red - ON	
	(480v RX MOV BD 2B1-B)	Green - OFF	
2-HS-62-135C	CHARGING PUMP FLOW RWST	Red - OFF	
	(480v RX MOV BD 2A1-A)	Green - ON	
2-HS-62-136C	RWST TO CHARGING PUMPS VALVE CONTROL	Red - OFF	
	(480v RX MOV BD 2B1-B)	Green - ON	

[46] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-XS-62-132	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2A1-A)	NORMAL	
2-XS-62-133	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2B1-B)	NORMAL	
2-XS-62-135	VCT OUTLET ISO VLV XFER SWITCH (480v RX MOV BD 2A1-A)	NORMAL	
2-XS-62-136	RWST TO CHARGING PUMPS XFER (480v RX MOV BD 2B1-B)	NORMAL	
2-HS-62-132A	VCT OUTLET ISO VLV CONTROL (2-M-5)	CLOSE	
2-HS-62-133A	VCT OUTLET ISO VLV CONTROL (2-M-5)	CLOSE	
2-HS-62-135A	RWST TO CHARGING PUMPS VALVE CONTROL (2-M-5)	CLOSE	
2-HS-62-136A	RWST TO CHARGING PUMPS VALVE CONTROL (2-M-5)	CLOSE	

Date ________

6.5.1 VCT LO-LO LEVEL TESTING (continued)

[47] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-132A	(2-M-5)	Red - OFF	
		Green - ON	
2-HS-62-133A	(2-M-5)	Red - OFF	
		Green - ON	
2-HS-62-135A	(2-M-5)	Red - OFF	
		Green - ON	
2-HS-62-136A	(2-M-5)	Red - OFF	
		Green - ON	

Date ________

6.5.2 MAKEUP TESTING

NOTES

1) The Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN as needed.
2) The Test Director may RESET 2-FQ-62-142 (2-M-6) and/ or 2-FQ-62-139 (2-M-6) as needed.

[1] **NOTIFY** Unit 1 Supervisor (US/SRO) or Shift Manager that testing will be performed on the Unit 2 Boric Acid Transfer Pumps and that boric acid will be transferred from the 2B Boric Acid Tank. ________

[2] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. ________

[3] **ENSURE** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-BKR-62-230	BORIC ACID TRANSFER PMP 2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	OPEN	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	OPEN	

[4] **VERIFY** Computer point XD2047 indicates "PWR OFF". ________

[5] **VERIFY** Computer point XD2052 indicates "PWR OFF". ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[6] **PERFORM** the following component alignment:

UNID	DESCRIPTION	POSITION	INITIAL
2-BKR-62-230	BORIC ACID TRANSFER PMP 2A-A (RX MOV BD 2A1-A Breaker in Compt. 2B)	CLOSE	
2-BKR-62-232	BORIC ACID TRANSFER PMP 2B-B (RX MOV BD 2B1-B Breaker in Compt. 2B)	CLOSE	

[7] **VERIFY** Computer point XD2047 indicates “PWR ON”. ________

[8] **VERIFY** Computer point XD2052 indicates “PWR ON”. ________

[9] **VERIFY** Computer point XD2048 indicates “NOT RUN”. ________

[10] **VERIFY** Computer point XD2053 indicates “NOT RUN”. ________

[11] **PERFORM** the following:

UNID	NOMENCLATURE	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	P AUTO	
2-HS-62-143	PW TO BLENDER (2-M-6)	P AUTO	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	P AUTO	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140B	CVCS MAKEUP MODE SELECTOR (2-M-6)	AUTO	
2-HS-62-140D	BA TO BLENDER (2-M-6)	P AUTO	
2-HS-62-230A	BA TRANS PUMP 2A-A CONTROL (2-M-6)	START	
2-HS-62-232A	BA TRANS PUMP 2B-B CONTROL (2-M-6)	START	
2-HS-62-230D	BA TRANS PUMP 2A-A SPEED (2-M-6)	SLOW	
2-HS-62-232D	BA TRANS PUMP 2B-B CONTROL (2-M-6)	SLOW	
2-HS-62-118A	DIVERSION FLOW TO HOLDUP TANKS (2-M-6)	VCTK	

Date ________

6.5.2 MAKEUP TESTING (continued)

[12] **PERFORM** the following:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 5 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =2500	
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 5 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS = 2500	

[13] **VERIFY** Computer point XD2048 indicates "RUNNING". ________

[14] **VERIFY** Computer point XD2053 indicates "RUNNING". ________

[15] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[16] **RECORD** VCT level from Computer Pt L0112A, VOL CONT TK LEVEL.

__________ % ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[17] **IF** VCT level is Less than 20%, **THEN**

MARK steps 6.5.2[18] and 6.5.2[19] N/A. ________

[18] **OPEN** 2-DRV-62-695, VCT DRAIN. ________

[19] **WHEN** Computer Pt L0112A, reads less than 20% **THEN**

CLOSE 2-DRV-62-695. ________

[20] **VERIFY** 2-XA-55-6A-111D (2-M-6), AUTO MAKE UP START SIGNAL BLOCKED, is CLEAR. ________

[21] **PLACE** 2-HS-62-140B (2-M-6), CVCS MAKEUP MODE SELECTOR, in MANUAL. ________

[22] **VERIFY** 2-FCV-62-140, BORIC ACID BLENDER ACID SUP FLOW CNTL, CLOSES. ________

[23] **VERIFY** 2-XA-55-6A-111D (2-M-6), AUTO MAKE UP START SIGNAL BLOCKED, ALARMS. **(Acc Crit)** ________

[24] **VERIFY** Events Display Monitor, 111-D AUTO MAKEUP START SIGNAL BLOCKED, is in ALARM. ________

[25] **PLACE** 2-HS-62-140B (2-M-6), CVCS MAKEUP MODE SELECTOR, in AUTO. ________

[26] **VERIFY** 2-XA-55-6A-111D (2-M-6), AUTO MAKE UP START SIGNAL BLOCKED, CLEARS ________

[27] **VERIFY** Events Display Monitor, 111-D AUTO MAKEUP START SIGNAL BLOCKED, is CLEARS. ________

[28] **VERIFY** 2-FCV-62-140, BORIC ACID BLENDER ACID SUP FLOW CNTL, OPENS. ________

[29] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running SLOW. ________

[30] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running SLOW. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[31] **MOMENTARILY DEPRESS** the RESET pushbutton on the following:

UNID	DESCRIPTION	INITIAL
2-FQ-62-142 (2-M-6)	PMW FLOW BATCH COUNTER	
2-FQ-62-139 (2-M-6)	PMW FLOW BATCH COUNTER	

[32] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[33] **VERIFY** the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	PARTIALLY CLOSES	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	PARTIALLY OPENS	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	OPENS	

[34] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running FAST. (**Acc Crit**) ________

[35] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running FAST. (**Acc Crit**) ________

[36] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, is CLEAR. ________

NOTE
Steps 6.5.2[37] - 6.5.2[40] simulate a Primary Water Low Flow Deviation situation.

[37] **PLACE** 2-HS-62-128 (2-M-6) in OPEN. ________

[38] **VERIFY** 2-FCV-62-128 OPENS. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[39] **PLACE** 2-HS-62-143 (2-M-6) in CLOSE. ________

[40] **VERIFY** locally 2-FCV-62-143 goes FULL CLOSED. ________

[41] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, ALARMS after approximately 30 seconds (**Acc Crit**). ________

[42] **VERIFY** 2-FCV-62-144 CLOSES. ________

[43] **VERIFY** Events Display Monitor, 112-E PW TO BLENDER FLOW DEVIATION (FS-62-142A), is in ALARM. ________

[44] **PLACE** 2-HS-62-143 (2-M-6) in P AUTO. ________

[45] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, CLEARS. ________

[46] **VERIFY** Events Display Monitor, 112-E PW TO BLENDER FLOW DEVIATION (FS-62-142A), is CLEARS. ________

[47] **VERIFY** 2-FCV-62-144 OPENS. ________

NOTES

1) The following step forces 2-FCV-62-143 Full Open to simulate a Primary Water High Flow Deviation situation.
2) Foxboro I/A workstation will be used to help perform some of the following steps. Ensure Foxboro I/A System Engineer or a qualified individual is available to perform this portion of the test.

[48] **ENSURE** The following Control Element is in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FCV0620143	

[49] **ENSURE** the following at Foxboro workstation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FCV0620143	100%	

Date ________

6.5.2 MAKEUP TESTING (continued)

[50] **VERIFY** 2-FCV-62-144 CLOSES after approximately 30 seconds. ________

[51] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, ALARMS. ________

[52] **RESTORE** the following Control Element to Automatic:

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FCV0620143	

[53] **VERIFY LOCALLY** 2-FCV-62-143 moves toward CLOSED ________

[54] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, CLEARS. ________

[55] **VERIFY** 2-FCV-62-144 OPENS. ________

[56] **PLACE** 2-HS-62-128 (2-M-6) in P AUTO. ________

[57] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[58] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running SLOW. ________

[59] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running SLOW. ________

[60] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[61] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[62] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[63] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	PARTIALLY OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	OPEN	

[64] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running FAST (**Acc Crit**). ________

[65] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running FAST (**Acc Crit**). ________

[66] **VERIFY** 2-XA-55-6A-111E (2-M-6), BA TO BLENDER FLOW DEVIATION, is CLEAR. ________

NOTE
Steps 6.5.2[67] - 6.5.2[70] simulate a Boric Acid Low Flow Deviation situation.

[67] **PLACE** 2-HS-62-128 (2-M-6) in OPEN. ________

[68] **VERIFY** 2-FCV-62-128 OPENS. ________

[69] **PLACE** 2-HS-62-140D (2-M-6) in CLOSE ________

[70] **VERIFY** locally 2-FCV-62-140, BORIC ACID BLENDER ACID SUP FLOW CNTL, goes FULL CLOSED ________

[71] **VERIFY** 2-FCV-62-144 CLOSES. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[72] **VERIFY** 2-XA-55-6A-111E (2-M-6), BA TO BLENDER FLOW DEVIATION, ALARMS after approximately 30 seconds (**Acc Crit**). ________

[73] **VERIFY** 2-FCV-62-144 CLOSES. ________

[74] **VERIFY** Events Display Monitor, 111-E BA TO BLENDER FLOW DEVIATION (FS-62-139A), is in ALARM. ________

[75] **PLACE** 2-HS-62-140D (2-M-6) in P AUTO. ________

[76] **VERIFY** 2-FCV-62-140 partially OPEN. ________

[77] **VERIFY** 2-FCV-62-144 OPENS. ________

[78] **VERIFY** 2-XA-55-6A-111E (2-M-6), BA TO BLENDER FLOW DEVIATION, CLEARS. ________

[79] **VERIFY** Events Display Monitor, 111-E BA TO BLENDER FLOW DEVIATION (FS-62-139A), is CLEAR. ________

NOTE
The following step simulates a Boric Acid High Flow Deviation situation.

[80] **PLACE** 2-HS-62-140D (2-M-6) in OPEN. ________

[81] **VERIFY** 2-FCV-62-140 OPENS. ________

[82] **VERIFY** 2-XA-55-6A-111E (2-M-6), BA TO BLENDER FLOW DEVIATION, ALARMS after approximately 30 seconds. (**Acc Crit**) ________

[83] **VERIFY** 2-FCV-62-144 CLOSES. ________

[84] **PLACE** 2-HS-62-140D (2-M-6) in P AUTO. ________

[85] **VERIFY** 2-FCV-62-140 moves toward CLOSE. ________

[86] **VERIFY** 2-FCV-62-144 moves toward OPEN. ________

[87] **VERIFY** 2-XA-55-6A-111E (2-M-6), BA TO BLENDER FLOW DEVIATION, CLEARS. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[88] **PLACE** 2-HS-62-128 (2-M-6) in P AUTO. ________

[89] **VERIFY** 2-FCV-62-128 CLOSES. ________

[90] **PLACE** 2-HS-62-140B (2-M-6) in STOP. ________

[91] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running SLOW. ________

[92] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running SLOW. ________

[93] **PLACE** 2-HS-62-140B (2-M-6) in MAN. ________

[94] **PLACE** 2-HS-62-128 (2-M-6) in OPEN. ________

[95] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[96] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running FAST (**Acc Crit**). ________

[97] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running FAST (**Acc Crit**). ________

[98] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	OPEN	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	CLOSED	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	PARTIALLY OPEN	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[99] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[100] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running SLOW. ________

[101] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running SLOW. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[102] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[103] **PLACE** 2-HS-62-140B (2-M-6) in DIL. ________

[104] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[105] **VERIFY** the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	OPENS	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	PARTIALLY OPENS	

NOTE

The following step forces 2-FCV-62-143 Full Open to simulate a Primary Water High Flow Deviation situation.

[106] **ENSURE** The following Control Element is in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FCV0620143	

Date ________

6.5.2 MAKEUP TESTING (continued)

[107] **ENSURE** the following at Foxboro workstation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W212CP	W2PRIWTR	2FCV0620143	100%	

[108] **VERIFY** 2-FCV-62-143 moves OPEN. ________

[109] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, ALARMS after approximately 30 seconds (**Acc Crit**). ________

[110] **VERIFY** 2-FCV-62-128 CLOSES. ________

[111] **RESTORE** the following Control Element to Automatic:

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W212CP	W2PRIWTR	2FCV0620143	

[112] **VERIFY** 2-XA-55-6A-112E (2-M-6), PW TO BLENDER FLOW DEVIATION, CLEARS. ________

[113] **VERIFY** 2-FCV-62-128 OPENS. ________

[114] **PLACE** 2-HS-62-144 (2-M-6) in P AUTO. ________

[115] **VERIFY** 2-FCV-62-144 CLOSES. ________

[116] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[117] **PLACE** 2-HS-62-140B (2-M-6) in ALT DIL. ________

[118] **MOMENTARILY DEPRESS** the RESET Pushbutton on 2-FQ-62-142 (2-M-6). ________

[119] **LOWER** 2-FQ-62-142 (2-M-6), PMW FLOW BATCH COUNTER, Target Gallons to 5. ________

[120] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[121] **VERIFY** the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	OPENS	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	PARTIALLY OPENS	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	OPENS	

[122] **WHEN** 2-FQ-62-142 (2-M-6) Actual Gallons reaches 5, **THEN**

VERIFY the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSES	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSES	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSES	

[123] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[124] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

[125] **MOMENTARILY DEPRESS** the RESET Pushbutton on 2-FQ-62-139 (2-M-6). ________

[126] **LOWER** 2-FQ-62-139 (2-M-6), BORIC ACID FLOW BATCH COUNTER, Target Gallons to 5. ________

[127] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running SLOW. ________

[128] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running SLOW. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[129] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[130] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[131] **VERIFY** the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	PARTIALLY CLOSES	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	OPEN	

[132] **VERIFY** 2-HS-62-230A (2-M-6), BA PMP A, light indicates pump is running FAST. ________

[133] **VERIFY** 2-HS-62-232A (2-M-6), BA PMP B, light indicates pump is running FAST. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[134] **WHEN** 2-FQ-62-139 (2-M-6) Actual Gallons reaches 5, **THEN**

VERIFY the following valve actions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPENS	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSES	

[135] **VERIFY** 2-PMP-62-230, BORIC ACID TRANSFER PUMP 2A-A, is running SLOW. ________

[136] **VERIFY** 2-PMP-62-232, BORIC ACID TRANSFER PUMP 2B-B, is running SLOW. ________

[137] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[138] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	OPEN	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	

[139] **RECORD** VCT level from Computer Pt L0112A, VOL CONT TK LEVEL.

____________ % ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[140] **IF** VCT level is Less than 35%, **THEN**

MARK steps 6.5.2[141] and 6.5.2[142] N/A. ________

[141] **OPEN** 2-DRV-62-695, VCT DRAIN. ________

[142] **WHEN** Computer Pt L0112A, reads less than 35% **THEN**

CLOSE 2-DRV-62-695. ________

[143] **PLACE** 2-HS-62-140B (2-M-6) in AUTO. ________

[144] **PERFORM** the following:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 50 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =2500	
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 0 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS = 0	
2-HS-62-140D	BA TO BLENDER (2-M-6)	CLOSE	

[145] **VERIFY** ICS point XD2002 displays "NOT P-L". ________

[146] **PLACE** 2-HS-62-230A (2-M-6), BA TRANS PUMP 2A-A CONTROL, in STOP PULL TO LOCK. ________

[147] **VERIFY** ICS point XD2002 displays "PULLT-L". ________

[148] **VERIFY** ICS point XD2003 displays "NOT P-L". ________

[149] **PLACE** 2-HS-62-232A (2-M-6), BA TRANS PUMP 2B-B CONTROL, in STOP PULL TO LOCK. ________

[150] **VERIFY** ICS point XD2003 displays "PULLT-L". ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[151] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[152] **ENSURE** The following Control Element is in Manual.

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS062130E	

[153] **ENSURE** the following at Foxboro workstation:

PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIAL
W213CP	W2VCTANK	2LS062130E	0	

[154] **VERIFY** the following valve actions:

UNID	DESCRIPTION	ACTION	INITIAL
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	PARTIALLY OPENS	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	OPENS	

[155] **RESTORE** the following Control Element to Automatic:

PROCESSOR	COMPOUND	ELEMENT	INITIAL
W213CP	W2VCTANK	2LS062130E	

[156] **WHEN** Computer Pt **L0112A**, reads greater than 41% , **THEN**

VERIFY the following valve actions: **(Acc Crit)**

UNID	DESCRIPTION	ACTION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSES	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSES	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSES	

[157] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

Date ________

6.5.2 MAKEUP TESTING (continued)

[158] **VERIFY** successful completion of Sub-Subsection 6.5.2 **(Acc Crit)** ________

Date ________

6.5.3 VCT HIGH LEVEL TESTING

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. ________

[2] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	P AUTO	
2-HS-62-143	PW TO BLENDER (2-M-6)	P AUTO	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	P AUTO	
2-HS-62-140D	BA TO BLENDER (2-M-6)	P AUTO	
2-HS-62-140B	CVCS MAKEUP MODE SELECTOR (2-M-6)	DIL	
2-HS-62-118A	DIVERSION FLOW TO HOLDUP TANKS (2-M-6)	P AUTO	
2-XS-62-118	DIVERSION FLOW TO HOLDUP TANKS (2-L-11A)	NORMAL	
2-LIC-62-130A	VOLUME CONTROL TANK LEVEL INDICATING CONT (2-M-6)	MAN/ OUTPUT=0	
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 5 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =2500	
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 0 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS = 0	

Date ________

6.5.3 VCT HIGH LEVEL TESTING (continued)

[3] **VERIFY** the following valve positions:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSED	
2-FCV-62-140	BORIC ACID BLENDER ACID SUP FLOW CNTL	CLOSED	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSED	
2-FCV-62-144	BA BLENDER CHEMICAL FEED TO CHARGING PUMP	CLOSED	
2-LCV-62-118	DIVERSION FLOW TO HOLDUP TANKS	TO VCT	

[4] **RECORD** VCT level from Computer Pt L0112A, VOL CONT TK LEVEL.

____________ % ________

[5] **IF** VCT level is Less Than 60%, **THEN**

MARK steps 6.5.3[6] and 6.5.3[7] N/A. ________

[6] **OPEN** 2-DRV-62-695 (Aux, 713 VCT RM), VCT DRAIN. ________

[7] **WHEN** Computer Pt L0112A, reads less than 60% **THEN**

CLOSE 2-DRV-62-695. ________

[8] **VERIFY** 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, is CLEAR. ________

Date ________

6.5.3 VCT HIGH LEVEL TESTING (continued)

NOTE

2-LCV-62-118, Diversion Flow To Holdup Tanks, begins to position to HUT (Hold-Up Tank) when VCT Level reaches 63%. 2-LCV-62-118 will increase the amount of flow diverted to the HUT as VCT level increases. When VCT Level reaches 93% 2-LCV-62-118 will be fully positioned to the HUT.

[9] **PLACE** 2-HS-62-140A (2-M-6) in START. ________

[10] **VERIFY** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	OPENS	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	MOVES OPEN	

[11] **WHEN** Computer Pt L0112A reads Greater Than 63%, **THEN**

VERIFY locally 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, begins positioning to HUT .**(Acc Crit)** ________

[12] **RECORD** VCT level.

____________ % ________

[13] **VERIFY** locally that as VCT Level increases 2-LCV-62-118 positions more toward the HUT. ________

[14] **WHEN** Computer Pt L0112A reads Greater Than 92%, **THEN**

VERIFY 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, ALARMS **(Acc Crit)** ________

[15] **RECORD** VCT level.

____________ % ________

[16] **VERIFY** Events Display Monitor, 109-A VCT LEVEL HI (LS-62-129D), is in ALARM. ________

Date ________

6.5.3 VCT HIGH LEVEL TESTING (continued)

[17] **VERIFY** Events Display Monitor, 109-A VCT LEVEL HI (LS-62-130A), is in ALARM. ________

[18] **VERIFY** locally 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, is fully positioned to HUT. **(Acc Crit)** ________

[19] **PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[20] **VERIFY** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSES	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSES	

[21] **OPEN** 2-DRV-62-695. ________

[22] **WHEN** Computer Pt L0112A reads Less Than 93%, **THEN**

VERIFY 2-XA-55-6A-109A (2-M-6), VCT LEVEL HI/LO, CLEARS. ________

[23] **RECORD** VCT level.

__________ % ________

[24] **VERIFY** 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, positions to VCT. ________

[25] **CLOSE** 2-DRV-62-695. ________

[26] **PLACE** 2-HS-62-118C, DIVERSION FLOW TO HOLDUP TANKS, in P AUTO ________

[27] **PLACE** 2-XS-62-118 (2-L-11A),DIVERSION FLOW TO HOLDUP TANKS, in AUX ________

[28] **VERIFY** 2-XA-55-L10-306A, VCT LEVEL HI, (2-L-10) is CLEAR. ________

[29] **PLACE** 2-HS-62-140A (2-M-6) in START. ________

Date ________

6.5.3 VCT HIGH LEVEL TESTING (continued)

[30] **VERIFY** the following:

UNID	DESCRIPTION	ACTION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	PARTIALLY OPENS	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	MOVES OPEN	

[31] **WHEN** Computer Pt L0112A reads Greater Than 92%, **THEN**

VERIFY 2-XA-55-L10-306A (2-L-10), VCT LEVEL HI, ALARMS **(Acc Crit)** ________

[32] **RECORD** VCT level.

__________ % ________

[33] **VERIFY** 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, positions to HUT. ________

[34] **PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[35] **VERIFY** the following:

UNID	DESCRIPTION	ACTION	INITIAL
2-FCV-62-128	BA BLENDER MAKEUP TO VCT	CLOSES	
2-FCV-62-143	BORIC ACID BLENDER PRI WTR FLOW CNTL	CLOSES	

[36] **OPEN** 2-DRV-62-695. ________

[37] **WHEN** 2-LI-62-129C (2-L-10) reads Less Than 93%, **THEN**

VERIFY 2-XA-55-L10-306A, VCT LEVEL HI, CLEARS. ________

[38] **RECORD** VCT level.

__________ % ________

[39] **VERIFY** 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, positions to VCT. ________

Date ________

6.5.3 VCT HIGH LEVEL TESTING (continued)

[40] **CLOSE** 2-DRV-62-695. ________

[41] **PLACE** 2-XS-62-118, DIVERSION FLOW TO HOLDUP TANKS, in NORMAL ________

Date ________

6.6 Reactor Makeup Control Functional Tests Automatic

NOTE

For this Subsection the Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN, to maintain VCT Level between 35% and 80%

[1] **PERFORM** the following:

UNID	DESCRIPTION	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	P AUTO	
2-HS-62-143	PW TO BLENDER (2-M-6)	P AUTO	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	P AUTO	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	P AUTO	
2-HS-62-230A	BA TRANS PUMP 2A-A CONTROL (2-M-6)	START	
2-HS-62-232A	BA TRANS PUMP 2B-B CONTROL (2-M-6)	START	
2-HS-62-230D	BA TRANS PUMP 2A-A SPEED (2-M-6)	SLOW	
2-HS-62-232D	BA TRANS PUMP 2B-B CONTROL (2-M-6)	SLOW	
2-HS-62-118A	DIVERSION FLOW TO HOLDUP TANKS (2-M-6)	VCTK	

Date ________

6.6 Reactor Makeup Control Functional Tests Automatic (continued)

NOTES

1) A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.
2) 2290PPM was chosen to give 5GPM Boric Acid flow.
3) Boric Acid flow in GPM is determined by the following equation.

$$\text{BAFlow} = \frac{\text{PWFlow} * \text{PPM}}{1.011 * (6820\text{PPM} - \text{PPM})} \text{ or } \frac{10\text{GPM} * 2290\text{PPM}}{1.011 * (6820\text{PPM} - 2290\text{PPM})} = 5\text{GPM}$$

[2] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. ________

[3] **PLACE** 2-HS-62-140B (2-M-6) in AUTO. ________

[4] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 10 GPM	
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP=2290PPM	

[5] **RECORD** VCT level from Computer Pt L0112A, VOL CONT TK LEVEL.

____________ % ________

[6] **IF** VCT level is Less than 20%, **THEN**

MARK steps 6.6[7] and 6.6[8] N/A. ________

[7] **OPEN** 2-DRV-62-695 (Aux, 713 VCT RM), VCT DRAIN. ________

[8] **WHEN** Computer Pt L0112A, reads Less than 20% **THEN**

CLOSE 2-DRV-62-695. ________

[9] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

Date ________

6.6 Reactor Makeup Control Functional Tests Automatic (continued)

[10] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-140	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[11] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 10gpm. ________

[12] **RECORD** makeup flow rate from Computer Pt U0103, PMW TO BOR ACID BLNR, 2-M-6.

Flowrate = __________ gpm ________

[13] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 5gpm. ________

[14] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = __________ gpm ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Subsection 6.6(**Acc Crit**) ________

Date ________

6.7 Reactor Makeup Control Functional Tests Manual

NOTE

For this Subsection the Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN, to maintain VCT Level between 35% and 80%

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. ________

[2] **PERFORM** the following:

UNID	NOMENCLATURE	POSITION	INITIAL
2-HS-62-128	MAKEUP TO VCT INLET (2-M-6)	OPEN	
2-HS-62-143	PW TO BLENDER (2-M-6)	P AUTO	
2-HS-62-144	MAKEUP TO VCT OUTLET (2-M-6)	P AUTO	
2-HS-62-140A	VCT MAKEUP CONTROL (2-M-6)	STOP	
2-HS-62-140D	BA TO BLENDER (2-M-6)	P AUTO	
2-HS-62-230A	BA TRANS PUMP 2A-A CONTROL (2-M-6)	START	
2-HS-62-232A	BA TRANS PUMP 2B-B CONTROL (2-M-6)	START	
2-HS-62-230D	BA TRANS PUMP 2A-A SPEED (2-M-6)	SLOW	
2-HS-62-232D	BA TRANS PUMP 2B-B CONTROL (2-M-6)	SLOW	
2-HS-62-118A	DIVERSION FLOW TO HOLDUP TANKS (2-M-6)	VCTK	

Date ________

6.7 Reactor Makeup Control Functional Tests Manual (continued)

[3] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

[4] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 70GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =140	

[5] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) ________

[6] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 20 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =20	

[7] **PLACE** 2-HS-62-140B (2-M-6) in MAN. ________

[8] **SIMULTANEOUSLY START** TWO Stopwatches, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

Date ________

6.7 Reactor Makeup Control Functional Tests Manual (continued)

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-140	(2-M-6)	Red - ON	
		Green - ON	

[10] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 20 gpm. ________

[11] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = __________ gpm ________

[12] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 70gpm. ________

[13] **RECORD** makeup flow rate from Computer Pt U0103.

Flowrate = __________ gpm ________

[14] **WHEN** Indicator 2-FI-62-139, BORIC ACID TO BLENDER, indicates no flow **THEN**

STOP one Stopwatch **AND**

RECORD time:

Batch Time________ seconds (T)

M&TE ID#________ ________

[15] **VERIFY** Boric Acid Batch Time equals approximately 60 seconds. ________

Date ________

6.7 Reactor Makeup Control Functional Tests Manual (continued)

[16] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP one Stopwatch **AND**

RECORD time:

Batch Time________ seconds (T)

M&TE ID#________ ________

[17] **VERIFY** Primary Water Batch Time equals approximately 120 seconds. ________

[18] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[19] **VERIFY** successful completion of Subsection 6.7 (**Acc Crit**) ________

Date ________

6.8 Reactor Makeup Control Functional Tests Dilute

NOTE

For Sub-Subsections 6.8.1, 6.8.2, and 6.8.3 the Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN, to maintain VCT Level between 35% and 80%

6.8.1 Operational Capability of the Makeup Control System Dilute Mode 10 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. ________

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 10 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =300	

[3] **PLACE** 2-HS-62-140B (2-M-6) in DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	

Date ________

6.8.1 Operational Capability of the Makeup Control System Dilute Mode 10 GPM. (continued)

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 10gpm±0.036gpm. ________

[7] **RECORD** makeup flow rate from Computer Pt U0103.

Flowrate = ____________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 10 gpm and 2-FQ-62-142 set to 20 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{20\text{gal}}{10\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 20 Gallons. ________

Date ________

6.8.1 Operational Capability of the Makeup Control System Dilute Mode 10 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Batch Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.8.1 **(Acc Crit)** ________

Date ________

6.8.2 Operational Capability of the Makeup Control System Dilute Mode 50 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. ________

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 50 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =500	

[3] **PLACE** 2-HS-62-140B (2-M-6) in DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 50 gpm±.18gpm. ________

[7] **RECORD** makeup flow rate from Computer Pt U0103, PMW TO BOR ACID BLNR, 2-M-6.

Flowrate = __________ gpm ________

Date ________

6.8.2 Operational Capability of the Makeup Control System Dilute Mode 50 GPM. (continued)

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 50 gpm and 2-FQ-62-142 set to 100 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{100\text{gal}}{50\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 100 Gallons. ________

Date ________

6.8.2 Operational Capability of the Makeup Control System Dilute Mode 50 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.8.2 (**Acc Crit**) ________

Date ________

6.8.3 Operational Capability of the Makeup Control System Dilute Mode 100 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. ________

> **NOTE**
>
> A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 100 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =1000	

[3] **PLACE** 2-HS-62-140B (2-M-6) in DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	2-M-6	Red - ON	
		Green - OFF	
2-HS-62-143	2-M-6	Red - ON	
		Green - ON	

[6] **VERIFY** makeup flow rate on Pt U0103, PMW TO BOR ACID BLNR, reads approximately 100 gpm±.36gpm. ________

[7] **RECORD** makeup flow rate on Pt U0103, PMW TO BOR ACID BLNR, 2-M-6.

Flowrate = ____________ gpm ________

Date ________

6.8.3 Operational Capability of the Makeup Control System Dilute Mode 100 GPM. (continued)

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 100 gpm and 2-FQ-62-142 set to 200 gallons the Expected Batch Time from Start to no flow is 120 seconds.

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{200\text{gal}}{100\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 200 Gallons. ________

Date ________

6.8.3 Operational Capability of the Makeup Control System Dilute Mode 100 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.8.3 **(Acc Crit)** ________

Date ________

6.9 Reactor Makeup Control Functional Tests Alt-Dilute

NOTE

For Sub-Subsections 6.9.1 6.9.2, and 6.9.3 the Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN, to maintain VCT Level between 35% and 80%

6.9.1 Operational Capability of the Makeup Control System Alt-Dilute Mode 10 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. ________

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 10 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =300	

[3] **PLACE** 2-HS-62-140B (2-M-6) in ALT DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

Date ________

6.9.1 Operational Capability of the Makeup Control System Alt-Dilute Mode 10 GPM. (continued)

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 10gpm±0.036gpm. ________

[7] **RECORD** makeup flow rate from Computer Pt U0103.

Flowrate = __________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

Date ________

6.9.1 Operational Capability of the Makeup Control System Alt-Dilute Mode 10 GPM. (continued)

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 10 gpm and 2-FQ-62-142 set to 20 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{20\text{gal}}{10\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 20 Gallons. ________

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Batch Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.9.1 (**Acc Crit**) ________

Date ________

6.9.2 Operational Capability of the Makeup Control System Alt-Dilute Mode 50 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. ________

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 50 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =500	

[3] **PLACE** 2-HS-62-140B (2-M-6) in ALT DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0103, PMW TO BOR ACID BLNR, reads approximately 50 gpm±.18gpm. ________

Date ________

6.9.2 Operational Capability of the Makeup Control System Alt-Dilute Mode 50 GPM. (continued)

[7] **RECORD** makeup flow rate from Computer Pt U0103, PMW TO BOR ACID BLNR, 2-M-6.

Flowrate = ____________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 50 gpm and 2-FQ-62-142 set to 100 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{100\text{gal}}{50\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 100 Gallons. ________

Date ________

6.9.2 Operational Capability of the Makeup Control System Alt-Dilute Mode 50 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.9.2 (**Acc Crit**) ________

Date ________

6.9.3 Operational Capability of the Makeup Control System Alt-Dilute Mode 100 GPM.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. ________

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[2] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-142	PMW FLOW CONT TO BA BLENDER (2-M-6)	SETP = 100 GPM	
2-FQ-62-142	PMW FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =1000	

[3] **PLACE** 2-HS-62-140B (2-M-6) in ALT DIL. ________

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-143	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate on Pt U0103, PMW TO BOR ACID BLNR, reads approximately 100 gpm±.36gpm. ________

Date ________

6.9.3 Operational Capability of the Makeup Control System Alt-Dilute Mode 100 GPM. (continued)

[7] **RECORD** makeup flow rate on Pt U0103, PMW TO BOR ACID BLNR, 2-M-6.

Flowrate = ____________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-128	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-143	(2-M-6)	Red - OFF	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-142 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-142 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-142 set to 100 gpm and 2-FQ-62-142 set to 200 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\mathrm{Expected\_Batch\_Time} = \frac{\mathrm{Volume}}{\mathrm{FlowRate}} = \frac{200\mathrm{gal}}{100\frac{\mathrm{gal}}{\mathrm{min}}} \times \frac{60\mathrm{s}}{\mathrm{min}} = 120\mathrm{s}$$

[11] **SET** 2-FQ-62-142, PMW FLOW BATCH COUNTER (2-M-6), to 200 Gallons. ________

Date ________

6.9.3 Operational Capability of the Makeup Control System Alt-Dilute Mode 100 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-142 (2-M-6), PMW TO BOR ACID BLNR, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.9.3 **(Acc Crit)** ________

Date ________

6.10 Reactor Makeup Control Functional Tests Borate

NOTE

For Sub-Subsections 6.10.1, 6.10.2, 6.10.3, and 6.10.4 the Test Director may direct the opening and closing of Valve 2-DRV-62-695, VCT DRAIN, to maintain VCT Level between 35% and 80%.

6.10.1 Operational Capability of the Makeup Control System Borate Mode 2 GPM.

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.10 have been completed. ________

[2] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

[3] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 2 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =4	

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

Date ________

6.10.1 Operational Capability of the Makeup Control System Borate Mode 2 GPM. (continued)

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 2 gpm±0.007gpm. ________

[7] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = __________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-139 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-139 set to 2 gpm and 2-FQ-62-139 set to 4 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{4\text{gal}}{2\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-139, BORIC ACID FLOW BATCH COUNTER (2-M-6), to 4 Gallons. ________

Date ________

6.10.1 Operational Capability of the Makeup Control System Borate Mode 2 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-139, BORIC ACID TO BLENDER, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.10.1 **(Acc Crit)** ________

Date ________

6.10.2 Operational Capability of the Makeup Control System Borate Mode 5 GPM.

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.10 have been completed. ________

[2] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

[3] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 5 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =300	

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 5gpm±.0.018gpm. ________

Date ________

6.10.2 Operational Capability of the Makeup Control System Borate Mode 5 GPM. (continued)

[7] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = __________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-139 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-139 set to 5 gpm and 2-FQ-62-139 set to 10 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{10\text{gal}}{5\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-139, BORIC ACID FLOW BATCH COUNTER (2-M-6), to 4 Gallons. ________

Date ________

6.10.2 Operational Capability of the Makeup Control System Borate Mode 5 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-139, BORIC ACID TO BLENDER, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.10.2 (**Acc Crit**) ________

Date ________

6.10.3 Operational Capability of the Makeup Control System Borate Mode 7.5 GPM.

NOTE

A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.10 have been completed. ________

[2] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

[3] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 7.5 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =300	

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 7.5gpm ±0.027gpm. ________

Date ________

6.10.3 Operational Capability of the Makeup Control System Borate Mode 7.5 GPM. (continued)

[7] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = ____________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-139 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-139 set to 7.5 gpm and 2-FQ-62-139 set to 15 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{15\text{gal}}{7.5\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-139, BORIC ACID FLOW BATCH COUNTER (2-M-6), to 15 Gallons. ________

Date ________

6.10.3 Operational Capability of the Makeup Control System Borate Mode 7.5 GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-139, BORIC ACID TO BLENDER, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.10.3 (**Acc Crit**) ________

Date ________

6.10.4 Operational Capability of the Makeup Control System Borate Mode 10GPM.

NOTE
A predetermined value is set on the counters to facilitate a steady flow that is long enough to obtain assured readings.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.10 have been completed. ________

[2] **PLACE** 2-HS-62-140B (2-M-6) in BOR. ________

[3] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIAL
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 10 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =300	

[4] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. ________

[5] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - ON	
		Green - OFF	

[6] **VERIFY** makeup flow rate indicated by Computer Pt U0102, BORIC ACID TO BLENDER, reads approximately 10gpm±.036gpm. ________

Date ________

6.10.4 Operational Capability of the Makeup Control System Borate Mode 10GPM. (continued)

[7] **RECORD** makeup flow rate from Computer Pt U0102, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = __________ gpm ________

[8] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[9] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIAL
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - OFF	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[10] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) ________

NOTE

The following steps verify the functionality of 2-FQ-62-139 by comparing the Batch Time to the Expected Batch Time. With 2-FC-62-139 set to 10 gpm and 2-FQ-62-139 set to 20 gallons the Expected Batch Time from Start to no flow is 120 seconds

$$\text{Expected\_Batch\_Time} = \frac{\text{Volume}}{\text{FlowRate}} = \frac{20\text{gal}}{10\frac{\text{gal}}{\text{min}}} \times \frac{60\text{s}}{\text{min}} = 120\text{s}$$

[11] **SET** 2-FQ-62-139, BORIC ACID FLOW BATCH COUNTER (2-M-6), to 20 Gallons. ________

Date ________

6.10.4 Operational Capability of the Makeup Control System Borate Mode 10GPM. (continued)

[12] **SIMULTANEOUSLY START** Stopwatch, **AND**

PLACE Handswitch 2-HS-62-140A (2-M-6), VCT MAKEUP CONTROL, in START. ________

[13] **WHEN** Indicator 2-FI-62-139, BORIC ACID TO BLENDER, indicates no flow **THEN**

STOP the Stopwatch **AND**

RECORD time:

Time________ seconds (T)

M&TE ID#________ ________

[14] **VERIFY** Batch Time equals approximately 120s ±3s. ________

[15] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. ________

[16] **VERIFY** successful completion of Sub-Subsection 6.10.4 (**Acc Crit**) ________

Date ________

7.0 POST-PERFORMANCE ACTIVITY

[1] **VERIFY** that Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed and RECORD the results on Measuring and Test Equipment (M&TE) Log, Appendix F of SMP-9.0. ________

[2] **VERIFY** that Post-test calibration of permanent plant instruments used to record quantitative acceptance criteria has been satisfactorily performed **AND**

RECORD the results on Appendix C, Permanent Plant Instrumentation Log. ________

[3] **NOTIFY** the Unit 1 US/SRO of the test completion and system alignment. ________

[4] **NOTIFY** the Unit 2 US/SRO of the test completion and system alignment. ________

8.0 RECORDS

A. QA Records

Completed Data Package

B. Non-QA Records

None

Appendix A
(Page 1 of 1)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

Date ________

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE/ INSTRUCTION	REVISION/ CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
WBN2-62-4001			
2-TSD-62-1			
2-TSD-62-2			
FSAR Section 9.3.4 Table 14.2-1 Sheets 18 & 19 of 89			
SSD-2-LPF-62-139/140 (Review against SSD-1-LPF-62-139/140)			
SSD-2-LPF-62-142/143 (Review against SSD-1-LPF-62-142/143)			
SSD-2-LPL-62-129A (Review against SSD-1-LPL-62-129A)			
SSD-2-LPL-62-130A (Review against SSD-1-LPL-62-130A)			
SSD-2-LPL-62-129C (Review against SSD-1-LPL-62-129C)			
SSD-2-LPL-62-130C (Review against SSD-1-LPL-62-130C)			

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

Date ________

These steps will be marked N/A if no temporary condition existed. Additional copies of this table may be made as necessary.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
(Page 1 of)

PERMANENT PLANT INSTRUMENTATION LOG

Date ________

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LPL-62-129A							
2-LPL-62-129C							
2-LPL-62-130							
2-LPF-62-139/140							
2-LPF-62-142/143							
2-LPF-62-237							
2-LPL-62-242							
2-LPF-62-241							

1 These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (N/A)

2 May be identified as Not Applicable (N/A) if instrument was not used to verify/record quantitative acceptance criteria data.

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: ____Reactor Coolant Pressure Boundary Leakage Detection______

Instruction No: ___2-PTI-68-12________________
Revision No: __________0000________________

PREPARED BY: _Phillip R. Hitchcock / Phillip R Hitchcock DATE: 11/13/12
PRINT NAME / SIGNATURE

REVIEWED BY: _Alan Gordon Alan Gordon DATE: ___11/02/2012___
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-019

JTG CHAIRMAN: Mark A Welch DATE: 9/12/13

APPROVED BY : Mark A Welch DATE: 9/12/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: ______________

JTG CHAIRMAN: ______________________ DATE: ____________

APPROVED BY : ______________________ DATE: ____________
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	9/12/13	All	Initial Issue based on PTI-068-12, Rev. 0 from Unit 1

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Test Objectives

This Preoperational Test Instruction will demonstrate the operability of the Reactor Coolant Pressure Boundary (RCPB) Leak Detection System.

1.2 Scope

A. Demonstrates proper operation of the Reactor Vessel flange leak off temperature monitor.

B. Demonstrates proper operation of the upper and lower containment humidity monitors.

C. Demonstrates proper operation of the lower compartment temperature monitor.

D. Demonstrates proper operation and indication of an abnormal rate of rise in the Reactor Building Floor and Equipment Drain Pocket Sump.

2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, Conduct of Test

2.2 Developmental References

A. Unit 2 Final Safety Analysis Report-Amendment 110

1. Section 5.2.7, RCPB Leakage Detection Systems

2. Chapter 14 - Table 14.2.1 Sheet 59 of 89, Reactor Pressure Boundary Leakage Detection System Test Summary

B. Drawings

1. Flow Diagrams

a. 2-47W813-1, Rev 11, Flow Diagram Reactor Coolant System

b. 2-47W851-1, Rev 9, Mechanical Flow Diagram Floor & Equipment Drains

2.2 Developmental References (continued)

c. 1-47W830-2, Rev 35 Mechanical Flow Diagram Waste Disposal System

2. Electrical

a. 2-45W600-30-12, Rev 1, Wiring Diagrams Ventilating System Schematic Diagrams (2-ME-30-240 & 241)

b. 2-45W600-30-13, Rev 1, Wiring Diagrams Ventilating System Schematic Diagrams (2-TE-30-31)

c. 2-45B640-261, Rev 0, Contact Development of Selector Switches and Pushbuttons (2-HS-77-410 & 411)

d. 2-45W744-2, Rev 1, Wiring Diagrams 480V Aux Bldg Com MCC A Single Line Sh-2 (2-HS-77-410 & 411)

e. 2-45W760-77-6, Rev 2, Wiring Diagram Waste Disposal System Schematic Diagrams (2-MTR-77-410 & 411)

f. 45N706-4, Rev 18, 120-V AC Vital INST PWR BD 1-IV & 2-IV SH4

g. 2-45N2616-8, Rev 1, Wiring Diagrams Thermocouples & RTDS Connection Diagram Sh-8 (2-TE-68-21)

h. 2-45N2616-10, Rev 0, Wiring Diagrams Thermocouples & RTDs Connection Diagrams Sh-10 (2-TE-30-31)

i. 45N2632-10, Rev 7, Wiring Diagram Miscellaneous Controls Connection Diagram (2-ME-30-240 & 241)

j. 2-45N2635-13, Rev 3, Wiring Diagram Local Instrument Panels Connection Diagrams - Sht 13 (2-ME-30-241, 2-TE-30-31,)

k. 2-45N2635-66, Rev 0, Wiring Diagrams Local Instrument Panels Connection Diagrams - Sheet 66 (2-ME-30-241, 2-TE-30-31)

l. 2-45W2646-4, Rev 2, Wiring Diagram Unit Cont BD Panel 2-M-7 Connection Diagram SH 4 (Panel 2-M-7)

m. 45W2649-1, Rev K, Wiring Diagrams Unit Control Board Panel 2-M-10 Connection Diagrams - Sheet 1 (2-MR-30-240 & 241)

n. 45W2649-2, Rev F, Wiring Diagrams Unit Control Board Panel 2-M-10 Connection Diagrams - Sheet 2 (2-MR-30-240 & 241)

2.2 Developmental References (continued)

o. 2-45N2665-2, Rev 0 Wiring Diagram Process Instr Control Group 1 Connection Diagrams - Sheet 2 (2-TE-68-21)

p. 45W2673-8, Rev F, Wiring Diagram Balance of Plant Instr Rack, Non-Div Connection Diagram - Sheet 8 (2-LS-77-410 & 411, 2-MT-30-240 & 241)

q. 2-45W2673-8A, Rev 0, EDCR 52378 - FOXBORO I/A TA PNL 2-R-137

3. Mechanical

   None

4. Logic/Control

   a. 2-47W610-30-1, Rev 4, Electrical Control Diagram Ventilation System (2-TE-30-31, 2-ME-30-240 & 241)

   b. 2-47W610-68-2, Rev 6, Electrical Control Diagram Reactor Coolant System (2-TE-68-21)

   c. 2-47W610-77-4, Rev 5, Electrical Control Diagram Waste Disposal System (2-LI-77-410 & 411)

5. Vendor Drawings

   a. 18-6204-C34, Rev 2, XA-55-5A Lamp Box Engraving

   b. 18-6204-C36, Rev 1, XA-55-5C Lamp Box Engraving

   c. 08F802403-NL-2021, SH 8, Rev 3, CABINET AIR 2-R-137 BASEPLATE #7 (06)(A) BASEPLATE AND I/O POINT LOADING SDA4 & BOP (005-067) (2-MS-30-240 & 241, 2-MT-30-240 & 241)

   d. 08F802403-NL-2023, SH 8, Rev 3, CABINET AIR 2-R-137 BASEPLATE #7 (06)(B) AND I/O POINT LOADING SDMP & BOP (070-081) (2-LS-77-410 & 411, 2-LT-77-410 & 411)

   e. 08F802403-SC-2001, SH 3, Rev 5, SYSTEM CONFIGURATION SDA3 & TB-S, SDA4 & BOP (005-067) AND SDMP & BOP (070-081) (2-R-137)

   f. 08F802403-FD-2821, SH 1, Rev 4, BOP CONTAINMENT MOISTURE (2-MT-30-240 & 241)

2.2 Developmental References (continued)

g. 08F802403-FD-2855, SH 3, Rev 3, BOP RB FLR/EQ DRAIN SUMP LEVEL (2-LT-30-410 & 411)

C. Vendor Manuals

1. WBN-VTD-F180-4780, Foxboro Instruction for Dynatherm Resistance Bulbs with Aluminum Cap-Typ Head, Model DB-1 Series [Pub. # 16-123], Rev 0

2. WBN-VTD-F180-4790, Foxboro Technical Information for Resistance Bulbs [Pub # 5-24A], Rev 0

3. WBN-VTD-F180-4990, Foxboro Technical Information Dew Point to Dewcel Temperatures Fahrenheit Calibration Curve DI-2 [Pub # T15-41A], Rev 0

D. Documents

1. NPG-SDD-WBN2-68-4001, Reactor Coolant System Description, Rev 2

2. NPG/NGDC-SDD-N3-77C-4001, Liquid Radwaste Processing System, Rev 11

3. 2-TSD-68-12, Reactor Coolant Pressure Boundary - Leakage Detection System, Rev 1

4. Regulatory Guide 1.45, Guidance on Monitoring and Responding to Reactor Coolant System Leakage, May 2008, Rev 1

5. 2-SI-77-1, 18 MO CH CAL REACTOR BLDG AUX FLR AND EQUIP DRAIN POCKET SUMP LEVEL LOOP 2-LPL-77-410, Rev 0

6. 2-SI-77-2, 18 MO CH CAL REACTOR BLDG AUX FLR & EQUIP DRAIN POCKET SUMP LEVEL LOOP 2-LPL-77-411, Rev 0

2.2 Developmental References (continued)

7. Scaling and Setpoint Documents (SSD)

   a. SSD-1-LPL-77-410, Rev 9, Reactor Building Aux Floor and Equip Drain Level

      To be verified against SSD-2-LPL-77-410, (Current Rev), Reactor Building Aux Floor and Equip Drain Level in Appendix A

   b. SSD-1-LPL-77-411, Rev 9, Reactor Building Aux Floor and Equip Drain Level

      To be verified against SSD-2-LPL-77-411, (Current Rev), Reactor Building Aux Floor and Equip Drain Level in Appendix A

   c. SSD-1-LPM-30-240, Rev 8, Upper Compartment Moisture

      To be verified against SSD-2-LPM-30-240, (Current Rev), Upper Compartment Moisture in Appendix A

   d. SSD-1-LPM-30-241, Rev 9, Lower Compartment Moisture

      To be verified against SSD-2-LPM-30-241, (Current Rev), Lower Compartment Moisture in Appendix A

   e. SSD-1-LPT-68-21, Rev 0, Reactor Vessel Flange Leakoff Temp

      To be verified against SSD-2-LPT-68-21, (Current Rev), Reactor Vessel Flange Leakoff Temp in Appendix A

   f. SSD-2-TE-30-31, Rev 0, Lower Compartment Temp Element

   g. SSD-2-TS-30-31, Rev 0, Lower Compartment Temp Element Alarm

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.

B. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.

C. Discrepancies between component ID tags and the description in a procedure/instruction do not require a Test Deficiency Notice, (TDN) in accordance with SMP-14.0, if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description are sufficient to identify the component. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

D. All wires removed from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

E. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

F. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

G. Observe all Radiation Protection (RP) requirements when working in or near radiological areas.

H. Ensure there are no adverse affects to the operation of Unit 1 structures, systems, or components.

I. Test personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.

J. System water chemistry is within system specifiable parameters especially for fluids supplied from external sources.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

K. During the performance of this procedure visual observation of piping and components is required. This includes steady state and transient operations with visual confirmation that vibration is not excessive.

L. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN).

M. The Reactor Building Floor and Equipment Drain Sump discharge is normally aligned to the Tritiated Drain Collector Tank (TDCT) or the Floor Drain Collector Tank (FDCT).

N. When adding water into the Reactor Building Floor and Equipment Drain Pocket Sump, ensure end of hose is placed near the bottom of the sump to prevent agitation of the sump surface level.

Date ________

4.0 PREREQUISITE ACTIONS

NOTE

Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction Subsection to which they apply.

4.1 Preliminary Actions

[1] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL) and

ENSURE that they will **NOT** adversely affect the test performance and results. ________

[2] **ENSURE** changes to the references listed on Appendix A, have been reviewed, and determined **NOT** to adversely affect the test performance. ________

[3] **VERIFY** current revisions and change paper for referenced drawings has been reviewed and determined **NOT** to adversely affect the test performance and

ATTACH documentation of current drawing revision numbers and change paper that were reviewed to the data package. ________

[4] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. ________

[5] **ENSURE** special environmental conditions are available for testing if required. ________

[6] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modifications (T-Mods) do **NOT** adversely impact testing, and

ATTACH documentation of DCN's, EDCR's and T-Mods's that were reviewed to the data package. ________

Date ________

4.1 Preliminary Actions (continued)

[7] **ENSURE** required Component Testing has been completed prior to start of test. ________

[8] **VERIFY** System cleanness as required for the performance of this test has been completed in accordance with SMP-7.0 for piping systems.

A. Subsection 6.1 ________

B. Subsection 6.2 ________

C. Subsection 6.3 ________

D. Subsection 6.4 ________

[9] **ENSURE** all piping supports required for testing are installed and adjusted as required. ________

[10] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0. ________

[11] **ENSURE** communications are available for areas where testing is to be conducted. ________

[12] **VERIFY** plant instruments, listed on Appendix C, Permanent Plant Instrumentation Log, are placed in service and are within their calibration interval.

A. Subsection 6.1 ________

B. Subsection 6.2 ________

C. Subsection 6.3 ________

D. Subsection 6.4 ________

Date ________

4.1 Preliminary Actions (continued)

NOTES

1) Any Annunciator points associated with 2-MUX-55-12 and 2-MUX-55-13 ONLY have master switches at the bottom of each terminal strip.

2) All points associated with 2-TBK-55-25, 2-TBK-55-26, 2-TBK-55-27, and 2-TBK-55-28 will **NOT** have individual switches or a master switch.

[13] **ENSURE** System 55, Annunciator and Sequential Events Recording System applicable TBK switches are ON, the applicable Master Switches are ON, and window software input(s) are ENABLED for the following Annunciator windows.

A. 2-XA-55-5A/88-A (Subsection 6.1) ________

B. 2-XA-55-5C/103-B (Subsection 6.2) ________

C. 2-XA-55-5C/104-B (Subsection 6.3) ________

[14] **ENSURE** the following Integrated Computer System (ICS) points are in scan:

A. L0472A, RBF&ED POCKET SUMP LEVEL 1 ________

B. L0473A, RBF&ED POCKET SUMP LEVEL 2 ________

C. U0965, RBF&ED POCKET SMP 1 15M AVG RORISE ________

D. U0966, RBF&ED POCKET SMP 2 15M AVG RORISE ________

E. U0968, RBF&ED POCKET SMP 60M AVG RORISE ________

F. U0969, RBF&ED POCKET SMP 60M AVG RORISE ________

G. Y0701A, CNTMT UP-COMPARTMENT DEW PT TEMP ________

H. Y0702A, CNTMT LOW-COMPARTMENT DEW PT TEMP ________

[15] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) and/or Plant Operations. ________

Date ________

4.1 Preliminary Actions (continued)

[16] **ENSURE** a review of outstanding Clearances has been coordinated with Operations for impact to the test performance, and

RECORD in Appendix B, Temporary Condition Log if required. ________

[17] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, and

ATTACH to this PTI for use during the performance of this PTI. ________

[18] **VERIFY** Measuring and Test Equipment (M&TE) required for test performance has been (as required) filled, vented, place in service and recorded on Measuring and Test Equipment Log.

A. Subsection 6.1 ________

B. Subsection 6.2 ________

C. Subsection 6.3 ________

D. Subsection 6.4 ________

[19] **VERIFY** Measuring and Test Equipment (M&TE) calibration due dates will support the completion of this test performance.

A. Subsection 6.1 ________

B. Subsection 6.2 ________

C. Subsection 6.3 ________

D. Subsection 6.4 ________

[20] **PERFORM** a pretest walkdown on equipment to be tested to ensure no conditions exist that will impact test performance ________

[21] **REVIEW** preventive maintenance for system/components covered by this test, and

VERIFY NO conditions exist that will impact test performance. ________

[22] **ENSURE** water chemistry for systems/components with water sources other than normal water sources is appropriate for testing. ________

Date ________

4.2 Special Tools, Measuring and Test Equipment, Parts, and Supplies

[1] **ENSURE** the following equipment is available.

A. Type T thermocouple wire (Subsection 6.3) ________

B. Temporary hoses and valves (Subsection 6.4) ________

[2] **ENSURE** the following M&TE or equivalent is available and within their calibration due dates, and

RECORD the M&TE data on SMP-9.0, Measuring and Test Equipment (M&TE) Log.

A. 10-1000 ohm minimum RTD simulator (±0.012% of setting) (2 each) (Subsection 6.1) ________

B. 0-50 mAdc Digital Multimeter (DMM) (±.2% of reading) (Subsection 6.2) ________

C. Digital Thermometer for measuring water temperature Range of 50°F to 90°F (Subsection 6.4) ________

D. 0-150°F Digital Thermocouple Test Set (Biddle) or equivalent (±2°F) (Subsection 6.3) ________

E. 0-1.10 gpm Rotameter (±2%) Fisher-Porter 10A4555 1/2" Tube #FP-1/2-21-G-10 float #1/2-GNSVT-48A (Subsection 6.4) ________

F. 0-50 mAdc Ramp Generator (Subsection 6.2) ________

4.3 Field Preparations

[1] **ENSURE** scaffolding and platforms have been erected, as needed. ________

[2] **VERIFY** 2-XA-55-6A 115A, SSPS-B GEN WARNING is **NOT** LIT. ________

[3] **PERFORM** the Switch Lineup listed in Appendix F. (Subsection 6.4) ________

Date ________

4.3 Field Preparations (continued)

[4] **PERFORM** the Breaker Lineup listed in Appendix E. (Subsections 6.2 and 6.4) ________

[5] **PERFORM** the Valve Lineup listed in Appendix G. (Subsection 6.4) ________

[6] **VERIFY** The Plant Computer is available and the computer points listed on Appendix D are active and the description and status for each computer point has been verified. (Subsection 6.4) ________

[7] **VERIFY** the following systems are operational and have been placed in service to the extent necessary to perform this test:

A. System 032 - Control Air - Provide control air to all AOVs ________

B. System 059 - Demineralized Water - Provide input to Reactor Building Floor and Equipment Drain Pocket Sump (Subsection 6.4) ________

C. System 055 - Annunciator System - Provide System 030, 068 alarm status ________

D. System 232 - Reactor Vent Power System - Supply power to Reactor Building Sump Pumps (Subsection 6.4) ________

E. System 208 - Auxiliary Building Common Motor Control - Supply power to Reactor Building Sump Pumps (Subsection 6.4) ________

F. System 237 - 120V AC Instrument Power - Provide power to humidity recorders (Subsection 6.2) ________

G. System 77 - Waste Disposal System - Provide means to remove water from Reactor Building Floor & Equipment Drain Sump (Subsection 6.4) ________

[8] **ENSURE** 2-FAR-77-125, AUX R.B. FL & EQ DRAIN SUMP FLAME ARRESTOR, has been removed from vent (2-47W851-1) (RB EL. 716, AZ242). (Subsection 6.4) ________

RECORD WO________________

Date ________

4.3 Field Preparations (continued)

[9] **ENSURE** rotameter is connected to water source with sufficient length hose to input regulated flow rates into Reactor Building Floor and Equipment Drain Pocket Sump through the vent/flame arrestor piping. (Subsection 6.4) ________

4.4 Approvals and Notifications

[1] **OBTAIN** permission of the Preoperational Startup Manager to start the test.

______________________________ ________

Preoperational Startup Manager Signature — Date

[2] **OBTAIN** the Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

______________________________ ________

U2 US/SRO/SM Signature — Date

[3] **OBTAIN** the Unit 1 Supervisor's (US/SRO) or Shift Manager's (SM) authorization for Section 6.4 performance.

______________________________ ________

U1 US/SRO/SM Signature — Date

5.0 ACCEPTANCE CRITERIA

[1] The Reactor Vessel Flange Leakoff Temperature Monitor 2-TE-68-21 will generate an alarm in the Main Control Room (annunciator) upon a simulated high temperature signal. (Steps 6.1[9], 6.1[10], 6.1[11])

[2] The following humidity monitors will generate an alarm in the ICS computer and Main Control Room (annunciator) upon a simulated high humidity rate of change signal of ≥ 2.5°F Dew Point per minute:

A. 2-ME-30-240, CNTMT UPPER COMPARTMENT MOISTURE (Steps 6.2[9], 6.2[10], 6.2[11])

B. 2-ME-30-241, CNTMT LOWER COMPARTMENT MOISTURE (Steps 6.2[25], 6.2[26], 6.2[27])

[3] The Lower Compartment Temperature Monitor, 2-TE-30-31, will generate an alarm in the Main Control Room (annunciator) upon a simulated high temperature signal. (Steps 6.3[9], 6.3[10])

[4] The following level monitors will generate a rate of change alarm in the ICS computer and Main Control Room (annunciator) when the average for the last 15 minutes or 60 minutes exceeds 1 gpm above the normal rate at the time of calibration:

A. 2-LE-77-410, RB FLR/EQ DRN POCKET SUMP LEVEL (Steps 6.4[9], 6.4[10], 6.4[19], 6.4[20])

B. 2-LE-77-411, RB FLR/EQ DRN POCKET SUMP LEVEL (Steps 6.4[9], 6.4[10], 6.4[19], 6.4[20])

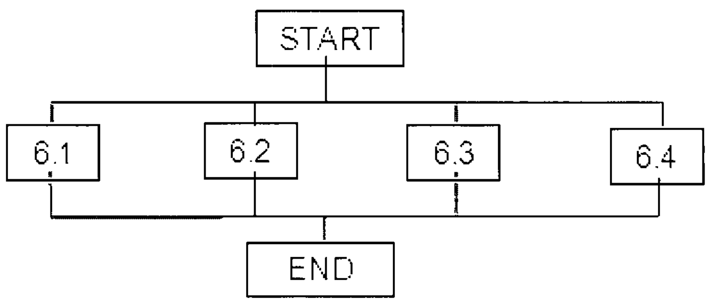
[5] The Reactor Building Floor and Equipment Drain Pocket Sump Level Monitor, 2-LS-77-410A, will generate an alarm in the Main Control Room in response to high level in the sump. (Step 6.4[11])

Date ________

6.0 PERFORMANCE

NOTE

This procedure can be performed in any order:



6.1 Reactor Vessel Flange Leakoff 2-TE-68-21

NOTE

The following steps verify the annunciation of 2-TS-68-21 upon a simulated high temperature input signal.

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.1 have been completed. ________

[2] **LIFT** Lead 15B1 from Terminal Board 15B Terminal Point 1 at Panel 2-R-15 (Col, C9Q, EL 708) (Dwg: 2-45N2665-2).

____
1st

____
CV

Date ________

6.1 Reactor Vessel Flange Leakoff 2-TE-68-21 (continued)

[3] **LIFT** Lead 15B2 from Terminal Board 15B Terminal Point 2 at Panel 2-R-15.

________ 1st

________ CV

[4] **LIFT** Lead 15B3 from Terminal Board 15B Terminal Point 3 at Panel 2-R-15.

________ 1st

________ CV

[5] **INSTALL** RTD Simulator with a resistance value of 217.657 ohms across Terminal Board 15B Terminal Points 2 and 3.

________ 1st

________ CV

M&TE ____________________ Cal Due Date ___________

[6] **INSTALL** RTD Simulator with a resistance value of 262.500 ohms across Terminal Board 15B Terminal Points 1 and 2.

________ 1st

________ CV

M&TE ____________________ Cal Due Date ___________

[7] **VERIFY** 2-XA-55-5A–88A, RX VESSEL FLNG LEAKOFF TEMP HI, is **NOT** LIT. ________

[8] **SLOWLY INCREASE** the resistance value across Terminal Board 15B Terminal Points 1 and 2 until 2-XA-55-5A–88A, RX VESSEL FLNG LEAKOFF TEMP HI, ALARMS. ________

Date ________

6.1 Reactor Vessel Flange Leakoff 2-TE-68-21 (continued)

[9] **RECORD** the resistance value at which the Annunciator alarmed. (**ACC CRIT**) ________

Alarm Resistance ____________________ Ω

Acceptable Resistance 263.97 (262.91 to 265.03) Ω

[10] **RECORD** the indicated temperature at 2-TI-68-21, RV FLNG LEAKOFF, at 2-M-5. (**ACC CRIT**) ________

2-TI-68-21 ____________________ °F

Acceptable Temperature 140°F (135°F to 145°F) °F

[11] **VERIFY** Unit 2 Alarm Monitor indicates 88-A RX VESSEL FLNG LEAKOFF TEMP HI (2-TS-68-21) is in ALARM (RED). (**ACC CRIT**) ________

[12] **SLOWLY DECREASE** the resistance value across Terminal Board 15B Terminal Points 1 and 2 until 2-XA-55-5A–88A, RX VESSEL FLNG LEAKOFF TEMP HI, is **NOT** LIT. ________

[13] **VERIFY** Unit 2 Alarm Monitor indicates 88-A RX VESSEL FLNG LEAKOFF TEMP HI (2-TS-68-21) is NORMAL (Green). ________

[14] **REMOVE** the RTD Simulator input from across Terminal Board 15B Terminal Points 1 and 2.

________ 1st

________ CV

[15] **REMOVE** the RTD Simulator input from across Terminal Board 15B Terminal Points 2 and 3.

________ 1st

________ CV

[16] **LAND** lifted Lead 15B3 on Terminal Board 15B Terminal Point 3 at Panel 2-R-15.

________ 1st

________ CV

Date ________

6.1 Reactor Vessel Flange Leakoff 2-TE-68-21 (continued)

[17] **LAND** lifted Lead 15B2 on Terminal Board 15B Terminal Point 2 at Panel 2-R-15.

________ 1st

________ CV

[18] **LAND** lifted Lead 15B1 on Terminal Board 15B Terminal Point 1 at Panel 2-R-15.

________ 1st

________ CV

Date ________

6.2 Humidity Monitors 2-ME-30-240 and 2-ME-30-241

NOTE
The following steps verify the annunciation of 2-MS-30-240 and 2-MS-30-241 upon a simulated high humidity input signal.

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.2 have been completed. ________

[2] **LIFT** Lead UC5 from Terminal Point 241 at Panel 2-R-137 (COL. C9Q, EL708) (Dwg: 45W2673-8).

________ 1st

________ CV

[3] **LIFT** Lead LC5 from Terminal Point 247 at Panel 2-R-137 (COL. C9Q, EL708) (Dwg: 45W2673-8).

________ 1st

________ CV

[4] **CONNECT** the output of the ramp generator, with DMM set for mAdc scale, across Terminal Point 241(+) and 242(-) at Panel 2-R-137.

________ 1st

________ CV

M&TE ____________________ Cal Due Date ___________

[5] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is **NOT** LIT. ________

[6] **INPUT** a ramp rate of 0.35 mAdc/min across Terminal Points 241 and 242. ________

[7] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, remains **NOT** LIT. ________

Date ________

6.2 Humidity Monitors 2-ME-30-240 and 2-ME-30-241 (continued)

[8] **INPUT** a ramp rate of 0.45 mAdc/min across Terminal Points 241 and 242. ________

[9] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is LIT. (**ACC CRIT**) ________

[10] **VERIFY** Unit 2 Alarm Monitor indicates 103-B UPPER CNTMT MOISTURE HI (MS-30-240) is in ALARM (Red). (**ACC CRIT**) ________

[11] **VERIFY** the High Alarm (HA) for Computer Point Y0701A, CNTMT UP-COMPARTMENT DEW PT TEMP, is in alarm state. (**ACC CRIT**) ________

[12] **DECREASE** the ramp rate from 0.45 mAdc/min to 0.00 mAdc/min across Terminal Points 241 and 242. ________

[13] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is **NOT** LIT. ________

[14] **VERIFY** Unit 2 Alarm Monitor indicates 103-B UPPER CNTMT MOISTURE HI (MS-30-240) is NORMAL (Green). ________

[15] **VERIFY** the High Alarm (HA) for Computer Point Y0701A, CNTMT UP-COMPARTMENT DEW PT TEMP, is **NOT** in alarm state. ________

[16] **INPUT** a value of 16.42 mAdc across Terminal Points 241 and 242. ________

[17] **RECORD** the dew point temperature as indicated from Computer Point Y0701A, CNTMT UP-COMPARTMENT DEW PT TEMP. ________

Y0701A	____________________	°F	Dewpoint
Expected Temperature:	115°F (114.7°F to 115.3°F)	°F	Dewpoint

[18] **INPUT** a value of 0.00 mAdc across Terminal Points 241 and 242. ________

Date ________

6.2 Humidity Monitors 2-ME-30-240 and 2-ME-30-241 (continued)

[19] **DISCONNECT** the output of the ramp generator and DMM from Terminal Points 241 and 242.

________ 1st

________ CV

[20] **CONNECT** the output of the ramp generator, with DMM set for mAdc scale, across Terminal Points 247(+) and 248(-) at Panel 2-R-137.

________ 1st

________ CV

M&TE ____________________ Cal Due Date ___________

[21] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is **NOT** LIT. ________

[22] **INPUT** a ramp rate of 0.35 mAdc/min across Terminal Points 247 and 248. ________

[23] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, remains **NOT** LIT. ________

[24] **INPUT** a ramp rate of 0.45 mAdc/min across Terminal Points 247 and 248. ________

[25] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is LIT. (**ACC CRIT**) ________

[26] **VERIFY** Unit 2 Alarm Monitor indicates 103-B LOWER CNTMT MOISTURE HI (MS-30-241) is in ALARM (Red). (**ACC CRIT**) ________

[27] **VERIFY** the High Alarm (HA) for Computer Point Y0702A, CNTMT LOW-COMPARTMENT DEWPT TEMP, is in alarm state. (**ACC CRIT**) ________

[28] **LOWER** the ramp rate from 0.45 mAdc/min to 0.00 mAdc/min across Terminal Points 247 and 248. ________

Date ________

6.2 Humidity Monitors 2-ME-30-240 and 2-ME-30-241 (continued)

[29] **VERIFY** 2-XA-55-5C–103B, CNTMT MOISTURE HI, is **NOT** LIT. ________

[30] **VERIFY** Unit 2 Alarm Monitor indicates 103-B LOWER CNTMT MOISTURE HI (MS-30-241) is NORMAL (Green). ________

[31] **VERIFY** the High Alarm (HA) for Computer Point Y0702A, CNTMT LOW-COMPARTMENT DEWPT TEMP, is **NOT** in alarm state. ________

[32] **INPUT** a value of 16.42 mAdc across Terminal Points 247 and 248. ________

[33] **RECORD** the dew point temperature as indicated by Computer Point Y0702A, CNTMT LOW-COMPARTMENT DEWPT TEMP. ________

Y0702A	____________________	°F	Dewpoint
Expected Temperature	115.0°F (114.7°F to 115.3°F)	°F	Dewpoint

[34] **INPUT** a value of 0.00 mAdc across Terminal Points 247 and 248. ________

[35] **DISCONNECT** the output of the ramp generator across Terminal Points 247 and 248.

________ 1st

________ CV

[36] **LAND** Lead UC5 on Terminal Point 241 at Panel 2-R-137.

________ 1st

________ CV

[37] **LAND** Lead LC5 on Terminal Point 247 at Panel 2-R-137.

________ 1st

________ CV

Date ________

6.3 Lower Compartment Temperature 2-TE-30-31

NOTE

The following steps verify the annunciation of 2-TS-30-31 upon a simulated high temperature input signal.

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.3 have been completed. ________

[2] **LIFT** blue lead (+) of Cable 2M2200 from positive (+) input of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, at Panel 2-L-185 (EL 716, AZ 300°) (Dwg: 2-45N2635-13)

________ 1st

________ CV

[3] **LIFT** red lead (-) of Cable 2M2200 from negative (-) input of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, at Panel 2-L-185.

________ 1st

________ CV

NOTE

During performance of Steps 6.3[4] and 6.3[5] use Type T thermocouple wire for inputs into the temperature switch.

[4] **CONNECT** blue thermocouple wire (+) from the output of the thermocouple calibrator to the positive (+) input terminal of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM. ________

[5] **CONNECT** red thermocouple wire (-) from the output of the thermocouple calibrator to the negative (-) input terminal of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM. ________

Date ________

6.3 Lower Compartment Temperature 2-TE-30-31 (continued)

[6] **INPUT** a temperature value of 100.0°F into 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, utilizing the Biddle or equivalent. ________

M&TE ____________________ Cal Due Date ____________

[7] **VERIFY** 2-XA-55-5C–104B, LWR CNTMT TEMP HI, is **NOT** LIT. ________

[8] **SLOWLY INCREASE** the temperature value into 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, until 2-XA-55-5C–104B, LWR CNTMT TEMP HI, is LIT. ________

[9] **RECORD** the temperature value at which the Annunciator alarmed. (**ACC CRIT**) ________

Alarm Temperature ____________________ °F

Acceptable Temperature 120°F (110°F to 130°F)

[10] **VERIFY** Unit 2 Alarm Monitor indicates 104-B LWR CNTMT TEMP HI (2-TS-30-31) is in ALARM (Red). (**ACC CRIT**) ________

[11] **SLOWLY DECREASE** the temperature value into 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, until 2-XA-55-5C–104B, LWR CNTMT TEMP HI, is **NOT** LIT. ________

[12] **VERIFY** Unit 2 Alarm Monitor indicates 104-B LWR CNTMT TEMP HI (2-TS-30-31) is NORMAL (Green). ________

[13] **DISCONNECT** red thermocouple wire (-) of the thermocouple calibrator from the negative (-) input terminal of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM.

____
1st

____
CV

[14] **DISCONNECT** blue thermocouple wire (+) of the thermocouple calibrator from the positive (+) input terminal of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM.

____
1st

____
CV

Date ________

6.3 Lower Compartment Temperature 2-TE-30-31 (continued)

[15] **LAND** lifted red lead (-) of Cable 2M2200 on the negative (-) input of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, at Panel 2-L-185.

________ 1st

________ CV

[16] **LAND** lifted blue lead (+) of Cable 2M2200 on the positive (+) input of 2-TS-30-31, LOWER COMPARTMENT TEMP ELEMENT ALM, at Panel 2-L-185.

________ 1st

________ CV

Date ________

6.4 Reactor Building Floor and Equipment Drain Pocket Sump Rate of Rise (2-SUMP-77-410)

NOTE

The following steps verify the Pocket Sump rate of rise alarm for both 15 minute running averages (U0965 & U0966) and for 60 minute running averages (U0968 & U0969) by actual water input into the Pocket Sump.

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.4 have been completed. ________

NOTES

1) If the Low Sump Level Trip has not been reset, the Pocket Sump Pump will not start
2) If desired by Operations to pump down the pocket sump faster, both Pocket Sump Pump A and Pocket Sump Pump B may be started as necessary with a remark made in the Chronological Test Log

[2] **IF** RB POCKET SUMP LEVEL, at 2-M-15, is greater than 21% **THEN**,

PLACE Handswitch 2-HS-77-410, POCKET SUMP PMP A, at 2-M-15, to the START position then RELEASE. ________

[3] **VERIFY** pump STOPS upon reaching low sump level trip setting of 17-21% as indicated on 2-LI-77-410, RB POCKET SUMP LEVEL at 2-M-15. ________

Date ________

6.4 Reactor Building Floor and Equipment Drain Pocket Sump Rate of Rise (2-SUMP-77-410) (continued)

[4] **VERIFY** Computer Points L0472A and L0473A indicate approximately 12 inches when the pump stops. ________

Computer Point L0472A	________________	inches
Computer Point L0473A	________________	inches
Expected Level	11.90 (11.53 to 12.27)	inches

[5] **VERIFY NO** external input of water is flowing into 2-SUMP-77-410, RB FL & EQ DRAIN POCKET SUMP (RB EL. 702, AZ 240). ________

[6] **INPUT** a flowrate using the rotameter setting of 82% (80% to 84%) into 2-SUMP-77-410, RB FLOOR & EQUIP DRAIN POCKET SUMP, utilizing an external source of demineralized water. ________

M&TE ________________ Cal Due Date __________

[7] **VERIFY** using a digital thermometer at the demineralized water coupling or valve that the water temperature is between 55°F and 85°F. ________

M&TE ________________ Cal Due Date __________

[8] **MONITOR** the sump level rate of rise and

RECORD required data on Appendixes H, I, J & K for a minimum of one hour. ________

[9] **REVIEW** Appendixes H & I, and

VERIFY the High Alarm (HA) for Computer Points U0965 and U0966 were **NOT** in the alarm state. (**ACC CRIT**) ________

[10] **REVIEW** Appendixes J & K, and

VERIFY the High Alarm (HA) for Computer Points U0968 and U0969 were **NOT** in the alarm state. (**ACC CRIT**) ________

Date ________

6.4 Reactor Building Floor and Equipment Drain Pocket Sump Rate of Rise (2-SUMP-77-410) (continued)

CAUTION

Do not overfill Pocket Sump. The expected high level alarm is elevation 699'-6". 100% Level is elevation 699'-9". Sump overflow is at elevation 702'.

[11] **CONTINUE** filling RB FLOOR & EQUIP DRAIN POCKET SUMP until 2-XA-55-15A-160C, REAC BLDG FL & EQ DR POCKET SUMP HI, is in **ALARM**. (**ACC CRIT**) ________

[12] **STOP** the input of demineralized water into 2-SUMP-77-410, RB FLOOR & EQUIP DRAIN POCKET SUMP. ________

NOTE

If desired by Operations to pump down the pocket sump faster, both Pocket Sump Pump A and Pocket Sump Pump B may be started as necessary with a remark made in the Chronological Test Log

[13] **PLACE** Handswitch 2-HS-77-411, POCKET SUMP PMP B, at 2-M-15, to the START position then RELEASE. ________

[14] **VERIFY** pump STOPS upon reaching low sump level trip setting of 17-21% as indicated on 2-LI-77-411, RB POCKET SUMP LEVEL at 2-M-15. ________

[15] **VERIFY NO** external input of water is flowing into 2-SUMP-77-410, RB FL & EQ DRAIN POCKET SUMP. ________

[16] **INPUT** a flowrate using the rotameter of 94% (92% - 96%) into 2-SUMP-77-410, RB FLOOR & EQUIP DRAIN POCKET SUMP, utilizing an external source of demineralized water. ________

M&TE ____________________ Cal Due Date ___________

Date ________

6.4 Reactor Building Floor and Equipment Drain Pocket Sump Rate of Rise (2-SUMP-77-410) (continued)

[17] **VERIFY** using a digital thermometer at the demineralized **water coupling or valve that the water temperature is between** 55°F and 85°F. ________

M&TE ____________________ Cal Due Date ___________

[18] **MONITOR** the sump level rate of rise and

RECORD required data on Appendixes H, I, J, & K for 1 hour or until all four ALARMS are received. ________

[19] **REVIEW** Appendixes H & I, and

VERIFY the High Alarm (HA) for Computer Points U0965 and U0966, were in alarm state and

VERIFY 2-XA-55-4B-83D, PLANT COMPUTER GENERATED ALARM, was in alarm. (**ACC CRIT**) ________

[20] **REVIEW** Appendixes J & K, and

VERIFY the High Alarm (HA) for Computer Points U0968 and U0969, were in alarm state and

VERIFY 2-XA-55-4B-83D, PLANT COMPUTER GENERATED ALARM, was in alarm. (**ACC CRIT**) ________

[21] **STOP** the input of demineralized water into 2-SUMP-77-410, RB FLOOR & EQUIP DRAIN POCKET SUMP. ________

Date ________

6.4 Reactor Building Floor and Equipment Drain Pocket Sump Rate of Rise (2-SUMP-77-410) (continued)

NOTE

If desired by Operations to pump down the pocket sump faster, both Pocket Sump Pump A and Pocket Sump Pump B may be started as necessary with a remark made in the Chronological Test Log

[22] **PLACE** Handswitch 2-HS-77-410, POCKET SUMP PMP A, at 2-M-15, to the START position then RELEASE. ________

[23] **VERIFY** pump STOPS upon reaching low sump level trip setting of 17-21% as indicated on 2-LI-77-410, RB POCKET SUMP LEVEL, AT 2-M-15. ________

Date ________

7.0 POST-PERFORMANCE ACTIVITY

[1] **NOTIFY** the Unit 2 US/SRO of the test completion and system alignment. ________

[2] **NOTIFY** the Unit 1 US/SRO of the test completion and system alignment. ________

[3] **VERIFY** that Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

RECORD the results on Measuring and Test Equipment (M&TE) Log. ________

[4] **VERIFY** that Post-test calibration of permanent plant instruments used to record quantitative acceptance criteria has been satisfactorily performed **AND**

RECORD the results on Appendix C, Permanent Plant Instrumentation Log. ________

[5] **INSTALL** 2-FAR-77-125, RB POCKET DRN SUMP FLAME ARRESTOR (RB EL. 716, AZ 240). ________

8.0 RECORDS

A. QA Records

Completed Test Package (PTI)

B. Non-QA Records

None

Appendix A
(Page 1 of 2)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
Unit 2 FSAR-Amendment 110 Section 5.2.7 Chapter 14 Table 14.2-1 Sheet 59 of 89			
2-TSD-68-12, Reactor Coolant Pressure Boundary-Leakage Detection System, Rev. 1			
SSD-1-LPL-77-410[1], Rev 9			
SSD-1-LPL-77-411[1], Rev 9			
SSD-1-LPM-30-240[1], Rev 8			
SSD-1-LPM-30-241[1], Rev 9			
SSD-1-LPT-68-21[1], Rev 0			
SSD-2-TE-30-31, Rev 0			
SSD-2-TS-30-31, Rev 0			
WBN-VTD-F180-4780, [Pub. # 16-123], Rev 0			
WBN-VTD-F180-4790, [Pub # 5-24A], Rev 0			
WBN-VTD-F180-4990, [Pub # T15-41A], Rev 0			
NPG-SDD-WBN2-68-4001, Rev 2			
NPG/NGDC-SDD-N3-77C-4001, Rev 11			

Appendix A
(Page 2 of 2)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
Regulatory Guide 1.45, May 2008, Rev 1			
2-SI-77-1, Rev 0			
2-SI-77-2, Rev 0			

[1] To be Reviewed against current, equivalent, U2 Procedure/Instruction for impact

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

NOTES

1) Additional copies of this table may be made as necessary.
2) These steps will be N/A'd if no temporary condition existed.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
(Page 1 of 1)

PERMANENT PLANT INSTRUMENTATION LOG

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LPT-68-21							
2-LPM-30-240							
2-LPM-30-241							
2-LPT-30-31							
2-LPL-77-410							
2-LPL-77-411							

1 These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (N/A)

2 May be identified as Not Applicable (N/A) if instrument was not used to verify/record quantitative acceptance criteria data.

Appendix D
(Page 1 of 1)

COMPUTER POINT VERIFICATION LOG

COMPUTER POINT	VERIFY DESCRIPTION	ACTIVE STATUS	INITIAL/DATE
L0472A	RBF&ED POCKET SUMP LEVEL 1	☐	/
L0473A	RBF&ED POCKET SUMP LEVEL 2	☐	/
U0965	RBF & ED POCKET SMP1 15M AVG RORISE	☐	/
U0966	RBF & ED POCKET SMP2 15M AVG RORISE	☐	/
U0968	RBF & ED POCKET SMP 60M AVG RORISE	☐	/
U0969	RBF & ED POCKET SMP 60M AVG RORISE	☐	/
Y0701A	CNTMT UP-COMPARTMENT DEW PT TEMP	☐	/
Y0702A	CNTMT LOW-COMPARTMENT DEW PT TEMP	☐	/

Appendix E
(Page 1 of 1)

BREAKER LINEUP

BREAKER IDENTIFICATION	BREAKER NOMENCLATURE	BREAKER LOCATION	POSITION	VERIFIED BY INITIAL/DATE
2-BKR-77-410	RB FLR/EQ DRN POCKET PUMP 2A (2-PMP-77-410)	480v Auxiliary Building Common MCC A Compt 6A	ON	
2-BKR-77-411	RB FLR/EQ DRN POCKET PUMP 2B (2-PMP-77-11)	480v Auxiliary Building Common MCC A Compt 6B	ON	
2-BKR-278-M010/19	UNIT CNTL BD 2-M-7B BKR19 TO 2-PNL-278-M010	2-M-7 INST PWR RACK B, 2-BD-278-M007B, BKR 19, DWG 2-45W2646-4	ON	

Appendix F
(Page 1 of 1)

SWITCH LINEUP

SWITCH NUMBER	SWITCH LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL/DATE
2-HS-77-410	2-M-15	POCKET SUMP PMP A	(Center)	
2-HS-77-411	2-M-15	POCKET SUMP PMP B	(Center)	

Appendix G
(Page 1 of 1)

VALVE LINEUP RB FLOOR & EQUIPMENT DRAIN POCKET SUMP

VALVE NUMBER	NOMENCLATURE	LOCATION	POSITION	VERIFIED BY INITIAL/DATE
2-ISV-77-960A	RB POCKET SUMP PUMP 2A DRAIN	RB/AZ230/702	CLOSED	
2-ISV-77-960B	RB POCKET SUMP PUMP 2B DRAIN	RB/AZ230/702	CLOSED	
2-ISV-77-1044	RB POCKET SUMP PUMP 2A SUCT ISOL	RB/AZ243/702	OPEN	
2-ISV-77-1045	RB POCKET SUMP PUMP 2B SUCT ISOL	RB/AZ243/702	OPEN	
2-VTV-77-1048	RB POCKET SUMP PUMP 2A VENT	RB/AZ230/702	CLOSED	
2-VTV-77-1049	RB POCKET SUMP PUMP 2B VENT	RB/AZ230/702	CLOSED	

Appendix H
(Page 1 of 1)

RBF & ED POCKET SMP1 15M AVG RORISE (U0965)

TIME INTERVAL	TIME	COMPUTER POINT	INDICATED VALUE	HIGH ALARM		VERIFIED BY INITIALS/DATE
				ICS(y/n)	MCR(y/n)	
0 (INITIAL)		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
0 (INITIAL)		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			
10 MINUTES		U0965	gpm			

Times High Alarm Received: _____/_____

_____ Initials _____ Date

Appendix I
(Page 1 of 1)

RBF & ED POCKET SMP 2 15M AVG RORISE (U0966)

TIME INTERVAL	TIME	COMPUTER POINT	INDICATED VALUE	HIGH ALARM		VERIFIED BY INITIALS/DATE
				ICS(y/n)	MCR(y/n)	
0 (INITIAL)		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
0 (INITIAL)		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			
10 MINUTES		U0966	gpm			

Times High Alarm Received: ____________

____________ ____________
Initials Date

Appendix J
(Page 1 of 1)

RBF & ED POCKET SMP 60M AVG RORISE (U0968)

TIME INTERVAL	TIME	COMPUTER POINT	INDICATED VALUE	HIGH ALARM		VERIFIED BY INITIALS/DATE
				ICS(y/n)	MCR(y/n)	
0 (INITIAL)		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
0 (INITIAL)		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			
10 MINUTES		U0968	gpm			

Times High Alarm Received: ____________

____________ ____________
Initials Date

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(Page 1 of 1)

RBF & ED POCKET SMP 60M AVG RORISE (U0969)

TIME INTERVAL	TIME	COMPUTER POINT	INDICATED VALUE	HIGH ALARM		VERIFIED BY INITIALS/DATE
				ICS(y/n)	MCR(y/n)	
0 (INITIAL)		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
0 (INITIAL)		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			
10 MINUTES		U0969	gpm			

Times High Alarm Received: ____________

____________ ____________
Initials Date

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: Auxiliary Feedwater System Dynamic Test

Instruction No: 2-PTI-03B-05
Revision No: 0000

PREPARED BY: Lawrence W. Haynes DATE: 04/11/13
PRINT NAME / SIGNATURE

REVIEWED BY: Bruce A. Eltzroth DATE: 04/11/13
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-024
JTG CHAIRMAN: DATE: 10/17/13
APPROVED BY: DATE: 10/17/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: ______
JTG CHAIRMAN ______ DATE ______
APPROVED BY ______ DATE ______
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	10/17/13	All	Initial Issue

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1.0 INTRODUCTION

1.1 Test Objectives

The objective of this test is to demonstrate the capability and reliability of the Auxiliary Feedwater System to supply feedwater to the steam generators and to maintain steam generator water inventory as required.

1.2 Scope

A. The hydraulic performance of each Auxiliary Feedwater Pump meets design requirements.

B. The endurance of each of the Auxiliary Feedwater Pumps will be demonstrated by performing a minimum 48 hour endurance run followed by a cool down then restart and run for a minimum of one hour.

C. The Motor Driven Auxiliary Feedwater Pumps pressure and flow controllers function to prevent Auxiliary Feedwater Pump runout.

D. The Auxiliary Feedwater Pumps are capable of delivering design flow to the steam generators within the acceptable response time.

E. The Turbine Driven Auxiliary Feedwater Pump successfully starts and achieves rated speed within the time required five consecutive times from a cold condition.

F. Demonstrate the capability of the Turbine Driven Auxiliary Feedwater Pump to deliver required flow at reduced steam generator pressure.

G. Demonstrate the capability of the Auxiliary Feedwater Steam Generator Level Control Valves and Auxiliary Feedwater Pumps Pressure Control Valves to operate properly during induced transients.

H. The Motor Driven Auxiliary Feedwater Pumps are capable of delivering design flow with the Steam Generator at zero pressure.

I. 2-PTI-999-01 Operational Vibration Testing will be performed in conjunction with this procedure. This procedure provides steps to notify the 2-PTI-999-01,Operational Vibration Testing, Test Engineer at various times when Auxiliary Feedwater equipment is operating. Data and Acceptance Critera documentation will remain with 2-PTI-999-01,Operational Vibration Testing.

2.0 REFERENCES

2.1 Performance References

A. IMI-46.002, UNIT 2, Auxiliary Feedwater Turbine 2A-S Overspeed Trip Test

B. N3C-945, Procedure For Evaluation And Qualification of Piping System Vibrations

C. 2-PTI-999-01, Operational Vibration Testing

D. 2-PTI-68-01, Hot Functional Test (HFT) Heatup And Cooldown

E. 2-TOP-015.01,Steam Generator Blowdown

F. 2-TOP-041.02, Steam Generator N2 Sparging, Pressurization, & Draining, Loop 1

G. 2-TOP-041.03, Steam Generator N2 Sparging, Pressurization, & Draining, Loop 2

H. 2-TOP-041.04, Steam Generator N2 Sparging, Pressurization, & Draining, Loop 3

I. 2-TOP-041.05, Steam Generator N2 Sparging, Pressurization, & Draining, Loop 4

J. 2-TOP-3.02, Auxiliary Feedwater System

K. WBN-VTM-DR04-0240, Dresser-Rand (Formerly Ingersoll-Rand) Turbine Driven Auxiliary Feedwater Pumps

L. TI-300, Electrical Arc Flash Personal Protective Equipment & Protective Boundary Matrices

M. GOI-7, Generic Equipment Operating Guidlines

N. 2-PTI-03B-04, Auxiliary Feedwater Pumps & Valves Logic Test

O. SMP-9.0, Watts Bar Nuclear Plant Unit 2 Conduct Of Test

P. SMP-14,Watts Bar Nuclear Plant Unit 2 Test Deficiency Notices

Q. TI-31.02, Plant Equipment Vibration Monitoring & Vibration Diagnostics Program

2.2 Developmental References

A. Final Safety Analysis Report (FSAR) - Amendment 110

1. FSAR Table 14.2-1, Sheets 71 and 72 of 89

2. FSAR Chapter 10, Section 10.4.9, Auxiliary Feedwater System

B. Unit 1 Preoperational Test

1. 1-PTI-003B-05, Auxiliary Feedwater System Dynamic Test, Rev 0

C. Unit 2 Technical Specifications, Amendement 90

LCO 3.7.5, Auxiliary Feedwater

D. Test Scoping Document

1. 2-TSD-3B-5, Auxiliary Feedwater System Pumps Dynamic Performance Test, Rev. 4.

2. EDCR 52893, MDAFWP, Rev. A.

3. EDCR 53276, TDAFWP, Rev. A.

E. Drawings

1. Flow Diagrams

a. 2-47W801-1, (CC), Flow Diagram Main & Reheat Steam, REV 12

b. 2-47W803-2, (CC), Flow Diagram Auxiliary Feedwater, REV 16

c. 2-47W803-3, (CC), Flow Diagram Auxiliary Feedwater, REV 11

d. 2-47W804-1, (CC), Flow Diagram Condensate, REV 13

2. Electrical

a. 2-45W600-46-6, (CC), Wiring Diagrams Feedwater Pump & Turbines Schematic Diagrams, REV 3

b. 2-45W600-57-26 (CC), Wiring Diagram Seeparation & Misc Aux Relays Schematic Diagrams, REV 3

2.2 Developmental References (continued)

c. 2-45W760-3-1, (CC), Wiring Diagram Main & Aux Feedwater System Schematic Diagrams, REV 4

d. 2-47A615-0, (CC), Integrated Computer System Terminations And I/O List, REV 1

e. 45N2637-2, (AD), Wiring Diagrams Aux Control Board - Panel 2-L-10 Connection Diagram Sheet 2, REV 13

f. 45N2637-4, (AC), Wiring Diagrams Aux Control Board - Panel 2-L-10 Connection Diagram Sheet 4, REV H

g. 45N2638-10, (AC), WIRING DIAGRAMS AUX CONTROL BOARD PANEL 2-L-11A CONNECTION DIAGRAM SH 10, REV S

h. 45N2639-10, (AC), Wiring Diagrams Aux Control Board Panel 2-L-11b Connection Diagram Sh 10, REV S

i. 2-45N2676-5, (CC), Wiring Diagrams Solid State Protection Sys Train A Connect Diagram Sh 5, REV 0

j. 2-54114-1-7246D11-22, (CC) SSPS Interconnection Diagram, REV 0

3. Vendor Drawings

a. 74C2-84376-0126D4450, (AC), Metalclad Switchgear Connection Diagram, REV F

b. 74C2-84376-0126D4509, (AC), Metalclad Switchgear Connection Diagram, REV F

F. Documents

1. Regulatory Guide 1.68, Initial Test Programs For Water-Cooled Power Reactors, Rev 2

2. GOI-7, Generic Equipment Operating Guidelines, Rev 49

3. SMP-9.0, WBNP Unit 2 Conduct of Test, Rev 2

4. SMP-7.0, WBNP Unit 2 Control Of System Cleanness, Layup And Flushing, Rev 3

5. SMP-4.0, System Turnover, Rev 8

2.2 Developmental References (continued)

6. Chemistry Manual Chapter 3.01, System Chemistry Specifications, Rev. 86

7. WBN2-3B-4002, Auxiliary Feedwater System, Rev. 1.

8. 2-PTI-68-01, Hot Functional Test (HFT) Heatup And Cooldown, (Under Development)

9. NRC Commitment TROI Item No. NC0820268001 & NC0820268002, 48 Hour Endurance Test

G. Calculations

1. EPM-SDK-110689; Time Required to Deliver Rated Flow After *Receipt of Accident Signal (B18 921105 289)*

2. EPM-OED-070391, Equations for AFW Pump Performance Curves

3. HCG-TBG-091981; Rev 9, Design Parameters For Motor and Turbine Driven AFW Pumps

4. 2504-011-V1A-MPCA-00023-002, Flowserve MPCA Test Report - 5 HTMA 9 Stages 280-RLCU00063-01

5. 2504-011-V1A-MPCA-00050-002, Flowserve MPCA Test Report - 3HTMA 9 Stages

6. 2504-011-V1A-MPCA-00040-003, Flowserve MPCA Test Report - 3HTMA 9 Stages

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.

B. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.

C. Discrepancies between component ID tags and the description in a procedure/instruction do not require a Test Deficiency Notice (TDN) in accordance with SMP-14.0, if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

D. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

E. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

F. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

G. Observe all Radiation Protection (RP) requirements when working in or near radiological areas.

H. Ensure there are no adverse effects to the operation of Unit 1 structures, systems, or components.

I. Test personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.

J. System water chemistry is within system specifiable parameters especially for fluids supplied from external sources.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

K. During the performance of this procedure visual observation of piping and components is required. This includes steady state and transient operations with visual confirmation that vibration is not excessive.

L. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN).

M. When inserting fuses with actuators, ensure that the actuating rod is oriented correctly to provide for proper alarm initiation and visual indication.

N. The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.

O. The Turbine Driven Auxiliary Feedwater Pump room temperature limit of 104°F for normal operating conditions shall not be exceeded for more than 8 hours. If abnormal room temperatures exceed 110°F immediately secure the turbine.

P. The Essential Raw Cooling Water (ERCW) should never be admitted into the Auxiliary Feedwater (AFW) system. This will be prevented by deenergizing the ERCW isolation valves until sufficient tests have been performed to assure that low-pressure transients in the suction lines will not inadvertently open the valves.

Q. Chemistry must be checked per Chemistry Manual Chapter 3.01, Plant Chemistry Specifications Prior To Fuel Load, before Auxiliary Feedwater injection to the Steam Generators.

R. The Motor Driven and Turbine Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on miniflow. During operation on miniflow the pump should be monitored locally for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

S. The Turbine Driven Auxiliary Feedwater Pump will be uncoupled from the turbine during the performance of Section 6.7. The oil cooler will not be supplied with cooling water from the pump when the pump is uncoupled from the turbine. The turbine should not be operated continuously for more than one hour under these conditions and oil temperature leaving the bearings should not be allowed to exceed 180°F.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

T. Turbine Driven Auxiliary Feedwater pump speed must not be allowed to exceed 5317 RPM during performance of Section 6.7. The speed of the Turbine Driven Auxiliary Feedwater Pump should be monitored continuously during performance of Section 6.7.

U. The Turbine Driven Auxiliary Feedwater pump Trip and Throttle Valve (2-FCV-1-51) should not be operated continuously for more than five minutes. Continuous operation is valve travel from full open to full close then to full open (or vice versa) without a one minute delay between valve strokes. If the valve is operated continuously for more than 5 minutes, then the valve should be idle for a minimum of 45 minutes.

V. The Turbine Driven Auxiliary Feedwater Pump flow should not exceed 1300 GPM to prevent pump operation in a runout condition.

W. The Motor Driven Auxiliary Feedwater Pump flow should not exceed 700 GPM to prevent pump operation in a runout condition.

X. The Main Control Room clock will be utilized when the recording of time is specified in this procedure.

Y. The Motor and Turbine Driven Auxiliary Feedwater Pump start signal will isolate Secondary Sampling and Steam Generator Blowdown isolation valves. Notify Operations to re-establish Blowdown and/or Sampling flows as necessary when this condition occurs.

Z. The Condensate Storage Tank (CST) temperature should not exceed 140°F during the 48 Hour Endurance Test. The pump discharge temperature shall be monitored with indicator 2-TI-3-141 during the 48 Hour Endurance Test and the pump shall be secured if the temperature reaches 140°F.

AA. Any time Turbine Driven or Motor Driven AFW Pumps are running, oil level and temperature should be checked frequently. Pumps must be TRIPPED if pump bearing oil temperature exceeds 165°F and cause of overheating determined, and corrected prior to pump resuming operation.

BB. Standard precautions for equipment operations in accordance with GOI-7, Generic Equipment Operating Guidelines are applicable.

CC. At the discretion of Operations and the Test Engineer during performance of restoration steps at the end of a Section some steps may be marked N/A with an explanation documented in the CTL. An example would be the restoration step calls for shutting down a pump which will be required for another test or to maintain Steam Generator (SG) levels.

4.0 PREREQUISITE ACTIONS

NOTES

1) Step 4.4[2] must be completed prior to making any plant equipment configuration changes.
2) Administrative steps in Section 4.0 may be performed at any time following Step 4.4[1], obtaining permission from the Startup Manager, to begin the test.
3) Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction Section to which they apply.

4.1 Preliminary Actions

[1] **OBTAIN** the Unit 2 Supervisor's (US/SRO) OR Shift Manager's (SM) authorization prior to making any configuration changes on plant equipment.

________________________ __________
US/SRO/SM Signature Date

[2] **INITIATE** work orders for engineering/craft support for this PTI.

[2.1] Startup Test (SUT) perform 2-PTI-03B-05, Auxiliary Feedwater System Dynamic Test.

WO 112367223 ________

[2.2] Startup Test Instrumentation (SUTI) obtain, install, operate and remove M&TE as required to record data for this test.

WO 112274975 ________

[2.3] SUTI to lift and tape wires as required per Steps 4.3.6[3] and 4.3.6[4].

WO 112291315 ________

4.1 Preliminary Actions (continued)

[2.4] Startup Test Mechanical (SUTM) fabricate and install/remove temporary piping similar to Appendix V, Auxiliary Feedwater Temporary Piping - Full-Flow Header. Design engineering personnel will provide details of temporary components.

WO 112291317 ________

[2.5] SUTM to disassemble as needed the following valves to allow for attaching the temporary header to the AFW pumps discharge piping:

[2.5.1] 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL

WO 112291318 ________

[2.5.2] 2-PCV-3-132, AUX FEEDWATER PMP 2B-B DISCHARGE PRESS CONTROL

WO 112291323 ________

[2.5.3] 2-CKV-3-864, TD AUX FEEDWATER PUMP DISCHARGE CHECK.

WO 112291324 ________

[2.6] SUTM Remove/Reinstall 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S shaft coupling from the Turbine for Overspeed testing.

WO 112291328 ________

[2.7] SUTI Perform the 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S turbine overspeed testing in accordance with IMI-46.002.

WO 112307485 ________

[2.8] SUTM to install hoses as required to facilitate draining of SGs during AFW pump performance testing.

WO 112408340 ________

4.1 Preliminary Actions (continued)

NOTES

1) Step 4.1[3] may be N/A'd if overspeed testing has already been completed previously. The Test Engineer should obtain the documentation and include copies of the data into this instruction package.
2) If overspeed testing has been completed by use of the Turbine Trip Overspeed Device (TTOD), it is preferable to perform Section 6.7, Electrical and Mechanical Overspeed Trip Test, during the HFT under actual steam supply conditions.

[3] **IF** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S Electrical and Mechanical Overspeed testing and calibration of the speed pickups by use of the TTOD is desired to be performed prior to Hot Functional Testing, **THEN**

GO TO Section 6.15, Auxiliary Feedwater Turbine 2A-S Electrical and Mechanical Overspeed Test. ________

[4] **INFORM** Unit 1 Predictive Maintenance (PDM) personnel of requirement to measure vibration data on rotating equipment during periods of testing. ________

[5] **INFORM** Preoperational Startup engineering personnel of requirement to monitor piping and components for vibration during periods of testing. ________

[6] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. ________

[7] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0 **AND,**

ATTACH to this PTI for use during the performance of this PTI. ________

[8] **ENSURE** changes to the references listed on Appendix A, Test Procedures/Instructions Reference Review, have been reviewed, and determined **NOT** to adversely affect the test performance. ________

4.1 Preliminary Actions (continued)

[9] **VERIFY** current revisions and change paper for referenced drawings has been reviewed and determined **NOT** to adversely affect the test performance, **AND**

ATTACH documentation of current drawing revision numbers and change paper that were reviewed to the data package. ________

[10] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL) **AND**

ENSURE that they will **NOT** adversely affect the test performance.

A. Section 6.1 ________

B. Section 6.2 ________

C. Section 6.3 ________

D. Section 6.4 ________

E. Section 6.5 ________

F. Section 6.6 ________

G. Section 6.7 ________

H. Section 6.8 ________

I. Section 6.9 ________

J. Section 6.10 ________

K. Section 6.11 ________

L. Section 6.12 ________

M. Section 6.13 ________

N. Section 6.14 ________

O. Section 6.15 ________

[11] **ENSURE** required Component Testing and 2-PTI-03B-04 have been completed prior to start of test. ________

4.1 Preliminary Actions (continued)

[12] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modifications (T-Mods) do **NOT** adversely impact testing, **AND**

ATTACH documentation of DCN's, EDCR's and T-Mods that were reviewed to the data package. ________

[13] **ENSURE a** review of outstanding Clearances has been coordinated with Operations for impact to the test performance **AND**

RECORD in Appendix B, Temporary Condition Log, if required. ________

[14] **VERIFY** System cleanliness as required for the performance of this test has been completed in accordance with SMP-7.0. ________

[15] **REQUEST** SUTI personnel to verify plant instruments, listed on Appendix C, Permanent Plant Instrument Log, are placed in service and are within their calibration interval. ________ |

[16] **VERIFY** System 55, Annunciator and Sequential Events Recording System, FTA switch (in Panel 2-M-21) associated with the following Annunciator windows inputs are in the ON position.

A. 2-XA-55-3C/60-A, AFW PMP A-S ELEC OVERSPEED TRIP, Input Terminal Blocks 0263A & 0263B ________

B. 2-XA-55-3C-61A, AFW PMP A-S MECH OVERSPEED TRIP, Input Terminal Blocks 0264A & 0264B ________

C. 2-XA-55-3C-62A, AFW PMP A-S CNDS SUMP LEVEL HI, Input Terminal Blocks 0651A & 0651B ________

D. 2-XA-55-3C/63-A, CST HDR TO AFW PMPS PRESS LO, Input Terminal Blocks 0007 & H4, 0008 & H5, 0009 & H5, 032 & H17, 033 & H17 and 012 & H7 ________

E. 2-XA-55-6F/148-D, AFW TURB FLOW 2-L-381/381A, Input Terminal Blocks 029 & H15 ________

4.1 Preliminary Actions (continued)

[17] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) and/or Plant Operations. ________

[18] **PERFORM** a pretest walkdown on equipment to be tested to ensure **NO** conditions exist that will impact test performance. ________

[19] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0. ________

[20] **ENSURE** that communications are available for areas where testing is to be conducted. ________

[21] **VERIFY** the Plant Computer is available and the computer points listed on Appendix J, Computer Point Verification Log, are active and the description and status for each computer point has been verified. ________

[22] **ENSURE** the following personnel have been notified and are available to support the test: ________

		Number Required	
		Day	Night
Operations	UO	1	1
	AUO	2	2
Craft	Instrument	2	2
	Electrical	2	2
	Mechanical	2	2
	Other	2	2
Startup Test Engineer		2	2

[23] **VERIFY** the following systems are in service to the extent necessary to perform this test using U-2 TOPs:

A. System 032, Control Air - Provide control air for AOVs ________

4.1 Preliminary Actions (continued)

B. System 002, Condensate - Auxiliary Feedwater Pumps normal water supply source ________

C. System 041, Layup Water Treatment System ________

D. System 015, Steam Generator Blowdown - Reduce SG levels when required ________

E. System 213, Reactor Motor Operated Valve Power - Supply power to MOVs ________

F. System 211, 6.9KV Shutdown Power - Supply power to Auxiliary Feedwater motor driven pumps ________

G. System 235, 120V AC Vital Power - Supply power to control instrumentation ________

H. System 236, 125V DC Vital Power - Supply power for level control valves and Auxiliary Feedwater motor driven pumps control circuitry ________

I. System 46B, Auxiliary Feedwater Control Systems - Control circuitry for trip & throttle and governor valve ________

NOTE

Appendices E, Breaker Alignment, Section 6.7 and/or 6.15; G, Switch Alignment, Section 6.7; and I, Valve Alignment, 6.7, will be performed when called for in Section 6.7.

[24] **ESTABLISH** the switch lineup listed in Appendix F, Switch Alignment.

A. Section 6.1 ________

B. Section 6.2 ________

C. Section 6.3 ________

D. Section 6.4 ________

E. Section 6.5 ________

F. Section 6.6 ________

4.1 Preliminary Actions (continued)

G. Section 6.8 ________

H. Section 6.9 ________

I. Section 6.10 ________

J. Section 6.11 ________

K. Section 6.12 ________

L. Section 6.13 ________

M. Section 6.14 ________

[25] **ESTABLISH** the breaker positions listed in Appendix D, Normal Test Breaker Alignment

A. Section 6.1 ________

B. Section 6.2 ________

C. Section 6.3 ________

D. Section 6.4 ________

E. Section 6.5 ________

F. Section 6.6 ________

G. Section 6.8 ________

H. Section 6.9 ________

I. Section 6.10 ________

J. Section 6.11 ________

K. Section 6.12 ________

L. Section 6.13 ________

M. Section 6.14 ________

[26] **ESTABLISH** the valve positions listed in Appendix H, Normal Test Valve Alignment.

4.1 Preliminary Actions (continued)

A. Section 6.1 ________

B. Section 6.2 ________

C. Section 6.3 ________

D. Section 6.4 ________

E. Section 6.5 ________

F. Section 6.6 ________

G. Section 6.8 ________

H. Section 6.9 ________

I. Section 6.10 ________

J. Section 6.11 ________

K. Section 6.12 ________

L. Section 6.13 ________

M. Section 6.14 ________

4.2 Special Tools, Measuring and Test Equipment, Parts and Supplies.

[1] **ENSURE** the following M&TE or equivalent is available:

A. Pressure gauges (3 required): 0-3000 PSIG, ± 0.25% full scale accuracy (Sections 6.1 thru 6.6, 6.8, 6.9 and 6.12 through 6.14). ________

B. Pressure gauges (2 required): 0-30 PSIG, ± 0.25% full scale accuracy (Sections 6.1 thru 6.6 and 6.11 through 6.12 through 6.14). ________

C. Pressure gauge: 0-60 PSIG, ± 0.25% full scale accuracy (Sections 6.5, 6.6, 6.8, 6.9, and 6.11 thru 6.13). ________

D. Tachometer: Shimpo Model DT-103C, minimum 0-6000 rpm, ± 8 rpm accuracy (Sections 6.1 thru 6.4 and 6.8, thru 6.10 and 6.14). ________

4.2 Special Tools, Measuring and Test Equipment, Parts and Supplies. (continued)

E. Psychrometer: 40-120°F, ± 2°F accuracy (Sections 6.2, 6.3 thru 6.6, 6.9, and 6.11). ________

F. Digital Thermometer: Fluke Model 2190A, minimum 0-200°F, ± 3°F accuracy (Sections 6.1 thru 6.6, 6.8, 6.10 and 6.11). ________

G. Temporary Flowmeter: Tyme-Flyte Model TF-P (E20231), 0-1300 GPM, ± 3% of reading accuracy (Sections 6.1 thru 6.6, 6.8, through 6.11, 6.13 and 6.14). ________

H. Strip Chart Recorder: Western Graptec Model WR3310, 7 channels minimum with 5 Model AL3301DC preamplifiers and 2 Model AS3301DC preamplifiers, ± 0.24% chart speed accuracy, ± 1.8% voltage accuracy (Sections 6.6 and 6.11). ________

I. Precision Resistors: 10 ohm (4 required), ± 0.1% accuracy or decade boxes (Sections 6.6 and 6.11). ________

J. Precision Resistors: 500 ohm (1 required), ± 0.1% accuracy or decade boxes (Section 6.11). ________

K. Digital Multimeter: 0-2Vdc, ± 0.12% of reading accuracy (Sections 6.6 and 6.11). ________

L. Digital Voltage Source: 0-11Vdc, Transmation Model 1040 (Sections 6.6 and 6.11). ________

M. Pressure Transmitter - Rosemount Model 1151, 0-1500 PSIG, ± 0.25% of span accuracy (Section 6.11). ________

[2] **ENSURE** that jumpers with single pole/single throw switches (2) are available. ________

4.3 Field Preparations

NOTE
All the test gauges in Section 4.3 will require installation for the completion of this test. Each gauge should be installed, filled and vented ready for use by a particular performance Section.

4.3.1 Installation of Flow and Pressure Test Gauges

NOTES

1) The suction pressure gauges and discharge pressure gauges for each pump (2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B) should be installed at approximately (± 1 foot) the same datum elevation to ensure elevation differences do not influence pump performance data.
2) Each temporary gauge entered into the M&TE log should reflect both the M&TE identification number and the temporary gauge number assigned by this test to provide for tracking of each gauge and the location utilized in the test.

NOTE
Steps 4.3.1[1] and 4.3.1[2] are applicable for Sections 6.1 through 6.6 and 6.12 through 6.14.

[1] **INSTALL** the 0 to 3000 PSIG gauge at the test connection for 2-PI-3-122B AUX FEEDWATER PMP 2A-A DISCHARGE PRESS.

_______ 1st

_______ CV

[2] **LABEL** the test gauge "TG-2" **AND**

RECORD M&TE NO. __________ _______

4.3.1 Installation of Flow and Pressure Test Gauges (continued)

NOTE

Steps 4.3.1[3] and 4.3.1[4] are applicable for Sections 6.1 through 6.6 and 6.12 through 6.14..

[3] **INSTALL** the 0-30 PSIG pressure gauge at the test connection for 2-PI-3-117, AUX FEEDWATER PMP 2A-A SUCTION PRESS **AND**

ENSURE the test gauge is located at approximately (± 1 foot) the same elevation as test gauge TG-2.

_________ 1st

_________ CV

[4] **LABEL** the test gauge "TG-1" **AND**

RECORD M&TE NO. __________ _________

NOTE

Steps 4.3.1[5] and 4.3.1[6] are applicable for Sections 6.1, through 6.6 and 6.12 through 6.14.

[5] **INSTALL** the 0-3000 PSIG pressure gauge at the test connection for 2-PI-3-132B.

_________ 1st

_________ CV

[6] **LABEL** the test gauge "TG-4" **AND**

RECORD M&TE NO. __________. _________

4.3.1 Installation of Flow and Pressure Test Gauges (continued)

NOTE

Steps 4.3.1[7] and 4.3.1[8] are applicable for Sections 6.1, through 6.6 and 6.12 through 6.14.

[7] **INSTALL** the 0-30 PSIG pressure gauge at the test connection for 2-PI-3-127 AUX FEEDWATER PMP 2B-B SUCTION PRESS **AND**

ENSURE the test gauge is located at approximately (± 1 foot) the same elevation as test gauge TG-4.

_________ 1st

_________ CV

[8] **LABEL** the test gauge "TG-3" **AND**

RECORD M&TE NO. __________. _________

NOTE

Steps 4.3.1[9] and 4.3.1[10] are applicable for Sections 6.1 through 6.6, and 6.8 through 6.14.

[9] **INSTALL** the 0-3000 PSIG pressure gauge at the test connection for 2-PI-3-138, TD AUX FEEDWATER PUMP DISCHARGE PRESS.

_________ 1st

_________ CV

[10] **LABEL** the test gauge "TG-6" **AND**

RECORD M&TE NO. __________. _________

4.3.1 Installation of Flow and Pressure Test Gauges (continued)

NOTE

Steps 4.3.1[11] and 4.3.1[12] are applicable for Sections 6.5, 6.6, 6.8, 6.9, and 6.11 thru 6.13.

[11] **INSTALL** the 0-60 PSIG pressure gauge at the test connection for 2-PI-3-137, TD AUX FEEDWATER PUMP SUCTION 00PRESS **AND**

ENSURE the test gauge is located at the same elevation (± 1 foot) as test gauge TG-6.

________ 1st

________ CV

[12] **LABEL** the test gauge "TG-5" **AND**

RECORD M&TE NO. __________. ________

NOTE

Steps 4.3.1[13] and 4.3.1[14] are applicable for Sections 6.1 through 6.6, 6.8 through 6.11, 6.13 and 6.14.

[13] **INSTALL** a temporary flowmeter on the horizontal length of the Auxiliary Feedwater Pumps suction line in Auxiliary Building 713' hallway for Sections 6.1, through 6.6, 6.8 through 6.11, 6.13 and 6.14.

________ 1st

________ CV

[14] **LABEL** the temporary flowmeter "TF-1" **AND**

RECORD M&TE NO. __________. ________

4.3.2 Sections 6.1, 6.2, 6.3, 6.4, 6.8 and 6.9, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 2-PMP-128, AUX FEEDWATER PMP 2B-B and 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance and Endurance Tests

[1] **ENSURE** the auxiliary feedwater temporary piping full flow header has been installed, as required, to each Auxiliary Feedwater Pump as depicted on Appendix V Auxiliary Feedwater Temporary Piping - Full-Flow Header, for the following Sections:

A. Section 6.1 ________

B. Section 6.2 ________

C. Section 6.3 ________

D. Section 6.4 ________

E. Section 6.8 ________

F. Section 6.9 ________

4.3.3 Sections 6.6, and 6.14, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time at NOP/NOT, and SG Full Flow at NOP/NOT Tests

[1] **VERIFY** the following Aux Feedwater Pump configuration (Sections 6.6, or 6.14):

[1.1] 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, temporary discharge header has been REMOVED. ________

[1.2] Valve 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL, has been REINSTALLED. ________

[2] **VERIFY** the following Aux Feedwater Pump configuration (Sections 6.6, or 6.14):

[2.1] 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, temporary discharge header has been REMOVED. ________

4.3.3 Sections 6.6, and 6.14, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time at NOP/NOT, and SG Full Flow at NOP/NOT Tests (continued)

[2.2] Valve 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL, has been REINSTALLED. ________

[3] **ENSURE** SG levels are 30 - 34% for Response Time tests in Section 6.6. ________

[4] **REQUEST** I&C personnel obtain and connect recorders required in Section 6.6. ________

[5] **ENSURE** SG levels are 30 - 34% for Response Time tests in Section 6.14. ________

4.3.4 Sections 6.7 and 6.15, 2-TURB-001-0002 A-S, AUX FEEDWATER PUMP 2A TURBINE, Electrical Overspeed & Mechanical Overspeed Test

[1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PUMP 2A-S and 2-TURB-001-0002A-S, AUX FEEDWATER PUMP 2A TURBINE are uncoupled and a blank and/or support are installed, in accordance with vendor recommendations (WBN-VTM-DR04-0240), to maintain turbine balance integrity for Section 6.7 or 6.15.

____
1st

____
CV

[2] **VERIFY** plant conditions are being controlled at the 350°F Test Plateau or some greater temperature plateau in accordance with 2-PTI-068-01, HFT HEATUP AND COOLDOWN for Section 6.7. ________

4.3.5 Sections 6.5, 6.10, 6.11, 6.12, and 6.13, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Response Time at NOP/NOT (w/Cold Quick Start Test), Water Hammer Test and Minimum Steam Pressure Operation

NOTE

This Section verifies Aux Feedwater Pump configuration for Sections 6.5, 6.10, 6.11, 6.12 and 6.13.

[1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, temporary discharge header has been REMOVED. ________

[2] **VERIFY** 2-CKV-3-864, TD AUX FEEDWATER PUMP DISCHARGE CHECK, internals have been REINSTALLED. ________

4.3.6 General Prerequisites

[1] **ENSURE** CST B level is maintained from a low of 200,000 gals. to a high level of 270,000 gals. throughout this instruction, as indicated by 2-LI-2-233D, CNDS STORAGE TANK B LEVEL, (2-M-2) Sections 6.1 through 6.14. ________

NOTE

Step 4.3.6[2] will prevent any automatic starts to the AFW pumps from actuating the pump breakers or the Trip and Throttle Valve as well as preventing actuating the AFW level control valves to the accident mode. Fuses will be REINSTALLED when necessary to perform specific testing. (Applicable in sections 6.1 through 6.14)

[2] **ENSURE** the following fuses are REMOVED:

- 2-FU-275-R73/K13 & K14 (2-R-73)

  ________ 1st

  ________ CV

- 2-FU-275-R73/K15, AUX FEED PUMP TURBINE STEAM SUP TRANSFER, (2-R-73).

  ________ 1st

  ________ CV

4.3.6 General Prerequisites (continued)

- 2-FU-275-R74/K1 & K2 (2-R-74)

  _______ 1st

  _______ CV

- 2-FU-275-R77/K1 & K2 (2-R-77)

  _______ 1st

  _______ CV

- 2-FU-275-R78/K13 & K14 (2-R-78)

  _______ 1st

  _______ CV

[3] **LIFT AND TAPE** wire (TTAB2) at TB429-1 in Panel 2-R-74 **THEN**

LOG in CTL.

_______ 1st

_______ CV

[4] **LIFT AND TAPE** wire (TTBB2) at TB730-4 in Panel 2-R-77 **THEN**

LOG in CTL.

_______ 1st

_______ CV

[5] **VERIFY** that supports required for System 3B testing are in place or an equivalent engineering approved temporary support is installed. (Applicable in sections 6.1 through 6.14.) _______

[6] **VERIFY** that spring cans identified for System 3B testing are installed, unpinned, and on scale with **NO** visual indication of damage, loose parts or interferences. (Applicable in sections 6.1 through 6.14.) _______

[7] **VERIFY** that snubbers identified for System 3B testing are installed with **NO** visual indication of damage, loose parts or interferences. (Applicable in sections 6.1 through 6.14.) _______

4.3.6 General Prerequisites (continued)

[8] **ENSURE** drain hose(s) connected to facilitate draining of SGs during this test per 2-TOP-041.02 through 041.05. (Applicable in sections 6.1 through 6.14) ______

WO 112408340

[9] **ENSURE** Measuring and Test Equipment (M&TE) required for test performance has been (as required) filled, vented, placed in service and recorded in Appendix OO, Measuring and Test Equipment Log. (Applicable in sections 6.1 through 6.14.) ______

[10] **VERIFY** Measuring and Test Equipment (M&TE) calibration due dates will support the completion of this test performance. ______

[11] **ENSURE** scaffolding and platforms have been erected, as needed. ______

4.4 Approvals and Notifications

[1] **OBTAIN** permission of the Preoperational Startup Manager to start the test.

____________________ __________

Preoperational Startup Manager Signature   Date

[2] **OBTAIN** the Unit 2 Supervisor's (US/SRO) OR Shift Manager's (SM) authorization to start the test.

____________________ __________

US/SRO/SM Signature   Date

5.0 ACCEPTANCE CRITERIA

A. The Auxiliary Feedwater Pumps meet the following hydraulic performance requirements:

1. 2-PMP-3-118, AUX FEEDWATER PMP 2A-A:

   a. Total Dynamic Head and the corresponding flow of 217 GPM (207-227 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.1.2[32])

   b. Total Dynamic Head and the corresponding flow of 374 GPM (364-384 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.1.2[32])

   c. Total Dynamic Head and the corresponding flow of 450 GPM (440-460 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.1.2[32])

   d. Total Dynamic Head and the corresponding flow of 583 GPM (573-593 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.1.2[32])

   e. Total Dynamic Head and the corresponding flow of 645 GPM (635-655 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.1.2[32])

   f. Mini-flow is ≥ 30 GPM (Step 6.1.2[3])

   g. Recirc-flow is ≥ 170 GPM (Step 6.1.2[5])

2. 2-PMP-3-128, AUX FEEDWATER PMP 2B-B

   a. Total Dynamic Head and the corresponding flow of 227 GPM (217-237 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.3.2[25])

   b. Total Dynamic Head and the corresponding flow of 314 GPM (304-324 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.3.2[25])

   c. Total Dynamic Head and the corresponding flow of 445 GPM (435-455 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.3.2[25])

5.0 ACCEPTANCE CRITERIA (continued)

d. Total Dynamic Head and the corresponding flow of 582 GPM (572-592 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.3.2[25])

e. Total Dynamic Head and the corresponding flow of 612 GPM (602-622 GPM) meet or exceed the Total Dynamic Head on the Certified Vendor Curve (Step 6.3.2[25])

f. Mini-flow is ≥ 30 GPM (Step 6.3.2[1.2])

g. Recirc-Flow is ≥ 170 GPM (Step6.3.2[1.5])

3. 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S,

a. Total Dynamic Head and the corresponding flow of 257 (247-267) GPM meets or exceeds the Total Dynamic Head on the Certified Vendor Curve (Step 6.8.2[28]).

b. Total Dynamic Head and the corresponding flow of 451 (441-461) GPM meets or exceeds the Total Dynamic Head on the Certified Vendor Curve (Step 6.8.2[28]).

c. Total Dynamic Head and the corresponding flow of 790 (780-800) GPM meets or exceeds the Total Dynamic Head on the Certified Vendor Curve (Step 6.8.2[28]).

d. Total Dynamic Head and the corresponding flow of 1053 (1043-1063) GPM meets or exceeds the Total Dynamic Head on the Certified Vendor Curve (Step 6.8.2[28]).

e. Total Dynamic Head and the corresponding flow of 1246 (1236-1256) GPM meets or exceeds the Total Dynamic Head on the Certified Vendor Curve (Step 6.8.2[28]).

f. Recirc flow is ≥ 50 GPM (Step 6.8.2[7.2])

B. The Auxiliary Feedwater Pumps endurance is demonstrated by:

1. 2-PMP-3-118, AUX FEEDWATER PMP 2A-A

a. The Motor Driven Auxiliary Feedwater Pumps are capable of 48 hours of continuous operation at ≥ 50% rated flow (225 GPM), then cooled to within 20°F of initial conditions and restarted for one hour with flows at ≥ 50% rated flow(Steps 6.2.2[8.4], 6.2.2[9]), 6.2.2[25] and 6.2.2[26]).

5.0 ACCEPTANCE CRITERIA (continued)

2. 2-PMP-3-128, AUX FEEDWATER PMP 2B-B

   a. The Motor Driven Auxiliary Feedwater Pumps are capable of 48 hours of continuous operation at ≥ 50% rated flow (225 GPM), then cooled to within 20°F of initial conditions and restarted for one hour with flows at ≥ 50% rated flow.2-PMP-3-118, AUX FEEDWATER PMP 2A-A (Steps 6.4.2[8.4], 6.4.2[9], 6.4.2[25] and 6.4.2[26]).

3. 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S

   a. The Turbine Driven Auxiliary Feedwater Pump is capable of 48 hours of continuous operation at ≥ 50% rated flow (380 GPM), then cooled to within 20°F of initial conditions and restarted for one hour with flows at ≥50% rated flow.(Steps 6.9.2[7.3], 6.9.2[7.4], 6.9.2[19.3] and 6.9.2[19.4]).

C. The Auxiliary Feedwater Pumps Bearing Oil Temperatures are proven to be satisfactory when:

1. 2-PMP-3-118, AUX FEEDWATER PMP 2A-A

   a. The Motor Driven Auxiliary Feedwater Pumps bearing oil temperatures during the 48 Hour Endurance Test, were maintained ≤ 165°F (Step 6.2.2[10] and 6.2.2[27]).

2. 2-PMP-3-128, AUX FEEDWATER PMP 2B-B

   a. The Motor Driven Auxiliary Feedwater Pumps bearing oil temperatures during the 48 Hour Endurance Test, were maintained ≤ 165°F (Step 6.4.2[10] and 6.4.2[27]).

3. 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S

   a. The Turbine Driven Auxiliary Feedwater Pump bearing oil temperatures during the 48 Hour Endurance Test, were maintained ≤ 165°F (Step 6.9.2[7.5] and 6.9.2[19.5]).

5.0 ACCEPTANCE CRITERIA (continued)

D. The Auxiliary Feedwater Pump's flow controllers function to prevent pump runout as demonstrated by:

1. Pressure Control Valve 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL, functions to prevent 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, from reaching pump runout by limiting flow to ≤700 GPM. (Step 6.14.2[9])

2. Pressure Control Valve 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL, functions to prevent 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, from reaching pump runout by limiting flow to ≤700 GPM. (Step 6.14.2[18])

3. The Turbine Driven Auxiliary Feedwater Pump Flow/Speed Control functions to prevent 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, from reaching runout by limiting flow to ≤1300 GPM. (Step 6.10.2[25])

E. The Auxiliary Feedwater Pumps response time analysis is demonstrated by:

NOTE
2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 410 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

1. The Motor Driven Auxiliary Feedwater Pumps are capable of delivering a flow rate ≥ 410 GPM gpm to two steam generators at 1092 ±35 PSIG within 1 minute upon receipt of an ESFAS signal.

   a. 2-PMP-3-118, AUX FEEDWATER PMP 2A-A. (Step 6.6.2[1.12]).

   b. 2-PMP-3-128, AUX FEEDWATER PMP 2B-B (Step 6.6.2[2.12]).

5.0 ACCEPTANCE CRITERIA (continued)

F. The Turbine Driven Pump 5 consecutive starts from a cold condition is demonstrated by:

NOTE
2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow) to at least two intact steam generators at 1092 ± 35 psig. The recorded time will be provided to The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, will accelerate from a cold condition to controller speed requirements without tripping on overspeed and deliver the required flow rate of ≥ 720 GPM to two steam generators (1 & 2 or 3 & 4) at 1092 ±35 PSIG within 1 minute of receiving a start signal for five consecutive starting attempts.

1. **COLD START SEQUENCE 1** (Step, 6.11.2[12.1])
2. **COLD START SEQUENCE 2** (Step, 6.11.2[42.1])
3. **COLD START SEQUENCE 3** (Step, 6.11.2[58.1])
4. **COLD START SEQUENCE 4** (Step, 6.11.2[74.1])
5. **COLD START SEQUENCE 5** (Step, 6.11.2[91.1])
6. **5 COLD START SEQUENCES** completed without a pump trip on overspeed (Step 6.11.2[91.3])

G. 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, minimum steam pressure operation is demonstrated by:

The Turbine Driven AFW Pump 2A-S delivers ≥410 GPM flow to 2 Steam Generators with a steam supply of 100 (80-120) PSIG (Step 6.13.2[3.17.2])

H. The Turbine Driven Pump speed control is demonstrated by:

1. The Turbine Driven Pump speed controls transfer from manual to automatic with indicated flow ≥ 1140 GPM, runs back and then regulates at the 850 GPM setpoint. (Steps 6.10.2[18.1], 6.10.2[18.3] and 6.10.2[18.5])

5.0 ACCEPTANCE CRITERIA (continued)

2. On loss of flow control signal while in the automatic mode, the Turbine Driven Pump speed will transfer to manual and run back and control at 2260 (2226-2294) RPM. (Steps 6.10.2[19.1] and 6.10.2[19.2])

I. **The Auxiliary Feedwater Steam Generator Level Control Valves and MD AFW PMP Pressure Control Valves achieve proper control without excessive oscillations during induced transients is demonstrated by:**

1. Simultaneous Start of 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B and 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. (Step 6.12.2[7])
2. Simultaneous Trip of 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B. (Step 6.12.2[11])
3. Simultaneous Start of 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B. (Step 6.12.2[16])
4. Trip of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. (Step 6.12.2[20])

J. **2-PTI-999-01 Operational Vibration Testing will be performed in conjunction with this procedure.** This procedure provides steps to notify the 2-PTI-999-01, Operational Vibration Testing,Test Engineer at various times when Auxiliary Feedwater equipment is operating. Original Data and Acceptance Critera documentation will remain with 2-PTI-999-01,Operational Vibration Testing.

This confirmsTVA Design Criteria WB-DC-40-31.16, CRITERIA FOR VIBRATION QUALIFICATION OF PIPING, APPENDIX A and components.

K. **2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S trips at setpoint:**

1. Mechanical Overspeed trip occurs three times in sucession at between 4839-5036 RPM. (Steps 6.7.2[9], 6.7.2[18] and 6.7.2[25])
2. Electrical Overspeed trip occurs between 4258 and 4432 RPM. (Step 6.7.2[34])

L. **Each MDAFW pump is capable of delivering 410 (400-420) GPM to two steam generators at a pressure between 300 and 500 psig to verify operability of the 2" bypass LCVs**

1. 2-PMP-3-118, AUX FEEDWATER PMP 2A-A (Step 6.5.2[1.14.3])

5.0 ACCEPTANCE CRITERIA (continued)

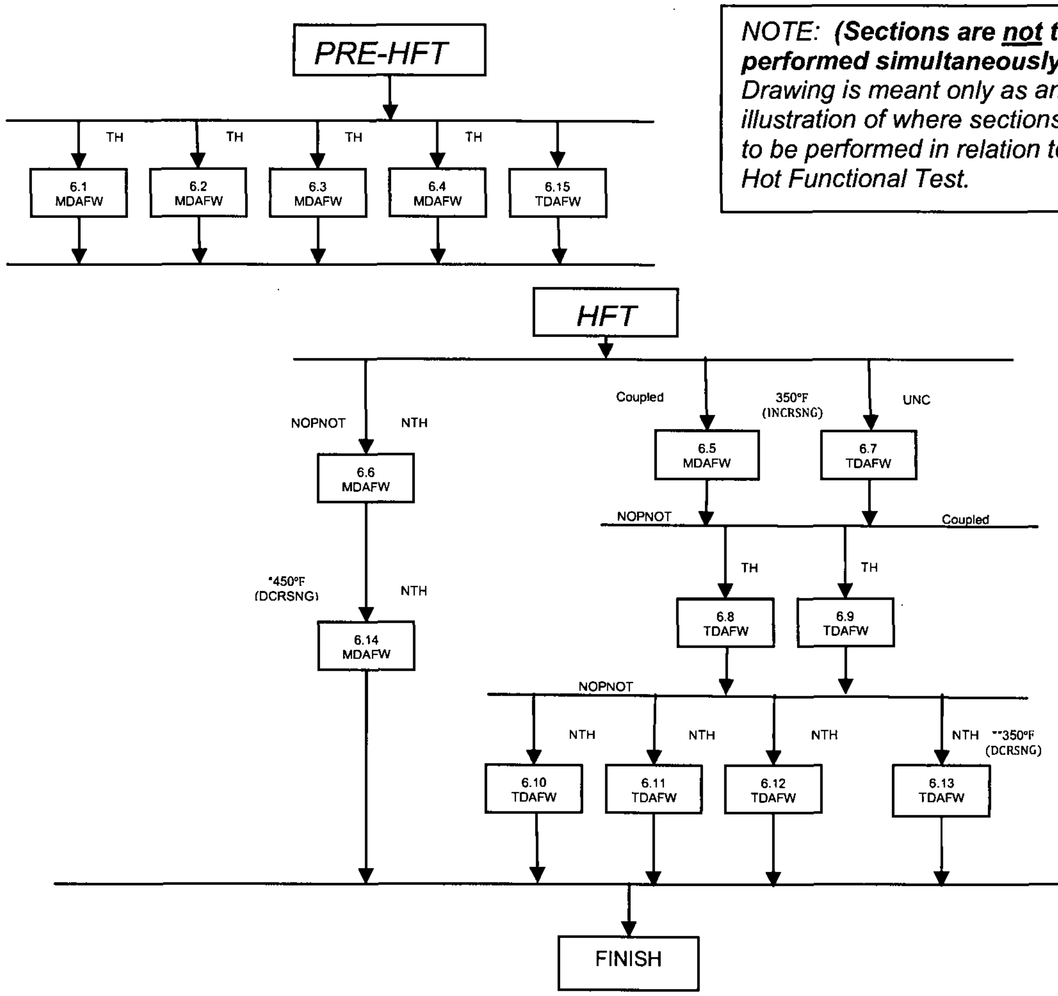
2. 2-PMP-3-128, AUX FEEDWATER PMP 2B-B (Step 6.5.2[2.15.3])

6.0 PERFORMANCE

NOTES

1) Sections 6.1 through 6.4 may be performed in any order prior to Hot Functional heatup activities.
2) Sections 6.5 and 6.7 will be performed in the heatup portion of the Hot Functional Test at the 350°F plateau.
3) Section 6.6 requires RCS/SG conditions of RCS Hot Standby - normal operating pressures and temperatures (nominal) 2235 psig and 557°F
4) Section 6.8 and 6.9 will be performed at RCS/SG conditions of RCS Hot Standby - normal operating pressures and temperatures (nominal) 2235 psig and 557°F, following performance of Section 6.6.
5) Sections 6.10, 6.11, and 6.12 will be performed following Sections 6.7, and 6.8 at conditions of RCS Hot Standby - normal operating pressures and temperatures (nominal) 2235 psig and 557°F
6) Section 6.13 requires performance at the 350°F plateau when cooling down after the Hot Functional Test, following Section 6.6.
7) Section 6.14 is required to be performed in the Hot Functional, 450°F plateau, when cooling down after the Hot Functional Test.
8) Section 6.15 performs overspeed testing of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, utilizing the Turbine Trip Overspeed Device with a means of spinning the turbine without steam. This Section should be performed prior to the U2 Hot Functional Test.
9) Steam Generators may be drained to support testing at the discretion of Preoperational Startup Engineering or Plant Operations.

6.0 PERFORMANCE (continued)



NOTE: ***(Sections are <u>not</u> to be performed simultaneously.)*** *Drawing is meant only as an illustration of where sections are to be performed in relation to the Hot Functional Test.*

1. HFT - Activities performed during Hot Functional Test, heatup, Hot Standby, cooldown.
2. Pre-HFT - Activities performed prior to heatup for HFT.
3. TH - Sections of the PTI that require the full flow test header installed.
4. NTH - Sections of the PTI that do not utilize a full flow test header.
5. UNC - Section 6.7 of the PTI performed with the Turbine and Pump uncoupled for testing.
6. Coupled - Turbine and pump coupled.
7. 350°F - Activities performed at the HFT heatup plateau.
8. NOPNOT - Activities performed at the RCS pressures/temperatures of 2235 psig/557°F.
9. *450°F - Activities performed at the HFT cooldown plateau.
10. **350°F Activity performed at the HFT cooldown plateau (SG press ≤80 psig (100 ±20 psig)).

6.1 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Hydraulic Performance Test

6.1.1 Final Field Preparations

[1] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[2] **ENSURE** 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10 is OPEN and RACKED UP into position. ________

[3] **VERIFY** prerequisites listed in Section 4.0 for Section 6.1 have been completed. ________

[4] **ENSURE** Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL [2-M-2]. ________

[5] **ENSURE** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer has test equipment and personnel in place to support vibration testing. ________

CAUTION

Inadequate venting of the suction piping and the AFW pump casings could lead to equipment damage. Personnel should be prepared to catch water and route to a drain to ensure a good solid stream of water is observed from the vent locations to ensure no voids exist in the pump casings or suction headers prior to running a pump.

[6] **ENSURE** Operations performs AFW pump and piping venting as follows:

[6.1] **VENT** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, [A13T/713] temporary discharge piping to the Condensate Storage Tanks. ________

[6.2] **VENT** AFW pump suction header at 2-VTV-2-675, CNDS XFER PMP/AFW PMP CST B SUP HDR VENT. ________

6.1.1 Final Field Preparations (continued)

[6.3] **VENT** AFW pump suction header in the Auxiliary Building at 2-VTV-3-908, AUX FEEDWATER PUMP SUCTION VENT. ________

[6.4] **VENT** AFW pump suction header, 2-VTV-3-909, AUX FEEDWATER PUMP SUCTION VENT. ________

[6.5] **VENT** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A casing, 2-VTV-3-931. ________

[6.6] **VENT** 2-PMP-3-128, AUX FEEDWATER PUMP 2B-B casing, 2-VTV-3-932. ________

[6.7] **VENT** TDAFW pump 2-PMP-3-2-AS, 2-VTV-3-930, TD AUX FEEDWATER PUMP CASING VENT. ________

[7] **NOTIFY** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer, that conditions have been established for short cycle steady state event for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A. ________

6.1.2 Section Performance

CAUTIONS
The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
The Motor Driven Auxiliary Feedwater Pump may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.

[1] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START, **AND**

VERIFY locally 2-PMP-3-118, AUX FEEDWATER PMP 2A-A [A13T/713] is RUNNING. ________

[2] **RECORD** the flow indicated on the temporary flowmeter, TF-1:

Mini flow(temporary flowmeter, TF-1) __________GPM ________

[3] **VERIFY** that the temporary flowmeter, TF-1 indicates $\geq$ 30 GPM **(Acc Crit)** ________

[4] **PLACE** 2-HS-3-355, MDAFP 2A-A RECIRC VLV [2-M-4], to OPEN, **THEN**

RECORD the flow indicated on the temporary flowmeter, TF-1:

Combinition Recirc flow-Mini flow(temporary flowmeter, TF-1)

__________GPM ________

6.1.2 Section Performance (continued)

[5] **CALCULATE** RECIRC FLOW by subtracting flow entered in Step 6.1.2[2] from flow entered in Step 6.1.2[4]

Step 6.1.2[4] - Step 6.1.2[2] = RECIRC FLOW GPM

__________ - __________ = __________ GPM ________

AND

VERIFY that RECIRC FLOW is ≥ 170 GPM **(Acc Crit)** ________

[6] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

____
2-PTI-999-01
Test Eng

[7] **PLACE** 2-HS-3-355, MDAFP 2A-A RECIRC VLV, to CLOSE. ________

[8] **PERFORM** the following to throttle 2-PMP-3-118, AUX FEEDWATER PMP 2A-A flow to 217 GPM (207-227 GPM). ________

[9] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 217 GPM (207-227 GPM). ________

[9.1] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[9.2] **VERIFY** that the temporary flowmeter, TF-1 indicates 217 GPM (207-227 GPM). ________

NOTE
Step 6.1.2[10] through Step 6.1.2[12] should be performed simultaneously.

[10] **RECORD** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, data on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification, Section 1.0, Data Collection Sheet 1. ________

[11] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

____
2-PTI-999-01
Test Eng

6.1.2 Section Performance (continued)

NOTE

A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[12] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

[13] **PERFORM** the following to throttle 2-PMP-3-118, AUX FEEDWATER PMP 2A-A flow to 374 GPM (364-384 GPM).

[13.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 374 GPM (364-384 GPM). ________

[13.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM

____

[13.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 374 GPM (364-384 GPM). ________

NOTE

Step 6.1.2[14] and 6.1.2[15] may be performed simultaneously.

[14] **RECORD** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, data on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification, Section 2.0, Data Collection Sheet 2. ________

6.1.2 Section Performance (continued)

NOTE

A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[15] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

[16] **PERFORM** the following to throttle 2-PMP-3-118, AUX FEEDWATER PMP 2A-A flow to 450 GPM (440-460 GPM).

[16.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 450 GPM (440-460 GPM). ________

[16.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[16.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 450 GPM (440-460 GPM). ________

NOTE

Step 6.1.2[17] and 6.1.2[18] may be performed simultaneously.

[17] **RECORD** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, data on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification, Section 3.0, Data Collection Sheet 3. ________

6.1.2 Section Performance (continued)

NOTE
A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[18] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________

TI-31.02
Test Engr

[19] **PERFORM** the following to throttle 2-PMP-3-118, AUX FEEDWATER PMP 2A-A flow to 583 GPM (573-593 GPM). ________

[20] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 583 GPM (573-593 GPM). ________

[20.1] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[20.2] **VERIFY** that the temporary flowmeter, TF-1 indicates 583 GPM (573-593 GPM). ________

NOTE
Step 6.1.2[21] through Step 6.1.2[23] should be performed simultaneously.

[21] **RECORD** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, data on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification, Section 4.0, Data Collection Sheet 4. ________

6.1.2 Section Performance (continued)

[22] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

____
2-PTI-999-01
Test Eng

[23] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[24] **PERFORM** the following to throttle 2-PMP-3-118, AUX FEEDWATER PMP 2A-A flow to 645 GPM (635-655 GPM). _________

[25] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 645 GPM (635-655 GPM). _________

[25.1] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM _________

[25.2] **VERIFY** that the temporary flowmeter, TF-1 indicates 645 GPM (635-655 GPM). _________

NOTE
Step 6.1.2[26] through Step 6.1.2[28] should be performed simultaneously.

[26] **RECORD** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, data on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification, Section 5.0, Data Collection Sheet 5. _________

6.1.2 Section Performance (continued)

[27] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

_________ 2-PTI-999-01 Test Eng

[28] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

_________ TI-31.02 Test Engr

[29] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **THEN**

VERIFY locally 2-PMP-3-118, AUX FEEDWATER PMP 2A-A has STOPPED. _________

[30] **CLOSE** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV. _________

[31] **PERFORM** Data Reduction and Calculations on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Total Dynamic Head Verification, Sections 6.0 through 10.0. _________

[32] **VERIFY** that the Total Dynamic Head and the corresponding flow determined on Appendix K, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Total Dynamic Head Verification, Sections 6.0 through 10.0 meet or exceed the Total Dynamic Head on the Certified Vendor Curve, Appendix R, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Pump Curve, for the corresponding flows. **(Acc Crit).** _________

[33] **ATTACH** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, hydraulic performance vibration test results, **AND**

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program, Plant Equipment Vibration Monitoring & Vibration Diagnostics Program.

_________ TI-31.02 Test Engr

[34] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.2 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

6.2.1 Final Field Preparations

[1] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[2] **VERIFY** prerequisites listed in Section 4.0 for Section 6.2 have been completed. ________

6.2.2 Section Performance

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) The Motor Driven Auxiliary Feedwater Pump may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The CST Temperature will be monitored during the 48 Hour Endurance Test utilizing pump discharge Temperature Indicator 2-TI-3-141 and should not exceed 140°F. If temperature reaches 140°F, secure the pump.

[1] **RECORD** pre-test data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test, 48 Hour Performance Run, TIME:PRE-TEST CONDITIONS. ________

[2] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START, [2-M-4] **AND**

VERIFY locally 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, [A13T/713], is RUNNING. ________

6.2.2 Section Performance (continued)

[3] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥225 GPM. ________

[3.1] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[3.2] **VERIFY** the recorded flow is ≥225 GPM. ________

NOTE
The Main Control Room clock will be utilized when the recording of time is specified in this procedure.

[4] **RECORD** Date/Time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs) ____________________ d/hr:min ________

[5] **RECORD** time T-0 data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test, 48 Hour Performance Run, TIME:T-0. ________

6.2.2 Section Performance (continued)

NOTE

Step 6.2.2[6] and Step 6.2.2[7] must be performed simultaneously at the designated times.

[6] **RECORD** the data, as required, on Endurance Test Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, 48 Hour Performance Run, at the designated times over the next 48 hours :

	Data Sheet	Time After T-0	Initials
A.	TIME: T-0 + 15 MIN.	15 min.	______
B.	TIME: T-0 + 30 MIN.	30 min.	______
C.	TIME: T-0 + 1 HOUR	1 hr	______
D.	TIME: T-0 + 4 HOURS	4 hrs	______
E.	TIME: T-0 + 8 HOURS	8 hrs	______
F.	TIME: T-0 + 12 HOURS	12 hrs	______
G.	TIME: T-0 + 18 HOURS	18 hrs	______
H.	TIME: T-0 + 24 HOURS	24 hrs	______
I.	TIME: T-0 + 30 HOURS	30 hrs	______
J.	TIME: T-0 + 36 HOURS	36 hrs	______
K.	TIME: T-0 + 42 HOURS	42 hrs	______
L.	TIME: T-0 + 48 HOURS	48 hrs	______

6.2.2 Section Performance (continued)

NOTE

A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[7] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program., at the designated times or until the bearing temperatures are stable and just prior to stopping the pump. **N/A** if **NO** data was collected:

	Time After 0 hrs	Initials
A.	TIME: T-0 + 15 MIN.	________
B.	TIME: T-0 + 30 MIN.	________
C.	TIME: T-0 + 1 HOUR	________
D.	TIME: T-0 + 4 HOURS	________
E.	TIME: T-0 + 8 HOURS	________
F.	TIME: T-0 + 12 HOURS	________
G.	TIME: T-0 + 18 HOURS	________
H.	TIME: T-0 + 24 HOURS	________
I.	TIME: T-0 + 30 HOURS	________
J.	TIME: T-0 + 36 HOURS	________
K.	TIME: T-0 + 42 HOURS	________
L.	TIME: T-0 + 48 HOURS	________

6.2.2 Section Performance (continued)

NOTE

All data collection in steps 6.2.2[6] and 6.2.2[7] should be confirmed PRIOR to performance of 6.2.2[8].

[8] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **THEN**

PERFORM the following:

[8.1] **VERIFY** locally 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, STOPS. ________

[8.2] **RECORD** Stop Date/Time:

Stop Date/Time ____________________ d/hr:min ________

[8.3] **RECORD** the Elapsed Time (Step 6.2.2[8.2] - 6.2.2[4]).

Elapsed Time ____________________ d/hr:min ________

[8.4] **VERIFY** Elapsed Time from Step 6.2.2[8.3] is greater than 48 hours **(Acc Crit)** ________

[9] **VERIFY** flow rates recorded on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, were all ≥225 GPM for the 48 hour endurance run. **(Acc Crit)**. ________

[10] **VERIFY** pump bearing oil temperatures recorded on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, were ≤ 165°F for all times during the 48 Hour Performance Run. **(Acc Crit)** ________

[11] **CLOSE** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV. ________

6.2.2 Section Performance (continued)

NOTE
2-PMP-3-118, AUX FEEDWATER PMP 2A-A, bearing oil temperature must cool for a minimum of 1 hour after the performance of Step 6.2.2[8.2] and must be within 20°F of the initial temperatures recorded on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test, Post 48 Hour Performance Run, Pre-Test Conditions, before performing Step 6.2.2[13]

[12] **RECORD** pre-test data for the one (1) hour run following the 48 hour Endurance Test on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test, Post 48 Hour Performance Run, Pre-Test Conditions. ______

[13] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START, **THEN**

VERIFY locally 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, is RUNNING. ______

[14] **PERFORM** the following to throttle the 2-PMP-3-118, AUX FEEDWATER PMP 2A-A discharge flow:

[14.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥225 GPM. ______

[14.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ______

[14.3] **VERIFY** the recorded flow is ≥225 GPM. ______

[15] **RECORD** time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs)____________________ d/hr:min ______

6.2.2 Section Performance (continued)

NOTE

Step 6.2.2[16] and Step 6.2.2[17] should be performed simultaneously.

[16] **RECORD** data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0. ________

[17] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

NOTE

Step 6.2.2[18] and Step 6.2.2[19] should be performed simultaneously.

[18] **RECORD** data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 15 MIN. ________

[19] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

NOTE

Step 6.2.2[20] and Step 6.2.2[21] should be performed simultaneously.

[20] **RECORD** data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 30 MIN. ________

[21] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

6.2.2 Section Performance (continued)

NOTE

Step 6.2.2[22] and Step 6.2.2[23] should be performed simultaneously.

[22] **RECORD** data on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 1 HOUR. ________

[23] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________ TI-31.02 Test Engr

[24] **WHEN** Steps 6.2.2[22] and 6.2.2[23] are complete, **THEN**

PLACE Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP and PULL-TO-LOCK**, AND**

PERFORM the following:

[24.1] **VERIFY** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, STOPS. ________

[24.2] **RECORD** Stop Time:

Stop Date/Time ____________________ d/hr:min ________

[24.3] **RECORD** the Elapsed Time (Step 6.2.2[24.2] - Step6.2.2[15]).

Elapsed Time ____________________ d/hr:min ________

[25] **VERIFY** time recorded in Step 6.2.2[24.3] is ≥one (1) hour. **(Acc Crit)** ________

[26] **VERIFY** flow rates recorded on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, were ≥225 GPM for all times during the Post 48 Hour Performance Run. **(Acc Crit)** ________

6.2.2 Section Performance (continued)

[27] **VERIFY** pump bearing oil temperatures recorded on Appendix L, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A 48 Hour Endurance Test, were ≤ 165°F for all times during the for the 1 hour endurance run. **(Acc Crit)** _______

[28] **CLOSE** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV. _______

[29] **ATTACH** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Endurance Test vibration test results, **AND**

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[30] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _______

6.3 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Hydraulic Performance Test

6.3.1 Final Field Preparations.

[1] **ENSURE** Appendix F, Switch Alignment, is completed for Section 6.3. ________

[2] **ENSURE** 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10 is OPEN and RACKED UP into position: ________

[3] **VERIFY** prerequisites listed in Section 4.0 for Section 6.3 have been completed. ________

[4] **ENSURE** Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL [2-M-2]. ________

[5] **ENSURE** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer has test equipment and personnel in place to support vibration testing. ________

CAUTION

Inadequate venting of the suction piping and the AFW pump casings could lead to equipment damage. Personnel should be prepared to catch water and route to a drain to ensure a good solid stream of water is observed from the vent locations to ensure no voids exist in the pump casings or suction headers prior to running a pump.

[6] **ENSURE** Operations performs AFW pump and piping venting as follows:

[6.1] **VENT** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, [A13T/713], temporary discharge piping to the Condensate Storage Tanks. ________

[6.2] **VENT** AFW pump suction header at 2-VTV-2-674, CNDS XFER PMP/AFW PMP CST B SUP HDR DRAIN. ________

6.3.1 Final Field Preparations. (continued)

[6.3] **VENT** AFW pump suction header in the Auxiliary Building at 2-VTV-3-908, AUX FEEDWATER PUMP SUCTION VENT. _______

[6.4] **VENT** AFW pump suction header, 2-VTV-3-909, AUX FEEDWATER PUMP SUCTION VENT. _______

[6.5] **VENT** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, casing, 2-VTV-3-931. _______

[6.6] **VENT** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B casing, 2-VTV-3-932. _______

[6.7] **VENT** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 2-VTV-3-930, TD AUX FEEDWATER PUMP CASING VENT. _______

[7] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for short cycle steady state event for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B. _______

6.3.2 Section Performance

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) The Motor Driven Auxiliary Feedwater Pump may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.

[1] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to START, **AND**

VERIFY locally 2-PMP-3-128, AUX FEEDWATER PMP 2B-B [A13T/713] is RUNNING. ________

[1.1] **RECORD** the flow indicated on the temporary flowmeter, TF-1:

Mini flow(temporary flowmeter, TF-1) __________GPM ________

[1.2] **VERIFY** that the temporary flowmeter, TF-1 indicates ≥ 30 GPM **(Acc Crit)** ________

[1.3] **PLACE** 2-HS-3-359, MDAFP 2B-B RECIRC VLV, to OPEN, **THEN**

RECORD the flow indicated on the temporary flowmeter, TF-1:

Combinition Recirc flow-Mini flow(temporary flowmeter, TF-1) __________GPM ________

[1.4] **CALCULATE** RECIRC FLOW by subtracting flow entered in Step 6.3.2[1.1] from flow entered in Step 6.3.2[1.3]

<u>Step 6.3.2[1.3]</u> - <u>Step 6.3.2[1.1]</u> = <u>RECIRC FLOW</u> GPM

___________ - ___________ = ___________ GPM ________

6.3.2 Section Performance (continued)

[1.5] **VERIFY** that RECIRC FLOW is ≥ 170 GPM **(Acc Crit)** ________

[1.6] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing. ________
2-PTI-999-01
Test Eng

[2] **PLACE** 2-HS-3-359, MDAFP 2B-B RECIRC VLV, to CLOSE. ________

[3] **PERFORM** the following to throttle 2-PMP-3-128, AUX FEEDWATER PMP 2B-B flow to 227 GPM (217-237 GPM). ________

[4] **SLOWLY OPEN** TV-2, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 227 GPM (217-237 GPM). ________

[4.1] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[4.2] **VERIFY** that the temporary flowmeter, TF-1 indicates 227 GPM (217-237 GPM). ________

NOTE
Step 6.3.2[5] through Step 6.3.2[7] should be performed simultaneously.

[5] **RECORD** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, data on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification, Section 1.0, Data Collection Sheet 1. ________

[6] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing. ________
2-PTI-999-01
Test Engr

[7] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

6.3.2 Section Performance (continued)

[8] **PERFORM** the following to throttle 2-PMP-3-128, AUX FEEDWATER PMP 2B-B flow to 314 GPM (304-324 GPM).

[8.1] **SLOWLY OPEN** TV-1, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 314 GPM (304-324 GPM). _________

[8.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM _________

[8.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 314 GPM (304-324 GPM). _________

NOTE
Step 6.3.2[9] and 6.3.2[10] may be performed simultaneously.

[9] **RECORD** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, data on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification, Section 2.0, Data Collection Sheet 2. _________

NOTE
A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[10] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[11] **PERFORM** the following to throttle 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, flow to 450 GPM (440-460 GPM).

[11.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until pump flow INDICATED on the temporary flowmeter, TF-1 is 450 GPM (440-460 GPM). _________

6.3.2 Section Performance (continued)

[11.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[11.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 450 GPM (440-460 GPM). ________

NOTE
Steps 6.3.2[12] and 6.3.2[13] may be performed simultaneously.

[12] **RECORD** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, data on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification, Section 3.0, Data Collection Sheet 3. ________

NOTE
A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[13] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[14] **PERFORM** the following to throttle 2-PMP-3-128, AUX FEEDWATER PMP 2B-B flow to 582 GPM (572-592 GPM).

[14.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until temporary flowmeter, TF-1 indicates 582 GPM (572-592 GPM). ________

[14.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[14.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 582 GPM (572-592 GPM). ________

6.3.2 Section Performance (continued)

NOTE

Step 6.3.2[15] through Step 6.3.2[17] should be performed simultaneously.

[15] **RECORD** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, data on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification, Section 4.0, Data Collection Sheet 4. ________

[16] **PERFORM** piping testing in accordance with 2-PTI-999-01,Operational Vibration Testing. ________
2-PTI-999-01
Test Engr

[17] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

[18] **PERFORM** the following to throttle 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, flow to 612 GPM (602-622 GPM).

[18.1] **SLOWLY OPEN** TV-1, AFW PUMP 2A-A TEMPORARY DISCHARGE VLV [A13T/718] until temporary flowmeter, TF-1 indicates 612 GPM (602-622 GPM). ________

[18.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[18.3] **VERIFY** that the temporary flowmeter, TF-1 indicates 612 GPM (602-622 GPM). ________

NOTE

Step 6.3.2[19] through Step 6.3.2[21] should be performed simultaneously.

[19] **RECORD** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, data on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification, Section 5.0, Data Collection Sheet 5. ________

6.3.2 Section Performance (continued)

[20] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

_________ 2-PTI-999-01 Test Engr

[21] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

_________ TI-31.02 Test Engr

[22] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **THEN**

VERIFY locally 2-PMP-3-128, AUX FEEDWATER PMP 2B-B has STOPPED. _________

[23] **CLOSE** TV-2, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV. _________

[24] **PERFORM** Data Reduction and Calculations on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Total Dynamic Head Verification, Sections 6.0 through 10.0. _________

[25] **VERIFY** that the Total Dynamic Head and the corresponding flow determined on Appendix M, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Total Dynamic Head Verification, Sections 6.0 through 10.0 meet or exceed the Total Dynamic Head on the Certified Vendor Curve, Appendix S, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Pump Curve, for the corresponding flows. **(Acc Crit)** _________

[26] **ATTACH** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, hydraulic performance vibration test results, **AND**

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program, Plant Equipment Vibration Monitoring & Vibration Diagnostics Program.

_________ TI-31.02 Test Engr

[27] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.4 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

6.4.1 Final Field Preparations

[1] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[2] **VERIFY** prerequisites listed in Section 4.0 for Section 6.4 have been completed. ________

6.4.2 Section Performance

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the Pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) The Motor Driven Auxiliary Feedwater Pump may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The CST Temperature will be monitored during the 48 Hour Endurance Test utilizing pump discharge Temperature Indicator 2-TI-3-141 and should not exceed 140°F. If temperature reaches 140°F, secure the pump.

[1] **RECORD** system pre-test data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, 48 Hour Performance Run, TIME: Pre -Test Conditions. ________

6.4.2 Section Performance (continued)

CAUTION

The CST Temperature will be monitored during the 48 Hour Endurance Test utilizing pump discharge Temperature Indicator 2-TI-3-146 and should not exceed 140°F. If temperature reaches 140°F, secure the pump.

[2] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to START, **AND**

VERIFY locally 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, [A13T/713], is RUNNING. _________

[3] **PERFORM** the following to throttle the 2-PMP-3-128, AUX FEEDWATER PMP 2B-B discharge flow:

[3.1] **SLOWLY OPEN** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, temporary discharge valve TV-2 until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥225 GPM _________

[3.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM _________

[3.3] **VERIFY** the recorded flow is ≥225 GPM. _________

NOTE

The Main Control Room clock will be utilized when the recording of time is specified in this procedure.

[4] **RECORD** Date/Time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs) ____________________ d/hr:min _________

[5] **RECORD** time T-0 data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, 48 Hour Performance Run, TIME: T-0. _________

6.4.2 Section Performance (continued)

NOTE

Step 6.4.2[6] and 6.4.2[7] must be performed simultaneously at the designated times.

[6] **RECORD** the data, as required, on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, 48 Hour Performance Run, at the designated times over the next 48 hours :

	Data Sheet	Time After T-0	Initials
A.	TIME: T-0 + 15 MIN.	15 min.	
B.	TIME: T-0 + 30 MIN.	30 min.	
C.	TIME: T-0 + 1 HOUR	1 hr	
D.	TIME: T-0 + 4 HOURS	4 hrs	
E.	TIME: T-0 + 8 HOURS	8 hrs	
F.	TIME: T-0 + 12 HOURS	12 hrs	
G.	TIME: T-0 + 18 HOURS	18 hrs	
H.	TIME: T-0 + 24 HOURS	24 hrs	
I.	TIME: T-0 + 30 HOURS	30 hrs	
J.	TIME: T-0 + 36 HOURS	36 hrs	
K.	TIME: T-0 + 42 HOURS	42 hrs	
L.	TIME: T-0 + 48 HOURS	48 hrs	

6.4.2 Section Performance (continued)

NOTE

A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[7] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program, at the designated times or until the bearing temperatures are stable and just prior to stopping the pump. **N/A** if **NO** data was collected:

	Time After 0 hrs	Initials
A.	TIME: T-0 + 15 MIN.	________
B.	TIME: T-0 + 30 MIN.	________
C.	TIME: T-0 + 1 HOUR	________
D.	TIME: T-0 + 4 HOURS	________
E.	TIME: T-0 + 8 HOURS	________
F.	TIME: T-0 + 12 HOURS	________
G.	TIME: T-0 + 18 HOURS	________
H.	TIME: T-0 + 24 HOURS	________
I.	TIME: T-0 + 30 HOURS	________
J.	TIME: T-0 + 36 HOURS	________
K.	TIME: T-0 + 42 HOURS	________
L.	TIME: T-0 + 48 HOURS	________

6.4.2 Section Performance (continued)

NOTE
All data collection in steps 6.4.2[6] and 6.4.2[7] should be confirmed PRIOR to performance of 6.4.2[8].

[8] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

PERFORM the following:

[8.1] **VERIFY** locally 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, STOPS. ________

[8.2] **RECORD** Stop Date/Time:

Stop Date/Time ____________________ d/hr:min ________

[8.3] **RECORD** the Elapsed Time (Step 6.4.2[8.2] - Step 6.4.2[4].

Elapsed Time ____________________ d/hr:min ________

[8.4] **VERIFY** Elapsed Time from Step 6.4.2[8.3] is greater than 48 hours **(Acc Crit)** ________

[9] **VERIFY** flow rates recorded on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, 48 Hour Performance Run,are ≥225 gpm for the 48 hour endurance run. **(Acc Crit).** ________

[10] **VERIFY** pump bearing oil temperatures recorded on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, were ≤ 165°F for all times during the 48 Hour Performance Run. **(Acc Crit)** ________

[11] **CLOSE** TV-2, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV. ________

6.4.2 Section Performance (continued)

NOTE

2-PMP-3-128, AUX FEEDWATER PMP 2B-B, bearing oil temperature must cool for a minimum of 1 hour after the performance of Step 6.4.2[8.2] and must be within 20°F of the initial temperatures recorded on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, 48 Hour Performance Run, TIME: Pre -Test Conditions, before performing Step 6.4.2[13].

[12] **RECORD** pre-test data for the one (1) hour run following the 48 hour Endurance Test on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Post 48 Hour Performance Run, Pre-Test Conditions. ________

[13] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to START, **THEN**

VERIFY locally 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, is RUNNING. ________

[14] **PERFORM** the following to throttle the 2-PMP-3-128, AUX FEEDWATER PMP 2B-B discharge flow:

[14.1] **SLOWLY OPEN** TV-2, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥225 GPM. ________

[14.2] **RECORD** the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[14.3] **VERIFY** the recorded flow is ≥225 GPM. ________

[15] **RECORD** time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs) ____________________ d/hr:min ________

6.4.2 Section Performance (continued)

NOTE

Step 6.4.2[16] and Step 6.4.2[17] should be performed simultaneously.

[16] **RECORD** data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0. ________

[17] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

NOTE

Step 6.4.2[18] and Step 6.4.2[19] should be performed simultaneously.

[18] **RECORD** data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 15 MIN. ________

[19] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02
Test Engr

NOTE

Step 6.4.2[20] and Step 6.4.2[21] should be performed simultaneously.

[20] **RECORD** data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 30 MIN. ________

6.4.2 Section Performance (continued)

[21] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

NOTE
Step 6.4.2[22] and Step 6.4.2[23] should be performed simultaneously.

[22] **RECORD** data on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, Post 48 Hour Performance Run, TIME: T-0 + 1 HOUR. ________

[23] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[24] **WHEN** Steps 6.4.2[22] and 6.4.2[23] are complete, **THEN**

PLACE Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP and PULL-TO-LOCK, **AND**

PERFORM the following:

[24.1] **VERIFY** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, STOPS. ________

[24.2] **RECORD** Stop Time:

Stop Date/Time ____________________ d/hr:min ________

[24.3] **RECORD** the Elapsed Time (Step 6.4.2[24.2] - Step 6.4.2[15]).

Elapsed Time ____________________ d/hr:min ________

[25] **VERIFY** time recorded in Step 6.4.2[24.3] is ≥one (1) hour. **(Acc Crit)** ________

6.4.2 Section Performance (continued)

[26] **VERIFY** flow rates recorded on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test, Post 48 Hour Performance Run, were ≥225 GPM for the 1 hour endurance run. **(Acc Crit)** ________

[27] **VERIFY** pump bearing oil temperatures recorded on Appendix N, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B 48 Hour Endurance Test, were ≤ 165°F for all times during the for the 1 hour endurance run. **(Acc Crit)** ________

[28] **CLOSE** TV-2, AFW PUMP 2B-B TEMPORARY DISCHARGE VLV. ________

[29] **ATTACH** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Endurance Test vibration test results, **AND**

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[30] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. ________

6.5 2-PMP-3-118, AUX FEEDWATER PMP 2A-A , 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Flow Tests at ≥300 ≤500 PSIG and all AFW PUMP VERIFICATION OF MINIMUM CURVE ACCEPTABILITY

6.5.1 Final Field Preparations

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.5 have been completed. ________

[2] **ENSURE** that Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL, [2-M-2]. ________

[3] **ENSURE** the following breakers are OPEN and RACKED UP into position:

A. 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10. ________

B. 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10. ________

[4] **ENSURE** the switch lineup listed in Appendix DD, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time Tests, Control Switch Alignment, is completed. ________

[5] **IF** temporary full flow test header is installed, **THEN**

REQUEST clearance **AND**

REMOVE full flow test header from 2A-A, 2B-B and 2A-S AFW pumps. ________

6.5.2 Section Performance

[1] AFW PMP 2A-A to Steam Generators 1 & 2

CAUTIONS

1) Monitor Steam Generators 1 and 2 level during 2-PMP-3-118, AUX FEEDWATER PMP 2A-A operation. Do not allow level to exceed 75% or fall below 30% as indicated by the narrow range level indication.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[1.1] **ENSURE** that steam generator pressure is 400 (350-450) psig. ________

[1.2] **RECORD** the system pre-test data for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A on Appendix T, Section 1.0, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Pre-Test Data. ________

[1.3] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-164, AFW PMP A-A SG 1 LEVEL,(2-M-3) **AND**

RECORD the indicated level.

2-LI-3-164 Level______________% ________

[1.4] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-156, AFW PMP A-A SG 2 LEVEL, **AND**

RECORD the indicated level.

2-LI-3-156 Level______________% ________

6.5.2 Section Performance (continued)

[1.5] **PLACE** the following Level Indicating Controllers in MANUAL:

[1.5.1] 2-LIC-3-156A, SG 2 SUPPLY FRM PMP 2 A-A ________

[1.5.2] 2-LIC-3-164A, SG 1 SUPPLY FRM PMP 2 A-A ________

[1.6] **ENSURE** the following valves are CLOSED:

[1.6.1] 2-LCV-3-156, SG 2 SUPPLY 2-LCV-3-156 CNTL ________

[1.6.2] 2-LCV-3-164, SG 1 SUPPLY 2-LCV-3-164 CNTL ________

[1.7] **IF** Steam Generator Blowdown is to remain in service, **THEN**

HOLD the following handswitches in OPEN while starting AFW PMP 2A-A:

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
SG 2 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-14/182	
SG 4 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-32/184	

[1.8] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START. ________

[1.9] **IF** Step 6.5.2[1.7] performed, **THEN**

RELEASE handswitches 2-HS-1-14/182 and 2-HS-1-32/184, for SG 2 and 4 Blowdown Vlvs. ________

[1.10] **MANUALLY** control LCVs with the Level Indicating Controllers until flows stabilize at a combined flow of 410 (400-420) GPM on Temporary Flowmeter TF-1 **AND**

RECORD the flow.

Temporary Flowmeter TF-1 __________410 (400-420) GPM. ________

6.5.2 Section Performance (continued)

[1.11] **RECORD** the system test data for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A on Appendix T, Section 2.0, TEST DATA. ________

[1.12] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **AND**

VERIFY locally that 2-PMP-3-118, AUX FEEDWATER PMP 2A-A STOPS. ________

[1.13] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System. ________

[1.14] **PERFORM** the calculations on Appendix T, Section 0 ________

[1.14.1] **PLOT** the intersection point of Total Dynamic Head and Flow on Appendix QQ. ________

[1.14.2] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

[1.14.3] **VERIFY** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A is capable of delivering 410 (400-420) GPM to two steam generators at a pressure between 300 and 500 psig to verify operability of the 2" bypass LCVs **(Acc Crit).** ________

6.5.2 Section Performance (continued)

[2] AFW PMP 2B-B to Steam Generators 3 & 4

CAUTIONS

1) Monitor Steam Generators 3 and 4 level during 2-PMP-3-128, AUX FEEDWATER PMP 2B-B operation. Do not allow level to exceed 75% or fall below 30% as indicated by the narrow range level indication.

2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.

3) The Motor Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[2.1] **ENSURE** that steam generator pressure is 400 (350-450) psig. ________

[2.2] **RECORD** the system pre-test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix T, Section 3.0, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Pre-Test Data. ________

[2.3] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-148, AFW PMP B-B SG 3 LEVEL,(2-M-3) **AND**

RECORD level: 2-LI-3-148 ____________% ________

[2.4] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-171, AFW PMP B-B SG 4 LEVEL, **AND**

RECORD level: 2-LI-3-171 ____________% ________

6.5.2 Section Performance (continued)

[2.5] **PLACE** the following Level Indicating Controllers in MANUAL:

[2.5.1] 2-LIC-3-148A, SG 3 SUPPLY FRM PMP 2B-B ________

[2.5.2] 2-LIC-3-171A, SG 4 SUPPLY FRM PMP 2B-B ________

[2.6] **ENSURE** the following valves are CLOSED:

[2.6.1] 2-LCV-3-148, SG 3 SUPPLY 2-LCV-3-148 CNTL ________

[2.6.2] 2-LCV-3-171, SG 4 SUPPLY 2-LCV-4-171 CNTL ________

[2.7] **IF** Steam Generator Blowdown is to remain in service, **THEN**

HOLD the following handswitches in OPEN while starting AFW PMP 2B-B:

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
SG 1 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-7/181	
SG 3 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-25/183	

[2.8] **PLACE** Handswitch 2-HS-3-128A, AFW PMP 2B-B, to START. ________

[2.9] **IF** Step 6.5.2[2.7] was performed, **THEN**

RELEASE handswitches 2-HS-1-7/181 and 2-HS-1-25/183, for SG 1 and 3 Blowdown Vlvs. ________

[2.10] **MANUALLY** control LCVs with the following Level Indicating Controllers until flows stabilize at a combined flow of 410 (400-420) GPM on Temporary Flowmeter TF-1 **AND**

RECORD the flow.
Temporary Flowmeter TF-1 __________410 (400-420) GPM ________

[2.11] **RECORD** the system test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix T, Section 4.0, 2-PMP-3-128, AUX FEEDWATER PMP 2B- B Test Data. ________

6.5.2 Section Performance (continued)

[2.12] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

VERIFY locally that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B STOPS. ________

[2.13] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System ________

[2.14] **LOWER** the control output to 0% (CLOSED) for the following controllers.

A. 2-LIC-3-156A, SG 2 SUPPLY FRM PMP A-A ________

B. 2-LIC-3-164A, SG 1 SUPPLY FRM PMP A-A, ________

C. 2-LIC-3-148A, SG 3 SUPPLY FRM PMP B-B ________

D. 2-LIC-3-171A, SG 4 SUPPLY FRM PMP B-B ________

[2.15] **PERFORM** the calculations on Appendix T Section 7.0. ________

[2.15.1] **PLOT** the intersection point of Total Dynamic Head and Flow on Appendix RR. ________

[2.15.2] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

[2.15.3] **VERIFY** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B is capable of delivering 410 (400-420) GPM to two steam generators at a pressure between 300 and 500 psig to verify operability of the 2” bypass LCVs **(Acc Crit).** ________

6.5.2 Section Performance (continued)

[3] AFW PMP 2A-S to all Steam Generators

CAUTIONS

1) The Turbine Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

2) 2-FCV-1-51 should not be operated continuously for more than five minutes. Continuous operation of valve is travel from FULL OPEN to FULL CLOSE, then FULL OPEN (or vice versa) without a one minute delay between valve strokes. If the valve is operated continuously for more than five minutes, then the valve should be idle for a minimum of 45 minutes.

[3.1] **ENSURE** that steam generator pressure is 400 (350-450) psig. ________

[3.2] **RECORD** the system pre-test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix T, Section 5.0, 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Pre-Test Data. ________

[3.3] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-164, AFW PMP A-A SG 1 LEVEL,(2-M-3) **AND**

RECORD level: 2-LI-3-164 ____________% ________

[3.4] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-156, AFW PMP A-A SG 2 LEVEL, **AND**

RECORD level: 2-LI-3-156 ____________% ________

[3.5] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-148, AFW PMP B-B SG 3 LEVEL,(2-M-3) **AND**

RECORD level: 2-LI-3-148 ____________% ________

6.5.2 Section Performance (continued)

[3.6] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-171, AFW PMP B-B SG 4 LEVEL, **AND**

RECORD level: 2-LI-3-171 ____________% ________

[3.7] **PLACE** the following Level Indicating Controllers in MANUAL:

[3.7.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP ________

[3.7.2] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP ________

[3.7.3] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP ________

[3.7.4] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP ________

[3.8] **ENSURE** the following valves are CLOSED:

[3.8.1] 2-LCV-3-172, SG 3 SUPPLY 2-LCV-3-172 CNTL ________

[3.8.2] 2-LCV-3-173, SG 2 SUPPLY 2-LCV-4-173 CNTL ________

[3.8.3] 2-LCV-3-174, SG 1 SUPPLY 2-LCV-3-174 CNTL ________

[3.8.4] 2-LCV-3-175, SG 4 SUPPLY 2-LCV-4-175 CNTL ________

[3.9] **IF** Steam Generator Blowdown is to remain in service, **THEN**

HOLD the following handswitches in OPEN while starting the TDAFW pump:

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
SG 1 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-7/181	
SG 2 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-14/183	
SG 3 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-25/183	
SG 4 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-32/184	

6.5.2 Section Performance (continued)

[3.10] **PLACE** Handswitch 2-HS-46-56A-S, TD AFWP T&T VLV, in OPEN **AND**

ENSURE AFWT comes to operating speed of 3900 to 4000 rpm on 2-SI-46-56A-S, T-D AFW PMP SPEED [2-M-4] _______

[3.11] **IF** Step 6.5.2[3.9] was performed, **THEN**

RELEASE all four Blowdown Valve handswitches. _______

[3.12] **MANUALLY** control LCVs with the following Level Indicating Controllers until flows stabilize at a combined flow of 720 (710-730) GPM on Temporary Flowmeter, TF-1.

[3.12.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP _______

[3.12.2] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP _______

[3.12.3] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP _______

[3.12.4] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP _______

[3.13] **RECORD** the flow indicated on Temporary Flowmeter, TF-1 __________720 (710-730) GPM _______

[3.14] **RECORD** the system test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix T, Section 6.0, TEST DATA. _______

[3.15] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

VERIFY locally that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B STOPS. _______

[3.16] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System. _______

6.5.2 Section Performance (continued)

[3.17] **LOWER** controller output to 0% (CLOSED) on the following LICs.

[3.17.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP ________

[3.17.2] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP ________

[3.17.3] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP ________

[3.17.4] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP ________

[3.18] **PERFORM** the calculations on Appendix T Section 7.0. ________

[3.18.1] **PLOT** the intersection point of Total Dynamic Head and Flow on Appendix RR. ________

[3.18.2] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

6.6 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time Tests

6.6.1 Final Field Preparations

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.6 have been completed. ______

[2] **ENSURE** that Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL, [2-M-2]. ______

[3] **ENSURE** the following breakers are OPEN and RACKED UP into position:

A. 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10. ______

B. 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10. ______

[4] **ENSURE** the switch lineup listed in Appendix DD, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time Tests, Control Switch Alignment, is completed. ______

[5] **IF** temporary full flow test header is installed, **THEN**

REQUEST clearance **AND**

REMOVE full flow test header from 2A-A and 2B-B AFW pumps. ______

6.6.1 Final Field Preparations (continued)

[6] **INSTALL** a 10 ohm precision resistor or decade box at 2-FM-3-163BB, SG #1 AUX FW FLOW MOD as follows:

[6.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-163BB, SG #1 AUX FW FLOW MOD, [2-L-11B]

_______ 1st

_______ CV

[6.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

[7] **INSTALL** a 10 ohm precision resistor or decade box at 2-FM-3-155AB, SG #2 AUX FW FLOW MOD as follows:

[7.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-155AB, SG #2 AUX FW FLOW MOD, [2-L-11A]

_______ 1st

_______ CV

[7.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.6.1 Final Field Preparations (continued)

[8] **INSTALL** a 10 ohm precision resistor or decade box at 2-FM-3-147BB, SG #3 AUX FW FLOW MOD as follows:

[8.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-147BB, SG #3 AUX FW FLOW MOD, [2-L-11B]

_______ 1st

_______ CV

[8.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

[9] **INSTALL** a 10 ohm precision resistor or decade box at 2-FM-3-170AB, SG #4 AUX FW FLOW MOD as follows:

[9.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-170AB, SG #4 AUX FW FLOW MOD, [2-L-11A]

_______ 1st

_______ CV

[9.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.6.1 Final Field Preparations (continued)

NOTE
Step 6.6.1[10] installs a Strip Chart Recorder channel to initiate a time mark on 2-PMP-3-118, AUX FEEDWATER PMP 2A-A breaker closure (0 VDC/CLEAR -125 VDC/ACTUATED).

[10] **INSTALL** the leads for Strip Chart Recorder Channel No. 1 across Terminal Block GG, Points 11(ST9) and 12 (ST10) located in 6900-V SHUTDOWN BOARD 2A-A Panel 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

NOTE
Step 6.6.1[11] installs a Strip Chart Recorder channel to initiate a time mark on 2-PMP-3-128, AUX FEEDWATER PMP 2B-B breaker closure (0 VDC/CLEAR -125 VDC/ACTUATED).

[11] **INSTALL** the leads for Strip Chart Recorder Channel No. 2 across Terminal Block GG, Points 11(ST9) and 12 (ST10) located in 6900-V SHUTDOWN BOARD 2B-B Panel 10 **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

6.6.1 Final Field Preparations (continued)

NOTE

Step 6.6.1[12] installs a Strip Chart Recorder channel to monitor the Motor Driven Auxiliary Feedwater Pump flow rate to Steam Generator 1 as indicated at 2-FI-3-163B, STM GEN #1 AUX FW IN (Scaling 10 GPM/mm, Signal Span 100.0 mVdc to 328.5 mVdc).

[12] **INSTALL** the leads for Strip Chart Recorder Channel No. 3 across the precision resistor or decade box installed at 2-FM-3-163BB, SG #1 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-163BB [2-L-11B] **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

NOTE

Step 6.6.1[13]installs a Strip Chart Recorder channel to monitor the Motor Driven Auxiliary Feedwater Pump flow rate to Steam Generator 2 as indicated at 2-FI-3-155A, STM GEN #2 AUX FW IN (Scaling 10 GPM/mm, Signal Span 100.0 mVdc to 328.5 mVdc).

[13] **INSTALL** the leads for Strip Chart Recorder Channel No. 4 across the precision resistor or decade box installed at 2-FM-3-155AB, SG #2 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-155AB [2-L-11B] **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

6.6.1 Final Field Preparations (continued)

[14] **RECORD** reference calibration signals on the Strip Chart Recorder analog channel traces (Channels 3 and 4).

M&TE_____________ Cal Due Date_____________ ________

NOTE
Step6.6.1[15] installs a Strip Chart Recorder channel to monitor the Motor Driven Auxiliary Feedwater Pump flow rate to Steam Generator 3 as indicated at 2-FI-3-147B, STM GEN #3 AUX FW IN (Scaling 10 GPM/mm, Signal Span 100.0 mVdc to 328.5 mVdc.)

[15] **INSTALL** the leads for Strip Chart Recorder Channel No. 5 across the precision resistor or decade box installed at 2-FM-3-147BB, SG #3 AUX FW FLOW MOD, with the NEGATIVE lead connected to Terminal 10 of 2-FM-3-147BB [2-L-11B] **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

6.6.1 Final Field Preparations (continued)

NOTE
Step 6.6.1[16] installs a Strip Chart Recorder channel to monitor the Motor Driven Auxiliary Feedwater Pump flow rate to Steam Generator 4 as indicated at 2-FI-3-170A, STM GEN #4 AUX FW IN (Scaling 10 GPM/mm, Signal Span 100.0 mVdc to 328.5 mVdc.)

[16] **INSTALL** the leads for Strip Chart Recorder Channel No. 6 across the precision resistor or decade box installed at 2-FM-3-170AB, SG #4 AUX FW FLOW MOD, with the NEGATIVE lead connected to Terminal 10 of 2-FM-3-170AB [2-L-11A] **AND**

RECORD the M&TE information.

M&TE__________ Cal Due Date__________

____
1st

____
CV

[17] **RECORD** reference calibration signals on the Strip Chart Recorder analog channel traces (Channels 5 and 6). ________

6.6.2 Section Performance

[1] Steam Generators 1 & 2

CAUTIONS

1) Monitor Steam Generators 1 and 2 level during 2-PMP-3-118, AUX FEEDWATER PMP 2A-A operation. Do not allow level to exceed 75% or fall below 30% as indicated by the narrow range level indication.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[1.1] **RECORD** the system pre-test data for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A on Appendix MM, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Response Time, Section 1.0, PRE-TEST DATA. ________

[1.2] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-164, AFW PMP A-A SG 1 LEVEL,(2-M-3) **AND**

RECORD level from 2-LI-3-164:______________%. ________

[1.3] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-156, AFW PMP A-A SG 2 LEVEL,(2-M-3) **AND**

RECORD level from 2-LI-3-156:______________%. ________

[1.4] **START** the Strip Chart Recorder at 25mm/sec. ________

[1.5] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START. ________

6.6.2 Section Performance (continued)

[1.6] **WHEN** the flow to the Steam Generators stabilizes, **THEN**

RECORD the following:

- Pump flow (temporary flowmeter, TF-1) __________GPM. ________
- Suction Pressure (temporary gauge, TG-1) ___________Psig. ________
- Discharge Pressure (temporary gauge, TG-2) ___________Psig. ________

[1.7] **STOP** the Strip Chart Recorder. ________

[1.8] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **AND**

VERIFY locally that 2-PMP-3-118, AUX FEEDWATER PMP 2A-A STOPS. ________

[1.9] **RECORD** post-test calibration signals on the Strip Chart Recorder analog traces (Channels 3 and 4) **AND**

ANALYZE the Strip Chart Recorder trace as directed on Appendix MM, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Response Time, Section 2.0, RECORDER TRACE ANALYSIS. ________

[1.10] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix MM, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Response Time, Section 3.0, RECORDER TRACE ANALYSIS. ________

6.6.2 Section Performance (continued)

[1.11] Transfer the information from Appendix MM, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Response Time, Section 2.0, RECORDER TRACE ANALYSIS and Appendix MM, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Response Time, Section 3.0, RECORDER TRACE ANALYSIS to the table below. ________

NOTE

2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 410 gpm (+ Recirc Flow)to at least two intact steam generators at 1107 ± 50 psia (1092 ± 35 psig). The total time response requirement of less than 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

Parameter	Value	Criteria	Actual	Initials
Response Time	Sec	≤ 41 Sec		
Flow to SGs	GPM	≥ 410 GPM		
Recirc Flow	GPM	≥ 30 GPM		
P0400A, STM GEN 1 STM OUT 1 PRESSURE	PSIG	1092 ±35 PSIG		
P0420A-STM GEN 2 STM OUT 1 PRESSURE	PSIG	1092 ±35 PSIG		

[1.12] **VERIFY** that 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, is capable of delivering a flow ≥ 410 GPM to two steam generators at 1092 ±35 PSIG within 41.0 seconds of pump breaker closure as determined on Table at Step 6.6.2[1.11] **(ACC CRIT)** ________

[1.13] **PERFORM** the calculations on Appendix MM Section 4.0, **THEN**

PLOT the intersection point of Total Dynamic Head and Flow on Appendix QQ. ________

[2] Steam Generators 3 & 4

6.6.2 Section Performance (continued)

[2.1] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated on 2-LI-3-148, AFW PMP B-B SG 3 LEVEL, **AND**

RECORD level from 2-LI-3-148 ____________% ________

[2.2] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-171, AFW PMP B-B SG 4 LEVEL, **AND**

RECORD level from 2-LI-3-171 _____________% ________

[2.3] **RECORD** the system pre-test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix NN, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Response Time, Section 1.0, PRE-TEST DATA. ________

[2.4] **START** the Strip Chart Recorder at 25mm/sec. ________

[2.5] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to START. ________

[2.6] **WHEN** the flow to the Steam Generators stabilizes, **THEN**

RECORD the following:

- Pump flow (temporary flowmeter, TF-1) __________GPM. ________
- Suction Pressure (temporary gauge, TG-3) ___________Psig. ________
- Discharge Pressure (temporary gauge, TG-4) ___________Psig. ________

[2.7] **STOP** the Strip Chart Recorder. ________

6.6.2 Section Performance (continued)

[2.8] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

VERIFY locally that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B STOPS. ________

[2.9] **RECORD** post-test calibration signals on the Strip Chart Recorder analog traces (Channels 5 and 6) **AND**

ANALYZE the Strip Chart Recorder trace as directed on Appendix NN, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time, Section 2.0, RECORDER TRACE ANALYSIS. ________

[2.10] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix NN, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Response Time, Section 3.0, RECORDER TRACE ANALYSIS. ________

6.6.2 Section Performance (continued)

[2.11] Transfer the information from Appendix NN, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Response Time, Section 2.0, RECORDER TRACE ANALYSIS and Appendix NN, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Response Time, Section 3.0, RECORDER TRACE ANALYSIS to the table below. ________

NOTE

2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 410 gpm (+ Recirc Flow)to at least two intact steam generators at 1107 ± 50 psia (1092 ± 35 psig). The total time response requirement of less than 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

Parameter	Value	Criteria	Actual	Initials
Response Time	Sec	≤ 41 Sec		
Flow to SGs	GPM	≥ 410 GPM		
Recirc Flow	GPM	≥ 30 GPM		
P0440A, STM GEN 3 STM OUT 1 PRESSURE	PSIG	1092 ±35 PSIG		
P0460A-STM GEN 4 STM OUT 1 PRESSURE	PSIG	1092 ±35 PSIG		

[2.12] **VERIFY** that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, is capable of delivering a flow ≥ 410 GPM to two steam generators at 1092 ±35 PSIG within 41.0 seconds of pump breaker closure as determined on Table at Step 6.6.2[2.11] **(ACC CRIT)** ________

[2.13] **PERFORM** the calculations on Appendix NN Section 4.0, **THEN**

PLOT the intersection point of Total Dynamic Head and Flow on Appendix RR. ________

6.6.2 Section Performance (continued)

[3] **REMOVE** the leads connected to Strip Chart Recorder channel 1 from Terminal Block GG, Points 11(ST9) and 12 (ST10) located in 6900-V SHUTDOWN BOARD 2A-A Panel 10. (Step 6.6.1[9]).

_______ 1st

_______ CV

[4] **REMOVE** the leads connected to Strip Chart Recorder channel 2 from Terminal Block GG, Points 11(ST9) and 12 (ST10) located in 6900-V SHUTDOWN BOARD 2B-B Panel 10. (Step 6.6.1[10])

_______ 1st

_______ CV

[5] **REMOVE** the leads connected to Strip Chart Recorder channel 3 from the precision resistor or decade box installed at 2-FM-3-163BB, SG #1 AUX FW FLOW MOD. (2-L-11B) (Step 6.6.1[11]).

_______ 1st

_______ CV

[6] **REMOVE** the leads connected to Strip Chart Recorder channel 4 from the precision resistor or decade box installed at 2-FM-3-155AB, SG #2 AUX FW FLOW MOD. (Step 6.6.1[12])

_______ 1st

_______ CV

[7] **REMOVE** the leads connected to Strip Chart Recorder channel 5 from the precision resistor or decade box installed at 2-FM-3-147BB, SG #3 AUX FW FLOW MOD. (Step 6.6.1[14])

_______ 1st

_______ CV

6.6.2 Section Performance (continued)

[8] **REMOVE** the leads connected to Strip Chart Recorder channel 6 from the precision resistor or decade box installed at 2-FM-3-170AB, SG #4 AUX FW FLOW MOD. (Step 6.6.1[15]) ________
1st

____
CV

[9] **LOWER** the output to 0% (CLOSED) for the following controllers.

A. 2-LIC-3-156A, SG 2 SUPPLY FRM PMP A-A ________

B. 2-LIC-3-164A, SG 1 SUPPLY FRM PMP A-A, ________

C. 2-LIC-3-148A, SG 3 SUPPLY FRM PMP B-B ________

D. 2-LIC-3-171A, SG 4 SUPPLY FRM PMP B-B ________

6.7 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Electrical & Mechanical Overspeed Trip Test

NOTE
This Section may be N/A if overspeed testing has already been performed as part of the assembly of the 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. The Test Engineer may annotate the test log and provide documentation of work order and data sheet information in this instruction package.

6.7.1 Final Field Preparations

NOTE
Section 6.15, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Overspeed Trip Setup and Testing Pre-Hot Functional Test, may be performed any time using the Turbine Trip Overspeed Device (TTOD) referenced in IMI-46.002 prior to entering the Hot Functional Test.

[1] **ENSURE** that Section 6.15, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, OVERSPEED TRIP SETUP AND TESTING PRE-HOT FUNCTIONAL TEST has been satisfactorily completed prior to continuing. ________

[2] **VERIFY** prerequisites listed in Section 4.0 for Section 6.7 have been completed. ________

[3] **ESTABLISH** the switch lineup listed in Appendix G, Switch Alignment, Section 6.7. ________

[4] **ESTABLISH** the breaker lineup listed in Appendix E, Breaker Alignment, Section 6.7 and/or 6.15. ________

[5] **ESTABLISH** the valve alignment listed in Appendix I, Valve Alignment, Section 6.7. ________

6.7.1 Final Field Preparations (continued)

NOTE
A temporary jumper and test switch is installed in Panel 2-L-381 to simulate loss of flow controller signal (Section 6.7).

[6] **INSTALL** a temporary jumper with a test switch as follows:

[6.1] **LIFT** wire at Terminal Block TB-1, Point 16 (AFP40), located in Panel 2-L-381 [A14T/692]

_______ 1st

_______ CV

[6.2] **INSTALL** a temporary jumper with a CLOSED single pole/single throw test switch (Test Switch TS-2) between the lifted wire and TB-1, Point 16.

_______ 1st

_______ CV

6.7.2 Section Performance

CAUTIONS

1) The turbine should not be operated continuously for more than one hour and oil temperature leaving the bearings should not be allowed to exceed 180 °F with the pump uncoupled from the turbine because the oil cooler will not be supplied with cooling water from the pump.
2) 2-FCV-1-51 should not be operated continuously for more than five minutes. Continuous operation is valve travel from FULL OPEN to FULL CLOSE, then FULL OPEN (or vice versa) without a one minute delay between valve strokes. If the valve is operated continuously for more than five minutes, then the valve should be idle for a minimum of 45 minutes.

NOTE

The following step will defeat the electrical overspeed trip.

[1] **LIFT** wire 23 at Terminal 9 on 2-SM-46-56, AFWT A-S AUTO EOT SIG CONVERTER, located in Panel 2-L-326 [A14U/692]. ________ 1st

________ CV

[2] **ENSURE** Potentiometer 2-XC-46-54 [A14T/692], AFWT A-S IDLE SPEED POT, located in Panel 2-L-381, adjusted to the 0% position. ________

[3] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, MANUAL Pushbutton. ________

[4] **DEPRESS** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTRL, AUTO pushbutton located in Panel 2-L-381 [A14T/692]. ________

[5] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to lower control output to 0%. ________

6.7.2 Section Performance (continued)

NOTE

During turbine operation monitor the shaft gland seals for steam leakage.

[6] **SLOWLY OPEN** Valve 2-FCV-1-51, [A14U/692] TD AUX FEEDWATER PMP TRIP & THROTTLE VALVE, using manual hand wheel until turbine governor is controlling turbine speed, **THEN**

THROTTLE OPEN 2-FCV-1-51 until 1 turn from FULL OPEN. ________

CAUTION

Turbine Speed must be continuously monitored while rolling the turbine to ensure maximum turbine speed of 5317 RPM is not exceeded.

[7] **RECORD** the following, **AND**

VERIFY specified minimum criteria are met where applicable.

Parameter	Indication	Criteria	Initials
SPEED 2-SI-46-56B [2-L-381]	RPM	N/A	
SPEED 2-SI-46-56A-S [2-M-4]	RPM	N/A	
SPEED LOCAL M&TE TACH	RPM	N/A	
2-FIC-46-57A Output Meter [2-M-4]	%	< 3%	
2-FIC-46-57B Output Meter [2-L-381]	%	< 3%	

M&TE____________ Cal Due Date____________ ________

6.7.2 Section Performance (continued)

[8] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to raise control output to 100%(OPEN)., **THEN**

RECORD the following and verify criteria is met as applicable.

Parameter	Indication	Criteria	Initials
SPEED 2-SI-46-56B	RPM	N/A	
SPEED 2-SI-46-56A	RPM	N/A	
SPEED LOCAL M&TE	RPM	N/A	
2-FIC-46-57A Output Meter	%	> 97%	
2-FIC-46-57B Output Meter	%	> 97%	

M&TE____________ Cal Due Date____________ ________

[9] **SLOWLY INCREASE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, output until the turbine mechanical overspeed trip mechanism ACTUATES, **THEN**

RECORD the speed at which the trip occurs, **AND**

VERIFY the speed recorded locally is between 4839 and 5036 RPM.

SPEED (2-SI-46-56B)__________RPM ________

SPEED (Local M&TE TACH)__________
Between 4839 and 5036 RPM (**Acc Crit)** ________

M&TE____________ Cal Due Date____________ ________

[10] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to lower control output to 0%. ________

[11] **ADJUST** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, to the 0% position. ________

[12] **PLACE** Handswitch 2-HS-46-56A [2-M-4], T-D AFWP T&T VLV, to CLOSE. ________

6.7.2 Section Performance (continued)

[13] **MANUALLY RESET** the overspeed trip linkage located at the governor end of the Auxiliary Feedwater Pump Turbine. ________

[14] **SLOWLY OPEN** valve 2-FCV-1-51, TD AUX FEEDWATER PMP TRIP and THROTTLE VALVE using the manual hand wheel until the turbine governor is controlling the turbine speed **THEN**

THROTTLE OPEN 2-FCV-1-51 until 1 turn from FULL OPEN. ________

[15] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to raise control output to 100%, **THEN**

RECORD the following:

SPEED (2-SI-46-56B)__________RPM ________

SPEED (Local M&TE TACH)__________RPM ________

M&TE______________ Cal Due Date______________ ________

[16] **DEPRESS** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTROL, MANUAL pushbutton. ________

[17] **DEPRESS** 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, AUTO pushbutton, **AND**

RECORD the following:

SPEED (2-SI-46-56B)__________RPM ________

SPEED (Local M&TE TACH)__________RPM ________

M&TE______________ Cal Due Date______________ ________

6.7.2 Section Performance (continued)

[18] **SLOWLY INCREASE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, output until the turbine mechanical overspeed trip mechanism ACTUATES, **THEN**

RECORD the speed at which the trip occurs, **AND**

VERIFY the speed recorded locally is between 4839 and 5036 RPM.

SPEED (2-SI-46-56B)__________RPM __________

SPEED (Local M&TE TACH)__________
Between 4839 and 5036 RPM (**Acc Crit**) __________

M&TE_____________ Cal Due Date_____________ __________

[19] **ADJUST** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, to 0% position. __________

[20] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. __________

[21] **MANUALLY RESET** the overspeed trip linkage located at the governor end of the Auxiliary Feedwater Pump Turbine. __________

[22] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to lower control output to 0%. __________

[23] **SLOWLY OPEN** valve 2-FCV-1-51, TD AUX FEEDWATER PUMP TRIP & THROTTLE VALVE using the manual hand wheel until the turbine governor is controlling turbine speed, **THEN**

THROTTLE OPEN 2-FCV-1-51 until 1 turn from **FULL OPEN**. __________

[24] **ADJUST** Controller 2-FIC-46-57A, T-D AFWP FLOW CONTROLLER, to raise control output to 100%. __________

6.7.2 Section Performance (continued)

[25] **SLOWLY INCREASE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, output until the turbine mechanical overspeed trip mechanism ACTUATES, **THEN**

RECORD the speed at which the trip occurs, **AND**

VERIFY the speed recorded locally is between 4839 and 5036 RPM.

SPEED (2-SI-46-56B)__________RPM ________

SPEED (Local M&TE TACH)__________
Between 4839 and 5036 RPM **(Acc Crit)** ________

M&TE_____________ Cal Due Date_____________ ________

NOTE
Step 6.7.2[26] reinstates the Electrical Overspeed trip function for the Electrical Overspeed Test.

[26] **TERMINATE** Wire 23 at Terminal 9 on 2-SM-46-56, located in Panel 2-L-326. (Step 6.7.2 [1])

____
1st

____
CV

[27] **ADJUST** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, to the 0% position. ________

[28] **ADJUST** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTROL, to lower control output to 0%. ________

[29] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. ________

[30] **MANUALLY RESET** the overspeed trip linkage located at the governor end of the Auxiliary Feedwater Pump Turbine. ________

6.7.2 Section Performance (continued)

[31] **SLOWLY OPEN** valve 2-FCV-1-51, TD AUX FEEDWATER PMP TRIP & THROTTLE Valve, using the manual hand wheel until the Turbine governor is controlling the Turbine speed, **THEN**

THROTTLE OPEN 2-FCV-1-51 until 1 turn from FULL OPEN. ________

[32] **ADJUST** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTROL, to raise control output to 100%. ________

[33] **VERIFY** Annunciator Window 60-A, AFW PMP A-S ELEC OVERSPEED TRIP, at Panel 2-XA-55-3C, is CLEAR. ________

[34] **SLOWLY INCREASE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, output until the turbine electrical overspeed trip mechanism ACTUATES, **THEN**

RECORD the speed at which the trip occurs, **AND**

VERIFY the speed recorded locally is between 4258 and 4432 RPM.

SPEED (2-SI-46-56B)__________RPM ________

SPEED (M&TE Tach)__________
Between 4258 and 4432) RPM (**Acc Crit**) ________

M&TE_____________ Cal Due Date_____________ ________

NOTE
The turbine electrical overspeed annunciation will occur upon exceeding overspeed setpoint and will reset as turbine speed decrease after trip and throttle valve closure.

[35] **VERIFY** Annunciator Window 60-A, AFW PMP A-S ELEC OVERSPEED TRIP, located at Panel XA-55-3C is in ALARM. ________

[36] **ADJUST** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, to the 0% position. ________

6.7.2 Section Performance (continued)

[37] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE, **AND**

VERIFY locally that the latch lever re-latches to the trip hook. ________

[38] **SLOWLY OPEN** valve 2-FCV-1-51, TD AUX FEEDWATER PMP TRIP & THROTTLE VALVE, using the manual hand wheel until Turbine Governor is controlling turbine speed **THEN**

THROTTLE OPEN 2-FCV-1-51 until 1 turn from FULL OPEN **AND**

RECORD the following speed indications.

SPEED (2-SI-46-56A)__________RPM ________

SPEED (Local M&TE TACH)__________RPM ________

M&TE_____________ Cal Due Date_____________ ________

[39] **OPEN** Test Switch TS-2, installed at Panel 2-L-381 [A14T/692], **AND**

RECORD the following:

SPEED (2-SI-46-56B)__________RPM ________

SPEED (Local M&TE TACH)__________RPM ________

M&TE_____________ Cal Due Date_____________ ________

[40] **SLOWLY INCREASE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, output until speed increases to 3950 (3900 - 4000) RPM INDICATED at 2-SI-46-56B, AFWT A-S, **THEN**

RECORD the following:

SPEED (2-SI-46-56B)__________RPM ________

SPEED (POSITION 2-XC-46-54)__________% ________

M&TE_____________ Cal Due Date_____________ ________

6.7.2 Section Performance (continued)

[41] **PLACE** Handswitch 2-HS-46-56A, T-D AWFP T&T VLV, to CLOSE. ______

[42] **OPEN** valve 2-FCV-1-17.using 2-HS-1-17A [2-M-4], STEAM HDR TO T-D AFW PMP ______

[43] **REMOVE** the blank and/or support INSTALLED on the turbine (Step 4.3.4[1]) for overspeed trip testing.

______ 1st

______ CV

[44] **REMOVE** Test Switch TS-2 INSTALLED between lifted wire AFP40, TB-1, Point 16, located in Panel 2-L-381. (Step 6.7.1[6.2])

______ 1st

______ CV

[45] **TERMINATE** wire AFP40 (lifted in Step 6.7.1[6.1]) at TB-1 Point 16, located in Panel 2-L-381.

______ 1st

______ CV

[46] **COUPLE** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, to the turbine REMOVED in Step 4.3.4[1].

______ 1st

______ CV

[47] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. ______

6.8 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

6.8.1 Final Field Preparations

[1] **ENSURE** plant conditions are being controlled at the 557°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown. ________

[2] **ENSURE** the auxiliary feedwater temporary piping full flow header has been installed, as required, to 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, as depicted on Appendix V, Auxiliary Feedwater Temporary Piping - Full-Flow Header. ________

NOTES

1) Operator action is required during this test performance to control RCS parameters within the provided bands for the purposes of this test. Normal operating procedures (GO, TOP) provide plant operating bands and are not to be exceeded.
2) Pressurizer heaters may be turned on as desired to obtain hot water flow out of the Pressurizer for additional heat input to RCS.
3) If Pressurizer level drops to the point which causes letdown to isolate, Operators should take appropriate action including stopping the cooldown and loss of Pressurizer level.

[3] **ENSURE** the following RCS and Pressurizer parameters are maintained during 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, testing:

[3.1] Pressurizer Pressure - 2235psig (2210 - 2250psig). ________

[3.2] Pressurizer Level - ≥20% (20 - 40%). ________

[3.3] RCS temperature - 557°F (551 - 558°F). ________

6.8.1 Final Field Preparations (continued)

NOTES

1) 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S will be drawing steam from SG 1 for the duration of the Hydraulic Performance Testing. It may become necessary to make up to the SG periodically.
2) Beginning the endurance run with an elevated SG NR water level may aid in reducing the amount of makeup to the SG.
3) Water additions to the SG should be done in a manner which limits the effect upon RCS temperature and pressure.
4) Following any addition of water to SG #1, time should be taken to allow the SG and RCS parameters to stabilize prior to beginning steam flow to 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S.

[4] **ENSURE** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A available for maintaining SG 1 level during 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, tests ________

[4.1] **IF** makeup is required, **THEN**

OPERATE 2-PMP-3-118, AUX FEEDWATER PMP 2A-A as required to maintain a SG 1 level band of 30-70% NR ________

[4.2] **MONITOR** RCS pressures and temperatures while slowly making up to SG 1. ________

[5] **VERIFY** the equipment alignment in the following Appendices are completed;

[5.1] Appendix F, Switch Alignment ________

[5.2] Appendix D, Breaker Alignment ________

[5.3] Appendix H, Valve Alignment ________

[6] **VERIFY** prerequisites listed in Section 4.0 for Section 6.8 have been completed. ________

[7] **ENSURE** Condensate Storage Tank level is greater than 200,000 gallons (200k - 270k) as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL, [2-M-2]. ________

6.8.1 Final Field Preparations (continued)

[8] **ENSURE** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer has test equipment and personnel in place to support vibration testing. ________

CAUTION

Inadequate venting of the suction piping and the AFW pump casings could lead to equipment damage. Personnel should be prepared to catch water and route to a drain to ensure a good solid stream of water is observed from the vent locations to ensure no voids exist in the pump casings or suction headers prior to running a pump.

[9] **ENSURE** Operations performs AFW pump and piping venting as follows:

[9.1] **VENT** AFW pump suction header at 2-VTV-2-675, CNDS XFER PMP/AFW PMP CST B SUP HDR VENT. ________

[9.2] **VENT** AFW pump suction header in the Auxiliary Building at 2-VTV-3-908, AUX FEEDWATER PUMP SUCTION VENT. ________

[9.3] **VENT** AFW pump suction header, 2-VTV-3-909, AUX FEEDWATER PUMP SUCTION VENT. ________

[9.4] **VENT** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 2-VTV-3-930, TD AUX FEEDWATER PUMP CASING VENT. ________

6.8.2 Section Performance

CAUTIONS

1) The Turbine Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) 2-FCV-1-51 should not be operated continuously for more than five minutes. Continuous operation of valve is travel from FULL OPEN to FULL CLOSE, then FULL OPEN (or vice versa) without a one minute delay between valve strokes. If the valve is operated continuously for more than five minutes, then the valve should be idle for a minimum of 45 minutes.

[1] **ENSURE** Potentiometer 2-XC-46-54, AFWT A-S IDLE SPEED POT, located in Panel 2-L-381 [A14T/692], is set to 0%. ________

[2] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, AUTO pushbutton, **AND**

VERIFY the auto mode status lamp is LIT. ________

[3] **DEPRESS** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTRL, AUTO pushbutton located at Panel 2-L-381 [A14T/692], **AND**

VERIFY the auto mode status lamp is LIT. ________

[4] **NOTIFY** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for short cycle steady state event for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

[5] **REQUEST** Operations to place Handswitch 2-HS-46-56A, T-D AFWP T & T VLV, to OPEN, **THEN**

VERIFY locally 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, is RUNNING. ________

[6] **DEPRESS** Controller 2-FIC-46-57B, AUX FPT FLOW INDICATING CONTRL, MANUAL pushbutton. ________

6.8.2 Section Performance (continued)

[7] **ADJUST** 2-FIC-3-57B, AUX FPT FLOW INDICATING CONTRL, Manual Drive Lever until the turbine speed of 3950 RPM (3925 to 3950 RPM), indicated on the local tachometer is established. _________

[7.1] **RECORD** the turbine speed indicated on the local tachometer, **AND**

VERIFY that the speed is 3950 RPM (3925 to 3950 RPM).

Turbine Speed (Local Tach)__________RPM _________

[7.2] **RECORD** the Recirc Flow indicated on the temporary flowmeter, TF-1, **AND**

VERIFY that the flow is ≥50 GPM.

Recirc Flow (temporary flowmeter, TF-1)

__________GPM **(Acc Crit)** _________

[8] **PERFORM** the following to throttle 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow to 257 GPM (247 to 267 GPM).

[8.1] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, temporary discharge valve TV-3 [A15T/692] until pump flow INDICATED on the temporary flowmeter, TF-1 is 257 GPM (247 to 267 GPM) _________

NOTE
Step 6.8.2[9] through Step 6.8.2[11] should be performed simultaneously.

[9] **RECORD** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, data on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Section 1.0, Data Collection Sheet 1. _________

6.8.2 Section Performance (continued)

[10] **PERFORM** piping vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

_________ 2-PTI-999-01 Test Engr

[11] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

_________ TI-31.02 Test Engr

NOTE
If speed adjustments are required to achieve the specified speed at Step 6.8.2[12.3], this may be performed using Controller 2-FIC-46-57B located at Panel 2-L-381.

[12] **PERFORM** the following to throttle 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow to 451 GPM (441 to 461 GPM).

[12.1] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, temporary discharge valve TV-3 [A15T/692] until pump flow INDICATED on the temporary flowmeter, TF-1 is 451 GPM (441 to 461 GPM). _________

[12.2] **RECORD** the flow indicated on the temporary flowmeter, TF-1, **AND**

VERIFY that the flow is 451 GPM (441 to 461 GPM).

Pump flow(temporary flowmeter, TF-1)__________GPM _________

[12.3] **RECORD** the Tachometer reading **AND**

VERIFY the tachometer reading is 3950 RPM (3925 to 3950 RPM)

Turbine Speed (Local Tach)__________RPM _________

6.8.2 Section Performance (continued)

NOTE
Step 6.8.2[13] and Step 6.8.2[14] may be performed simultaneously.

[13] **RECORD** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, data on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Section 2.0, Data Collection Sheet 2. ________

NOTE
A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[14] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

NOTE
If speed adjustments are required to achieve the specified speed at Step 6.8.2[15.3], this may be performed using Controller 2-FIC-46-57B located at Panel 2-L-381.

[15] **PERFORM** the following to throttle 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow to 790 GPM (780 to 800 GPM).

[15.1] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S; temporary discharge valve TV-3 until pump flow INDICATED on the temporary flowmeter, TF-1, TF-1 is 790 GPM (780 to 800 GPM). ________

6.8.2 Section Performance (continued)

[15.2] **RECORD** the flow indicated on the temporary flowmeter, TF-1, **AND**

VERIFY that the flow is 790 GPM (780 to 800 GPM).

Pump flow:(temporary flowmeter, TF-1)_________GPM _________

[15.3] **RECORD** the Tachometer reading **AND**

VERIFY the tachometer reading is 3950 RPM (3925 to 3975 RPM)

Turbine Speed (Local Tach)__________RPM _________

NOTE

Step 6.8.2[16] and Step 6.8.2[17] may be performed simultaneously.

[16] **RECORD** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, data on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Section 3.0, Data Collection Sheet 3. _________

NOTE

A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[17] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

6.8.2 Section Performance (continued)

NOTE
If speed adjustments are required to achieve the specified speed at Step 6.8.2[18.3], this may be performed using Controller 2-FIC-46-57B located at Panel 2-L-381.

[18] **PERFORM** the following to throttle 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow to 950 GPM (940 to 960 GPM).

[18.1] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S; temporary discharge valve TV-3 until pump flow INDICATED on the temporary flowmeter, TF-1 is 950 GPM (940 to 960 GPM). ________

[18.2] **RECORD** the flow indicated on the temporary flowmeter, TF-1, **AND**

VERIFY that the flow is 950 GPM (940 to 960 GPM).

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[18.3] **RECORD** the Tachometer reading **AND**

VERIFY the tachometer reading is 3950 RPM (3925 to 3975 RPM)

Turbine Speed (Local Tach)__________RPM ________

NOTE
Step 6.8.2[19] and Step 6.8.2[20] may be performed simultaneously.

[19] **RECORD** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, data on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Section 4.0, Data Collection Sheet 4. ________

[20] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

6.8.2 Section Performance (continued)

NOTE
If speed adjustments are required to achieve the specified speed at Step 6.8.2[21.3], this may be performed using Controller 2-FIC-46-57B located at Panel 2-L-381.

[21] **PERFORM** the following to throttle 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow to 1100 GPM (1090 to 1110 GPM).

[21.1] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S; temporary discharge valve TV-3 until pump flow INDICATED on the temporary flowmeter, TF-1 is 1100 GPM (1090 to 1110 GPM). ________

[21.2] **RECORD** the flow indicated on the temporary flowmeter, TF-1, **AND**

VERIFY that the flow is 1100 GPM (1090 to 1110 GPM).

Pump flow (temporary flowmeter, TF-1)
__________GPM ________

[21.3] **RECORD** the Tachometer reading **AND**

VERIFY the tachometer reading is 3950 RPM (3925 to 3975 RPM)

Turbine Speed (Local Tach)__________RPM ________

NOTE
Step 6.8.2[22] and Step 6.8.2[23] may be performed simultaneously.

[22] **RECORD** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, data on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Section 5.0, Data Collection Sheet 5. ________

6.8.2 Section Performance (continued)

NOTE
A copy of the completed TI-31.02 procedure with acceptance criteria shall be attached to this test.

[23] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[24] **DEPRESS** the mechanical overspeed trip lever located on the governor end bearing housing of the Auxiliary Feedwater Pump Turbine, **AND**

VERIFY locally the turbine TRIPPED. _________

[25] **CLOSE** temporary discharge valve TV-3. _________

[26] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE, **THEN**

MANUALLY RESET the mechanical overspeed trip linkage located at the governor end of the Auxiliary Feedwater Pump Turbine in accordance with 2-TOP-3.02, Auxiliary Feedwater System. _________

[27] **PERFORM** Data Reduction and Calculations on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Sections 6.0 through 10.0. _________

[28] **VERIFY** that the Total Dynamic Head and the corresponding flow determined on Appendix O, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance, Sections 6.0 through 10.0 meet or exceed the Total Dynamic Head on the Certified Vendor Curve, Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow. **(Acc Crit)** _________

6.8.2 Section Performance (continued)

[29] **ATTACH** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, hydraulic performance vibration test results, and

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[30] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.9 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

6.9.1 Final Field Preparations

[1] **IF** full flow test header is **NOT** INSTALLED for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, **THEN**

REQUEST clearance **AND**

INSTALL full flow test header to 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

[2] **VERIFY** plant conditions are being controlled at the 557°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown. ________

[3] **ENSURE** the auxiliary feedwater temporary piping full flow header has been installed, as required, to 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S as depicted on Appendix V, Auxiliary Feedwater Temporary Piping - Full-Flow Header. ________

[4] **ENSURE** 2-PMP-3-118, AUX FEEDWATER PUMP 2A-A available for maintaining SG 1 level during 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S tests. ________

[4.1] **IF** makeup is required, **THEN**

[4.1.1] **OPERATE** 2-PMP-3-118, AUX FEEDWATER PUMP 2A-A as required to maintain SG 1 level 30 - 60% NR ________

[4.1.2] **MONITOR** RCS pressures and temperatures while slowly making up to SG 1. ________

[5] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[6] **VERIFY** prerequisites listed in Section 4.0 for Section 6.9 have been completed. ________

6.9.1 Final Field Preparations (continued)

[7] **RECORD** system pre-test parameters on Endurance Test Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, TIME: PRE-TEST CONDITIONS. ________

[8] **ENSURE** Potentiometer 2-XC-46-54 [A14T/692], TD AFW PMP POT SPEED CONTROL, located at Panel 2-L-381 is set to 0%. ________

[9] **DEPRESS** Controller 2-FIC-46-57A, TD AFW PMP FW DISCH FLOW IND CNTLR, AUTO pushbutton, **AND**

VERIFY AUTO mode status lamp is LIT. ________

[10] **DEPRESS** Controller 2-FIC-46-57B-S, TD AFW PMP FW DISCH FLOW IND CNTLR, AUTO pushbutton, **AND**

VERIFY AUTO mode status lamp is LIT. ________

6.9.2 Section Performance

CAUTIONS

1) The Turbine Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) 2-FCV-1-51 should not be operated continuously for more than five minutes. Continuous operation of the valve involves travel from full open to full close and back to full open or vice versa without a minimum of 1 minute delay between strokes. If the valve is operated continuously for more than five minutes, then the valve should be idle for a minimum of 45 minutes.
3) The CST Temperature will be monitored during the 48 hour endurance test utilizing 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S pump discharge Temperature Indicator 2-TI-3-149 and should not exceed 140°F. If temperature reaches 140°F, secure the pump.

[1] **REQUEST** Operations place Handswitch 2-HS-46-56A, T-D AFWP T & T VLV, to OPEN **AND**

VERIFY locally AFW pump stabilizes. ________

NOTE

If speed adjustments are required to achieve 3950 RPM (3925 to 3950 RPM), then controller 2-FIC-46-57-B, located on panel 2-L-381, may be used to make the adjustments.

[2] **SLOWLY OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, temporary discharge valve TV-3 [A15T/692] until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥410 GPM. ________

[2.1] **RECORD** flow indicated on temporary flowmeter, TF-1.

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[2.2] **RECORD** the Tachometer reading.

Turbine Speed (Local Tach)__________RPM ________

6.9.2 Section Performance (continued)

NOTE
The Main Control Room clock will be utilized when the recording of time is specified in this procedure.

[3] **RECORD** the Date/Time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs) ____________________ d/hr:min ________

[4] **RECORD** time T-0 data on Endurance Test Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, TIME: T-0. ________

6.9.2 Section Performance (continued)

NOTE

Step 6.9.2[5] and Step 6.9.2[6] must be performed simultaneously at the designated times.

[5] **RECORD** the data as required, on the following Sheets of Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, at the designated times during the next 48 hours:

	Data Sheet	Time After T-0	Initials
A.	TIME: T-0 + 15 MIN.	15 min.	______
B.	TIME: T-0 + 30 MIN.	30 min.	______
C.	TIME: T-0 + 1 HOUR	1 hr	______
D.	TIME: T-0 + 4 HOURS	4 hrs	______
E.	TIME: T-0 + 8 HOURS	8 hrs	______
F.	TIME: T-0 + 12 HOURS	12 hrs	______
G.	TIME: T-0 + 18 HOURS	18 hrs	______
H.	TIME: T-0 + 24 HOURS	24 hrs	______
I.	TIME: T-0 + 30 HOURS	30 hrs	______
J.	TIME: T-0 + 36 HOURS	36 hrs	______
K.	TIME: T-0 + 42 HOURS	42 hrs	______
L.	TIME: T-0 + 48 HOURS	48 hrs	______

6.9.2 Section Performance (continued)

[6] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program, at the designated times:

	Time After 0 hrs	Initials
A.	TIME: T-0 + 15 MIN.	______
B.	TIME: T-0 + 30 MIN.	______
C.	TIME: T-0 + 1 HOUR	______
D.	TIME: T-0 + 4 HOURS	______
E.	TIME: T-0 + 8 HOURS	______
F.	TIME: T-0 + 12 HOURS	______
G.	TIME: T-0 + 18 HOURS	______
H.	TIME: T-0 + 24 HOURS	______
I.	TIME: T-0 + 30 HOURS	______
J.	TIME: T-0 + 36 HOURS	______
K.	TIME: T-0 + 42 HOURS	______
L.	TIME: T-0 + 48 HOURS	______

[7] **PLACE** Handswitch 2-HS-46-56A [2-M-4], T-D AFWP T & T VLV, to CLOSE, **THEN**

PERFORM the following:

[7.1] **VERIFY** locally 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS. ______

6.9.2 Section Performance (continued)

[7.2] **RECORD** Stop Date/Time.

Stop Date/Time (T+ 48 hrs) ______________ d/hr:min ________

[7.3] **DETERMINE** the elapsed Date/Time from Step 6.9.2[3] to Step 6.9.2[7.2], **THEN**

VERIFY the elapsed time is greater than 48 hours **AND**.

RECORD below:
Elapsed Date/Time ______________d/hr:min **(Acc Crit)** ________

[7.4] **VERIFY** flow rates recorded on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, are ≥380 GPM for the 48 hour endurance run. **(Acc Crit)**. ________

[7.5] **VERIFY** pump bearing oil temperatures recorded on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, were ≤ 165°F for all times during the Post 48 Hour Performance Run. **(Acc Crit)** ________

[8] **CLOSE** temporary discharge valve TV-3. ________

NOTE

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, bearing oil temperature must cool for a minimum of 4 hours after the performance of Step 6.9.2[7.2] and must be within 20°F of the initial temperatures recorded on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run, Pre-Test Conditions before performing Step 6.9.2[9]

[9] **RECORD** pre-test data for 1 hour run following Endurance Test Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run, Pre-Test Conditions. ________

6.9.2 Section Performance (continued)

[10] **REQUEST** Operations place Handswitch 2-HS-46-56A, T-D AFWP T & T VLV, to OPEN **AND**

VERIFY locally AFW pump stabilizes. ________

[11] **OPEN** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, temporary discharge valve TV-3 until pump flow INDICATED on the temporary flowmeter, TF-1 is ≥410 GPM **AND**

RECORD the indicated flow:

Pump flow(temporary flowmeter, TF-1)__________GPM ________

[12] **RECORD** the time, **AND**

DESIGNATE this as time T-0.

Start Date/Time (T-0 hrs) ____________________ d/hr:min ________

NOTE
Step 6.9.2[13] and Step 6.9.2[14] may be performed simultaneously.

[13] **RECORD** T-0, 1 hour run data on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run,TIME: T-0. ________

[14] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[15] **RECORD** T-0 + 15 min. data 1 hour run on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run,TIME: T-0 + 15 MIN. ________

6.9.2 Section Performance (continued)

[16] **RECORD** T-0 + 30 min. data 1 hour run on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run,TIME: T-0 + 30 MIN. ________

NOTE
Step 6.9.2[17] and Step 6.9.2[18] must be performed simultaneously.

[17] **RECORD** T-0 + 1 hr data 1 hour run on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run,TIME: T-0 + 1 HOUR. ________

[18] **PERFORM** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[19] **PLACE** 2-HS-46-56A [2-M-4], T-D AFWP T & T VLV, to CLOSE, **THEN**

PERFORM the following:

[19.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS. ________

[19.2] **RECORD** Stop Date/Time.

Stop Date/Time ______________ d/hr:min ________

[19.3] **DETERMINE** the Elapsed Date/Time from (Step 6.9.2[12] to Step 6.9.2[19.2]), **THEN**

VERIFY the elapsed time is greater than 1 hour **AND**.

RECORD below:

Elapsed Date/Time ____________________ d/hr:min
(Acc Crit) ________

6.9.2 Section Performance (continued)

[19.4] **VERIFY** flow rates recorded on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, Post 48 Hour Performance Run are ≥380 GPM for the 1 hour endurance run. **(Acc Crit)** ________

[19.5] **VERIFY** pump bearing oil temperatures recorded on Appendix P, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run, were ≤ 165°F for all times during the 1 hour endurance Run. **(Acc Crit)** ________

[20] **CLOSE** temporary discharge valve TV-3. ________

[21] **ATTACH** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Endurance Test vibration test results, **AND**

VERIFY data was within the acceptable limitations of TI 31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[22] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. ________

6.10 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Full Flow Test

6.10.1 Final Field Preparations

CAUTION

The level in Steam Generators 1, 2, 3 and 4 must be maintained between 75% and 40% narrow range level during operation of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, and continuous monitoring of levels is required. SGBD may assist in lowering levels or in decreasing the rate of rise of level.

[1] **IF** full flow test header is installed to 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, **THEN**

REQUEST clearance **AND**

REMOVE test header from 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. _______

[2] **ENSURE** 2-CKV-3-864, TDAFW PUMP DISCHARGE CHECK, is restored to normal. _______

[3] **VERIFY** plant conditions are being controlled at the 557°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown. _______

[4] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. _______

[5] **VERIFY** prerequisites listed in Section 4.0 for Section 6.10 have been completed. _______

[6] **ENSURE** the 2-PTI-999-01,Operational Vibration Testing,Test Engineer has test equipment and personnel available to support vibration testing. _______

6.10.1 Final Field Preparations (continued)

[7] **ENSURE** the following level controllers located at control board 2-M-4 are in MANUAL, **AND**

DECREASE controller output to 0% (CLOSED):

[7.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP _______

[7.2] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP _______

[7.3] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP _______

[7.4] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP _______

[8] **ENSURE** that the following valves are in the OPEN position:

[8.1] 2-ISV-3-875, TD AFW PUMP SG 3 LEVEL CONTROL ISOL. _______

[8.2] 2-ISV-3-876, TD AFW PUMP SG 2 LEVEL CONTROL ISOL. _______

[8.3] 2-ISV-3-877, TD AFW PUMP SG 1 LEVEL CONTROL ISOL. _______

[8.4] 2-ISV-3-878, TD AFW PMP SG 4 LEVEL CONTROL ISOL. _______

[9] **ENSURE** the potentiometer 2-XC-46-54 [A14T/692], AFWT A-S IDLE SPEED POT, located in Panel 2-L-381, is set to 0%. _______

[10] **DEPRESS** Controller 2-FIC-46-57A-S [2-M-4], T-D AFWP FLOW CONTROLLER, AUTO pushbutton. _______

[11] **DEPRESS** Controller 2-FIC-46-57B, T-D AFPT FLOW CONTROLLER, AUTO pushbutton located in Panel 2-L-381 [A14T/692]. _______

6.10.1 Final Field Preparations (continued)

CAUTION

The Turbine Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[12] **NOTIFY** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for steady state vibration for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

[13] **NOTIFY** the Test Engineer responsible for 2-PTI-999-02, Thermal Expansion Testing that conditions have been established for thermal data collection during operation of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

6.10.2 Section Performance

[1] **PLACE** Handswitch 2-HS-46-56A [2-M-4], T-D AFWP T & T VLV, to OPEN. ________

CAUTION

During the performance of Steps 6.10.2[2] through Step 6.10.2[16] heat removal may exceed the heat input capabilities of the system. Primary and Secondary Plant 557°F Test Plateau steady state conditions should be re-established at the direction of Operations as required during the performance of these steps.

NOTE

Steps 6.10.2[2] through 6.10.2[5] may be performed in any order or simultaneously as required to establish the specified flow rates.

[2] **ADJUST** 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP, Manual Drive Lever until the Steam Generator 1 auxiliary feedwater flow rate of 180 to 190 GPM, indicated at computer log point Y0708A, SG #1 AUX FW FLOW is established, **THEN**

RECORD the Steam Generator 1 auxiliary feedwater flow:

Log Pt Y0708A, SG #1 AUX FW FLOW__________GPM ________

[3] **ADJUST** 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP, Manual Drive Lever until the Steam Generator 2 auxiliary feedwater flow rate of 180 to 190 GPM, indicated at computer log point Y0704A, SG #2 AUX FW FLOW is established, **THEN**

RECORD the Steam Generator 2 auxiliary feedwater flow:

Log Pt Y0704A, SG #2 AUX FW FLOW__________GPM ________

6.10.2 Section Performance (continued)

[4] **ADJUST** 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP, Manual Drive Lever until the Steam Generator 3 auxiliary feedwater flow rate of 180 to 190 GPM, indicated at computer log point Y0703A, SG #3 AUX FW FLOW is established, **THEN**

RECORD the Steam Generator 3 auxiliary feedwater flow:

Log Pt Y0703A, SG #3 AUX FW FLOW__________GPM ________

[5] **ADJUST** 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP, Manual Drive Lever until the Steam Generator 4 auxiliary feedwater flow rate of 180 to 190 GPM, indicated at computer log point Y0709A, SG #4 AUX FW FLOW is established, **THEN**

RECORD the Steam Generator 4 auxiliary feedwater flow:

Log Pt Y0709A, SG #4 AUX FW FLOW__________GPM ________

[6] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV to CLOSE, **AND**

VERIFY locally 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS. ________

NOTE

Step 6.10.2[7] through Step 6.10.2[10] may be performed simultaneously.

[7] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-174, SG 1 LEVEL IND, [2-M-3] **THEN**

RECORD level: 2-LI-3-174 __________%. ________

[8] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-173, SG 2 LEVEL IND, [2-M-3] **THEN**

RECORD level: 2-LI-3-173 __________%. ________

6.10.2 Section Performance (continued)

[9] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-172, SG 3 LEVEL IND, [2-M-3] **THEN**

RECORD level: 2-LI-3-172 __________%. ________

[10] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-175, SG 4 LEVEL IND, [2-M-3] **THEN**

RECORD level: 2-LI-3-175 __________%. ________

[11] **PLACE** the following level controllers located at control board 2-M-4 in AUTO:

A. 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP ________

B. 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP ________

C. 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP ________

D. 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP ________

[12] **VERIFY** Annunciator Window, Flow > 1140, located at Panel 2-L-381 [A14T/692] is **NOT** LIT. ________

[13] **VERIFY** Annunciator Window 148-D, AFW TURB FLOW 2-L-381/381A, at 2-XA-55-6F is CLEAR. ________

[14] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for transient event for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

[15] **DEPRESS** Controller 2-FIC-46-57A-S, T-D AFWP FLOW CONTROLLER, [2-M-4] MANUAL pushbutton. ________

6.10.2 Section Performance (continued)

CAUTION

The Turbine Driven Auxiliary Feedwater Pump flow should not exceed 1300 GPM to prevent pump operation in a runout condition.

NOTES

1) Steps 6.10.2[16] thru 6.10.2[18.5] should be performed rapidly and may be performed as they occur.
2) It may be helpful to assign the following tasks to several personnel to assure required information is recorded accurately.

[16] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to OPEN, **AND**

VERIFY locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, is RUNNING. ________

[17] **PERFORM** vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing,. ________

2-PTI-999-01
Test Engr

NOTE

6.10.2[18] will test the automactic swapover of the FIC from MANUAL to AUTO at a setpoint of ~1140 PSIG, at which time annunciations should occur and flow automatically reduce and stabilize at a lesser rate.

[18] **INCREASE** FLOW using controller 2-FIC-46-57A-S, T-D AFWP FLOW CONTROLLER **AND**

PERFORM the following WHILE flow is increasing. ________

[18.1] **VERIFY** that Annunciator Window, FLOW >1140, located at Panel 2-L-381, annunciates and remains LIT until flow is reduced below flow switch reset.(**Acc Crit**) ________

[18.2] **VERIFY** that Annunciator Window 148D, AFW TURB FLOW 2-L-381/381A on 2-XA-55-6F, illuminates. ________

6.10.2 Section Performance (continued)

[18.3] **VERIFY** that 2-FIC-46-57A-S, T-D AFWP FLOW CONTROLLER, transfers to AUTO control as indicated by AUTO mode status lamp.(**Acc Crit**) ________

[18.4] **RECORD** maximum flow rate obtained as indicated on the temporary flowmeter, TF-1.

Maximum Flow (temporary flowmeter, TF-1) ________GPM (≤ 1300 GPM). ________

[18.5] **VERIFY** that turbine speed as indicated on 2-SI-46-56A-S [2-M-4], T-D AFWP SPEED, decreases and stabilizes, **THEN**

RECORD the flow when stable.

Flow (temporary flowmeter, TF-1) ________GPM (≥ 850 GPM) (**Acc Crit).** ________

[19] **PLACE** power switch for power supply located at Rack 2-L-381A, compartment C, Nest 1, slots 10 and 11 to OFF. ________

[19.1] **VERIFY** that controls transfer to MANUAL and turbine speed begins to lower. (**Acc Crit)** ________

[19.2] **VERIFY** that turbine speed as indicated on 2-SI-46-56A-S [2-M-4], T-D AFWP SPEED, stabilizes at 2260 (2226-2294) RPM **AND`**

RECORD the speed.

Speed (2-SI-46-56A-S)________RPM

2260 (2226-2294) RPM (**Acc Crit)** ________

NOTE
The Main Control Room clock will be utilized when the recording of time is specified in this procedure.

[20] **ENSURE** Operations personnel are prepared to maintain Steam Generator levels using the Motor Driven Feedwater Pump. ________

6.10.2 Section Performance (continued)

[21] **PLACE** handswitch 2-HS-46-55A [2-M-4], T-D AFWP OVERSPEED TRIP, to TRIP**, AND**

PERFORM the following:

[21.1] **VERIFY** locally that the turbine TRIPPED.

[21.2] **RECORD** the time the turbine tripped.

Turbine Trip Time__________hr:min ________

[22] **PLACE** power switch for power supply located at Rack 2-L-381, compartment C, slots 10 and 11 to ON. ________

6.10.2 Section Performance (continued)

NOTE
Step 6.10.2[23] may be performed after any or all of the remaining steps in Section 6.10 have been performed.

[23] **WHEN** 45 minutes has elapsed from the time recorded in Step 6.10.2[21.2], **THEN**

RECORD the following values:

Item	Parameter	Value	Criteria	Initials
A.	Time	min	> Step 6.10.2[23] + 45 min	
B.	Comp Pt T2425A SG 1 AFW Pipe Surf Temp	°F	≤ 190 °F	
C.	Comp Pt T2426A SG 2 AFW Pipe Surf Temp	°F	≤ 190 °F	
D.	Comp Pt T2427A SG 3 AFW Pipe Surf Temp	°F	≤ 190 °F	
E.	Comp Pt T2428A SG 4 AFW Pipe Surf Temp	°F	≤ 190 °F	
F.	2-TI-3-141 AFWP 2A-A Disch Temp	°F	N/A	
G.	2-TI-3-146 AFWP 2B-B Disch Temp	°F	N/A	
H.	2-TI-3-149 TD AFWP Disch Temp	°F	N/A	

6.10.2 Section Performance (continued)

[24] **PERFORM** the following calculation to determine maximum pump flow correcting for the temporary flowmeter, TF-1 inaccuracy. (Pump Flow/Step 6.10.2[18.4])

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM)$$

Where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = M&TE inaccuracy in percent

_________ 1st

_________ Verifier

NOTE
Step 6.10.2[24] demonstrates that the Turbine Driven Auxiliary Feedwater Pump Flow/Speed Control functions to prevent 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, from reaching runout by limiting flow to ≤ 1300 GPM.

[25] **VERIFY** the Turbine Driven Auxiliary Feedwater Pump maximum flow recorded in 6.10.2[24] is ≤ 1300 GPM.**(Acc Crit)** _________

[26] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE, **THEN**

VERIFY locally the latch lever relatches to the trip hook. _________

[27] **VERIFY** Annunciator Window, FLOW > 1140, located at Panel 2-L-381, is CLEAR. _________

[28] **VERIFY** Annunciator Window 148-D, TURBINE AFW FLOW 2-L-381/381A, is CLEAR. _________

[29] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.11 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Response Time and Cold Quick Start Test

6.11.1 Final Field Preparations

[1] **VERIFY** plant conditions are being controlled at the 557°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown. ________

[2] **IF** full flow test header is installed to TD AFW pump, **THEN**

REQUEST clearance **AND**

REMOVE test header from TD AFW pump. ________

[3] **ENSURE** 2-CKV-3-864, TDAFW PUMP DISCHARGE CHECK, is restored to normal. ________

[4] **VERIFY** prerequisites listed in Section 4.0 for Section 6.11 have been completed. ________

[5] **PERFORM** the switch alignment per Appendix X, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Response Time and Cold Quick Start Control Switch Alignment. ________

[6] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[7] **ENSURE** 2-FU-275-R73/K13 & K14 are INSTALLED to enable the TD AFW pump Trip and Throttle Valve to open via relay RAS from a simulated Lo-Lo SG level signal from K634 relay.

________ 1st

________ CV

[8] **ENSURE** 2-FU-274-R74/K1 & K2 are INSTALLED to enable the accident signal to actuate SG 1 and 2 AFW LCVs to the accident mode.

________ 1st

________ CV

6.11.1 Final Field Preparations (continued)

NOTE

Step 6.11.1[9] installs a temporary jumper and test switch in SSPS Train A Output Cabinet 2-R-48 at the output of K634 (contacts 1 - 2) to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generators.

[9] **ENSURE** a temporary jumper with an OPEN single pole/single throw test switch (Test Switch TS-1) is INSTALLED across the field side of terminals TB632-9 and TB632-10 located in SSPS Train A Output Cabinet 2-R-48 for Section 6.11

_______ 1st

_______ CV

NOTE

Step 6.11.1[9] installs a Strip Chart Recorder channel to initiate a time mark on a simulated Train A accident signal (0 VDC/ACTUATED - 125 VDC/CLEAR).

[10] **INSTALL** the leads for Strip Chart Recorder Channel No. 1 in parallel with Test Switch TS-1 (installed at Step 6.11.1[9]) across the field side of terminals TB632-9 (Positive) and TB632-10 (Negative) located in SSPS Train A Output Cabinet 2-R-48

_______ 1st

_______ CV

6.11.1 Final Field Preparations (continued)

NOTE

Steps 6.11.1[11] through 6.11.1[11.2] install a connection to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate as indicated at 2-FI-3-142C, TURB DRIV AUX FW PMP OUTLET FLOW IND.

[11] **ENSURE** the precision resistor or decade box is INSTALLED at Terminal 2-1E-8 located in Auxiliary Control Board Panel 2-L-10 as follows:

[11.1] **LIFT** the wire installed at Terminal 2-1E-8 located in Auxiliary Control Board Panel, [2-L-10].

_________ 1st

_________ CV

[11.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the following.

M&TE__________ Cal Due Date__________

_________ 1st

_________ CV

NOTE

Step 6.11.1[12] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate as indicated at 2-FI-3-142C, TURB DRIV AUX FW PMP OUTLET FLOW IND (Scaling 15 GPM/mm; Signal Span 315.4 mVdc - 500.0 mVdc).

[12] **INSTALL** the leads for Strip Chart Recorder Channel No. 2 across the precision resistor or decade box installed at Terminal 2-1E-8 located in Auxiliary Control Board Panel 2-L-10 with the NEGATIVE lead connected on Terminal 2-1E-8.

_________ 1st

_________ CV

6.11.1 Final Field Preparations (continued)

NOTE
Steps 6.11.1[13] through 6.11.1[13.3] installs a connection to monitor the Turbine Driven Auxiliary Feedwater Pump discharge pressure at the test connection for 2-PS-3-138B, TD AUX FEEDWATER PUMP DISCHARGE PRESS, [A14T/692] for Section 6.11:.

[13] **INSTALL** a 0-1500 PSIG pressure transmitter, (TT-1), power supply and precision transmitter output resistor or decade box at the test connection for 2-PS-3-138B, TD AUX FEEDWATER PUMP DISCHARGE PRESS, [A14T/692] for Section 6.11 as follows:

[13.1] **ENSURE** the 0-1500 PSIG pressure transmitter is INSTALLED at the test connection for 2-PS-3-138B.

_________ 1st

_________ CV

[13.2] **CONNECT** the transmitter power supply **AND**

RECORD the transmitter M&TE ID and Cal Due Date.

M&TE__________ Cal Due Date__________

_________ 1st

_________ CV

[13.3] **CONNECT** a 500 ohm precision resistor or decade box on the transmitter output **AND**

RECORD the following:

M&TE__________ Cal Due Date__________

_________ 1st

_________ CV

6.11.1 Final Field Preparations (continued)

> **NOTE**
>
> Step 6.11.1[14] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge pressure from the temporary pressure transmitter installed at 2-PS-3-138B, TD AUX FEEDWATER PUMP DISCHARGE PRESS.

[14] **INSTALL** the leads for Strip Chart Recorder Channel No. 3 across the 500 ohm precision resistor or decade box installed on the temporary pressure transmitter located at 2-PS-3-138B, TD AUX FEEDWATER PUMP DISCHARGE PRESS.

_______ 1st

_______ CV

> **NOTE**
>
> Steps 6.11.1[15] through 6.11.1[15.2] installs a connection to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to Steam Generator 2 as indicated at 2-FI-3-155A, STM GEN # 2 AUX FW IN, for baseline data only.

[15] **ENSURE** a 10 ohm precision resistor or decade box is INSTALLED at Auxiliary Control Board Panel 2-L-10 as follows:

[15.1] **LIFT** wire AFP110 (negative) at Terminal 2-1E-8 in Panel 2-L-10.

_______ 1st

_______ CV

[15.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 2-1E-8 **AND**

RECORD the following:

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.11.1 Final Field Preparations (continued)

NOTE

Step 6.11.1[16] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to Steam Generator 2 as indicated at 2-FI-3-155A, STM GEN # 2 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[16] **INSTALL** the leads for Strip Chart Recorder Channel No. 4 across the precision resistor or decade box installed at 2-FM-3-155AB, SG #2 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-155AB.

_______ 1st

_______ CV

NOTE

Steps 6.11.1[17] through 6.11.1[17.2] install a connection to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate as indicated at 2-FI-3-147B, STM GEN # 3 STM GEN # 3 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[17] **ENSURE** INSTALLED a 10 ohm precision resistor or decade box at 2-FM-3-147BB, SG #3 AUX FW FLOW MOD, [2-L-11B] as follows:

[17.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-147BB, SG #3 AUX FW FLOW MOD.

_______ 1st

_______ CV

[17.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the following.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.11.1 Final Field Preparations (continued)

NOTE
Step 6.11.1[18] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to Steam Generator 2 as indicated at 2-FI-3-147A, STM GEN # 3 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[18] **INSTALL** the leads for Strip Chart Recorder Channel No. 5 across the precision resistor or decade box installed at 2-FM-3-147BB, SG 3 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-147BB.

_______ 1st

_______ CV

NOTE
Steps 6.11.1[19] through 6.11.1[19.2] install a connection to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate as indicated at 2-FI-3-170A, STM GEN # 4 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[19] **ENSURE** INSTALLED a 10 ohm precision resistor or decade box at 2-FM-3-170AB, SG #4 AUX FW FLOW MOD, [2-L-11A], as follows:

[19.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-170AB, SG #4 AUX FW FLOW MOD.

_______ 1st

_______ CV

[19.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the following.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.11.1 Final Field Preparations (continued)

NOTE
Step 6.11.1[20] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to Steam Generator 4 as indicated at 2-FI-3-170A, STM GEN # 4 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[20] **INSTALL** the leads for Strip Chart Recorder Channel No. 6 across the precision resistor or decade box installed at 2-FM-3-170AB, SG 4 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-170AB.

_______ 1st

_______ CV

NOTE
Steps 6.11.1[21] through 6.11.1[19.2] install a connection to monitor the Turbine Driven Auxiliary Feedwater Pump flow rate to a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate as indicated at 2-FI-3-163B, STM GEN # 1 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[21] **ENSURE** INSTALLED a 10 ohm precision resistor or decade box at 2-FM-3-163BB, SG #1 AUX FW FLOW MOD as follows:

[21.1] **LIFT** wire (negative) at Terminal 10 on 2-FM-3-163BB, SG #1 AUX FW FLOW MOD, [2-L-11B].

_______ 1st

_______ CV

[21.2] **CONNECT** a 10 ohm precision resistor or decade box between the lifted wire and Terminal 10 **AND**

RECORD the following.

M&TE__________ Cal Due Date__________

_______ 1st

_______ CV

6.11.1 Final Field Preparations (continued)

NOTE

Step 6.11.1[22] installs a Strip Chart Recorder channel to monitor the Turbine Driven Auxiliary Feedwater Pump discharge flow rate to Steam Generator 1 as indicated at 2-FI-3-163B, STM GEN # 1 AUX FW IN, for baseline data only (Scaling 1.75 GPM/mVdc).

[22] **INSTALL** the leads for Strip Chart Recorder Channel No. 7 across the precision resistor or decade box installed at 2-FM-3-163BB, SG 1 AUX FW FLOW MOD, with the NEGATIVE lead connected on Terminal 10 of 2-FM-3-163BB. ________ 1st

________ CV

[23] **RECORD** reference calibration signals on the Strip Chart Recorder analog channel traces (Channels 2 through 7). ________

[24] **RECORD** System pre-test data on Cold Start No. 1 Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 1.0, PRE-TEST DATA. ________

NOTE

Step 6.11.1[25] through 6.11.1[30] may be performed simultaneously.

[25] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-174 [2-M-3], SG 1 LEVEL IND, **AND**

RECORD level: 2-LI-3-174__________%. ________

[26] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-173 [2-M-3], SG 2 LEVEL IND, **AND**

RECORD level: 2-LI-3-173__________%. ________

6.11.1 Final Field Preparations (continued)

[27] **ENSURE** Valve 2-ISV-3-875, TD AFW PUMP SG 3 LEVEL CONTROL ISOL, is CLOSED. _________

[28] **ENSURE** Valve 2-ISV-3-878, TD AFW PMP SG 4 LEVEL CONTROL ISOL is CLOSED. _________

[29] **ENSURE** Valve, 2-ISV-3-877, TD AFW PUMP SG 1 LEVEL CONTROL ISOL is OPEN. _________

[30] **ENSURE** Valve 2-ISV-3-876, TD AFW PUMP SG 2 LEVEL CONTROL ISOL is OPEN. _________

6.11.2 Section Performance

[1] **PERFORM** the following for each TD AFWP LCV listed:

[1.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position, **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-173A, SG 2 SUPPLY LCV-3-173 CNTL _________
- 2-HS-3-174A, SG 1 SUPPLY LCV-3-174 CNTL _________

[1.2] **ENSURE** BOTH LCVs go to/indicates CLOSED. _________

6.11.2 Section Performance (continued)

NOTE
2-PMP-003-0002A-S, TD AUX FEEDWATER PMP shall not have been operated within four hours prior to beginning Cold Start Sequence 1.

COLD START SEQUENCE 1

[2] **START** the Strip Chart Recorders at 10 mm/sec. ________

[3] **CLOSE** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train A Output Cabinet 2-R-48 to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generators **AND**

RECORD Pump Flow from temporary flowmeter, TF-1

Pump Flow (temporary flowmeter, TF-1)__________GPM ________

[4] **WHEN** flows to the Steam Generators stabilize,**THEN**

STOP the Strip Chart Recorders. ________

[5] **RECORD** the pump suction and discharge pressures:

- Suction Pressure (TG-5)__________PSIG ________
- Discharge Pressure(TG-6)__________PSIG ________

[6] **RECORD** the Steam Generator pressures.

- P0400A, STM GEN 1 STM OUT 1 PRESSURE__________ PSIG ________
- P0420A-STM GEN 2 STM OUT 1 PRESSURE__________ PSIG ________

[7] **OPEN** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train A Output Cabinet 2-R-48. ________

[8] **PLACE** Handswitch 2-HS-46-56A [2-M-4], T-D AFWP T&T VLV, to CLOSE. ________

6.11.2 Section Performance (continued)

[9] **VERIFY** locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS **AND**.

RECORD the STOP Time:

Stop Time:__________hr:min ________

[10] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 2.0, RECORDER TRACE ANALYSIS. ________

[11] **PERFORM** the data reduction and calculations on Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 3.0, DATA REDUCTION AND CALCULATIONS. ________

[12] Transfer the information from Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 2.0, RECORDER TRACE ANALYSIS and Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 3.0, DATA REDUCTION AND CALCULATIONS to the table below.

Parameter	Location	Value	Criteria	Initials
Response Time	Appendix Y Section 2.0	Sec	≤ 1 Min	
Flow to SGs	Appendix Y Section 3.0	GPM	≥ 720 GPM	
Total Dynamic Head	Appendix Y Section 3.0	Ft	N/A	
P0400A, STM GEN 1 STM OUT 1 PRESSURE	STEP 6.11.2[6]	PSIG	1092 ±35 PSIG	
P0420A-STM GEN 2 STM OUT 1 PRESSURE	STEP 6.11.2[6]	PSIG	1092 ±35 PSIG	

6.11.2 Section Performance (continued)

> **NOTE**
> 2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

[12.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow is greater than or equal to 720 GPM to two steam generators at 1092 ±35 PSIG within 1 minute of initiation signal as determined on Table at Step 6.11.2[12] **(Acc Crit)** _______

[12.2] **VERIFY** that the calculated total dynamic head and the corresponding flow determined on Appendix Y, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1, Section 2.0,RECORDER TRACE ANALYSIS meet or exceed the total dynamic head specified on the “Certified Vendor Curve, Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow (≥ 720 GPM). _______

[13] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, MANUAL pushbutton. _______

[14] **PERFORM** the following for each TD AFWP LCV listed:

[14.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-173A, SG 2 SUPPLYLCV-3-173 CNTL _______
- 2-HS-3-174A, SG 1 SUPPLY LCV-3-174 CNTL _______

[14.2] **ENSURE** BOTH LCVs go to/indicates CLOSED. _______

[15] **PLACE** Handswitch 2-HS-3-174A, SG 1 SUPPLY LCV-3-174 CNTL, [2-M-4], to CLOSE. _______

6.11.2 Section Performance (continued)

[16] **PLACE** Handswitch 2-HS-3-173A SG 2 SUPPLY LCV-3-173 CNTL, [2-M-4] to CLOSE. ________

[17] **PLACE** Handswitch 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL, [2-M-4], to CLOSE. ________

[18] **PLACE** Handswitch 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL, [2-M-4], to CLOSE. ________

NOTE
Step 6.11.2[19] through 6.11.2[23] may be performed simultaneously.

[19] **OPEN** Valve 2-ISV-3-875, TD AFW PUMP SG 3 LEVEL CONTROL ISOL. ________

[20] **OPEN** Valve 2-ISV-3-878, TD AFW PMP SG 4 LEVEL CONTROL ISOL. ________

[21] **CLOSE** Valve 2-ISV-3-877, TD AFW PUMP SG 1 LEVEL CONTROL ISOL. ________

[22] **CLOSE** Valve 2-ISV-3-876, TD AFW PUMP SG 2 LEVEL CONTROL ISOL. ________

[23] **REMOVE** the leads for Strip Chart Recorder Channel 1 and Test Switch TS-1 installed in parallel at Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51, **AND**

RESTORE terminal block wire connections to as found condition in step 6.11.1[9].

________ 1st

________ CV

[24] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-172 [2-M-3], SG 3 LEVEL IND, **AND**

RECORD Level: 2-LI-3-172 __________% ________

6.11.2 Section Performance (continued)

[25] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-175 [2-M-3], SG 3 LEVEL IND, **AND**

RECORD Level: 2-LI-3-175 ________% ________

NOTE
2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, bearing oil temperature must cool for a minimum of 4 hours after the performance of Step 6.11.2[9] and must be within 20°F of ambient temperature before starting the pump in **COLD START SEQUENCE 2**.

COLD START SEQUENCE 2

NOTE
A temporary jumper and test switch is installed in SSPS Train B Output Cabinet 2-R-51 at the output of K634 (contacts 1 - 2) to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generators.

[26] **INSTALL** a temporary jumper with an OPEN single pole/single throw test switch (Test Switch TS-1) across the field side of terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51 for Section 6.11

____
1st

____
CV

6.11.2 Section Performance (continued)

[27] **INSTALL** the leads for Strip Chart Recorder Channel No. 1 in parallel with Test Switch TS-1 (installed at Step 6.11.2[26]) across the field side of terminals TB632-9 (Positive) and TB632-10 (Negative) located in SSPS Train B Output Cabinet 2-R-51.

_________ 1st

_________ CV

[28] **ENSURE** INSTALLED 2-FU-275-R78/K13 & K14, to enable the TD AFW pump Trip and Throttle Valve to open via Relay RBS from a simulated Lo-Lo SG level signal from K634 relay.

_________ 1st

_________ CV

[29] **ENSURE** INSTALLED 2-FU-275-R77/K1 & K2, to enable the accident signal to actuate SG 3 and 4 AFW LCVs to the accident mode.

_________ 1st

_________ CV

[30] **RECORD** system pre-test data on Cold Start No. 2 Appendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S Cold Start No. 2, Section 1.0, PRE-TEST DATA. _________

[31] **PERFORM** the following for each TD AFWP LCV listed:

[31.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL _________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL _________

[31.2] **ENSURE** each LCV goes to/indicates CLOSED. _________

[32] **START** the Strip Chart Recorders at 10 mm/sec. _________

6.11.2 Section Performance (continued)

[33] **CLOSE** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51 to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generator **AND**

RECORD Pump Flow from temporary flowmeter, TF-1

Pump Flow(temporary flowmeter, TF-1)__________GPM ________

[34] **WHEN** flows to the Steam Generators stabilize, **THEN**

STOP the Strip Chart Recorders. ________

[35] **RECORD** the pump suction and discharge pressures:

- Suction Pressure (TG-5)__________PSIG ________
- Discharge Pressure(TG-6)__________PSIG ________

[36] **RECORD** the Steam Generator pressures.

- P0440A, STM GEN 3 STM OUT 1 PRESSURE__________ PSIG ________
- P0460A-STM GEN 4 STM OUT 1 PRESSURE__________ PSIG ________

[37] **OPEN** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51. ________

[38] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. ________

[39] **VERIFY** locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS **AND**.

RECORD the STOP Time:

Stop Time:__________hr:min ________

[40] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2, Section 2.0, RECORDER TRACE ANALYSIS. ________

6.11.2 Section Performance (continued)

[41] **PERFORM** the data reduction and calculations on Appendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2, Section 3.0, DATA REDUCTION AND CALCULATIONS

____

[42] **TRANSFER** the information fromAppendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2, Section 2.0, RECORDER TRACE ANALYSIS and Appendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2, Section 3.0, DATA REDUCTION AND CALCULATIONS to the table below. _________

Parameter	Location	Value	Criteria	Initials
Response Time	Appendix Z Section 2.0	Sec	≤ 1 Min	
Flow to SGs	Appendix Z Section 3.0	GPM	≥ 720 GPM	
Total Dynamic Head	Appendix Z Section 3.0	Ft	N/A	
P0440A, STM GEN 3 STM OUT 1 PRESSURE	STEP 6.11.2[35]	PSIG	1092 ±35 PSIG	
P0460A-STM GEN 4 STM OUT 1 PRESSURE	STEP 6.11.2[35]	PSIG	1092 ±35 PSIG	

6.11.2 Section Performance (continued)

NOTE
2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

[42.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow is greater than or equal to 720 GPM to two steam generators at 1092 ±35 PSIG within 1 minute of initiation signal as determined on Table at Step 6.11.2[42] **(Acc Crit)** ________

[42.2] **VERIFY** that the calculated total dynamic head and the corresponding flow determined on Appendix Z, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2, Section 2.0, RECORDER TRACE ANALYSIS meet or exceed the total dynamic head specified on the "Certified Vendor Curve, Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow (≥ 720 GPM). ________

[43] **DEPRESS** Controller 2-FIC-46-57A], T-D AFWP FLOW CONTROLLER, MANUAL pushbutton. ________

[44] **PERFORM** for each TD AFWP LCV following:

[44.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL ________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL ________

[44.2] **ENSURE** each LCV goes to/indicates CLOSED. ________

6.11.2 Section Performance (continued)

[45] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-172 [2-M-3], SG 3 LEVEL IND, **AND**

RECORD level: 2-LI-3-172 __________% __________

[46] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-175 [2-M-3], SG 4 LEVEL IND, **AND**

RECORD level: 2-LI-3-175 __________% __________

NOTE
2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, bearing oil temperature must cool for a minimum of 4 hours after the performance of Step 6.11.2[39] and must be within 20°F of ambient temperature before starting pump in **COLD START SEQUENCE 3**.

COLD START SEQUENCE 3

[47] **RECORD** System pre-test data on Cold Start No. 3 Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 1.0, PRE-TEST DATA. __________

[48] **START** the Strip Chart Recorders at 10 mm/sec. __________

[49] **CLOSE** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51 to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generator **AND**

RECORD Pump Flow from temporary flowmeter, TF-1

Pump Flow(temporary flowmeter, TF-1)__________GPM __________

[50] **WHEN** flows to the Steam Generators stabilize, **THEN**

STOP the Strip Chart Recorders. __________

[51] **RECORD** the pump suction and discharge pressures:

- Suction Pressure (TG-5)__________PSIG __________
- Discharge Pressure(TG-6)__________PSIG __________

6.11.2 Section Performance (continued)

[52] **RECORD** the Steam Generator pressures.

- P0440A, STM GEN 3 STM OUT 1 PRESSURE__________ PSIG ________
- P0460A-STM GEN 4 STM OUT 1 PRESSURE__________ PSIG ________

[53] **OPEN** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51. ________

[54] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. ________

[55] **VERIFY** locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS **AND**.

RECORD the STOP Time:

Stop Time:__________hr:min ________

[56] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 2.0, RECORDER TRACE ANALYSIS. ________

[57] **PERFORM** the data reduction and calculations on Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 3.0, DATA REDUCTION AND CALCULATIONS. ________

6.11.2 Section Performance (continued)

[58] **TRANSFER** the information from Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 2.0, RECORDER TRACE ANALYSIS and Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 3.0, DATA REDUCTION AND CALCULATIONS to the table below. _________

Parameter	Location	Value	Criteria	Initials
Response Time	Appendix AA Section 2.0	Sec	≤ 1 Min	
Flow to SGs	Appendix AA Section 3.0	GPM	≥ 720 GPM	
Total Dynamic Head	Appendix AA Section 3.0	Ft	N/A	
P0440A, STM GEN 3 STM OUT 1 PRESSURE	STEP 6.11.2[52]	PSIG	1092 ±35 PSIG	
P0460A-STM GEN 4 STM OUT 1 PRESSURE	STEP 6.11.2[52]	PSIG	1092 ±35 PSIG	

NOTE

2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

[58.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow is greater than or equal to 720 GPM to two steam generators at 1092 ±35 PSIG within 1 minute of initiation signal as determined on Table at Step 6.11.2[58] **(Acc Crit).** _________

6.11.2 Section Performance (continued)

[58.2] **VERIFY** that the calculated total dynamic head and the corresponding flow determined on Appendix AA, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3, Section 2.0, RECORDER TRACE ANALYSIS meet or exceed the total dynamic head specified on the "Certified Vendor Curve, Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow (≥ 720 GPM). ________

[59] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, MANUAL pushbutton. ________

[60] **PERFORM** the following for each TD AFWP LCV listed:

[60.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL ________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL ________

[60.2] **ENSURE** each LCV goes to/indicates CLOSED. ________

[61] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-172, SG 3 LEVEL IND, **AND**

RECORD Level: 2-LI-3-172 __________% ________

[62] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-175 [2-M-3], SG 4 LEVEL IND, **AND**

RECORD Level: 2-LI-3-175 __________% ________

6.11.2 Section Performance (continued)

NOTE
2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, bearing oil temperature must cool for a minimum of 4 hours after the performance of Step 6.11.2[55] and must be within 20°F of ambient temperature before starting pump in **COLD START SEQUENCE 4**.

COLD START SEQUENCE 4

[63] **RECORD** System pre-test data on Cold Start No. 4 Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 1.0, PRE-TEST DATA. ________

[64] **START** the Strip Chart Recorders at 10 mm/sec. ________

[65] **CLOSE** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51 to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generator **AND**

RECORD Pump Flow from temporary flowmeter, TF-1.

Pump Flow(temporary flowmeter, TF-1)__________GPM ________

[66] **WHEN** flows to the Steam Generators stabilize, **THEN**

STOP the Strip Chart Recorders. ________

[67] **RECORD** the pump suction and discharge pressures:

- Suction Pressure (TG-5)__________PSIG ________
- Discharge Pressure(TG-6)__________PSIG ________

[68] **RECORD** the Steam Generator pressures.

- P0440A, STM GEN 3 STM OUT 1 PRESSURE__________ PSIG ________
- P0460A-STM GEN 4 STM OUT 1 PRESSURE__________ PSIG ________

[69] **OPEN** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51. ________

6.11.2 Section Performance (continued)

[70] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. ________

[71] **VERIFY** locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS **AND**.

RECORD the STOP Time:

Stop Time:__________hr:min ________

[72] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 2.0 RECORDER TRACE ANALYSIS. ________

[73] **PERFORM** the data reduction and calculations on Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 3.0, DATA REDUCTION AND CALCULATIONS. ________

[74] **TRANSFER** the information from Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 2.0 RECORDER TRACE ANALYSIS and Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 3.0, DATA REDUCTION AND CALCULATIONS to the table below. ________

Parameter	Location	Value	Criteria	Initials
Response Time	Appendix BB Section 2.0	Sec	≤ 1 Min	
Flow to SGs	Appendix BB Section 3.0	GPM	≥ 720 GPM	
Total Dynamic Head	Appendix BB Section 3.0	Ft	N/A	
P0440A, STM GEN 3 STM OUT 1 PRESSURE	STEP 6.11.2[68]	PSIG	1092 ±35 PSIG	
P0460A-STM GEN 4 STM OUT 1 PRESSURE	STEP 6.11.2[68]	PSIG	1092 ±35 PSIG	

6.11.2 Section Performance (continued)

NOTE
2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

[74.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow is greater than or equal to 720 GPM to two steam generators at 1092 ±35 PSIG within 1 minute of initiation signal as determined on Table at Step 6.11.2[74] **(Acc Crit)** ________

[74.2] **VERIFY** that the calculated total dynamic head and the corresponding flow determined on Appendix BB, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4, Section 2.0, RECORDER TRACE ANALYSIS meet or exceed the total dynamic head specified on the "Certified Vendor Curve", Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow (≥ 720 GPM). ________

[75] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, MANUAL pushbutton. ________

[76] **PERFORM** the following for each TD AFWP LCV listed:

[76.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL ________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL ________

[76.2] **ENSURE** each LCV goes to/indicates CLOSED. ________

6.11.2 Section Performance (continued)

[77] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-172 [2-M-3], SG 3 LEVEL IND, **AND**

RECORD Level: 2-LI-3-172 __________% ________

[78] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-175, SG 4 LEVEL IND, **AND**

RECORD Level: 2-LI-3-175 __________% ________

NOTE
2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, bearing oil temperature must cool for a minimum of 4 hours after the performance of Step 6.11.2[71] and must be within 20°F of the ambient temperature before starting pump in **COLD START SEQUENCE 5**.

COLD START SEQUENCE 5

[79] **RECORD** System pre-test data on Cold Start No. 5 Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 1.0, PRE-TEST DATA. ________

[80] **START** the Strip Chart Recorders at 10 mm/sec. ________

[81] **CLOSE** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51 to simulate 2 of 3 Lo-Lo level in any 2 of 4 steam generators **AND**

RECORD Pump Flow from temporary flowmeter, TF-1.

Pump Flow(temporary flowmeter, TF-1)__________GPM ________

[82] **WHEN** the flows to the Steam Generators stabilize **THEN**

STOP the Strip Chart Recorders. ________

[83] **RECORD** the pump suction and discharge pressures:

- Suction Pressure (TG-5)__________PSIG ________
- Discharge Pressure(TG-6)__________PSIG ________

6.11.2 Section Performance (continued)

[84] **RECORD** the Steam Generator pressures.

- P0440A, STM GEN 3 STM OUT 1 PRESSURE__________ PSIG __________
- P0460A-STM GEN 4 STM OUT 1 PRESSURE__________ PSIG __________

[85] **OPEN** Test Switch TS-1, installed across the field side of Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51. __________

[86] **PLACE** Handswitch 2-HS-46-56A, T-D AFWP T&T VLV, to CLOSE. __________

[87] **VERIFY** locally that 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, STOPS **AND**.

RECORD the STOP Time:

Stop Time:__________hr:min __________

[88] **RECORD** post-test reference calibration signals on the Strip Chart Recorder analog traces (Channels 2 through 7). __________

[89] **ANALYZE** the Strip Chart Recorder trace as directed on Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 2.0, RECORDER TRACE ANALYSIS. __________

[90] **PERFORM** the data reduction and calculations on Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 3.0, DATA REDUCTION AND CALCULATIONS. __________

6.11.2 Section Performance (continued)

[91] **TRANSFER** the information from Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 2.0, RECORDER TRACE ANALYSIS and Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 3.0, DATA REDUCTION AND CALCULATIONS to the table below. ________

Parameter	Location	Value	Criteria	Initials
Response Time	Appendix CC Section 2.0	Sec	≤ 1 Min	
Flow to SGs	Appendix CC Section 3.0	GPM	≥ 720 GPM	
Total Dynamic Head	Appendix CC Section 3.0	Ft	N/A	
P0440A, STM GEN 3 STM OUT 1 PRESSURE	STEP 6.11.2[84]	PSIG	1092 ±35 PSIG	
P0460A-STM GEN 4 STM OUT 1 PRESSURE	STEP 6.11.2[84]	PSIG	1092 ±35 PSIG	

NOTE

2-PTI-03B-05 will only time and record from the pump breaker closure to the time that the pump reaches ≥ 720 gpm (+ Recirc Flow)to at least two intact steam generators at 1092 ± 35 psig. The total time response requirement of within 1 minute upon receipt of an ESFAS signal will be verified in 2-PTI-099-01.

[91.1] **VERIFY** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, flow is greater than or equal to 720 GPM to two steam generators at 1092 ±35 PSIG within 1 minute of initiation signal as determined on Table at Step 6.11.2[91] **(Acc Crit).** ________

6.11.2 Section Performance (continued)

[91.2] **VERIFY** that the calculated total dynamic head and the corresponding flow determined on Appendix CC, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5, Section 2.0, RECORDER TRACE ANALYSIS meet or exceed the total dynamic head specified on the “Certified Vendor Curve”, Appendix Q, 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Pump Curve, for the corresponding flow (≥ 720 GPM). ________

[91.3] **VERIFY** that five consecutive starts without a pump trip on overspeed were completed during COLD START SEQUENCES 1 through 5. **(Acc Crit)** ________

[92] **DEPRESS** Controller 2-FIC-46-57A [2-M-4], T-D AFWP FLOW CONTROLLER, MANUAL pushbutton. ________

[93] **PERFORM** the following for each TD AFWP LCV listed :

[93.1] **ROTATE** to the ACC. RESET MODULATE position, **THEN**

ROTATE to the CLOSE position **AND**

RETURN each handswitch to the AUTO position.

- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL ________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL ________

[94] **VERIFY** all four LCVs indicate CLOSED.

- 2-HS-3-174A, SG 1 SUPPLY LCV-3-174 CNTL ________
- 2-HS-3-173A, SG 2 SUPPLY LCV-3-173 CNTL ________
- 2-HS-3-172A, SG 3 SUPPLY LCV-3-172 CNTL ________
- 2-HS-3-175A, SG 4 SUPPLY LCV-3-175 CNTL ________

6.11.2 Section Performance (continued)

[94.1] **OPEN** the following valves.

- 2-ISV-3-877, TD AFW PUMP SG 1 LEVEL CONTROL ISOL ________
- 2-ISV-3-876, TD AFW PUMP SG 2 LEVEL CONTROL ISOL. ________

[95] **REMOVE** the precision resistor or decade box installed in parallel between the lifted wire and Terminal 2-1E-8, located in Auxiliary Control Board Panel 2-L-10.

________ 1st

________ CV

[96] **TERMINATE** the lifted wire AFP110 (lifted at Step 6.11.1[15]) at Terminal 2-1E-8 located in Auxiliary Control Board panel 2-L-10.

________ 1st

________ CV

[97] **REMOVE** the leads for Strip Chart Recorder Channel 1 and Test Switch TS-1 installed in parallel at Terminals TB632-9 and TB632-10 located in SSPS Train B Output Cabinet 2-R-51, **AND**

RESTORE terminal block wire connections to normal.

________ 1st

________ CV

[98] **ENSURE** the following fuses are REMOVED.

- 2-FU-275-R74/K1 & K2

________ 1st

________ CV

- 2-FU-275-R73/K13 & K14

________ 1st

________ CV

6.11.2 Section Performance (continued)

- 2-FU-275-R77/K1 & K2

  _________ 1st

  _________ CV

- 2-FU-275-R78/K13 & K14

  _________ 1st

  _________ CV

[99] **ENSURE** INSTALLED 2-FU-275-R73/K15, AUX FEED PUMP TURBINE STEAM SUP TRANSFER (Panel 2-R-73)

_________ 1st

_________ CV

[100] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.12 Auxiliary Feedwater System Water Hammer

6.12.1 Final Field Preparations

[1] **VERIFY** plant conditions are being controlled at the 557°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown. ________

[2] **IF** full flow test header is installed to TD AFW pump, **THEN**

REQUEST clearance **AND**

REMOVE test header from 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S. ________

[3] **ENSURE** the following components have been RESTORED to NORMAL.

- 2-CKV-3-864, TDAFW PUMP DISCHARGE CHECK. ________
- 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL. ________
- 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL. ________

[4] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[5] **ENSURE** the following breakers are OPEN and RACKED UP into position:

A. 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10. ________

B. 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10. ________

[6] **VERIFY** all prerequisites listed in Section 4.0 for Section 6.12 have been completed. ________

- **ENSURE** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer has test equipment and personnel in place to support vibration testing. ________

6.12.1 Final Field Preparations (continued)

[7] **ENSURE** the following valves are OPEN:

- 2-ISV-3-875, TD AFW PUMP SG 3 LEVEL CONTROL ISOL. ________
- 2-ISV-3-876, TD AFW PUMP SG 2 LEVEL CONTROL ISOL. ________
- 2-ISV-3-877, TD AFW PUMP SG 1 LEVEL CONTROL ISOL. ________
- 2-ISV-3-878, TD AFW PUMP SG4 LEVEL CONTROL ISOL. ________
- 2-ISV-3-834, MD AFW PUMP 2B-B SG3 LEVEL CONTROL ISOL. ________
- 2-ISV-3-837, MD AFW PUMP 2B-B SG4 LEVEL CONTROL ISOL. ________
- 2-ISV-3-836, MD AFW PUMP 2A-A SG1 LEVEL CONTROL ISOL. ________
- 2-ISV-3-835, MD AFW PUMP 2A-A SG2 LEVEL CONTROL ISOL. ________

[8] **PERFORM** Control Switch Alignment per Appendix EE, Auxiliary Feedwater Water Hammer Control Switch Alignment. ________

[9] **VERIFY** CST level is 200,000 to 210,000 on 2-LI-2-233D, CST B LEVEL **AND**

RECORD level: 2-LI-2-233D __________% ________

[10] **RECORD** Static Data as required on Auxiliary Feedwater Water Hammer Pre-Test Appendix FF, Auxiliary Feedwater Water Hammer, PRE-TEST DATA. ________

[11] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for transient event for the Auxiliary Feedwater System. ________

6.12.2 Section Performance

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
2) The Motor & Turbine Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Mini-Flow. During operation on Mini-Flow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

NOTES

1) The quantity of auxiliary feedwater pumps in operation after the transient will be reduced to prevent rapid primary plant heat decay or excessive time duration of pump operation under minimum flow conditions.
2) Personnel will be stationed at each pump and level control valve to observe for indication of pump and valve cavitation.
3) Steam Generator levels will be reduced to create a Lo-Lo level transient in any 2 of 4 Steam Generators prior to initiation of Auxiliary Feedwater flow.

[1] **ENSURE** that 2 of any 4 Steam Generator levels are ≤ 18% narrow range **THEN**

SIMULTANEOUSLY PERFORM the following steps to initiate auxiliary feedwater flow.

[1.1] **PLACE** 2-HS-3-118A, AFW PMP A-A, to START. ________

[1.2] **PLACE** 2-HS-3-128A, AFW PMP B-B, to START. ________

[1.3] **PLACE** 2-HS-46-56A [2-M-4], AFW T & T VLV, to OPEN. ________

6.12.2 Section Performance (continued)

NOTE
Steps 6.12.2[2] through Step 6.12.2[5] should be performed simultaneously.

[2] **PERFORM** vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

_________ 2-PTI-999-01 Test Engr

[3] **VERIFY** Annunciator Window 63-A, CST HDR TO AFW PMPS PRESS LO, remained CLEAR during Auxiliary Feedwater Pumps simultaneous start transient. _________

[4] **VERIFY NO** Auxiliary Feedwater Pump cavitation was observed during simultaneous start transient. _________

[5] **VERIFY** by observation that there are **NO** excessive oscillations during the simultaneous start transient for the following control valves:

- Pressure Control Valve 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL. _________
- Pressure Control Valve 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL. _________
- Level Control Valve 2-LCV-3-148, MD AFW PUMP 2B-B SG3 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-148A, SG3 AUX FEEDWATER2-LCV-3-148 BYPASS. _________
- Level Control Valve 2-LCV-3-172, TD AFW PUMP SG3 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-156, MD AFW PUMP 2A-A SG 2 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-156A, SG3 AUX FEEDWATER2-LCV-3-156 BYPASS. _________
- Level Control Valve 2-LCV-3-173, TD AFW PUMP SG2 LEVEL CONTROL. _________

6.12.2 Section Performance (continued)

- Level Control Valve 2-LCV-3-164, MD AFW PUMP 2A-A SG1 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-164A, SG1 AUX FEEDWATER2-LCV-3-164 BYPASS. ________
- Level Control Valve 2-LCV-3-174, TD AFW PUMP SG1 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-171, MD AFW PUMP 2B-B SG4 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-171A, SG4 AUX FEEDWATER2-LCV-3-171 BYPASS. ________
- Level Control Valve 2-LCV-3-175, TD AFW PUMP SG4 LEVEL CONTROL. ________

[6] **RECORD** data on Appendix GG, Auxiliary Feedwater Pumps Full Flow Data. ________

[7] **VERIFY** that there were **NO** excessive oscillations during the simultaneous start transient for the control valves in step 6.12.2[5] (**Acc Crit**) ________

NOTE
Steps 6.12.2[8] through Step 6.12.2[10] should be performed simultaneously.

[8] **SIMULTANEOUSLY PLACE** the following handswitches to STOP:

- 2-HS-3-118A, AFW PMP A-A ________
- 2-HS-3-128A, AFW PMP B-B ________

6.12.2 Section Performance (continued)

[9] **PERFORM** vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

_________ 2-PTI-999-01 Test Engr

[10] **OBSERVE** that there are **NO** excessive oscillations during the simultaneous trip transient of AUX FEEDWATER PUMPS 2A-A and 2B-B for the following control valves:

- Level Control Valve 2-LCV-3-172, TD AFW PUMP SG3 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-173, TD AFW PUMP SG2 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-174, TD AFW PUMP SG1 LEVEL CONTROL. _________
- Level Control Valve 2-LCV-3-175, TD AFW PUMP SG4 LEVEL CONTROL. _________

[11] **VERIFY** that there were **NO** excessive oscillations during the simultaneous stop of AUX FEEDWATER PUMPS 2A-A and 2B-B transient for the control valves in step 6.12.2[10] (**Acc Crit**) _________

NOTE
Perform Steps 6.12.2[12] through 6.12.2[15] simultaneously.

[12] **PLACE** 2-HS-3-118A, AFW PMP A-A, to START. _________

[13] **PLACE** 2-HS-3-128A, AFW PMP B-B, to START. _________

[14] **OBSERVE** that there are **NO** excessive oscillations during the simultaneous start transient of AUX FEEDWATER PUMPS 2A-A and 2B-B for the following control valves:

- Pressure Control Valve 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL. _________
- Pressure Control Valve 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL. _________

6.12.2 Section Performance (continued)

- Level Control Valve 2-LCV-3-148, MD AFW PUMP 2B-B SG3 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-148A, SG3 AUX FEEDWATER 2-LCV-3-148 BYPASS. ________
- Level Control Valve 2-LCV-3-156, MD AFW PUMP 2A-A SG 2 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-156A, SG3 AUX FEEDWATER 2-LCV-3-156 BYPASS. ________
- Level Control Valve 2-LCV-3-164, MD AFW PUMP 2A-A SG1 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-164A, SG1 AUX FEEDWATER 2-LCV-3-164 BYPASS. ________
- Level Control Valve 2-LCV-3-171, MD AFW PUMP SG4 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-171A, SG4 AUX FEEDWATER 2-LCV-3-171 BYPASS. ________

[15] **PERFORM** vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

____
2-PTI-999-01
Test Engr

[16] **VERIFY** that there were **NO** excessive oscillations during the simultaneous start transient of AUX FEEDWATER PUMPS 2A-A and 2B-B for the control valves in step 6.12.2[14]: (**Acc Crit**) ________

NOTE
Steps 6.12.2[17] through Step 6.12.2[19] should be performed simultaneously.

[17] **PLACE** Handswitch 2-HS-46-55A [2-M-4], T-D AFWP OVERSPEED TRIP, to TRIP. ________

6.12.2 Section Performance (continued)

[18] **OBSERVE** that there are **NO** excessive oscillations during the trip transient of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S trip for the following control valves:

- Pressure Control Valve 2-PCV-3-122, AUX FEEDWATER PMP 2A-A DISCHARGE PRESS CONTROL. ________
- Pressure Control Valve 2-PCV-3-132, AUX FEEDWATER PUMP 2B-B DISCHARGE PRESS CONTROL. ________
- Level Control Valve 2-LCV-3-148, MD AFW PUMP 2B-B SG3 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-148A, SG3 AUX FEEDWATER 2-LCV-3-148 BYPASS. ________
- Level Control Valve 2-LCV-3-156, MD AFW PUMP 2A-A SG 2 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-156A, SG2 AUX FEEDWATER 2-LCV-3-156 BYPASS. ________
- Level Control Valve 2-LCV-3-164, MD AFW PUMP 2A-A SG1 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-164A, SG1 AUX FEEDWATER 2-LCV-3-164 BYPASS. ________
- Level Control Valve 2-LCV-3-171, MD AFW PUMP 2B-B SG4 LEVEL CONTROL. ________
- Level Control Valve 2-LCV-3-171A, SG4 AUX FEEDWATER 2-LCV-3-171 BYPASS. ________

[19] **PERFORM** vibration testing in accordance with 2-PTI-999-01,Operational Vibration Testing.

____
2-PTI-999-01
Test Engr

[20] **VERIFY** that there were **NO** excessive oscillations during the trip transient of 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S for the control valves in step 6.12.2[18] (**Acc Crit**) ________

6.12.2 Section Performance (continued)

NOTES
1) Operations must be prepared to restore Steam Generator levels using a Motor Driven Auxiliary Feedwater Pump PRIOR to performing steps 6.12.2[21] through 6.12.2[23].
2) Steps 6.12.2[21] thru 6.12.2[23] may be performed in any order.

[21] **PLACE** 2-HS-3-118A, AFW PMP A-A, to STOP. ________

[22] **PLACE** 2-HS-3-128A, AFW PMP B-B, to STOP. ________

[23] **PLACE** Handswitch 2-HS-46-56A-S [2-M-4], T-D AFWP T & T VLV, to CLOSE, **AND**

VERIFY locally that the latch lever relatches to the trip hook. ________

[24] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. ________

6.13 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Minimum Steam Pressure Operation and all AFW PUMP VERIFICATION OF MINIMUM CURVE ACCEPTABILITY

6.13.1 Final Field Preparations

[1] **VERIFY** prerequisites listed in Section 4.0 for Section 6.13 have been completed. _________

[2] **ENSURE** that Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 2-LI-2-233D, CNDS STORAGE TANK B LEVEL, [2-M-2]. _________

[3] **ENSURE** the following breakers are OPEN and RACKED UP into position:

A. 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10. _________

B. 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10. _________

[4] **ENSURE** the switch lineup listed in Appendix DD, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time Tests, Control Switch Alignment, is completed. _________

[5] **IF** temporary full flow test header is installed, **THEN**

REQUEST clearance **AND**

REMOVE full flow test header from 2A-A and 2B-B AFW pumps. _________

6.13.2 Section Performance

[1] AFW PMP 2 A-A to Steam Generators 1 & 2

CAUTIONS

1) Monitor Steam Generators 1 and 2 level during 2-PMP-3-118, AUX FEEDWATER PMP 2A-A operation. Do not allow level to exceed 75% or fall below 30% as indicated by the narrow range level indication.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[1.1] **RECORD** the system pre-test data for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A on Appendix U, Section 1.0, PRE-TEST DATA. ________

[1.2] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-164, AFW PMP A-A SG 1 LEVEL,(2-M-3) **AND**

RECORD Level: 2-LI-3-164 ______________% ________

[1.3] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-156, AFW PMP A-A SG 2 LEVEL, **AND**

RECORD Level: 2-LI-3-156 ______________% ________

6.13.2 Section Performance (continued)

[1.4] **PLACE** the following Level Indicating Controllers in MANUAL at 100%:

[1.4.1] 2-LIC-3-156A, SG 2 SUPPLY FRM PMP 2 A-A ________

[1.4.2] 2-LIC-3-164A, SG 1 SUPPLY FRM PMP 2 A-A ________

[1.5] **ENSURE** the following valves are CLOSED:

[1.5.1] 2-LCV-3-156, SG 2 SUPPLY 2-LCV-3-156 CNTL ________

[1.5.2] 2-LCV-3-164, SG 1 SUPPLY 2-LCV-3-164 CNTL ________

[1.6] **IF** Steam Generator Blowdown is remain in service, **THEN**

HOLD the following handswitches in OPEN while starting AFW PMP 2 A-A:

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
SG 2 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-14/182	
SG 4 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-32/184	

[1.7] **ENSURE** that Steam Generator pressure is 100 (80-120) PSIG. ________

[1.8] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START. ________

[1.9] **MANUALLY** control LCVs with the following Level Indicating Controllers until flows stabilize at a combined flow of ≥410 (410-430) GPM on Temporary Flowmeter TF-1.

- 2-LIC-3-156A, SG 2 SUPPLY FRM PMP 2 A-A ________
- 2-LIC-3-164A, SG 1 SUPPLY FRM PMP 2 A-A ________

6.13.2 Section Performance (continued)

[1.10] **RECORD** the system test data for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A on Appendix U, Section 2.0, TEST DATA. ________

[1.11] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **AND**

VERIFY locally that 2-PMP-3-118, AUX FEEDWATER PMP 2A-A STOPS. ________

[1.12] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System. ________

[1.13] **PERFORM** the calculations on Appendix U Section 7.0, **THEN**

PLOT the intersection point of Total Dynamic Head and Flow on Appendix QQ. ________

[1.13.1] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

6.13.2 Section Performance (continued)

[2] AFW PMP 2-B-B to Steam Generators 3 & 4

CAUTIONS

1) Monitor Steam Generators 3 and 4 level during 2-PMP-3-128, AUX FEEDWATER PMP 2A-A operation. Do not allow level to exceed 75% or fall below 30% as indicated by the narrow range level indication.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pumps should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.

[2.1] **ENSURE** prerequisites for Section 6.13 have been completed. ________

[2.2] **ENSURE** that the Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 0-LI-2-230A, CNDS STORAGE TANK A LEVEL,(2-M-2). ________

[2.3] **RECORD** the system pre-test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix U, Section 3.0, PRE-TEST DATA. ________

[2.4] **ENSURE** that Steam Generator No. 3 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-148, AFW PMP B-B SG 3 LEVEL,(2-M-3) **AND**

RECORD Level: 2-LI-3-148 ____________% ________

[2.5] **ENSURE** that Steam Generator No. 4 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-171, AFW PMP B-B SG 4 LEVEL, **AND**

RECORD Level: 2-LI-3-171 ____________% ________

6.13.2 Section Performance (continued)

[2.6] **PLACE** the following LICs in MANUAL:

[2.6.1] 2-LIC-3-148A, SG 3 SUPPLY FRM PMP 2B-B ________

[2.6.2] 2-LIC-3-171A, SG 4 SUPPLY FRM PMP 2B-B ________

[2.7] **ENSURE** the following valves are CLOSED:

[2.7.1] 2-LCV-3-148, SG 3 SUPPLY 2-LCV-3-148 CNTL ________

[2.7.2] 2-LCV-3-171, SG 4 SUPPLY 2-LCV-4-171 CNTL ________

[2.8] **IF** Steam Generator Blowdown is to remain in service, **THEN**

HOLD the following handswitches in OPEN while starting AFW PMP 2B-B:

NOMENCLATURE	LOCATION	POSITION	UNID	INITIALS
SG 1 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-7/181	
SG 3 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-25/183	

[2.9] **ENSURE** that steam generator pressure is 100 (80-120) PSIG. ________

[2.10] **PLACE** Handswitch 2-HS-3-128A, AFW PMP 2B-B, to START. ________

[2.11] **MANUALLY** control LCVs with the following Level Indicating Controllers until flows stabilize at a combined flow of ≥410 (410-430) GPM on Temporary Flowmeter TF-1.

- 2-LIC-3-148A, SG 3 SUPPLY FRM PMP 2 B-B ________
- 2-LIC-3-171A, SG 4 SUPPLY FRM PMP 2 B-B ________

[2.12] **RECORD** the system test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix U, Section 4.0, TEST DATA. ________

6.13.2 Section Performance (continued)

[2.13] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

VERIFY locally that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B STOPS. ________

[2.14] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System ________

[2.15] **POSITION** the Manual Drive Lever on the following controllers to decrease the control output meter indication to 0% (CLOSED).

A. 2-LIC-3-156A, SG 2 SUPPLY FRM PMP A-A ________

B. 2-LIC-3-164A, SG 1 SUPPLY FRM PMP A-A, ________

C. 2-LIC-3-148A, SG 3 SUPPLY FRM PMP B-B ________

D. 2-LIC-3-171A, SG 4 SUPPLY FRM PMP B-B ________

[2.16] **PERFORM** the calculations on Appendix U Section 8 **AND**

THEN PLOT the intersection point of Total Dynamic Head and Flow on Appendix RR. ________

[2.16.1] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

6.13.2 Section Performance (continued)

[3] AFW PMP 2 A-S to all Steam Generators

CAUTIONS

1) The Turbine Driven Auxiliary Feedwater Pump should not be operated continuously for more than 1 hour on Miniflow. During operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) 2-FCV-1-51 should not be operated continuously for more than five minutes. Continuous operation of valve is travel from FULL OPEN to FULL CLOSE, then FULL OPEN (or vice versa) without a one minute delay between valve strokes. If the valve is operated continuously for more than five minutes, then the valve should be idle for a minimum of 45 minutes.

[3.1] **ENSURE** prerequisites for Section 6.13 have been completed. ________

[3.2] **ENSURE** that the Condensate Storage Tank level is greater than 200,000 gallons as indicated at level indicator 0-LI-2-230A, CNDS STORAGE TANK A LEVEL,(2-M-2). ________

[3.3] **ENSURE** that Steam Generator No. 1 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-164, AFW PMP A-A SG 1 LEVEL,(2-M-3) **AND**

RECORD the indicated level.

2-LI-3-164 Level______________% ________

[3.4] **ENSURE** that Steam Generator No. 2 Level is lowered to 30% (26 to 34%) narrow range as indicated at 2-LI-3-156, AFW PMP A-A SG 2 LEVEL, **AND**

RECORD the indicated level.

2-LI-3-156 Level______________% ________

6.13.2 Section Performance (continued)

[3.5] **PLACE** the following Level Indicating Controllers in MANUAL at 100%:

[3.5.1] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP ________

[3.5.2] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP ________

[3.6] **ENSURE** the following valves are OPEN:

[3.6.1] 2-LCV-3-173, SG 2 SUPPLY 2-LCV-4-173 CNTL ________

[3.6.2] 2-LCV-3-174, SG 1 SUPPLY 2-LCV-3-174 CNTL ________

[3.7] **PLACE** the following Level Indicating Controllers in MANUAL at 0%:

[3.7.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP ________

[3.7.2] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP ________

[3.8] **ENSURE** the following valves are CLOSED

[3.8.1] 2-LIC-3-172A, SG 3 SUPPLY FRM T-D PMP ________

[3.8.2] 2-LIC-3-175A, SG 4 SUPPLY FRM T-D PMP ________

[3.9] **ENSURE** 2-FIC-046-0057A-S, AUX FPT FLOW IND CONTROLLER is in AUTO. ________

[3.10] **IF** it is desired to maintain Steam Generator Blowdown, **THEN**

HOLD the following handswitches in OPEN while starting the TDAFW pump:

NOMENCLATURE	LOCATION	POSITION	UNID	PERF INITIALS
SG 1 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-7/181	
SG 2 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-14/183	
SG 3 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-25/183	
SG 4 BLOWDOWN VLVS	2-M-4	OPEN	2-HS-1-32/184	

6.13.2 Section Performance (continued)

[3.11] **RECORD** the system pre-test data for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S on Appendix U Section 5.0, PRE-TEST DATA. ________

[3.12] **WHEN** steam line pressure is 100 (80-120) PSIG at Computer Log Points P0400A, STM GEN 1 STM OUT 1 PRESSURE, and P0420A, STM GEN 2 STM OUT 1 PRESSURE **THEN**

PLACE Handswitch 2-HS-46-56A-S, TD AFWP T&T VLV, in OPEN **AND**

ENSURE AFWT comes to operating speed of 3900 to 4000 rpm [2-SI-46-56A-S, T-D AFW PMP SPEED, [2-M-4] ________

[3.13] **WHEN** flow is stable **OR** begins to decrease **THEN**

RECORD the system test data for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B on Appendix U, Section 6.0, TEST DATA. ________

[3.14] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to STOP, **AND**

VERIFY locally that 2-PMP-3-128, AUX FEEDWATER PMP 2B-B STOPS. ________

[3.15] **IF** S/G Blowdown is required to be in service, **THEN**,

ESTABLISH S/G Blowdown per 2-TOP-15.01, Steam Generator Blowdown System. ________

[3.16] **LOWER** the output on the following controllers to 0% (CLOSED):

[3.16.1] 2-LIC-3-173A, SG 2 SUPPLY FRM T-D PMP ________

[3.16.2] 2-LIC-3-174A, SG 1 SUPPLY FRM T-D PMP ________

6.13.2 Section Performance (continued)

[3.17] **PERFORM** the calculations on Appendix U Section 9.0, **THEN**

PLOT the intersection point of Total Dynamic Head and Flow on Appendix RR. ________

[3.17.1] **VERIFY** that the plotted point is above the Minimum Pump Curve. ________

[3.17.2] **VERIFY** the Turbine Driven AFW Pump 2A-S delivers ≥410 GPM flow to 2 Steam Generators with a steam supply of 100 (80-120) PSIG:

- Flow ≥ 410 GPM on Appendix U, Section 6.0 **(Acc Crit)** ________
- Steam Supply Pressure 100 (80-120) PSIG on Appendix U, Section 6.0 **(Acc Crit)** ________

6.14 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Full Flow Tests

6.14.1 Final Field Preparations

[1] **VERIFY** Plant conditions are at the 450°F Test Plateau in accordance with 2-PTI-068-01, HFT Heatup And Cooldown for Section 6.14. ________

[2] **ENSURE** the switch lineup listed in Appendix F, Switch Alignment, is completed. ________

[3] **ENSURE** the following breakers are OPEN and RACKED UP into position:

- 2-BKR-3-118, AFW PUMP 2A-A (2-PMP-3-118) on 6900V Shutdown BD 2A-A, Panel 10. ________
- 2-BKR-3-128, AFW PUMP 2B-B (2-PMP-3-128) on 6900V Shutdown BD 2B-B, Panel 10. ________

[4] **ENSURE** SG 1 through 4 levels are 30-34% NR. ________

[5] **VERIFY** prerequisites listed in Section 4.0 for Section 6.14 have been completed. ________

[6] **ENSURE** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer has test equipment and personnel in place to support vibration testing. ________

[7] **PERFORM** the control switch alignment per Appendix JJ, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Full Flow Tests Control Switch Alignment. ________

6.14.1 Final Field Preparations (continued)

[8] **ENSURE** that the following valves are in the OPEN position:

- 2-ISV-3-834, MD AFW PUMP 2B-B SG 3 LEVEL CONTROL ISOL. ________
- 2-ISV-3-837, MD AFW PUMP 2B-B SG4 LEVEL CONTROL ISOL. ________
- 2-ISV-3-836, MD AFW PUMP 2A-A SG1 LEVEL CONTROL ISOL. ________
- 2-ISV-3-835, MD AFW PUMP 2A-A SG2 LEVEL CONTROL ISOL. ________

[9] **CLOSE** Valve 2-ISV-32-3753 [A13T/737], ESSENT CONTROL AIR ISOL VALVE TO 2-LCV-3-164. ________

[10] **OPEN** Regulator 2-PREG-3-164 [A13T/737], CONTROL AIR PRESSURE REG FOR 2-LCV-3-164, bleed valve, **THEN**

VERIFY 2-LCV-3-164, is OPEN. ________

[11] **CLOSE** 2-ISV-32-3751 [A13T/737], CONTROL AIR ISOL VALVE TO 2-LCV-3-156. ________

[12] **OPEN** Regulator 2-PREG-3-156 [A13T/737], CONTROL AIR PRESSURE REG FOR 2-LCV-3-156, bleed valve, **THEN**

VERIFY 2-LCV-3-156, is OPEN. ________

[13] **CLOSE** Valve 2-ISV-32-3687 [A13S/737], ESSENT CONTROL AIR ISOL VALVE 2-LCV-3-148. ________

[14] **OPEN** Regulator 2-PREG-3-148 [A13S/741], CONTROL AIR PRESSURE REG FOR 2-LCV-3-148, bleed valve, **THEN**

VERIFY 2-LCV-3-148, is OPEN. ________

[15] **CLOSE** Valve 2-ISV-32-3689 [A13S/737], ESSENT CONTROL AIR ISOL VALVE TO 2-LCV-3-171. ________

[16] **OPEN** Regulator 2-PREG-3-171 [A13S/741], CONTROL AIR PRESSURE REG FOR 2-LCV-3-171, bleed valve, **THEN**

VERIFY 2-LCV-3-171 is OPEN. ________

6.14.2 Section Performance

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 15 minutes on Miniflow. During Operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pump Flow should not exceed 700 GPM to prevent pump operation in a runout condition.

NOTES

1) The purpose of Steps 6.14.2[1] through]6.14.2[9] is to verify that 2-PCV-3-122, AUX FW PMP A-A OUTLET prevents pump runout at ≤ 700 GPM.
2) Maximum Motor Driven Auxiliary Feedwater flow to Steam Generators 1 and 2 will be established during performance of Step 6.14.2[2] through Step 6.14.2[7]. Step 6.14.2[2] through Step 6.14.2[7] should be performed rapidly to minimize the duration of the transient.

[1] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Start Transient. ______

[2] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to START, **AND**

VERIFY locally that the pump is RUNNING. ______

6.14.2 Section Performance (continued)

[3] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Steady State vibration testing. ________

[4] **RECORD** maximum flow data on Appendix KK, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Maximum Flow Test. ________

[5] **PERFORM** 2-PMP-3-118, AUX FEEDWATER PMP 2A-A, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program.

____
TI-31.02
Test Engr

[6] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Stop Transient. ________

[7] **PLACE** Handswitch 2-HS-3-118A, AFW PMP A-A, to STOP, **AND**

VERIFY locally that 2-PMP-3-118, AUX FEEDWATER PMP 2A-A STOPS. ________

[8] **PERFORM** the following calculation to determine maximum pump flow, correcting for the temporary flowmeter, TF-1 inaccuracy. (Pump Flow/Appendix KK, 2-PMP-3-118, AUX FEEDWATER PMP 2A-A Maximum Flow Test).

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM)$$

Where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = M&TE inaccuracy in percent

____
1st

____
Verifier

6.14.2 Section Performance (continued)

[9] **VERIFY** that the maximum flow rate as calculated at Step 6.14.2[8] is ≤700 GPM. **(Acc Crit)** ________

CAUTIONS

1) The Motor Driven Auxiliary Feedwater Pump should not be operated continuously for more than 15 minutes on Miniflow. During Operation on Miniflow, the pump should be LOCALLY MONITORED for abnormal operating conditions such as excessive heating of the pump casing, unusual vibration, etc.
2) The Motor Driven Auxiliary Feedwater Pumps may have 2 consecutive starts at ambient temperature and 1 start at operating temperature. Subsequent starts with the motor running continuously between starts must be a minimum of 20 minutes apart. Subsequent starts with the motor standing between starts must be a minimum of 45 minutes apart.
3) The Motor Driven Auxiliary Feedwater Pump Flow should not exceed 700 GPM to prevent pump operation in a runout condition.

NOTES

1) The purpose of Steps 6.14.2[10] through 6.14.2[18] is to verify that 2-PCV-3-132, AUX FW PMP B-B OUTLET prevents pump runout at ≤ 700 GPM.
2) Maximum motor driven auxiliary feedwater flow to Steam Generators 3 and 4 will be established during performance of Step 6.14.2[11] through Step 6.14.2[16]. Step 6.14.2[11] through Step 6.14.2[16] should be performed rapidly to minimize the duration of the transient.

[10] **NOTIFY** 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Start Transient. ________

[11] **PLACE** Handswitch 2-HS-3-128A, AFW PMP B-B, to START, **AND**

VERIFY locally that the pump is RUNNING. ________

6.14.2 Section Performance (continued)

[12] **NOTIFY** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Steady State vibration testing. ________

[13] **RECORD** maximum flow data on Appendix LL, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Maximum Flow Test, DATA COLLECTION. ________

[14] **PERFORM** 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, vibration testing in accordance with TI-31.02, Plant Equipment Vibration Monitoring And Vibration Diagnostics Program. ________
TI-31.02 Test Engr

[15] **NOTIFY** the 2-PTI-999-01,Operational Vibration Testing, Test Engineer that conditions have been established for 2-PMP-3-128, AUX FEEDWATER PMP 2B-B Stop Transient. ________

[16] **PLACE** handswitch 2-HS-3-128A, AFW PMP B-B to STOP, **AND**

VERIFY locally that the pump STOPS. ________

[17] **PERFORM** the following calculation to determine maximum pump flow, correcting for the temporary flowmeter, TF-1 inaccuracy. (Pump Flow/Appendix LL, 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Maximum Flow Test).

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_(\text{GPM}) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_(\text{GPM})$$

Where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = M&TE inaccuracy in percent

____
1st

____
Verifier

6.14.2 **Section Performance (continued)**

[18] **VERIFY** that the maximum flow rate calculated at Step 6.14.2[17] is ≤700 GPM. **(Acc Crit)** _________

[19] **CLOSE** Regulator 2-PREG-3-164, CONTROL AIR PRESSURE REG FOR 2-LCV-3-164, bleed valve. _________

[20] **OPEN** Valve 2-ISV-32-3765, ESSENT CONTROL AIR ISOL VALVE TO 2-LCV-3-164. _________

[21] **CLOSE** Regulator 2-PREG-3-156, CONTROL AIR PRESSURE REG FOR 2-LCV-3-156, bleed valve. _________

[22] **OPEN** Valve 2-ISV-32-3761, CONTROL AIR ISOLATION VALVE TO 2-LCV-3-156. _________

[23] **CLOSE** Regulator 2-PREG-3-148, CONTROL AIR PRESSURE REG FOR 2-LCV-3-148, bleed valve. _________

[24] **OPEN** Valve 2-ISV-32-3745, ESSENT CONTROL AIR ISOL VALVE TO 2-LCV-3-148. _________

[25] **CLOSE** Regulator 2-PREG-3-171, CONTROL AIR PRESSURE REG FOR 2-LCV-3-171, bleed valve. _________

[26] **OPEN** Valve 2-ISV-32-3747, ESSENT CONTROL AIR ISOL VALVE TO 2-LCV-3-171. _________

[27] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

6.15 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Overspeed Trip Setup and Testing - Pre Hot Functional Test

NOTES

1) This Section may be N/A if overspeed testing has already been completed. The Test Engineer should obtain the documentation and include copies of the data into this instruction package.
2) It is preferable that this Section be performed PRIOR to entering the Unit 2 Hot Functional Test in order to efficiently perform Section 6.7, Electrical and Mechanical Overspeed Trip Test, during the Hot Functional Test, such that the actual mechanical and electrical testing is minimized and verifies the trip setpoints.

[1] **ENSURE** 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S is UNCOUPLED. _________

[2] **ENSURE** Appendix E, Breaker Alignment, Section 6.7 and/or 6.15, checklist is completed. _________

[3] **PERFORM** overspeed trip testing for 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S in accordance with IMI-46.002, LATEST REVISION. _________

[4] **WHEN** testing is completed, **THEN**

ENSURE 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S remains uncoupled for further Hot Functional testing in accordance with Section 6.7 under hot plant conditions. _________

[5] **ATTACH** completed Sections and data sheets from IMI-46.002 to this test and annotate chronological test log. _________

[6] **CONTINUE** performance of instruction in Sections as determined by the Test Engineer. _________

[7] **ATTACH** test data to this procedure and **PROVIDE** a copy to Engineering for review. _________

7.0 POST-PERFORMANCE ACTIVITIES

NOTE

The restoration steps in Section 7.0 may be performed prior to completion of Section 6.0 when the associated configuration is no longer required to support 6.0 testing.

7.1 Post Performance System Alignment

[1] **ENSURE** the temporary flowmeter, (TF-1), installed on the horizontal length of the Auxiliary Feedwater Pumps suction piping in Auxiliary Building 713' hallway is REMOVED.

_______ 1st

_______ CV

[2] **ENSURE** the 0-30 PSIG pressure gauge, (TG-1), installed at the test connection for 2-PI-3-117, AUX FEEDWATER PMP 2A-A SUCTION PRESS, [A12S/713] is REMOVED.

_______ 1st

_______ CV

[3] **ENSURE** the 0-3000 PSIG pressure gauge, (TG-2), installed at the test connection for 2-PI-3-122B AUX FEEDWATER PMP 2A-A DISCHARGE PRESS, [A13S/713] is REMOVED.

_______ 1st

_______ CV

[4] **ENSURE** the 0-30 PSIG pressure gauge, (TG-3), installed at the test connection for 2-PI-3-127 AUX FEEDWATER PMP 2B-B SUCTION PRESS, [A13S/713] is REMOVED.

_______ 1st

_______ CV

[5] **ENSURE** the 0-3000 PSIG pressure gauge, (TG-4), installed at the test connection for 2-PI-3-132B, AUX FEEDWATER PMP 2B-B DISCHARGE PRESS, [A13S/713] is REMOVED.

_______ 1st

_______ CV

7.1 Post Performance System Alignment (continued)

[6] **ENSURE** the 0-60 PSIG pressure gauge, (TG-5), installed at the test connection for 2-PI-3-137, TD AUX FEEDWATER PMP SUCTION, [A14U/692] is REMOVED.

_______ 1st

_______ CV

[7] **ENSURE** the 0-3000 PSIG pressure gauge, (TG-6), installed at the test connection for 2-PI-3-138, TD AUX FEEDWATER PUMP DISCHARGE PRESS, [A14U/692] is REMOVED.

_______ 1st

_______ CV

[8] **ENSURE** the 0-1500 PSIG pressure transmitter, (TT-1), installed at the test connection for 2-PS-3-138B, TD AUX FEEDWATER PUMP DISCHARGE PRESSURE, [A14T/692] is REMOVED.

_______ 1st

_______ CV

[9] **ENSURE** the following fuses are REMOVED:

- 2-FU-275-R73/K13 & K14 (2-R-73)

  _______ 1st

  _______ CV

- 2-FU-275-R73/K15, AUX FEED PUMP TURBINE STEAM SUP TRANSFER, (2-R-73).

  _______ 1st

  _______ CV

- 2-FU-275-R74/K1 & K2 (2-R-74)

  _______ 1st

  _______ CV

- 2-FU-275-R77/K1 & K2 (2-R-77)

  _______ 1st

  _______ CV

7.1 Post Performance System Alignment (continued)

- 2-FU-275-R78/K13 & K14 (2-R-78)

1st ______

CV ______

[10] **ENSURE** the precision resistor or decade box installed between the lifted wire and 2-FM-3-163BB, SG #1 AUX FW FLOW MOD (Step6.6.1[6.2]) is REMOVED.

1st ______

CV ______

[11] **ENSURE** the lifted wire (wire lifted at Step 6.6.1[6.1]) located at 2-FM-3-163BB, SG #1 AUX FW FLOW MOD, to Terminal 10 of 2-FM-3-155AB is TERMINATED.

1st ______

CV ______

[12] **ENSURE** the precision resistor or decade box installed between the lifted wire and 2-FM-3-155AB, SG #2 AUX FW FLOW MOD (Step 6.6.1[7.2]) is REMOVED.

1st ______

CV ______

[13] **ENSURE** the lifted wire (wire lifted at Step 6.6.1[7.1]) located at 2-FM-3-155AB, SG #2 AUX FW FLOW MOD, to Terminal 10 of 2-FM-3-155AB is TERMINATED.

1st ______

CV ______

[14] **ENSURE** the precision resistor installed between the lifted wire and 2-FM-3-147BB, SG #3 AUX FW FLOW MOD (Step 6.6.1[8.2]) is REMOVED.

1st ______

CV ______

7.1 Post Performance System Alignment (continued)

[15] **ENSURE** the lifted wire (wire lifted at Step 6.6.1[8.1]) located at 2-FM-3-147BB, SG #3 AUX FW FLOW MOD, to Terminal 10 of 2-FM-3-147BB is TERMINATED.

_______ 1st

_______ CV

[16] **ENSURE** the precision resistor or decade box installed between the lifted wire and 2-FM-3-170AB, SG #4 AUX FW FLOW MOD (Step 6.6.1[9.2]) is REMOVED.

_______ 1st

_______ CV

[17] **ENSURE** the lifted wire (wire lifted at Step 6.6.1[9.1] located at 2-FM-3-170AB, SG #4 AUX FW FLOW MOD, to Terminal 10 of 2-FM-3-170AB is TERMINATED.

_______ 1st

_______ CV

[18] **NOTIFY** Operations that AFW Train A initiation from MFP TRIPS and AMSAC will be re-armed **THEN**

ENSURE the lifted wire (TTAB2) (wire lifted at Step 4.3.6[3]) located at TB429-1 in Panel 1-R-74 is TERMINATED.

_______ 1st

_______ CV

[19] **NOTIFY** Operations that AFW Train B initiation from MFP TRIPS and AMSAC will be re-armed **THEN**

ENSURE the lifted wire (TTBB2) (wire lifted at Step 4.3.6[4]) located at TB730-4 in Panel 1-R-77 is TERMINATED.

_______ 1st

_______ CV

[20] **VERIFY** that post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed and the results recorded in Appendix OO, Measuring and Test Equipment (M&TE) Log. _______

7.1 Post Performance System Alignment (continued)

[21] **VERIFY** that post-test calibration of permanent plant instruments used to record quantitative acceptance criteria has been satisfactorily performed and the results recorded on Appendix C, Permanent Plant Instrument Log. ________

[22] **NOTIFY** the Shift Manager (SM) or his/her designee of the test completion and system alignment. ________

8.0 RECORDS

A. QA Records

Complete Test Package

B. Non-QA Records

None

Appendix A
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Test Procedures/Instructions Reference Review

Additional copies of this table may be made as necessary.

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	INITIAL AND DATE (N/A for no change)
2-PTI-68-01, Hot Functional Test (HFT) Heatup And Cooldown, (Under Development)		
2-TSD-3B-5, Rev 4		
Chemistry Manual Chapter 3.01, System Chemistry Specifications, Rev. 86		
EDCR 52893, MDAFWP, Rev. A		
EDCR 53276, TDAFWP, Rev. A		
FSAR Section 10.4.9, Amendment 110		
FSAR Table 14.2-1, Sheets 71 and 72 of 89, Amendment 110		
GOI-7, Generic Equipment Operating Guidelines, Rev 49		
LCO 3.7.5, U-2 FSAR (Developmental G)		
NRC Commitment TROI Item No. NC0820268001 & NC0820268002, 48 Hour Endurance Test, Rev N/A		
Regulatory Guide 1.68, Initial Test Programs For Water-Cooled Power Reactors, Rev 2		
SMP-4.0, System Turnover, Rev 8		
SMP-7.0, WBNP Unit 2 Control Of System Cleanness, Layup And Flushing, Rev 3		
SMP-9.0, WBNP Unit 2 Conduct of Test, Rev 2		
TI-31.02, Rev. 0023		
WBN2-3B-4002, Auxiliary Feedwater System, Rev. 1.		

Reviewed By:

______________________________ Startup Test Director ____________ Date

Appendix B
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Temporary Condition Log

These steps will be N/A'd if no temporary condition existed. Additional copies of this table may be made as necessary.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
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Permanent Plant Instrument Log

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-LPP-3-122A							
2-LPP-3-122C							
2-LPP-3-132A							
2-LPP-3-132C							
2-LPL-3-148							
2-LPL-3-156							
2-LPL-3-164							
2-LPL-3-171							
2-LPL-3-172							
2-LPL-3-173							
2-LPL-3-174							
2-LPL-3-175							
2-LPS-46-56							
2-LPS-46-57							
2-PS-3-139A							

Appendix C
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Permanent Plant Instrument Log

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-PS-3-139B							
2-PS-3-139D							
2-PS-3-138A							
2-PS-3-138B							
2-PS-3-144A							
2-PS-3-144B							
2-PS-3-144D							
2-PS-3-148							
2-PS-3-156							
2-PS-3-164							
2-PS-3-171							
2-LPF-3-142							
2-PI-3-127							
2-PI-3-117							
2-EI-3-39							

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Permanent Plant Instrument Log

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-EI-3-66							
2-ITI-3-1000							
2-ITI-3-1001							
2-TI-3-120B							
2-TI-3-120A							
2-EI-3-119A							
2-EI-3-129A							
2-TI-3-141							
2-LI-2-233D							
2-ITI-3-1002							
2-ITI-3-1003							
2-TI-3-130B							
2-TI-3-130A							
2-TI-3-146							
2-TI-3-1B							

Appendix C
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Permanent Plant Instrument Log

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-TI-3-1A							
2-TI-3-149							
2-LPF-3-155A							
2-LPF-3-155B							
2-LPF-3-163A							
2-LPF-3-163B							
2-LPF-3-147A							
2-LPF-3-147B							
2-LPF-3-170A							
2-LPF-3-170B							

1 These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as not Applicable. (N/A)

2 May be identified as not Applicable (N/A) if instrument was not used to verify/record quantitative acceptance criteria data.

Appendix D
(Page 1 of 4)

Normal Test Breaker Alignment

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
6900-V SHUTDOWN BOARD 2A-A (2-BD-211-A-A)	PANEL 10 2-BKR-3-118	AUXILIARY FEEDWATER PUMP 2A-A 2-MTR-3-118-A	RACKED DOWN	 CV
6900-V SHUTDOWN BOARD 2B-B (2-BD-211-B-B)	PANEL 10 2-BKR-3-128	AUXILIARY FEEDWATER PUMP 2B-B 2-MTR-3-128-B	RACKED DOWN	 CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2A 2-BKR-3-116A	ERCW HDR B AFW PMP 2A-A SUCTION 2-FCV-3-116A-A	OFF	 CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2B 2-BKR-3-116B	ERCW HDR B AFW PMP 2A-A SUCTION 2-FCV-3-116B-A	OFF	 CV
480V REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 2A 2-BKR-3-126A	ERCW HDR B AFW PMP 2B-B SUCTION 2-FCV-3-126A-B	OFF	 CV
480V REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 2B 2-BKR-3-126B	ERCW HDR B AFW PMP 2B-B SUCTION 2-FCV-3-126B-B	OFF	 CV
480 REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 3A 2-BKR-3-179A	ERCW HDR B TD AFW PMP SUCTION 2-FCV-3-179A-B	OFF	 CV
480 REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 3B 2-BKR-3-179B	ERCW HDR B TD AFW PMP SUCTION 2-FCV-3-179B-B	OFF	 CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 3A 2-BKR-3-136A	ERCW HDR B TD AFW PMP SUCTION 2-FCV-3-136A-A	OFF	 CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 3B 2-BKR-3-136B	ERCW HDR B TD AFW PMP SUCTION 2-FCV-3-136B-A	OFF	 CV

Appendix D
(Page 2 of 4)

Normal Test Breaker Alignment

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2D 2-BKR-1-15-A	SG 1 STM SUP TO TD AFW PMP (2-FCV-1-15)	ON	CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 6A 2-BKR-1-16-A	SG 4 STM SUP TO TD AFW PMP (2-FCV-1-16)	ON	CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2E 2-BKR-1-17-A	MS HDR TO TD AFW PMP (2-FCV-1-17)	ON	CV
480V REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 2E 2-BKR-1-18-B	MS HDR TO TD AFW PMP (2-FCV-1-18)	ON	CV
480V REACTOR MOV BD 2A1-A (2-MCC-213-A1-A)	COMPT 4E 2-BKR-3-118D-A	AUX FEEDWATER PUMP A-A/ LUBE OIL PUMP A-A (2-MTR-3-118D-A)	ON	CV
480V REACTOR MOV BD 2B1-B (2-MCC-213-B1-B)	COMPT 17D 2-BKR-3-128D-B	AUX FEEDWATER PUMP B-B/ LUBE OIL PUMP B-B (2-MTR-3-128D-B)	ON	CV
120V AC VITAL INST PWR BD 2-III (2-BD-235-3-F)	BKR 28	AUX FEEDWATER PUMP A PRESSURE CONT 2-PDIC-3-122A	ON	CV
120V AC VITAL INST PWR BD 2-I (2-BD-235-1-D)	BKR 31	AUX CONT PNL A INST BUS	ON	CV
120V AC VITAL INST PWR BD 2-IV (2-BD-235-4-G)	BKR 43	AUX FEEDWATER PUMP B PRESSURE CONT 2-PDIC-3-132A	ON	CV
120V AC VITAL INST PWR BD 2-III (2-BD-235-3-F)	BKR 32	AUX CONT PNL 2-L-11A A INSTRUMENT BUS	ON	CV

Appendix D
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Normal Test Breaker Alignment

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
120V AC VITAL INST PWR BD 2-II (2-BD-235-2-E)	BKR 39	AFPT LEVEL CONT INSTR POWER TO PNL 2-L-11B	ON	 CV
120V AC VITAL INST PWR BD 2-IV (2-BD-235-4-G)	BKR 41	AUX CONT PNL 2-L-11B B INSTRUMENT BUS	ON	 CV
120V AC VITAL INST PWR BD 2-I (2-BD-235-1-D)	BKR 39	AFPT LEVEL CONT INSTR POWER TO PNL 2-L-11A	ON	 CV
120V AC VITAL INST PWR BD 2-I (2-BD-235-1-D)	BKR 40	AFPT FLOW CONT NOR FDR FIC-46-57	ON	 CV
120V AC VITAL INST PWR D 2-II (2-BD-235-2-E)	BKR 40	AFPT FLOW CONT ALT FDR FIC-46-57	ON	 CV
125V DC VITAL BATTERY BD I (0-BD-236-1-D)	BKR 321	UNIT 2 AUXILIARY FEED PUMP TURBINE NOR FDR	ON	 CV
125V DC VITAL BATTERY BD II (0-BD-236-2-E)	BKR 321	UNIT 2 AUXILIARY FEED PUMP TURBINE ALT FDR	ON	 CV
125V DC VITAL BATTERY BD I (0-BD-236-1-D)	BKR 310	125V DC NOR SUPPLY BTRY BD I CKT A16 2-LCV-3-172, TD AFW PUMP SG3 LEVEL CONTROL	ON	 CV
		125V DC NOR SUPPLY BTRY BD I CKT A32 2-LCV-3-175, TD AFW PUMP SG4 LEVEL CONTROL		 CV

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Normal Test Breaker Alignment

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
125V DC VITAL BATTERY BD I (0-BD-236-1-D)	BKR 311	125V DC AUX SUPPLY BTRY BD I CKT B33 2-LCV-3-175, TD AFW PUMP SG4 LEVEL CONTROL	ON	 CV
125V DC VITAL BATTERY BD I (0-BD-236-1-D)	BKR 312	125V DC AUX SUPPLY BTRY BD I CKT C9 2-LCV-3-172, TD AFW PUMP SG3 LEVEL CONTROL	ON	 CV
125V DC VITAL BATTERY BD II (0-BD-236-2-E)	BKR 310	125V DC NOR SUPPLY BTRY BD II CKT A19 2-LCV-3-173, TD AFW PUMP SG4 LEVEL CONTROL	ON	 CV
		125V DC NOR SUPPLY BTRY BD II CKT A25 2-LCV-3-174, TD AFW PUMP SG4 LEVEL CONTROL		 CV
125V DC VITAL BATTERY BD II (0-BD-236-2-E)	BKR 311	125V DC AUX SUPPLY BTRY BD II CKT B19 2-LCV-3-173, TD AFW PUMP SG4 LEVEL CONTROL	ON	 CV
		125V DC AUX SUPPLY BTRY BD II CKT B25 2-LCV-3-174, TD AFW PUMP SG4 LEVEL CONTROL		 CV

Appendix E
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Breaker Alignment, Section 6.7 and/or 6.15

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2D 2-BKR-1-15-A	SG 1 STM SUP TO TD AFW PMP (2-FCV-1-15)	ON	CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 6A 2-BKR-1-16-A	SG 4 STM SUP TO TD AFW PMP (2-FCV-1-16)	ON	CV
480V REACTOR MOV BD 2A2-A (2-MCC-213-A2-A)	COMPT 2E 2-BKR-1-17-A	MS HDR TO TD AFW PMP (2-FCV-1-17)	ON	CV
480V REACTOR MOV BD 2B2-B (2-MCC-213-B2-B)	COMPT 2E 2-BKR-1-18-B	MS HDR TO TD AFW PMP (2-FCV-1-18)	ON	CV
120V AC VITAL INST PWR BD 2-III (2-BD-235-3-F)	BKR 32	AUX CONT PNL 2-L-11A A INSTRUMENT BUS	ON	CV
120V AC VITAL INST PWR BD 2-II (2-BD-235-2-E)	BKR 39	AFPT LEVEL CONT INSTR POWER TO PNL 2-L-11B	ON	CV
120V AC VITAL INST PWR BD 2-IV (2-BD-235-4-G)	BKR 41	AUX CONT PNL 2-L-11B B INSTRUMENT BUS	ON	CV

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Breaker Alignment, Section 6.7 and/or 6.15

LOCATION	COMPONENT	DESCRIPTION	POSITION	INITIALS/DATE
120V AC VITAL INST PWR BD 2-I (2-BD-235-1-D)	BKR 39	AFPT LEVEL CONT INSTR POWER TO PNL 2-L-11A	ON	 CV
125V DC VITAL BATTERY BD I (0-BD-236-1-D)	BKR 321	UNIT 2 AUXILIARY FEED PUMP TURBINE NOR FDR	ON	 CV
125V DC VITAL BATTERY BD II (0-BD-236-2-E)	BKR 321	UNIT 2 AUXILIARY FEED PUMP TURBINE ALT FDR	ON	 CV
120V AC VITAL INST PWR BD 2-I (2-BD-235-1-D)	BKR 40	AFPT FLOW CONT NOR FDR FIC-46-57	ON	 CV
120V AC VITAL INST PWR D 2-II (2-BD-235-2-E)	BKR 40	AFPT FLOW CONT ALT FDR FIC-46-57	ON	 CV

Appendix F
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Normal Test Switch Alignment

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-HS-3-118A	MAIN CONTROL ROOM PANEL 2-M-4	AFW PMP A-A	PULL-TO-LOCK	
2-HS-3-128A	MAIN CONTROL ROOM PANEL 2-M-4	AFW PMP B-B	PULL-TO-LOCK	
2-XS-3-118	6900-V SHUTDOWN BOARD 2A-A/COMPT 10	AUX FW PMP A-A TRANS SW	NOR	
2-XS-3-128	6900-V SHUTDOWN BOARD 2B-B/COMPT 10	AUX FW PMP B-B TRANS SW	NOR	
2-HS-3-118C	6900-V SHUTDOWN BOARD 2A-A/COMPT 10	AUX FW PMP A-A MOTOR SW	AUTO	
2-HS-3-128C	6900-V SHUTDOWN BOARD 2B-B/COMPT 10	AUX FW PMP B-B MOTOR SW	AUTO	
2-XS-3-122	AUXILIARY CONTROL ROOM PANEL 2-L-11A	AFW PMP A-A DISCH PCV CONTROLLER	NOR	
2-XS-3-132	AUXILIARY CONTROL ROOM PANEL 2-L-11B	AFW PMP B-B DISCH PCV CONTROLLER	NOR	
2-XS-3-148	AUXILIARY CONTROL ROOM PANEL 2-L-11B	AFW TO SG 3 FROM PMP B-B	NOR	
2-XS-3-171	AUXILIARY CONTROL ROOM PANEL 2-L-11A	AFW TO SG 4 FROM PMP B-B	NOR	
2-XS-3-164	AUXILIARY CONTROL ROOM PANEL 2-L-11A	AFW TO SG 1 FROM PMP A-A	NOR	
2-XS-3-156	AUXILIARY CONTROL ROOM PANEL 2-L-11A	AFW TO SG 2 FROM PMP A-A	NOR	

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(Page 2 of 4)

Normal Test Switch Alignment

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-XS-3-164A	AUXILIARY CONTROL ROOM PANEL 2-L-11A	AFW TO SG 1	NOR	
2-HS-3-148A	MAIN CONTROL ROOM PANEL 2-M-4	SG 3 SUPPLY LCV 3-148 CNTL	AUTO	
2-HS-3-171A	MAIN CONTROL ROOM PANEL 2-M-4	SG 4 SUPPLY LCV 3-171 CNTL	AUTO	
2-XS-3-148A	AUXILIARY CONTROL ROOM 2-L-11A	AFW TO SG 3	NOR	
2-XS-3-171A	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 4	NOR	
2-XS-3-156A	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 2	NOR	
2-HS-3-164A	MAIN CONTROL ROOM PANEL 2-M-4	SG 1 SUPPLY LCV 3-164 CNTL	AUTO	
2-HS-3-156A	MAIN CONTROL ROOM PANEL 2-M-4	SG 2 SUPPLY LCV-3-156 CNTL	AUTO	
2-XS-3-172	AUXILIARY CONTROL ROOM 2-L-11A	AFW TO SG 3 FROM T-D PMP	NOR	
2-XS-3-175	AUXILIARY CONTROL ROOM 2-L-11A	AFW TO SG 4 FROM T-D PMP	NOR	
2-XS-3-173	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 2 FROM T-D PMP	NOR	
2-XS-3-174	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 1 FROM T-D PMP	NOR	

Appendix F
(Page 3 of 4)

Normal Test Switch Alignment

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-XS-3-172A	AUXILIARY CONTROL ROOM 2-L-11A	AFW TO SG 3	NOR	
2-XS-3-175A	AUXILIARY CONTROL ROOM 2-L-11A	AFW TO SG 4	NOR	
2-XS-3-173A	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 2	NOR	
2-XS-3-174A	AUXILIARY CONTROL ROOM 2-L-11B	AFW TO SG 1	NOR	
2-HS-3-172A	MAIN CONTROL ROOM 2-M-4	SG 3 SUPPLY LCV-3-172 CNTL	AUTO	
2-HS-3-173A	MAIN CONTROL ROOM 2-M-4	SG 2 SUPPLY LCV-3-173 CNTL	AUTO	
2-HS-3-174A	MAIN CONTROL ROOM 2-M-4	SG 1 SUPPLY LCV-3-174 CNTL	AUTO	
2-HS-3-175A	MAIN CONTROL ROOM 2-M-4	SG 4 SUPPLY LCV-3-175 CNTL	AUTO	
2-XS-1-15	480V REACTOR MOV BD 2A2-A/COMPT 2D	SG 1 STM SUP TO TD AFW PMP (2-FCV-1-15)	NOR	
2-XS-1-16	480V REACTOR MOV BD 2A2-A/COMPT 6A	SG 4 STM SUP TO TD AFW PMP (2-FCV-1-16)	NOR	
2-XS-1-17	480V REACTOR MOV BD 2A2-A/COMPT 2E	MS HDR TO TD AFW PMP (2-FCV-1-17)	NOR	
2-XS-1-18	480V REACTOR MOV BD 2B2-B/COMPT 2E	MS HDR TO TD AFW PMP (2-FCV-1-18)	NOR	
2-HS-1-15C	480V REACTOR MOV BD 2A2-A/COMPT 2D	AUX FWPT STEAM SUPPLY FROM SG 1 REMOTE HANDSWITCH	P-AUTO	
2-HS-1-16C	480V REACTOR MOV BD 2A2-A/COMPT 6A	AUX FWPT STEAM SUPPLY FROM SG 1 REMOTE HANDSWITCH	P-AUTO	

Appendix F
(Page 4 of 4)

Normal Test Switch Alignment

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-HS-1-17C	480V REACTOR MOV BD 2A2-A/COMPT 2E	STEAM FLOW AUX FWPT ISOL VALVE REMOTE HANDSWITCH	P-AUTO	
2-HS-1-18C	480V REACTOR MOV BD 2B2-B/COMPT 2E	STEAM FLOW AUX FWPT ISOL VALVE REMOTE HANDSWITCH	P-AUTO	
2-HS-1-17A	MAIN CONTROL ROOM PANEL 2-M-4	STEAM HDR TO T-D AFW PMP	P-AUTO	
2-HS-1-18A	MAIN CONTROL ROOM PANEL 2-M-4	STEAM HDR TO T-D AFW PMP	P-AUTO	
2-SW-46-AC-S	A14T/692	AFPT AC SUPPLY	NOR	
2-SW-46-DC-S	A14T/692	DC MANUAL TRANSFER SWITCH	NOR	
2-XS-46-57	A14T/692	TD AFW PMP CONTROLS TRANSFER SWITCH	NOR	
2-XS-46-57A	A14T/692	TD AFW PMP FW DISCH FLOW IND CNTLR XFER SW	NOR	
2-HS-30-214	A14U/692	TD AUX FW PMP RM VENT FAN	AUTO	

Appendix G
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Switch Alignment, Section 6.7

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-XS-1-15	480V REACTOR MOV BD 2A2-A/COMPT 2D	SG 1 STM SUP TO TD AFW PMP (2-FCV-1-15)	NOR	
2-XS-1-16	480V REACTOR MOV BD 2A2-A/COMPT 6A	SG 4 STM SUP TO TD AFW PMP (2-FCV-1-16)	NOR	
2-XS-1-17	480V REACTOR MOV BD 2A2-A/COMPT 2E	MS HDR TO TD AFW PMP (2-FCV-1-17)	NOR	
2-XS-1-18	480V REACTOR MOV BD 2B2-B/COMPT 2E	STEAM FLOW AUX FWPT ISOL VALVE TRF SW	NOR	
2-HS-1-15C	480V REACTOR MOV BD 2A2-A/COMPT 2D	AUX FWPT STEAM SUPPLY FROM SG 1 REMOTE HANDSWITCH	P-AUTO	
2-HS-1-16C	480V REACTOR MOV BD 2A2-A/COMPT 6A	AUX FWPT STEAM SUPPLY FROM SG 4 REMOTE HANDSWITCH	P-AUTO	
2-HS-1-17C	480V REACTOR MOV BD 2A2-A/COMPT 2E	STEAM FLOW AUX FWPT ISOL VALVE REMOTE HANDSWITCH	P-AUTO	
2-HS-1-18C	480V REACTOR MOV BD 2B2-B/COMPT 2E	STEAM FLOW AUX FWPT ISOL VALVE REMOTE HANDSWITCH	P-AUTO	
2-HS-1-17A	MAIN CONTROL ROOM PANEL 2-M-4	STEAM HDR TO T-D AFW PMP	P-AUTO	
2-HS-1-18A	MAIN CONTROL ROOM PANEL 2-M-4	STEAM HDR TO T-D AFW PMP	P-AUTO	
2-SW-46-AC-S	A14T/692	AFPT AC SUPPLY	NOR	

Appendix G
(Page 2 of 2)

Switch Alignment, Section 6.7

SWITCH	LOCATION	DESCRIPTION	POSITION	INITIALS/DATE
2-SW-46-DC-S	A14T/692	DC MANUAL TRANSFER SWITCH	NOR	
2-XS-46-57	A14T/692	TD AFW PMP CONTROLS TRANSFER SWITCH	NOR	
2-XS-46-57A	A14T/692	TD AFW PMP FW DISCH FLOW IND CONTLR XFER SW	NOR	
2-HS-30-214	A14U/692	TD AUX FW PMP RM VENT FAN	AUTO	

Appendix H
(Page 1 of 13)

Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
TV-1	AFW PUMP 2A-A TEMPORARY DISCHARGE VLV	A13S/713	CLOSED	
TV-2	AFW PUMP 2B-B TEMPORARY DISCHARGE VLV	A13S/713	CLOSED	
TV-3	AFW PUMP 2A-S TEMPORARY DISCHARGE VLV	A15T/692	CLOSED	
2-FCV-1-15	MAIN STEAM LOOP 1 TD AUX PMP SUP	SVVR	OPEN	
2-FCV-1-16	MAIN STEAM LOOP 4 TD AUX PMP SUP	SVVR	CLOSED	
2-FCV-1-17	MAIN STEAM AUX FWP HDR SUPPLY ISOL	SVVR	OPEN	
2-FCV-1-18	MAIN STEAM AUX FWP HDR SUPPLY ISOL	SVVR	OPEN	
2-FCV-1-51	TD AUX FEEDWATER PMP TRIP & THROTTLE VALVE	A14U/692	CLOSED	
2-FCV-3-116A	ERCW HEADER A AFW PUMP 2A-A SUCTION	A12S/713	CLOSED	
2-FCV-3-116B	ERCW HEADER A AFW PUMP 2A-A SUCTION	A12S/713	CLOSED	
2-FCV-3-126A	ERCW HEADER B AFW PUMP 2B-B SUCTION	A13S/713	CLOSED	
2-FCV-3-126B	ERCW HEADER B AFW PUMP 2B-B SUCTION	A13S/713	CLOSED	
2-FCV-3-136A	ERCW HEADER A TD AFW PMP SUCT	A15T/692	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-FCV-3-136B	ERCW HEADER A TD AFW PMP SUCT	A15T/692	CLOSED	
2-FCV-3-179A	ERCW HEADER B TD AFW PMP SUCT	A14T/692	CLOSED	
2-FCV-3-179B	ERCW HEADER B TD AFW PMP SUCT	A14T/692	CLOSED	
2-RTV-3-308A	2-PS-3-144A/144B/144D ROOT	A13S/713	OPEN	
2-RTV-3-309A	SPARE	A13S/713	CLOSED	
2-RTV-3-310A	SPARE	A13S/713	CLOSED	
2-RTV-3-311A	2-PS-3-139A/PS-3-139B 2-PS-3-139D ROOT	A12S/713	OPEN	
2-RTV-3-312A	RT VLV (SPARE)	A12S/713	CLOSED	
2-RTV-3-313A	RT VLV (SPARE)	A12S/713	CLOSED	
2-RTV-3B-314A	2-PI-3-127/PDT-3-132A/PDT-3-132C ROOT	A13S/713	OPEN	
2-RTV-3-315A	2-PI-3-132B/PDT-3-132A/PDT-3-132C ROOT	A13T/713	OPEN	
2-RTV-3-316A	2-PI-3-117/PDT-3-122A/PDT-3-122C ROOT	A12S/713	OPEN	
2-RTV-3-317A	2-PI-3-122B/PDT-3-122A/PDT-3-122C ROOT	A12T/713	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-RTV-3-321A	2-PI-3-137 ROOT	A15T/692	OPEN	
2-RTV-3-322A	2-PS-3-138A/PI-3-138/PT-3-135 ROOT	A15T/692	OPEN	
2-RTV-3-323A	2-FT-3-142 ROOT	A15U/692	OPEN	
2-RTV-3-324A	2-FT-3-142 ROOT	A15U/692	OPEN	
2-RTV-3-325A	2-PT-3-145 ROOT	A13T/737	CLOSED	
2-RTV-3-326A	2-FT-3-147A/147B ROOT	A12W/737	OPEN	
2-RTV-3-327A	2- FT-3-147A/147B ROOT	A12W/737	OPEN	
2-RTV-3-328A	2-PT-3-153 ROOT	A13S/737	CLOSED	
2-RTV-3-329A	2-FT-3-155A/155B ROOT	A12W/737	OPEN	
2-RTV-3-330A	2-FT-3-155A/155B ROOT	A12W/737	OPEN	
2-RTV-3-331A	2-PT-3-161 ROOT	A13T/737	CLOSED	
2-RTV-3-332A	2-FT-3-163A ROOT	SVVR	OPEN	
2-RTV-3-333A	2-FT-3-163A ROOT	SVVR	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-RTV-3-334A	2-PT-3-168 ROOT	A13T/737	CLOSED	
2-RTV-3-335A	2-FT-3-170A ROOT	SVVR	OPEN	
2-RTV-3-336A	2-FT-3-170A ROOT	SVVR	OPEN	
2-RTV-3-341A	2-FT-3-163B ROOT	A13U/749	OPEN	
2-RTV-3-342B	2-FT-3-163B ROOT	A15U/749	OPEN	
2-RTV-3-343A	2-FT-3-170B ROOT	SVVR	OPEN	
2-RTV-3-344A	2-FT-3-170B ROOT	SVVR	OPEN	
2-RTV-3-345A	2-PI-3-184 ROOT	A14U/692	OPEN	
2-TV-3-351A	AUX FEEDWATER PMP 2A-A SG2 PRESS TEST	AZ142°/702	CLOSED	
2-TV-3-352A	AUX FEEDWATER PMP 2B-B SG3 PRESS TEST	AZ218°/702	CLOSED	
2-TV-3-353A	AUX FEEDWATER PMP 2B-B SG3 PRESS TEST	AZ213°/702	CLOSED	
2-RTV-3-363A	2-PS-3-138B ROOT	A15T/692	OPEN	
2-RTV-3-364A	2-PS-3-148 ROOT	A13T/737	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-RTV-3-365A	2-PS-3-156 ROOT	A13T/737	OPEN	
2-RTV-3-366A	2-PS-3-164 ROOT	A13T/757	OPEN	
2-RTV-3-367A	2-PS-3-171 ROOT	A13T/737	OPEN	
2-RTV-3-368A	2-FI-3-131 ROOT	A14R/724	CLOSED	
2-RTV-3-369A	2-FI-3-131 ROOT	A14R/724	CLOSED	
2-RTV-3-370A	2-PS-3-125A ROOT	A14T/692	OPEN	
2-RTV-3-371A	2-PS-3-125B ROOT	A14T/692	OPEN	
2-RTV-3-372A	2-PS-3-125D ROOT	A14T/692	OPEN	
2-TV-3-373A	AUX FEEDWATER PMP 2A-A SG 2 PRESSURE TEST	AZ150°/729	CLOSED	
2-TV-3-374A	AUX FEEDWATER PMP 2A-A SG 2 PRESSURE TEST	AZ150°/729	CLOSED	
2-TV-3-375A	AUX FEEDWATER PMP 2B-B SG 3 PRESSURE TEST	AZ218°/729	CLOSED	
2-TV-3-376A	AUX FEEDWATER PMP 2B-B SG 3 PRESSURE TEST	AZ200°/729	CLOSED	
2-RTV-1-496A	2-FT-1-17 ROOT	SVVR	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-RTV-1-497A	2-FT-1-17 ROOT	SVVR	OPEN	
2-ISV-3-800	CONDENSATE SUPPLY ISOL TO AUX FEEDWATER	A15Q/713	OPEN	
2-DRV-3-801	AUX FEEDWATER PMP 2A-A SUCTION DRAIN	A12S/713	CLOSED	
2-DRV-3-802	AUX FEEDWATER PMP 2B-B SUCTION DRAIN	A13S/713	CLOSED	
2-ISV-3-803	AUX FEEDWATER PMP 2A-A SUCTION ISOL	A12S/713	OPEN	
2-ISV-3-804	AUX FEEDWATER PMP 2B-B SUCTION ISOL	A13S/713	OPEN	
2-TTV-3-807	AUX FEEDWATER PMP 2A-A SUCTION TELLTALE DRAIN	A12S/713	OPEN	
2-TTV-3-808	AUX FEEDWATER PMP 2B-B SUCTION TELLTALE DRAIN	A13S/713	OPEN	
2-ISV-3-809	TD AUX FEEDWATER PUMP SUCTION ISOL	A15T/692	OPEN	
2-TTV-3-811	TD AUX FEEDWATER PMP ERCW TELLTALE DRAIN	A15T/692	OPEN	
2-TTV-3-812	TD AUX FEEDWATER PMP ERCW TELLTALE DRAIN	A15T/692	OPEN	
2-DRV-3-813	TD AUX FEEDWATER PUMP CASING DRAIN	A15T/692	CLOSED	
2-ISV-3-816	AUX FEEDWATER PMP 2A-A RECIRC ISOL	A12S/713	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-ISV-3-817	AUX FEEDWATER PMP 2B-B RECIRC ISOL	A13S/713	OPEN	
2-ISV-3-819	TD AUX FEEDWATER PUMP RECIRC ISOL	A15T/692	OPEN	
2-DRV-3-822	AUX FEEDWATER PMP 2A-A DISCHARGE DRAIN	A12S/713	CLOSED	
2-DRV-3-823	AUX FEEDWATER PMP 2B-B DISCHARGE DRAIN	A13S/713	CLOSED	
2-BYV-3-838	AUX FEEDWATER PMP 2B-B 2-ISV-3-826 BYPASS	A13T/737	CLOSED	
2-BYV-3-839	AUX FEEDWATER PMP 2A-A 2-ISV-3-827 BYPASS	A13T/737	CLOSED	
2-BYV-3-840	AUX FEEDWATER PMP 2A-A 2-ISV-3-828 BYPASS	A13T/737	CLOSED	
2-BYV-3-841	AUX FEEDWATER PMP 2B-B 2-ISV-3-829 BYPASS	A13T/737	CLOSED	
2-VTV-3-842	SG 3 AUX FEEDWATER SUPPLY VENT	A11W°/737	CLOSED	
2-BYV-3-843	AUX FEEDWATER PMP 2B-B 2-ISV-3-834 BYPASS	A13U/737	CLOSED	
2-BYV-3-844	AUX FEEDWATER PMP 2A-A 2-ISV-3-835 BYPASS	A13U/737	CLOSED	
2-BYV-3-845	AUX FEEDWATER PMP 2A-A 2-ISV-3-836 BYPASS	A13T/737	CLOSED	
2-BYV-3-846	AUX FEEDWATER PMP 2B-B 2-ISV-3-837 BYPASS	A13T/737	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-VTV-3-847	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY VENT	A13T/737	CLOSED	
2-VTV-3-848	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY VENT	A12T/737	CLOSED	
2-VTV-3-849	AUX FEEDWATER PMP 2A-A SG 1 SUPPLY VENT	A12T/737	CLOSED	
2-VTV-3-850	AUX FEEDWATER PMP 2B-B SG 4 SUPPLY VENT	A13T/737	CLOSED	
2-DRV-3-851	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY DRAIN	A13S/737	CLOSED	
2-DRV-3-852	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY DRAIN	A13T/737	CLOSED	
2-DRV-3-853	AUX FEEDWATER PMP 2A-A SG 1 SUPPLY DRAIN	A13T/737	CLOSED	
2-DRV-3-854	AUX FEEDWATER PMP 2B-B SG 4 SUPPLY DRAIN	A13T/737	CLOSED	
2-DRV-3-855	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY DRAIN	A13U/737	CLOSED	
2-DRV-3-856	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY DRAIN	A13U/737	CLOSED	
2-DRV-3-857	AUX FEEDWATER PMP 2A-A SG 1 SUPPLY DRAIN	A12T/737	CLOSED	
2-DRV-3-858	AUX FEEDWATER PMP 2B-B SG 4 SUPPLY DRAIN	A13T/737	CLOSED	
2-SMV-3-865	TD AUX FEEDWATER PMP DISCHARGE SAMPLE	A15U/692	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-TV-3-866	TD AUX FEEDWATER PMP DISCHARGE PRESSURE TEST	SVVR/729	CLOSED	
2-ISV-3-867	TD AFW PUMP SG3 LEVEL CONTROL ISOL	A13U/737	OPEN	
2-ISV-3-868	TD AFW PUMP SG2 LEVEL CONTROL ISOL	A12U/737	OPEN	
2-ISV-3-869	TD AFW PUMP SG1 LEVEL CONTROL ISOL	A16V/755	OPEN	
2-ISV-3-870	TD AFW PUMP SG4 LEVEL CONTROL ISOL	A16V/755	OPEN	
2-ISV-3-875	TD AFW PUMP SG3 LEVEL CONTROL ISOL	A13U/737	CLOSED	
2-ISV-3-876	TD AFW PUMP SG2 LEVEL CONTROL ISOL	A13U/737	CLOSED	
2-ISV-3-877	TD AFW PUMP SG1 LEVEL CONTROL ISOL	A16V/755	CLOSED	
2-ISV-3-878	TD AFW PUMP SG4 LEVEL CONTROL ISOL	A16V/755	CLOSED	
2-BYV-3-879	TD AUX FEEDWATER PUMP 2-ISV-3-867 BYPASS	A13U/737	CLOSED	
2-BYV-3-880	TD AUX FEEDWATER PUMP 2-ISV-3-868 BYPASS	A13U/737	CLOSED	
2-BYV-3-881	TD AUX FEEDWATER PUMP 2-ISV-3-869 BYPASS	SVVR/729	CLOSED	
2-BYV-3-882	TD AUX FEEDWATER PUMP 2-ISV-3-870 BYPASS	SVVR/729	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-BYV-3-883	TD AUX FEEDWATER PUMP 2-ISV-3-875 BYPASS	A13U/737	CLOSED	
2-BYV-3-884	TD AUX FEEDWATER PUMP 2-ISV-3-876 BYPASS	A13U/737	CLOSED	
2-BYV-3-885	TD AUX FEEDWATER PUMP 2-ISV-3-877 BYPASS	SVVR/729	CLOSED	
2-BYV-3-886	TD AUX FEEDWATER PUMP 2-ISV-3-878 BYPASS	SVVR/729	CLOSED	
2-DRV-3-887	TD AUX FEEDWATER PUMP SG 3 SUPPLY DRAIN	A13U/737	CLOSED	
2-DRV-3-888	TD AUX FEEDWATER PUMP SG 2 SUPPLY DRAIN	A13U/737	CLOSED	
2-DRV-3-889	TD AUX FEEDWATER PUMP SG 1 SUPPLY DRAIN	SVVR/755	CLOSED	
2-DRV-3-890	TD AUX FEEDWATER PUMP SG 4 SUPPLY DRAIN	A16V/755	CLOSED	
2-DRV-3-893	TD AUX FEEDWATER PUMP SEAL EJECTOR BLOWDOWN	A15U/692	CLOSED	
2-DRV-3-894	AUX FEEDWATER PMP 2A-A BEARING DRAIN	A12S/713	CLOSED	
2-DRV-3-895	AUX FEEDWATER PMP 2B-B BEARING DRAIN	A13S/713	CLOSED	
2-VTV-3-896	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY VENT	A13U/737	CLOSED	
2-VTV-3-897	TD AUX FEEDWATER PUMP SG 3 SUPPLY VENT	A13U/737	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-VTV-3-898	TD AUX FEEDWATER PUMP SG 3 SUPPLY VENT	A13U/737	CLOSED	
2-VTV-3-899	SG 2 AUX FEEDWATER SUPPLY VENT	NVVR/729	CLOSED	
2-VTV-3-900	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY VENT	A13U/737	CLOSED	
2-VTV-3-901	TD AUX FEEDWATER PUMP SG 2 SUPPLY VENT	A13U/737	CLOSED	
2-VTV-3-902	TD AUX FEEDWATER PUMP SG 2 SUPPLY VENT	A13U/737	CLOSED	
2-VTV-3-903	AUX FEEDWATER PMP 2A-A SG 1 SUPPLY VENT	SVVR/729	CLOSED	
2-VTV-3-904	TD AUX FEEDWATER PUMP SG 1 SUPPLY VENT	SVVR/755	CLOSED	
2-VTV-3-905	TD AUX FEEDWATER PUMP SG 1 SUPPLY VENT	SVVR/729	CLOSED	
2-VTV-3-906	AUX FEEDWATER PMP 2B-B SG 4 SUPPLY VENT	SVVR/729	CLOSED	
2-VTV-3-907	TD AUX FEEDWATER PUMP SG 4 SUPPLY VENT	SVVR/729	CLOSED	
2-VTV-3-908	AUX FEEDWATER PUMP SUCTION VENT	A15U/713	CLOSED	
2-VTV-3-909	AUX FEEDWATER PUMP SUCTION VENT	A13S/713	CLOSED	
2-IDV-3-914	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-IDV-3-915	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-IDV-3-916	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-IDV-3-917	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-DRV-3-918	TD AUX FEEDWATER PUMP MS DRAIN TRAP DRAIN	A14T/692	CLOSED	
2-DRV-3-919	TD AUX FEEDWATER PUMP MS DRAIN TRAP DRAIN	A15U/692	CLOSED	
2-IDV-3-920	TD AUX FEEDWATER PUMP SEAL EJECTOR SUP ISOL	A15U/692	OPEN	
2-VTV-3-923	TD AUX FEEDWATER PUMP RECIRC VENT	A9S/713	CLOSED	
2-DRV-3-925	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY DRAIN	AZ150°/729	CLOSED	
2-DRV-3-926	AUX FEEDWATER PMP 2A-A SG 2 SUPPLY DRAIN	AZ150°/729	CLOSED	
2-DRV-3-927	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY DRAIN	AZ200°/729	CLOSED	
2-DRV-3-928	AUX FEEDWATER PMP 2B-B SG 3 SUPPLY DRAIN	AZ200°/729	CLOSED	
2-VTV-3-930	TD AUX FEEDWATER PUMP CASING VENT	A14U/692	CLOSED	
2-VTV-3-931	AUX FEEDWATER PMP 2A-A CASING VENT	A12S/713	CLOSED	

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Normal Test Valve Alignment

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-VTV-3-932	AUX FEEDWATER PMP 2B-B CASING VENT	A13S/713	CLOSED	
2-DRV-3-933	AUX FEEDWATER PMP 2A-A CASING DRAIN	A12T/713	CLOSED	
2-DRV-3-934	AUX FEEDWATER PMP 2B-B CASING DRAIN	A12T/713	CLOSED	
2-TRAP-3-935	TD AUX FEEDWATER PUMP DRAIN TANK DRAIN TRAP	A15T/692	OPEN	
2-TRAP-3-936	TD AUX FEEDWATER PUMP DRAIN TANK DRAIN TRAP	A13U/692	OPEN	
2-DRV-3-940	TD AUX FEEDWATER PUMP BEARING DRAIN	A14T/713	CLOSED	

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Valve Alignment, Section 6.7

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-FCV-1-15	MAIN STEAM LOOP 1 TD AUX PMP SUP	SVVR	OPEN	
2-FCV-1-16	MAIN STEAM LOOP 4 TD AUX PMP SUP	SVVR	CLOSED	
2-FCV-1-17	MAIN STEAM AUX FWP HDR SUPPLY ISOL	SVVR	OPEN	
2-FCV-1-18	MAIN STEAM AUX FWP HDR SUPPLY ISOL	SVVR	OPEN	
2-FCV-1-51	TD AUX FEEDWATER PMP TRIP & THROTTLE VALVE	A14U/692	CLOSED	
2-RTV-3-345A	2-PI-3-184 ROOT	A15U/692	OPEN	
2-RTV-1-496A	2-FT-1-17 ROOT	A12U/729	OPEN	
2-RTV-1-497A	2-FT-1-17 ROOT	A12U/729	OPEN	
2-IDV-3-914	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-IDV-3-915	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-IDV-3-916	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-IDV-3-917	TD AUX FEEDWATER PUMP MS DRAIN TRAP ISOL	A15U/692	OPEN	
2-DRV-3-918	TD AUX FEEDWATER PUMP DRAIN MS TRAP DRAIN	A15U/692	CLOSED	

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Valve Alignment, Section 6.7

VALVE	DESCRIPTION	LOCATION	POSITION	INITIALS/DATE
2-DRV-3-919	TD AUX FEEDWATER PUMP DRAIN MS TRAP DRAIN	A15U/692	CLOSED	
2-IDV-3-920	TD AUX FEEDWATER PUMP SEAL EJECTOR SUP ISOL	A15U/692	OPEN	
2-TRAP-3-935	TD AUX FEEDWATER PUMP DRAIN TANK DRAIN TRAP	A15T/692	OPEN	
2-TRAP-3-936	TD AUX FEEDWATER PUMP DRAIN TANK DRAIN TRAP	A13U/692	OPEN	

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Computer Point Verification Log

		STATUS		
COMPUTER POINT	DESCRIPTION	SET	RESET	INITIALS/DATE
Y0708A	SG #1 AUX FW FLOW	N/A	N/A	
Y0704A	SG #2 AUX FW FLOW	N/A	N/A	
Y0703A	SG #3 AUX FW FLOW	N/A	N/A	
Y0709A	SG #4 AUX FW FLOW	N/A	N/A	
P0400A	STM GEN 1 STM OUT 1 PRESSURE	N/A	N/A	
P0420A	STM GEN 2 STM OUT 1 PRESSURE	N/A	N/A	
P0440A	STM GEN 3 STM OUT 1 PRESSURE	N/A	N/A	
P0460A	STM GEN 4 STM OUT 1 PRESSURE	N/A	N/A	
P2410A	AUX FW TO STM GEN 1 PRESSURE	N/A	N/A	
P2411A	AUX FW TO STM GEN 2 PRESSURE	N/A	N/A	
P2412A	AUX FW TO STM GEN 3 PRESSURE	N/A	N/A	
P2413A	AUX FW TO STM GEN 4 PRESSURE	N/A	N/A	
T2425A	AUX FW TO STM GEN 1 PIPE SURF TEMP	N/A	N/A	
T2426A	AUX FW TO STM GEN 2 PIPE SURF TEMP	N/A	N/A	
T2427A	AUX FW TO STM GEN 3 PIPE SURF TEMP	N/A	N/A	
T2428A	AUX FW TO STM GEN 4 PIPE SURF TEMP	N/A	N/A	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

1.0 DATA COLLECTION SHEET 1

STEP 6.1.2[10]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-1	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	217 (207-227)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3577		RPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD A-A	EI-57-39	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-122A	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-141	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

2.0 DATA COLLECTION SHEET 2

STEP 6.1.2[14]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	374 (364-384)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3577		RPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD A-A	EI-57-39	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-122A	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-141	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

3.0 DATA COLLECTION SHEET 3

STEP 6.1.2[17]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-1	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	450 (440-460)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3577		RPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD A-A	EI-57-39	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-122A	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-141	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

4.0 DATA COLLECTION SHEET 4

STEP 6.1.2[21]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-1	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	583 (573-593)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3577		RPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD A-A	EI-57-39	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-122A	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-141	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

5.0 DATA COLLECTION SHEET 5

STEP 6.1.2[26]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-1	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	645 (635-655)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3577		RPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD A-A	EI-57-39	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-122A	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-141	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

6.0 DATA REDUCTION AND CALCULATIONS

STEP 6.1.2[31]

Pump Discharge Corrections (TG-2/Data Collection Section 1)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 1)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-2_C(\text{PSIG}) - TG-1_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \underline{\qquad\qquad}(\text{PSIG}) - \underline{\qquad\qquad}(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \underline{\qquad\qquad}(\text{ft})$$

where: $TG-1_A$ = Actual test gauge TG-1 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

7.0 DATA REDUCTION AND CALCULATIONS

STEP 6.1.2[31]

Pump Discharge Corrections (TG-2/Data Collection Section 2)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 2)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG - 2_C(PSIG) - TG - 1_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_(ft)$$

where: $TG - 1_A$ = Actual test gauge TG-1 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

8.0 DATA REDUCTION AND CALCULATIONS

STEP 6.1.2[31]

Pump Discharge Corrections (TG-2/Data Collection Section 3)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 3)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-2_C(\text{PSIG}) - TG-1_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_\_(\text{ft})$$

where: $TG-1_A$ = Actual test gauge TG-1 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

9.0 DATA REDUCTION AND CALCULATIONS

STEP 6.1.2[31]

Pump Discharge Corrections (TG-2/Data Collection Section 4)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}2_C$	=	Corrected test gauge TG-2 reading in PSIG.
$TG\text{-}2_I$	=	Indicated test gauge TG-2 reading in PSIG.
$TG\text{-}2_S$	=	Span of test gauge TG-2 in PSI.
$TG\text{-}2_E$		Error or inaccuracy of test gauge TG-2 in percent.
$TG\text{-}2_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 4)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where:

PF_C	=	Pump flow corrected for M&TE inaccuracy
PF_I	=	Pump flow indicated by M&TE
FM_E	=	Flow meter M&TE inaccuracy in percent

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-2_C(\text{PSIG}) - TG-1_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_(\text{ft})$$

where: $TG-1_A$ = Actual test gauge TG-1 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

10.0 DATA REDUCTION AND CALCULATIONS

STEP 6.1.2[31]

Pump Discharge Corrections (TG-2/Data Collection Section 5)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 5)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-2_C(PSIG) - TG-1_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-1_A$ = Actual test gauge TG-1 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: PRE-TEST CONDITIONS

STEP 6.2.2[1]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCTION PRES	TG-1	LOCAL	≥ 10		PSIG	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0

STEP 6.2.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 15 MIN.

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 30 MIN.

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 1 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 4 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 8 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 12 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 18 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 24 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 30 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 36 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 42 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 48 HOURS

STEP 6.2.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-141	LOCAL	≤ 140		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
PRE-TEST CONDITIONS

STEP 6.2.2[12]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCTION PRES	TG-1	LOCAL	≥ 10		PSIG	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0

STEP 6.2.2[16]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0+15MIN

STEP 6.2.2[18]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0 + 30MIN

STEP 6.2.2[20]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0 + 1 HOUR

STEP 6.2.2[22]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-2	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1000	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1001	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-120B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-120A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

1.0 DATA COLLECTION SHEET 1

STEP 6.3.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-3	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	227 (217-237)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD B-B	EI-57-66	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-132	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-146	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

2.0 DATA COLLECTION SHEET 2

STEP 6.3.2[9]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-3	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	314 (304-324)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD B-B	EI-57-66	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-132	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-146	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

3.0 DATA COLLECTION SHEET 3

STEP 6.3.2[12]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-3	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	450 (440-460)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD B-B	EI-57-66	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-132	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-146	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

4.0 DATA COLLECTION SHEET 4

STEP 6.3.2[15]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-3	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	582 (572-592)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD B-B	EI-57-66	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-132	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-146	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

5.0 DATA COLLECTION SHEET 5

STEP 6.3.2[19]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-3	PUMP RM	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	PUMP RM	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	612 (602-622)		GPM	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
6.9KV SHTDN BD B-B	EI-57-66	2-M-1	N/A		VOLTS	
PUMP ΔP	PDI-3-132	2-M-4	N/A		PSID	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP DISCH TEMP	TI-3-146	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

6.0 DATA REDUCTION AND CALCULATIONS

STEP 6.3.2[24]

Pump Discharge Corrections (TG-4/Data Collection Section 1)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

	$TG\text{-}4_C$	=	Corrected test gauge TG-4 reading in PSIG.
	$TG\text{-}4_I$	=	Indicated test gauge TG-4 reading in PSIG.
	$TG\text{-}4_S$	=	Span of test gauge TG-4 in PSI.
	$TG\text{-}4_E$		Error or inaccuracy of test gauge TG-4 in percent.
	$TG\text{-}4_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 1)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM)$$

where:

	PF_C	=	Pump flow corrected for M&TE inaccuracy
	PF_I	=	Pump flow indicated by M&TE
	FM_E	=	Flow meter M&TE inaccuracy in percent

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(\mathrm{ft}) = TG-4_C(\mathrm{PSIG}) - TG-3_A(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_\_(\mathrm{PSIG}) - \_\_\_\_\_\_\_\_(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_\_\_(\mathrm{ft})$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

Performed By Signature	Date

Verified By Signature	Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

7.0 DATA REDUCTION AND CALCULATIONS

STEP 6.3.2[24]

Pump Discharge Corrections (TG-4/Data Collection Section 2)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter,TF-1/Data Collection Section 2)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-4_C(PSIG) - TG-3_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

_______________________ Performed By Signature _______ Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

8.0 DATA REDUCTION AND CALCULATIONS

STEP 6.3.2[24]

Pump Discharge Corrections (TG-4/Data Collection Section 3)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

> **NOTE**
>
> Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 3)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-4_C(\text{PSIG}) - TG-3_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_(\text{ft})$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

_______________________ Performed By Signature ________ Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

9.0 DATA REDUCTION AND CALCULATIONS

STEP 6.3.2[24]

Pump Discharge Corrections (TG-4/Data Collection Section 4)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 4)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-4_C(PSIG) - TG-3_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

Performed By Signature	Date
Verified By Signature	Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

10.0 DATA REDUCTION AND CALCULATIONS

STEP 6.3.2[24]

Pump Discharge Corrections (TG-4/Data Collection Section 5)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 5)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Total Dynamic Head Verification

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-4_C(PSIG) - TG-3_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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Verified By Signature Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: PRE-TEST CONDITIONS

STEP 6.4.2[1]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCTION PRES	TG-3	LOCAL	≥ 10		PSIG	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0

STEP 6.4.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 +15 MIN

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 +30 MIN

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 +1 HOUR

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 +4 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 8 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 12 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 18 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 24 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 30 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 36 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 42 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

48 HOUR PERFORMANCE RUN
TIME: T-0 + 48 HOURS

STEP 6.4.2[6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-146	LOCAL	≤ 140		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
PRE-TEST CONDITIONS

STEP 6.4.2[12]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCTION PRES	TG-3	LOCAL	≥ 10		PSIG	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0

STEP 6.4.2[16]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
TIME: T-0 + 15 MIN.

STEP 6.4.2[18]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
Time: T-0 + 30 min.

STEP 6.4.2[20]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, 48 Hour Endurance Test

POST 48 HOUR PERFORMANCE RUN
Time: T-0 + 1 HOUR.

STEP 6.4.2[22]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESSURE	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESSURE	TG-4	LOCAL	< 1645		PSIG	
PUMP FLOW	TF-1	LOCAL	≥ 225		GPM	
PUMP INB BRG OIL TEMP	ITI-3-1002	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	ITI-3-1003	LOCAL	≤ 165		°F	
MOTOR INB BRG OIL TEMP	TI-3-130B	LOCAL	≤ 71		°C	
MOTOR OUTB BRG OIL TEMP	TI-3-130A	LOCAL	≤ 71		°C	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	≥ 3574		RPM	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

1.0 DATA COLLECTION SHEET 1

STEP 6.8.2[9]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-5	PUMP RM	≥ 16		PSIG	
PUMP DISCH PRESSURE	TG-6	PUMP RM	N/A		PSIG	
TURB SPEED	SI-46-56A	2-M-4	N/A		RPM	
TURB SPEED	TACH	LOCAL	3925 to 3975		RPM	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP DISCH TEMP	TI-3-149	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	257 (247-267)		GPM	
EJECTOR MOTIVE PRESSURE	PI-3-184	LOCAL	N/A		PSIG	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

2.0 DATA COLLECTION SHEET 2

STEP 6.8.2[13]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-5	PUMP RM	≥ 16		PSIG	
PUMP DISCH PRESSURE	TG-6	PUMP RM	N/A		PSIG	
TURB SPEED	SI-46-56A	2-M-4	N/A		RPM	
TURB SPEED	TACH	LOCAL	3925 to 3975		RPM	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP DISCH TEMP	TI-3-149	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	451 (441-461)		GPM	
EJECTOR MOTIVE PRESSURE	PI-3-184	LOCAL	N/A		PSIG	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

3.0 DATA COLLECTION SHEET 3

STEP 6.8.2[16]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-5	PUMP RM	≥ 16		PSIG	
PUMP DISCH PRESSURE	TG-6	PUMP RM	N/A		PSIG	
TURB SPEED	SI-46-56A	2-M-4	N/A		RPM	
TURB SPEED	TACH	LOCAL	3925 to 3975		RPM	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP DISCH TEMP	TI-3-149	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	790 (780-800)		GPM	
EJECTOR MOTIVE PRESSURE	PI-3-184	LOCAL	N/A		PSIG	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

4.0 DATA COLLECTION SHEET 4

STEP 6.8.2[19]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-5	PUMP RM	≥ 16		PSIG	
PUMP DISCH PRESSURE	TG-6	PUMP RM	N/A		PSIG	
TURB SPEED	SI-46-56A	2-M-4	N/A		RPM	
TURB SPEED	TACH	LOCAL	3925 to 3975		RPM	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP DISCH TEMP	TI-3-149	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	950 (940-960)		GPM	
EJECTOR MOTIVE PRESSURE	PI-3-184	LOCAL	N/A		PSIG	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

5.0 DATA COLLECTION SHEET 5

STEP 6.8.2[22]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCT PRESSURE	TG-5	PUMP RM	≥ 16		PSIG	
PUMP DISCH PRESSURE	TG-6	PUMP RM	N/A		PSIG	
TURB SPEED	SI-46-56A	2-M-4	N/A		RPM	
TURB SPEED	TACH	LOCAL	3925 to 3975		RPM	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP DISCH TEMP	TI-3-149	LOCAL	N/A		°F	
PUMP SUCT TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	1100 (1090-1110)		GPM	
EJECTOR MOTIVE PRESSURE	PI-3-184	LOCAL	N/A		PSIG	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

6.0 DATA REDUCTION AND CALCULATIONS

STEP 6.8.2[27]

Pump Discharge Corrections (TG-6/Data Collection Section 1)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}6_C$ = Corrected test gauge TG-6 reading in PSIG.

$TG\text{-}6_I$ = Indicated test gauge TG-6 reading in PSIG.

$TG\text{-}6_S$ = Span of test gauge TG-6 in PSI.

$TG\text{-}6_E$ Error or inaccuracy of test gauge TG-6 in percent.

$TG\text{-}6_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE
Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 1)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-6_C(\text{PSIG}) - TG-5_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_(\text{ft})$$

where: $TG-5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

____________________ Performed By Signature __________ Date

____________________ Verified By Signature __________ Date

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

7.0 DATA REDUCTION AND CALCULATIONS

STEP 6.8.2[27]

Pump Discharge Corrections (TG-6/Data Collection Section 2)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

	$TG\text{-}6_C$	=	Corrected test gauge TG-6 reading in PSIG.
	$TG\text{-}6_I$	=	Indicated test gauge TG-6 reading in PSIG.
	$TG\text{-}6_S$	=	Span of test gauge TG-6 in PSI.
	$TG\text{-}6_E$		Error or inaccuracy of test gauge TG-6 in percent.
	$TG\text{-}6_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 2)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where:

	PF_C	=	Pump flow corrected for M&TE inaccuracy
	PF_I	=	Pump flow indicated by M&TE
	FM_E	=	Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-6_C(\text{PSIG}) - TG-5_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_\_\_(\text{ft})$$

where: $TG-5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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Performed By Signature Date

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Verified By Signature Date

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

8.0 DATA REDUCTION AND CALCULATIONS

STEP 6.8.2[27]

Pump Discharge Corrections (TG-6/Data Collection Section 3)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}6_C$ = Corrected test gauge TG-6 reading in PSIG.

$TG\text{-}6_I$ = Indicated test gauge TG-6 reading in PSIG.

$TG\text{-}6_S$ = Span of test gauge TG-6 in PSI.

$TG\text{-}6_E$ Error or inaccuracy of test gauge TG-6 in percent.

$TG\text{-}6_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 3)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-6_C(PSIG) - TG-5_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_\_(ft)$$

where: $TG-5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

9.0 DATA REDUCTION AND CALCULATIONS

STEP 6.8.2[27]

Pump Discharge Corrections (TG-6/Data Collection Section 4)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}6_C$ = Corrected test gauge TG-6 reading in PSIG.

$TG\text{-}6_I$ = Indicated test gauge TG-6 reading in PSIG.

$TG\text{-}6_S$ = Span of test gauge TG-6 in PSI.

$TG\text{-}6_E$ Error or inaccuracy of test gauge TG-6 in percent.

$TG\text{-}6_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 4)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

Total Dynamic Head Calculation

$$H_{TD}(\mathrm{ft}) = TG-6_C(\mathrm{PSIG}) - TG-5_A(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_(\mathrm{PSIG}) - \_\_\_\_\_\_\_(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_\_(\mathrm{ft})$$

where: $TG-5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

Performed By Signature	Date
Verified By Signature	Date

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

10.0 DATA REDUCTION AND CALCULATIONS

STEP 6.8.2[27]

Pump Discharge Corrections (TG-6/Data Collection Section 5)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}6_C$ = Corrected test gauge TG-6 reading in PSIG.

$TG\text{-}6_I$ = Indicated test gauge TG-6 reading in PSIG.

$TG\text{-}6_S$ = Span of test gauge TG-6 in PSI.

$TG\text{-}6_E$ Error or inaccuracy of test gauge TG-6 in percent.

$TG\text{-}6_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 5)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(\%) \times \_\_\_\_\_\_(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_(GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Hydraulic Performance

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG - 6_C(PSIG) - TG - 5_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_\_\_(ft)$$

where: $TG - 5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: PRE-TEST CONDITIONS

STEP 6.9.1[7]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	≥ 200		GAL x 1000	
PUMP SUCTION PRES	TG-5	LOCAL	≥ 16		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 160		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 160		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	
PUMP DISCH WATER TEMP	TI-3-149	LOCAL	N/A		°F	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0

STEP 6.9.2[4]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	≥ 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 15 MIN

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 30 MIN

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 1 HOUR

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 4 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 8 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 12 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 18 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 24 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 30 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 36 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 42 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

Appendix P
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

TIME: T-0 + 48 HOURS

STEP 6.9.2[5]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

POST 48 HOUR PERFORMANCE RUN
PRE-TEST CONDITIONS

STEP 6.9.2[9]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRES	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	N/A		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP LOCAL RELATIVE HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	N/A		PSIG	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
PUMP CASING TEMP	PYROMETER	LOCAL	N/A		°F	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

POST 48 HOUR PERFORMANCE RUN
TIME: T - 0

STEP 6.9.2[13]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
MSL 1 PRESS	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

Appendix P
(Page 17 of 19)

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

POST 48 HOUR PERFORMANCE RUN
TIME: T - 0 + 15 MIN

STEP 6.9.2[15]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
MSL 1 PRESS	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

POST 48 HOUR PERFORMANCE RUN
TIME: T - 0 + 30 MIN

STEP 6.9.2[16]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
MSL 1 PRESS	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

Appendix P
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, 48 Hour Endurance Run

POST 48 HOUR PERFORMANCE RUN
TIME: T - 0 + 1 HOUR

STEP 6.9.2[17]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	> 200		GAL x 1000	
PUMP SUCT PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCH PRES	TG-6	LOCAL	< 1560		PSIG	
PUMP ROOM AMBIENT TEMP	PYROMETER	LOCAL	< 104		°F	
PUMP ROOM REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	≤ 165		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	≤ 165		°F	
TURB INB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURB OUTB BRG OIL TEMP	PYROMETER	LOCAL	≤ 180		°F	
TURBINE SPEED	SI-46-56A	2-M-4	N/A		RPM	
MSL 1 PRESS	P0400A	COMP CONSOLE	N/A		PSIG	
TURBINE SPEED	TACH	LOCAL	N/A		RPM	
PUMP FLOW	TF-1	LOCAL	≥380		GPM	

Appendix Q
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2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S, Pump Curve

1.0 Manufacturer's Curve

25402-011-V1A-MPCA-00023-001

FLOWSERVE
Los Angeles, California

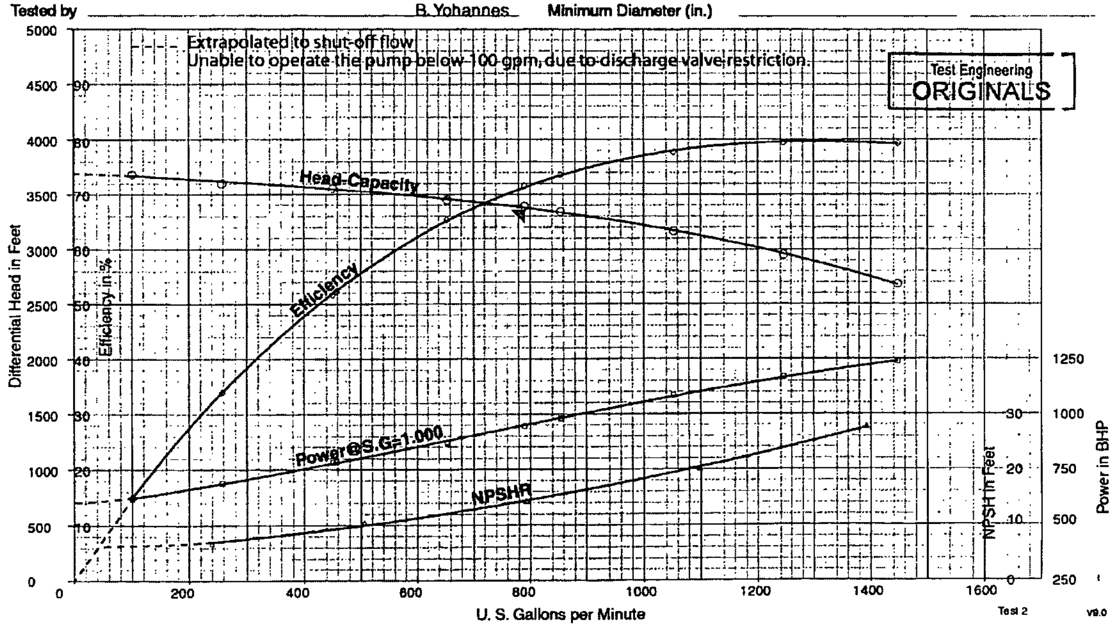
Baraki Shamsel	A Picardo	
Test Engr.	Approved	Witness

Doc./Curve No. 280- RLCU00064-01

Size 5 Type HMTA Stages 6 R.P.M. 3950
Date 9/15/2010 Impeller Eye Area (sq. in.) 26.6

Contractor	
Customer	TVA Watts Bar Nuclear
Item No.	RLCU0006410382211
P. O. No.	77740
Pump Serial Number	0874142
Tested by	B. Yohannes

	Ist Stage	Series Stage
Impeller Pattern	5HMTA3EX0	5HMTA3DX0
Maximum Diameter (in.)	10.250	10.250
Rated Diameter (in.)	10.246	10.246/10.251
Minimum Diameter (in.)		



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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Pump Curve

1.0 Manufacturer's Curve

25402-011-V1A-MPCA-00050-001

FLOWSERVE
Los Angeles, California

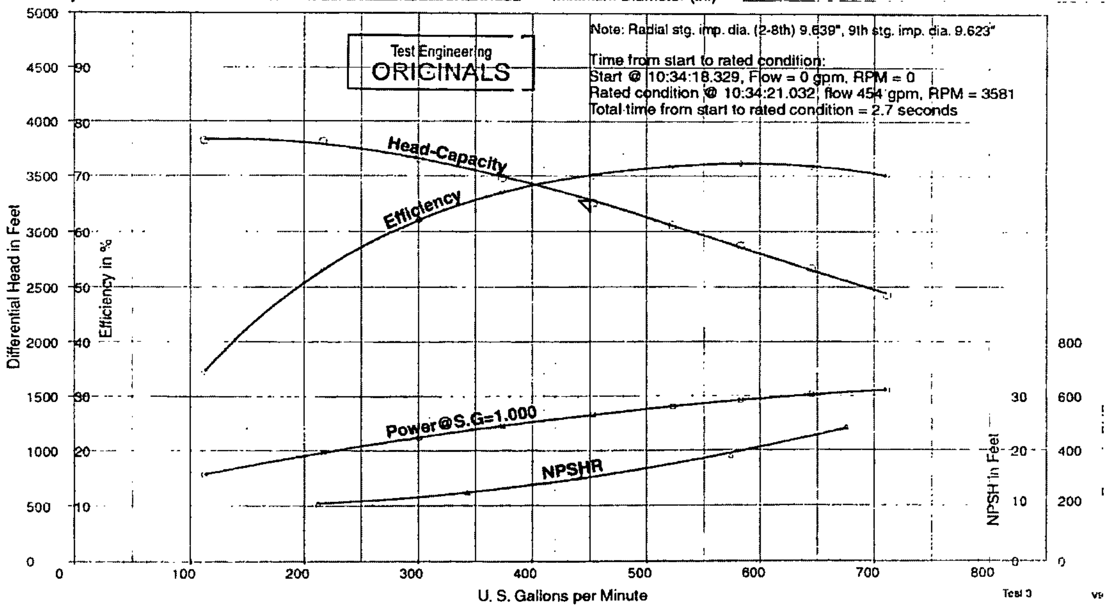
Test Engr. | A. Picardo Approved | Witness

Doc./Curve No. 280- RLCU00063-01

Contractor: Bechtel
Customer: TVA Watts Bar Nuclear
Item No.: 10387741
P. O. No.: 77683
Pump Serial Number: 0874-139
Tested by: B. Yohannes

Size 3HMTA Type HMTA Stages 9 R.P.M. 3577
Date 1/20/2011 Impeller Eye Area (sq. in.) 240

	Ist Stage	Series Stage
Impeller Pattern	3HMTA3L	3HMTA3B/R
Maximum Diameter (in.)		
Rated Diameter (in.)	9.637	See note
Minimum Diameter (in.)		



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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Pump Curve

1.0 Manufacturer's Curve

25402-011-V1A-MPCA-00040-002

FLOWSERVE
Los Angeles, California

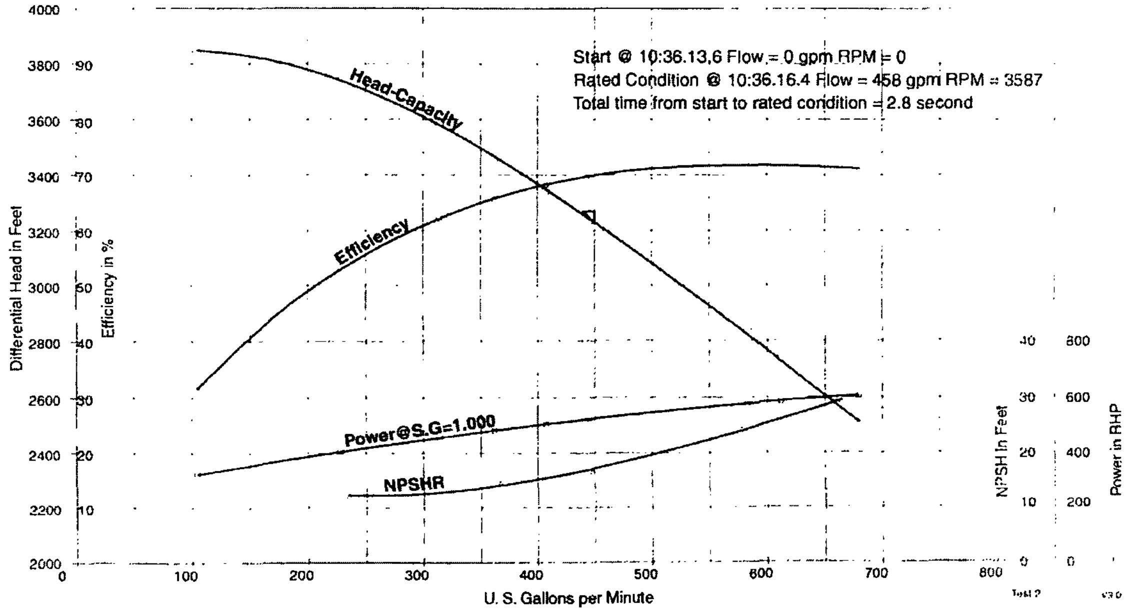
Doc./Curve No. 280- RLCU00054-01 (Rev.1)

R Bonner Test Engr. | A Ricardo Approved | Witness

Size 3HMTA Type ---- Stages 9 R.P.M. 3577
Date 11/19/2010 Impeller Eye Area (sq. in.) 16.47

Contractor: Bechtel
Customer: TVA Watts Bar Nuclear
Item No.: RLCU00054 10371297
P. O. No.: 73543
Pump Serial Number: 09RLCU0005401001
Tested by: R. Bonner

	Ist Stage	Series Stage
Impeller Pattern	3HMTA3L	3HMTA3B/R
Maximum Diameter (in.)		
Rated Diameter (in.)	9.621	9.625
Minimum Diameter (in.)		



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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

1.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Pre-Test Data

STEP 6.5.2[1.2]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	400 ± 50		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

2.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Test Data

Step 6.5.2[1.11]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	410 (400-420)		GPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	400 ± 50		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

3.0 2 PMP- 3- 128, AUX FEEDWATER PMP 2B- B Pre-Test Data

STEP 6.5.2[2.2]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	400 ± 50		PSIG	

1 CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

4.0 2-PMP-3-128, AUX FEEDWATER PMP 2B- B Test Data

STEP 6.5.2[2.11]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	410 (400-420)		GPM	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	400 ± 50		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

5.0 2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S Pre-Test Data

STEP 6.5.2[3.2]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-6	LOCAL	N/A		PSIG	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	400 ± 50		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

6.0 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Test Data

STEP 6.5.2[3.14]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-6	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	720 ± 10		GPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	400 ± 50		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	400 ± 50		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

9.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Calculations

STEP 6.5.2[1.14]

Pump Discharge Corrections (TG-2/Data Collection Section 2)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where: $TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-2_C(PSIG) - TG-1_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-1_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 2)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$

$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM) + \_\_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_\_ (GPM) \div 100$$

$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM)$$

where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

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Performed By Signature Date

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Verified By Signature Date

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

7.0 2 PMP- 3- 128, AUX FEEDWATER PMP 2B- B Calculations

STEP 6.5.2[2.15]

Pump Discharge Corrections (TG-4/Data Collection Section 4)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = [TG-4_C(PSIG) - TG-3_A(PSIG)] \times 2.311 \frac{ft}{PSI}$$
$$H_{TD}(ft) = [\_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG)] \times 2.311 \frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

<u>Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 4)</u>

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM) + \_\_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_\_ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

________________________ __________

Performed By Signature Date

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Verified By Signature Date

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

8.0 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Calculations

STEP 6.5.2[3.18]

Pump Discharge Corrections (TG-6/Data Collection Section 6)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}6_C$ = Corrected test gauge TG-6 reading in PSIG.

$TG\text{-}6_I$ = Indicated test gauge TG-6 reading in PSIG.

$TG\text{-}6_S$ = Span of test gauge TG-6 in PSI.

$TG\text{-}6_E$ Error or inaccuracy of test gauge TG-6 in percent.

$TG\text{-}6_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE
Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-6_C(PSIG) - TG-5_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-5_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 300 - 500 PSIG

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 6)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_\ (GPM) + \_\_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\_\ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_\ (GPM)$$

where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

1.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Pre-Test Data

STEP 6.13.2[1.1]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	100 (80-120)		PSIG	

1 CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

2.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Test Data

Step 6.13.2[1.10]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	≥410 (410-430)		GPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	100 (80-120)		PSIG	

1 CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

3.0 2 PMP- 3- 128, AUX FEEDWATER PMP 2B- B Pre-Test Data

STEP 6.13.2[2.3]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	100 (80-120)		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

4.0 2 PMP- 3- 128, AUX FEEDWATER PMP 2B- B Test Data

STEP 6.13.2[2.12]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	≥410 (410-430)		GPM	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	100 (80-120)		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

5.0 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Pre-Test Data

STEP 6.13.2[3.11]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-6	LOCAL	N/A		PSIG	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	100 (80-120)		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

6.0 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Test Data

STEP 6.13.2[3.13]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-6	LOCAL	N/A		PSIG	
TEMPORARY FLOWMETER	TF-1	LOCAL	≥410 (410-430)		GPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	100 (80-120)		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	100 (80-120)		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

7.0 2 PMP- 3- 118, AUX FEEDWATER PMP 2A- A Calculations

STEP 6.13.2[1.13]

Pump Discharge Corrections (TG-2/Data Collection Section 2)

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}2_C$ = Corrected test gauge TG-2 reading in PSIG.

$TG\text{-}2_I$ = Indicated test gauge TG-2 reading in PSIG.

$TG\text{-}2_S$ = Span of test gauge TG-2 in PSI.

$TG\text{-}2_E$ Error or inaccuracy of test gauge TG-2 in percent.

$TG\text{-}2_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE
Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-2_C(PSIG) - TG-1_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_\_(ft)$$

where: $TG-1_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 2)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM) + \_\_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_\_ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM)$$

where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

8.0 2 PMP- 3- 128, AUX FEEDWATER PMP 2B- B Calculations

STEP 6.13.2[2.16]

Pump Discharge Corrections (TG-4/Data Collection Section 4)

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

$TG\text{-}4_C$ = Corrected test gauge TG-4 reading in PSIG.

$TG\text{-}4_I$ = Indicated test gauge TG-4 reading in PSIG.

$TG\text{-}4_S$ = Span of test gauge TG-4 in PSI.

$TG\text{-}4_E$ Error or inaccuracy of test gauge TG-4 in percent.

$TG\text{-}4_R$ = Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-4_C(PSIG) - TG-3_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-3 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 4)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM) + \_\_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_\_ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_ (GPM)$$

where:

PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

9.0 2-PMP-003-2A-S, TD AUX FEEDWATER PUMP 2A-S Calculations

STEP 6.13.2[3.17]

Pump Discharge Corrections (TG-6/Data Collection Section 6)

$$TG-6_C(PSIG) = TG-6_I(PSIG) - TG-6_S(PSI) \times TG-6_E(\%) \div 100 - TG-6_R$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-6_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:

	$TG\text{-}6_C$	=	Corrected test gauge TG-6 reading in PSIG.
	$TG\text{-}6_I$	=	Indicated test gauge TG-6 reading in PSIG.
	$TG\text{-}6_S$	=	Span of test gauge TG-6 in PSI.
	$TG\text{-}6_E$		Error or inaccuracy of test gauge TG-6 in percent.
	$TG\text{-}6_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-6 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG-6_C(PSIG) - TG-5_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where:

	$TG-5_A$	=	Actual test gauge TG-5 reading in PSIG.
	H_{TD}	=	Total Dynamic Head (ft.)

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AUX FEEDWATER PUMPS Flow Tests at 100 PSIG

Pump Flow Corrections (Temporary Flowmeter, TF-1/Data Collection Section 6)

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_\ (GPM) + \_\_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\_\ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\_\ (GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

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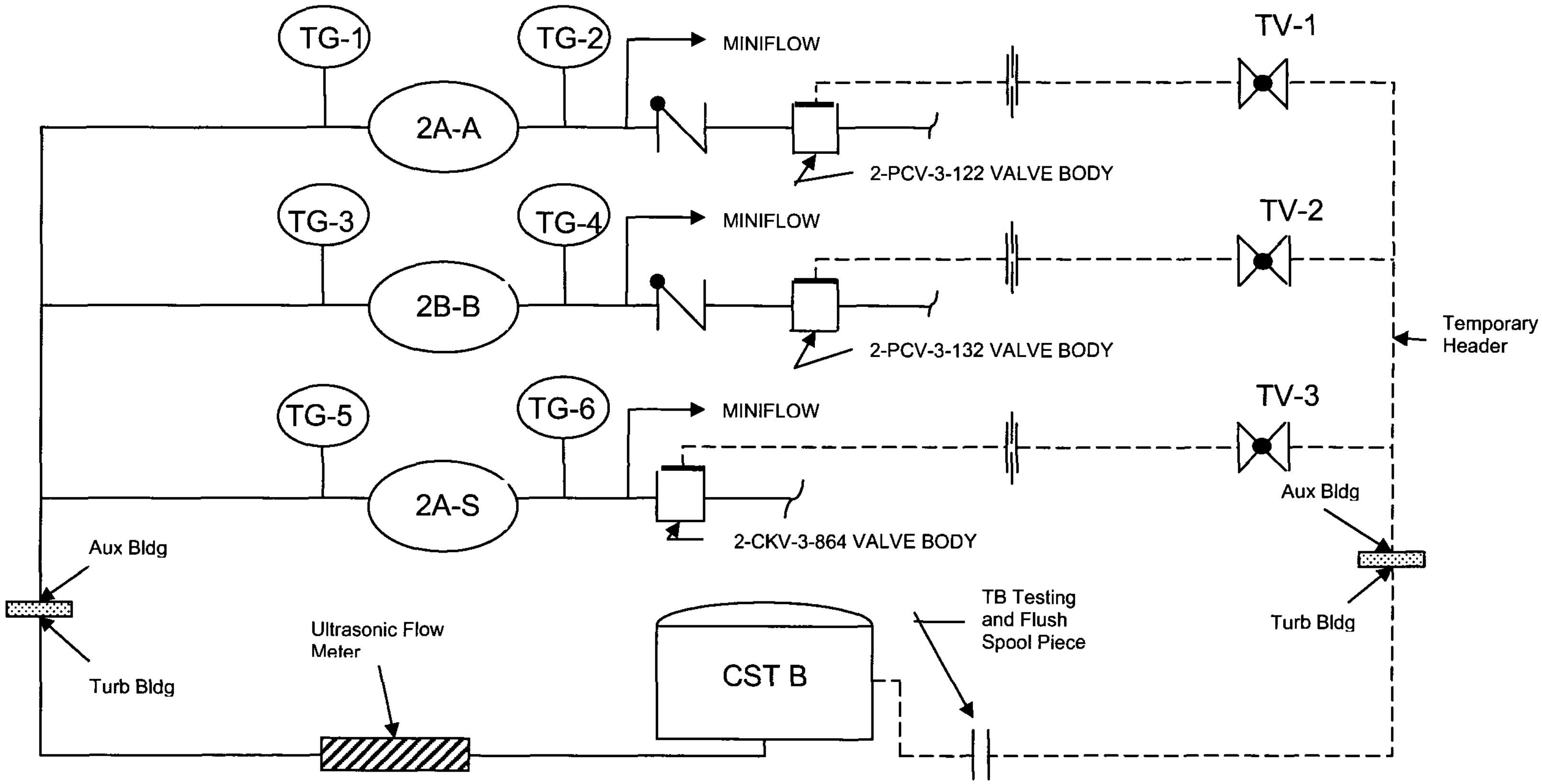
Auxiliary Feedwater Temporary Piping - Full-Flow Header



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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Response Time and Cold Quick Start Control Switch Alignment

STEP 6.11.1 [5]

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
MAIN CONTROL BOARD 2-M-4			
2-LIC-3-174A	SG 1 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-173A	SG 2 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-172A	SG 3 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-175A	SG 4 SUPPLY FRM T-D PMP	AUTO	
2-HS-3-174A	SG 1 SUPPLY LCV-3-174 CNTL	CLOSE[1]	
2-HS-3-173A	SG 2 SUPPLY LCV-3-173 CNTL	CLOSE[1]	
2-HS-3-172A	SG 3 SUPPLY LCV-3-172 CNTL	CLOSE[1]	
2-HS-3-175A	SG 4 SUPPLY LCV-3-175 CNTL	CLOSE[1]	
2-FIC-46-57A	T-D AFWP FLOW CONTROLLER	MANUAL	
TD AUX FEEDWATER PUMP LOCAL CONTROL PANEL 2-L-381			
2-LIC-3-174B	TD AFW PUMP SG1 LVL CNTL	AUTO	
2-LIC-3-173B	TD AFW PUMP SG2 LVL CNTL	AUTO	
2-LIC-3-172B	TD AFW PUMP SG3 LVL CNTL	AUTO	
2-LIC-3-175B	TD AFW PUMP SG4 LVL CNTL	AUTO	
2-FIC-46-57B	AUX FPT FLOW INDICATING CNTRL	AUTO	
2-XC-46-54	AFWT A-S IDLE SPEED POT	0%	

[1] Handswitch returns to auto position after placing it in the close position.

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1

1.0 PRE-TEST DATA

STEP 6.11.1[24]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200-270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP DISCHARGE PRESS	TG-6	LOCAL			PSIG	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104°		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	<Ambient +20°F		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	<Ambient +20°F		°F	
TURBINE INB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
TURBINE OUTB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0430A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0440A	COMP CONSOLE	1092 ±35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1

2.0 RECORDER TRACE ANALYSIS

STEP 6.11.2[10]

[1] Mark the time point on the recorder trace where the discharge flow rate (Channel 2) exceeded 720 GPM and record the flow.

Flow __________ GPM __________

[2] Determine the distance in millimeters from the initiation signal (Channel 1) and the 720 GPM time point determined at [1].

Distance __________ mm __________

[3] Divide the distance (mm) determined at [2] by 10 to determine response time in seconds.

Response Time __________ sec __________

[4] Determine the discharge pressure recorded on Channel 3 for the time point determined as the 720 GPM time point at [1].

Discharge Pressure __________ PSIG __________

[5] Subtract the suction pressure recorded on Page 1 of this Data Sheet from the discharge pressure determined at [4] to determine pump differential pressure.

[6] Differential Pressure __________ PSID

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1

3.0 DATA REDUCTION AND CALCULATIONS

STEP 6.11.2[11]

Pump Discharge Corrections (Chart Recorder Channel 3/Section 2.0/Appendix Y)

$$\text{Chan } 3_C(\text{PSIG}) = \text{Chan } 3_I(\text{PSIG}) - \text{Chan } 3_S(\text{PSI}) \times \text{Chan } 3_E(\%) \div 100$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG }) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(\text{ PSIG })$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG })$$

where: Chan-3_C = Corrected Chart Recorder Chan-3 reading in PSIG.

Chan-3_I = Indicated Chart Recorder Chan-3 reading in PSIG.

Chan-3_S = Span of Chart Recorder Chan-3 in PSI.

Chan-3_E Error or inaccuracy of Chart Recorder Chan-3 in percent.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation. Flow correction is based on DCN-30339-A.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Appendix Y)

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM}) + \_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\ (\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM})$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 1

Total Dynamic Head Calculation

$$H_{TD}(ft) = TG - 6_C(PSIG) - TG - 5_A(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$

$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: H_{TD} = Total Dynamic Head (ft.)

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2

1.0 PRE-TEST DATA.

STEP 6.11.2[30]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200-270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104°		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	<Ambient +20°F		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	<Ambient +20°F		°F	
TURBINE INB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
TURBINE OUTB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0430A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0440A	COMP CONSOLE	1092 ±35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2

2.0 RECORDER TRACE ANALYSIS

STEP 6.11.2[40]

[1] Mark the time point on the recorder trace where the discharge flow rate (Channel 2) exceeded 720 GPM and record the flow.

Flow __________ GPM __________

[2] Determine the distance in millimeters from the initiation signal (Channel 1) and the 720 GPM time point determined at [1].

Distance __________ mm __________

[3] Divide the distance (mm) determined at [2] by 10 to determine response time in seconds.

Response Time __________ sec __________

[4] Determine the discharge pressure recorded on Channel 3 for the time point determined as the 720 GPM time point at [1].

Discharge Pressure __________ PSIG __________

[5] Subtract the suction pressure recorded on Page 1 of this Data Sheet from the discharge pressure determined at [4] to determine pump differential pressure.

[6] Differential Pressure __________ PSID

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2

3.0 DATA REDUCTION AND CALCULATIONS

STEP 6.11.2[41]

Pump Discharge Corrections (Chart Recorder Channel 3/Section 2.0/Appendix Z)

$$\text{Chan } 3_C(\text{PSIG}) = \text{Chan } 3_I(\text{PSIG}) - \text{Chan } 3_S(\text{PSI}) \times \text{Chan } 3_E(\%) \div 100$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{PSIG}) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(\text{PSIG})$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{PSIG})$$

where: Chan-3_C = Corrected Chart Recorder Chan-3 reading in PSIG.

Chan-3_I = Indicated Chart Recorder Chan-3 reading in PSIG.

Chan-3_S = Span of Chart Recorder Chan-3 in PSI.

Chan-3_E Error or inaccuracy of Chart Recorder Chan-3 in percent.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation. Flow correction is based on DCN-30339-A.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Appendix Y)

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM}) + \_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\ (\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM})$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

Appendix Z
(Page 4 of 4)

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 2

Total Dynamic Head Calculation

$$H_{TD}(\mathrm{ft}) = TG-6_C(\mathrm{PSIG}) - TG-5_A(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_(\mathrm{PSIG}) - \_\_\_\_\_\_(\mathrm{PSIG}) \times 2.311\frac{\mathrm{ft}}{\mathrm{PSI}}$$

$$H_{TD}(\mathrm{ft}) = \_\_\_\_\_\_(\mathrm{ft})$$

where: H_{TD} = Total Dynamic Head (ft.)

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Appendix AA
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3

1.0 PRE-TEST DATA

STEP 6.11.2[47]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200-270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104°		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	<Ambient +20°F		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	<Ambient +20°F		°F	
TURBINE INB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
TURBINE OUTB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0430A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0440A	COMP CONSOLE	1092 ±35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3

2.0 RECORDER TRACE ANALYSIS

STEP 6.11.2[56]

[1] Mark the time point on the recorder trace where the discharge flow rate (Channel 2) exceeded 720 GPM and record the flow.

Flow __________ GPM __________

[2] Determine the distance in millimeters from the initiation signal (Channel 1) and the 720 GPM time point determined at [1].

Distance __________ mm __________

[3] Divide the distance (mm) determined at [2] by 10 to determine response time in seconds.

Response Time __________ sec __________

[4] Determine the discharge pressure recorded on Channel 3 for the time point determined as the 720 GPM time point at [1].

Discharge Pressure __________ PSIG __________

[5] Subtract the suction pressure recorded on Page 1 of this Data Sheet from the discharge pressure determined at [4] to determine pump differential pressure.

[6] Differential Pressure __________ PSID

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Performed By Signature Date

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Verified By Signature Date

Appendix AA
(Page 3 of 4)

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3

3.0 DATA REDUCTION AND CALCULATIONS

STEP 6.11.2[57]

Pump Discharge Corrections (Chart Recorder Channel 3/Section 2.0/Appendix AA)

$$\text{Chan } 3_C(\text{PSIG}) = \text{Chan } 3_I(\text{PSIG}) - \text{Chan } 3_S(\text{PSI}) \times \text{Chan } 3_E(\%) \div 100$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG }) \times \_\_\_\_\_\_(\%) \ \div 100 - \_\_\_\_\_\_(\text{ PSIG })$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG })$$

where:
- Chan-3_C = Corrected Chart Recorder Chan-3 reading in PSIG.
- Chan-3_I = Indicated Chart Recorder Chan-3 reading in PSIG.
- Chan-3_S = Span of Chart Recorder Chan-3 in PSI.
- Chan-3_E Error or inaccuracy of Chart Recorder Chan-3 in percent.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation. Flow correction is based on DCN-30339-A.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Appendix Y)

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM}) + \_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\ (\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\ (\text{GPM})$$

where:
- PF_C = Pump flow corrected for M&TE inaccuracy
- PF_I = Pump flow indicated by M&TE
- FM_E = Flow meter M&TE inaccuracy in percent

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 3

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-6_C(\text{PSIG}) - TG-5_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{ft})$$

where: H_{TD} = Total Dynamic Head (ft.)

Performed By Signature	Date
Verified By Signature	Date

Appendix BB
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4

1.0 PRE-TEST DATA

STEP 6.11.2[63]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200-270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104°		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	<Ambient +20°F		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	<Ambient +20°F		°F	
TURBINE INB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
TURBINE OUTB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0430A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0440A	COMP CONSOLE	1092 ±35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4

2.0 RECORDER TRACE ANALYSIS

STEP 6.11.2[72]

[1] Mark the time point on the recorder trace where the discharge flow rate (Channel 2) exceeded 720 GPM and record the flow.

Flow __________ GPM __________

[2] Determine the distance in millimeters from the initiation signal (Channel 1) and the 720 GPM time point determined at [1].

Distance __________ mm __________

[3] Divide the distance (mm) determined at [2] by 10 to determine response time in seconds.

Response Time __________ sec __________

[4] Determine the discharge pressure recorded on Channel 3 for the time point determined as the 720 GPM time point at [1].

Discharge Pressure __________ PSIG __________

[5] Subtract the suction pressure recorded on Page 1 of this Data Sheet from the discharge pressure determined at [4] to determine pump differential pressure.

[6] Differential Pressure __________ PSID

__________________________ __________
Performed By Signature Date

__________________________ __________
Verified By Signature Date

Appendix BB
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4

3.0 DATA REDUCTION AND CALCULATIONS

STEP 6.11.2[73]

Pump Discharge Corrections (Chart Recorder Channel 3/Section 2.0/Appendix BB)

$$\text{Chan } 3_C(\text{PSIG}) = \text{Chan } 3_I(\text{PSIG}) - \text{Chan } 3_S(\text{PSI}) \times \text{Chan } 3_E(\%) \div 100$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG}) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(\text{ PSIG})$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{ PSIG})$$

where: Chan-3_C = Corrected Chart Recorder Chan-3 reading in PSIG.

Chan-3_I = Indicated Chart Recorder Chan-3 reading in PSIG.

Chan-3_S = Span of Chart Recorder Chan-3 in PSI.

Chan-3_E Error or inaccuracy of Chart Recorder Chan-3 in percent.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation. Flow correction is based on DCN-30339-A.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Appendix Y)

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_ (\text{GPM}) + \_\_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_\_ (\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_ (\text{GPM})$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flow meter M&TE inaccuracy in percent

Appendix BB
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 4

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-6_C(\text{PSIG}) - TG-5_A(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{PSIG}) - \_\_\_\_\_\_(\text{PSIG}) \times 2.311\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{ft})$$

where: H_{TD} = Total Dynamic Head (ft.)

Performed By Signature ______ Date ______

Verified By Signature ______ Date ______

Appendix CC
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5

1.0 PRE-TEST DATA

STEP 6.11.2[79]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200-270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-5	LOCAL	≥ 16		PSIG	
PUMP LOCAL AMBIENT TEMP	PYROMETER	LOCAL	< 104°		°F	
PUMP LOCAL REL HUMIDITY	PSYCHROMETER	LOCAL	< 80		%	
PUMP INB BRG OIL TEMP	TI-3-1B	LOCAL	<Ambient +20°F		°F	
PUMP OUTB BRG OIL TEMP	TI-3-1A	LOCAL	<Ambient +20°F		°F	
TURBINE INB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
TURBINE OUTB BRG OIL TEMP	PYROMETER	LOCAL	N/A		°F	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0430A	COMP CONSOLE	1092 ±35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0440A	COMP CONSOLE	1092 ±35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

Appendix CC
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5

2.0 RECORDER TRACE ANALYSIS - STEP 6.11.2 [70]

[1] Mark the time point on the recorder trace where the discharge flow rate (Channel 2) exceeded 720 GPM and record the flow.

Flow __________ GPM __________

[2] Determine the distance in millimeters from the initiation signal (Channel 1) and the 720 GPM time point determined at [1].

Distance __________ mm __________

[3] Divide the distance (mm) determined at [2] by 10 to determine response time in seconds.

Response Time __________ sec __________

[4] Determine the discharge pressure recorded on Channel 3 for the time point determined as the 720 GPM time point at [1].

Discharge Pressure __________ PSIG __________

[5] Subtract the suction pressure recorded on Page 1 of this Data Sheet from the discharge pressure determined at [4] to determine pump differential pressure.

[6] Differential Pressure __________ PSID

Performed By Signature __________ Date __________

Verified By Signature __________ Date __________

Appendix CC
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5

3.0 DATA REDUCTION AND CALCULATIONS - STEP 6.11.2 [71]

Pump Discharge Corrections (Chart Recorder Channel 3/Section 2.0/Appendix CC)

$$\text{Chan } 3_C(\text{PSIG}) = \text{Chan } 3_I(\text{PSIG}) - \text{Chan } 3_S(\text{PSI}) \times \text{Chan } 3_E(\%) \div 100$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{PSIG}) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(\text{PSIG})$$
$$\text{Chan } 3_C(\text{PSIG}) = \_\_\_\_\_\_(\text{PSIG})$$

where:

	$\text{Chan-}3_C$	=	Corrected Chart Recorder Chan-3 reading in PSIG.
	$\text{Chan-}3_I$	=	Indicated Chart Recorder Chan-3 reading in PSIG.
	$\text{Chan-}3_S$	=	Span of Chart Recorder Chan-3 in PSI.
	$\text{Chan-}3_E$		Error or inaccuracy of Chart Recorder Chan-3 in percent.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation. Flow correction is based on DCN-30339-A.

Pump Flow Corrections (Temporary Flowmeter, TF-1/Appendix Y)

$$PF_C(\text{GPM}) = PF_I(\text{GPM}) + FM_E(\%) \times PF_I(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_(\text{GPM}) + \_\_\_\_\_\_\_(\%) \times \_\_\_\_\_\_\_(\text{GPM}) \div 100$$
$$PF_C(\text{GPM}) = \_\_\_\_\_\_\_(\text{GPM})$$

where:

	PF_C	=	Pump flow corrected for M&TE inaccuracy
	PF_I	=	Pump flow indicated by M&TE
	FM_E	=	Flow meter M&TE inaccuracy in percent

Appendix CC
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2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Cold Start No. 5

Total Dynamic Head Calculation

$$H_{TD}(\text{ft}) = TG-6_C(\text{PSIG}) - TG-5_A(\text{PSIG}) \times 2.311\,\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{ PSIG}) - \_\_\_\_\_\_(\text{ PSIG}) \times 2.311\,\frac{\text{ft}}{\text{PSI}}$$

$$H_{TD}(\text{ft}) = \_\_\_\_\_\_(\text{ ft})$$

where: H_{TD} = Total Dynamic Head (ft.)

Performed By Signature	Date
Verified By Signature	Date

Appendix DD
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2-PMP-3-118, AUX FEEDWATER PMP 2A-A and PMP-3-128, AUX FEEDWATER PMP-2B-B, Response Time Tests Control Switch Alignment

STEP 6.6.1 [4]

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
	MAIN CONTROL BOARD 2-M-4		
2-LIC-3-164A	SG 1 SUPPLY FRM PMP A-A	AUTO	
2-LIC-3-156A	SG 2 SUPPLY FRM PMP A-A	AUTO	
2-LIC-3-148A	SG 3 SUPPLY FRM PMP B-B	AUTO	
2-LIC-3-171A	SG 4 SUPPLY FRM PMP B-B	AUTO	
2-PDIC-3-122A,	AFW PMP 2A-A DISCH PRESS CNTL	AUTO	
2-PDIC-3-132A	AFW PMP B-B DISCH PRESS CONTROL	AUTO	
2-HS-3-164A	SG 1 SUPPLY LCV 3-164 CNTL	CLOSE[1]	
2-HS-3-156A	SG 2 SUPPLY LCV-3-156 CNTL	CLOSE[1]	
2-HS-3-148A	SG 3 SUPPLY LCV-3-148 CNTL	CLOSE[1]	
2-HS-3-171A	SG 4 SUPPLY LCV-3-171 CNTL	CLOSE[1]	
	AUX CONTROL BOARD PANEL 2-L-11A		
2-LIC-3-164B	STM GEN 1 LVL INDICATING CNTRL	AUTO	
2-LIC-3-156B	STM GEN 2 LVL INDICATING CNTRL	AUTO	
	AUX CONTROL BOARD PANEL 2-L-11B		
2-LIC-3-148B	STM GEN 3 LVL INDICATING CNTRL	AUTO	
2-LIC-3-171B	STM GEN 4 LVL INDICATING CNTRL	AUTO	

1 Handswitch returns to the auto position after placing it in the close position.

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(Page 1 of 2)

Auxiliary Feedwater Water Hammer Control Switch Alignment

STEP 6.12.1 [9]

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
MAIN CONTROL BOARD 2-M-4			
2-LIC-3-174A	SG 1 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-173A	SG 2 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-172A	SG 3 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-175A	SG 4 SUPPLY FRM T-D PMP	AUTO	
2-LIC-3-164A	SG 1 SUPPLY FRM PMP A-A	AUTO	
2-LIC-3-156A	SG 2 SUPPLY FRM PMP A-A	AUTO	
2-LIC-3-148A	SG 3 SUPPLY FRM PMP B-B	AUTO	
2-LIC-3-171A	SG 4 SUPPLY FRM PMP B-B	AUTO	
2-PDIC-3-122A	AFW PMP 2A-A DISCH PRESS CNTL	AUTO	
2-PDIC-3-132A	AFW PMP B-B DISCH PRESS CONTROL	AUTO	
2-FIC-46-57A	AUX FPT FLOW INDICATING CNTRL	AUTO	
2-HS-3-174A	SG 1 SUPPLY LCV-3-174 CNTL	RESET/MODULATE[1]	
2-HS-3-173A	SG 2 SUPPLY LCV-3-173 CNTL	RESET/MODULATE[1]	
2-HS-3-172A	SG 3 SUPPLY LCV-3-172 CNTL	RESET/MODULATE[1]	
2-HS-3-175A	SG 4 SUPPLY LCV-3-175 CNTL	RESET/MODULATE[1]	
2-HS-3-156A	SG 2 SUPPLY LCV-3-156 CNTL	RESET/MODULATE[1]	
2-HS-3-148A	SG 3 SUPPLY LCV-3-148 CNTL	RESET/MODULATE[1]	

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Auxiliary Feedwater Water Hammer Control Switch Alignment

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
2-HS-3-171A	SG 4 SUPPLY LCV-3-171 CNTL	RESET/MODULATE[1]	
2-HS-3-164A	SG 1 SUPPLY LCV-3-164 CNTL	RESET/MODULATE[1]	
TD AUX FEEDWATER PUMP LOCAL CONTROL PANEL 2-L-318			
2-LIC-3-174B	TD AFW PUMP SG 1 LVL CNTL	AUTO	
2-LIC-3-173B	TD AFW PUMP SG 2 LVL CNTL	AUTO	
2-LIC-3-172B	TD AFW PUMP SG 3 LVL CNTL	AUTO	
2-LIC-3-175B	TD AFW PUMP SG 4 LVL CNTL	AUTO	
2-FIC-46-57B	AUX FPT FLOW INDICATING CNTRL	AUTO	
2-XC-46-54	AFWT A-S IDLE SPEED POT	0%	
AUX CONTROL BOARD PANEL 2-L-11A			
2-LIC-3-164B	AFW TO SG 1 FROM PMP A-A	AUTO	
2-LIC-3-156B	AFW TO SG 2 FROM PMP A-A	AUTO	
AUX CONTROL BOARD PANEL 2-L-11B			
2-LIC-3-148B	AFW TO SG 3 FROM PMP B-B	AUTO	
2-LIC-3-171B	AFW TO SG 4 FROM PMP B-B	AUTO	

[1] Handswitch returns to the AUTO position after placing it in the RESET/MODULATE position.

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Auxiliary Feedwater Water Hammer

PRE-TEST DATA - STEP 6.12.1 [11]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIAL/DATE
CST LEVEL	2-LI-2-233D	2-M-2	≈200[1]		GAL x 1000	
2-PMP-3-2A-A SUCTION PRESS	TG-1	LOCAL	≥10		PSIG	
2-PMP-3-2B-B SUCTION PRESS	TG-3	LOCAL	≥ 10		PSIG	
2-PMP-3-2A-S PUMP SUCTION PRESS	TG-5	LOCAL	≥ 20		PSIG	
MSL 1 PRESS	P0400	COMPUTER CONSOLE	N/A		PSIG	

[1] CST level should be as close to the minimum level as feasible.

Appendix GG
(Page 1 of 1)

Motor Driven Auxiliary Feedwater Pumps Full Flow Data

DATA COLLECTION - STEP 6.12.2 [6]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	≥ N/A		GAL X 1000	
2-PMP-3-118 SUCT PRESS	TG-1	LOCAL	> 6		PSIG	
2-PMP-3-118 DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
2-PMP-3-128 SUCT PRESS	TG-3	LOCAL	> 6		PSIG	
2-PMP-3-128 DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
SG 1 LEVEL	LI-3-164	2-M-3	N/A		%	
SG 2 LEVEL	LI-3-156	2-M-3	N/A		%	
SG 3 LEVEL	LI-3-148	2-M-3	N/A		%	
SG 4 LEVEL	LI-3-171	2-M-3	N/A		%	
SG #1 AUX FW FLOW	Y0708A	COMPUTER CONSOLE	N/A		GPM	
SG #2 AUX FW FLOW	Y0704A	COMPUTER CONSOLE	N/A		GPM	
SG #3 AUX FW FLOW	Y0703A	COMPUTER CONSOLE	N/A		GPM	
SG #4 AUX FW FLOW	Y0709A	COMPUTER CONSOLE	N/A		GPM	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	N/A		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	N/A		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	N/A		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	N/A		PSIG	

Appendix HH
(Page 1 of 1)

2-PMP-003-0002A-S, TD AUX FEEDWATER PMP 2A-S, Minimum Steam Pressure Control Switch Alignment

STEP 6.13.1 [5]

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
MAIN CONTROL BOARD 2-M-4			
2-LIC-3-174A	SG 1 SUPPLY FRM T-D PMP	MANUAL	
2-LIC-3-173A	SG 2 SUPPLY FRM T-D PMP	MANUAL	
2-FIC-46-57A	AUX FPT FLOW INDICATING CNTRL	AUTO	
2-HS-3-174A	SG 1 SUPLY LCV-3-174 CNTL	RESET/MODULATE[1]	
2-HS-3-173A	SG 2 SUPLY LCV-3-173 CNTL	RESET/MODULATE[1]	
TO AUX FEEDWATER PUMP LOCAL CONTROL PANEL 2-L-381			
2-XC-46-54	AFWT A-S IDLE SPEED POT	0%	

[1] Handswitch returns to the AUTO position after placing it in the RESET/MODULATE position.

Appendix II
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This Appendix Deleted

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A and 2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Full Flow Tests Control Switch Alignment

STEP 6.14.1 [7]

CONTROL SWITCH NUMBER	DESCRIPTION	REQUIRED POSITION	INITIALS/DATE
MAIN CONTROL BOARD 2-M-4			
2-LIC-3-164A	SG 1 SUPPLY FRM PMP A-A	MANUAL	
2-LIC-3-156A	SG 2 SUPPLY FRM PMP A-A	MANUAL	
2-LIC-3-148A	SG 3 SUPPLY FRM PMP B-B	MANUAL	
2-LIC-3-171A	SG 4 SUPPLY FRM PMP B-B	MANUAL	
2-PDIC-3-122A	AFW PMP 2A-A DISCH PRESS CNTL	AUTO	
2-PDIC-3-132A	AFW PMP B-B DISCH PRESS CONTROL	AUTO	
2-HS-3-164A	SG 1 SUPPLY LCV-3-164 CNTL	CLOSE[1]	
2-HS-3-156A	SG 2 SUPPLY LCV-3-156 CNTL	CLOSE[1]	
2-HS-3-148A	SG 3 SUPPLY LCV-3-148 CNTL	CLOSE[1]	
2-HS-3-171A	SG 4 SUPPLY LCV-3-171 CNTL	CLOSE[1]	
AUX CONTROL BOARD PANEL 2-L-11A			
2-LIC-3-164B	STM GEN 1 LVL INDICATING CNTRL	AUTO	
2-LIC-3-156B	STM GEN 2 LVL INDICATING CNTRL	AUTO	
AUX CONTROL BOARD PANEL 2-L-11B			
2-LIC-3-148B	STM GEN 3 LVL INDICATING CNTRL	AUTO	
2-LIC-3-171B	STM GEN 4 LVL INDICATING CNTRL	AUTO	

1 Handswitch returns to the auto position after placing it in the close position.

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(Page 1 of 1)

2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Maximum Flow Test

DATA COLLECTION - STEP 6.14.2 [4]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	≤ 700		GPM	
MOTOR CURRENT	EI-3-119A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	3577		RPM	

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(Page 1 of 1)

2-PMP-3-128, AUX FEEDWATER PMP 2B-B-Maximum Flow Test

DATA COLLECTION - STEP 6.14.2 [13]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
PUMP FLOW	TF-1	LOCAL	≤ 700		GPM	
MOTOR CURRENT	EI-3-129A	2-M-4	≤ 49.5		AMPS	
MOTOR SPEED	TACH	LOCAL	3577		RPM	

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(Page 1 of 6)

2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

1.0 PRE-TEST DATA

STEP 6.6.2[1.1]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-1	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-2	LOCAL	N/A		PSIG	
STM GEN 1 STM OUT 1 PRESSURE	P0400A	COMPUTER CONSOLE	1092 ± 35 PSIG		PSIG	
STM GEN 2 STM OUT 1 PRESSURE	P0420A	COMPUTER CONSOLE	1092 ± 35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

2.0 RECORDER TRACE ANALYSIS

STEP 6.6.2[1.9]

[1] **MARK** the time point on the recorder chart where the sum of the discharge flow rates indicated by the Channel 3 trace and the Channel 4 trace show that flow is maintained above 410 GPM, **AND**

RECORD the flows.

Channel 3 Flow: ___________ GPM

Channel 4 Flow: ___________ GPM

Total Flow to Steam Generators Calculation

$F_{SG} = F_3 + F_4$

$F_{SG} =$ ______(GPM) + ______(GPM)

$F_{SG} =$ ______(GPM)

Where:

F_3 = Flow indicated by recorder Channel 3 trace.

F_4 = Flow indicated by recorder Channel 4 trace.

F_{SG} = Total pump flow to SGs.

[2] **DETERMINE** the distance in millimeters from the initiation signal (Channel 1) and the time point determined at step [1], **AND**

RECORD the distance.

Distance: ___________ mm

Appendix MM
(Page 3 of 6)

2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

[3] **DIVIDE** the distance (mm) determined at step [2] by 25, **AND**

RECORD this value as the response time in seconds.

Response Time: __________ sec

______________________________ __________
Performed By Signature Date

______________________________ __________
Verified By Signature Date

Flow Corrections (Temporary Flowmeter, TF-1/Step 6.6.2[1.6])

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\ (GPM) + \_\_\_\_\_\_\ (\%) \times \_\_\_\_\_\_\ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_\ (GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

Recirc Flow Calculation

$$RF(GPM) = PFC(GPM) - FSG(GPM)$$
$$RF(GPM) = \_\_\_\_\_\_(GPM) - \_\_\_\_\_\_(GPM)$$
$$RF(GPM) = \_\_\_\_\_\_(GPM)$$

where: RF = Recirc flow

PF_C = Pump flow corrected for M&TE inaccuracy in previous calculation

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

F_{SG} = Total Pump Flow to SGs from Total Flow to Steam Generators Calculation on page 2 of 4

3.0 RECORDER TRACE ANALYSIS

STEP 6.6.2[1.10]

[1] **MARK** the time point on the recorder chart where the sum of the discharge flow rates indicated by the Channel 3 trace and the Channel 4 trace show that flow is maintained steady state, **AND**

RECORD the flows.

Channel 3 Flow: __________ GPM

Channel 4 Flow: __________ GPM

$F_T = F_3 + F_4$

$F_T =$ ______(GPM) + ______(GPM)

$F_T =$ ______(GPM)

Where:

F_3 = Flow indicated by recorder Channel 3 trace.

F_4 = Flow indicated by recorder Channel 4 trace.

F_T = Total pump flow.

______________________________ __________
Performed By Signature Date

______________________________ __________
Verified By Signature Date

Appendix MM
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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

4.0 Minimum Pump Curve Calculations

STEP 6.6.2[1.13]

Pump Discharge Corrections (TG-2/STEP 6.6.2[1.6])

$$TG-2_C(PSIG) = TG-2_I(PSIG) - TG-2_S(PSI) \times TG-2_E(\%) \div 100 - TG-2_R$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-2_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:	$TG\text{-}2_C$	=	Corrected test gauge TG-2 reading in PSIG.
	$TG\text{-}2_I$	=	Indicated test gauge TG-2 reading in PSIG.
	$TG\text{-}2_S$	=	Span of test gauge TG-2 in PSI.
	$TG\text{-}2_E$		Error or inaccuracy of test gauge TG-2 in percent.
	$TG\text{-}2_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-2 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation (TG-1/STEP 6.6.2[1.6])

$$H_{TD}(ft) = TG-2_C(PSIG) - TG-1_A(PSIG) \times 2.311\ \frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\ \frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-1_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-118, AUX FEEDWATER PMP 2A-A, Response Time

<u>Pump Flow Corrections, See Section 2 [3], (Temporary Flowmeter, TF-1/Step 6.6.2[1.6]).</u>

Performed By Signature	Date
Verified By Signature	Date

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

1.0 PRE-TEST DATA

STEP 6.6.2[2.3]

MEASUREMENT	INSTRUMENT	LOCATION	EXPECTED VALUE	DATA	UNITS	INITIALS/DATE
CST LEVEL	2-LI-2-233D	2-M-2	200 to 270[1]		GAL X 1000	
PUMP SUCTION PRESS	TG-3	LOCAL	≥ 6		PSIG	
PUMP DISCH PRESS	TG-4	LOCAL	N/A		PSIG	
STM GEN 3 STM OUT 1 PRESSURE	P0440A	COMPUTER CONSOLE	1092 ± 35 PSIG		PSIG	
STM GEN 4 STM OUT 1 PRESSURE	P0460A	COMPUTER CONSOLE	1092 ± 35 PSIG		PSIG	

[1] CST volumes between 200,000 and 270,000 correspond to approximate elevations of 745 ft. to 750 ft. A deviation of 5 ft. from the reference elevation of 745 ft. is considered negligible for static corrections.

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

2.0 RECORDER TRACE ANALYSIS

STEP 6.6.2[2.9]

[1] **MARK** the time point on the recorder chart where the sum of the discharge flow rates indicated by the Channel 3 trace and the Channel 4 trace show that flow is maintained above 410 GPM, **AND**

RECORD the flows.

Channel 3 Flow: __________ GPM

Channel 4 Flow: __________ GPM

Total Flow to Steam Generators Calculation

$F_{SG} = F_3 + F_4$

$F_{SG} =$ ______(GPM) + ______(GPM)

$F_{SG} =$ ______(GPM)

Where:

F_3 = Flow indicated by recorder Channel 3 trace.

F_4 = Flow indicated by recorder Channel 4 trace.

F_{SG} = Total pump flow to SGs.

[2] **DETERMINE** the distance in millimeters from the initiation signal (Channel 1) and the time point determined at step [1], **AND**

RECORD the distance.

Distance: __________ mm

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

[3] **DIVIDE** the distance (mm) determined at step [2] by 25, **AND**

RECORD this value as the response time in seconds.

Response Time: __________ sec

______________________________ __________
Performed By Signature Date

______________________________ __________
Verified By Signature Date

Flow Corrections (Temporary Flowmeter, TF-1/Step 6.6.2[2.6]

$$PF_C(GPM) = PF_I(GPM) + FM_E(\%) \times PF_I(GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_ (GPM) + \_\_\_\_\_\_ (\%) \times \_\_\_\_\_\_ (GPM) \div 100$$
$$PF_C(GPM) = \_\_\_\_\_\_ (GPM)$$

where: PF_C = Pump flow corrected for M&TE inaccuracy

PF_I = Pump flow indicated by M&TE

FM_E = Flowmeter M&TE inaccuracy in percent

Recirc Flow Calculation

$$RF(GPM) = PF_C(GPM) - F_{SG}(GPM)$$
$$RF(GPM) = \_\_\_\_\_\_ (GPM) - \_\_\_\_\_\_ (GPM)$$
$$RF(GPM) = \_\_\_\_\_\_ (GPM)$$

where: RF = Recirc flow

PF_C = Pump flow corrected for M&TE inaccuracy in previous calculation

F_{SG} = Total Pump Flow to SGs from Total Flow to Steam Generators Calculation on page 2 of 4

Appendix NN
(Page 4 of 6)

2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

3.0 RECORDER TRACE ANALYSIS

STEP 6.6.2[2.10]

[1] **MARK** the time point on the recorder chart where the sum of the discharge flow rates indicated by the Channel 3 trace and the Channel 4 trace show that flow is maintained steady state, **AND**

RECORD the flows.

Channel 3 Flow: __________ GPM

Channel 4 Flow: __________ GPM

$$F_T = F_3 + F_4$$
$$F_T = \_\_\_\_\_\_(GPM) + \_\_\_\_\_\_(GPM)$$
$$F_T = \_\_\_\_\_\_(GPM)$$

Where:

F_3 = Flow indicated by recorder Channel 3 trace.

F_4 = Flow indicated by recorder Channel 4 trace.

F_T = Total pump flow.

______________________________ Performed By Signature __________ Date

______________________________ Verified By Signature __________ Date

Appendix NN
(Page 5 of 6)

2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

4.0 Minimum Pump Curve Calculations

STEP 6.6.2[2.13]

Pump Discharge Corrections (TG-4/STEP 6.6.2[2.6])

$$TG-4_C(PSIG) = TG-4_I(PSIG) - TG-4_S(PSI) \times TG-4_E(\%) \div 100 - TG-4_R$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG) \times \_\_\_\_\_\_(\%) \div 100 - \_\_\_\_\_\_(PSIG)$$
$$TG-4_C(PSIG) = \_\_\_\_\_\_(PSIG)$$

where:	$TG\text{-}4_C$	=	Corrected test gauge TG-4 reading in PSIG.
	$TG\text{-}4_I$	=	Indicated test gauge TG-4 reading in PSIG.
	$TG\text{-}4_S$	=	Span of test gauge TG-4 in PSI.
	$TG\text{-}4_E$		Error or inaccuracy of test gauge TG-4 in percent.
	$TG\text{-}4_R$	=	Resolution, 1/2 of the value of the smallest test gauge TG-4 division.

NOTE

Pump Suction Pressure corrections are considered negligible since it would contribute less than 0.1% inaccuracy in the Total Dynamic Head calculation.

Total Dynamic Head Calculation (TG-1/STEP 6.6.2[2.6])

$$H_{TD}(ft) = TG-4_C(PSIG) - TG-3_A(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(PSIG) - \_\_\_\_\_\_(PSIG) \times 2.311\frac{ft}{PSI}$$
$$H_{TD}(ft) = \_\_\_\_\_\_(ft)$$

where: $TG-3_A$ = Actual test gauge TG-5 reading in PSIG.

H_{TD} = Total Dynamic Head (ft.)

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2-PMP-3-128, AUX FEEDWATER PMP 2B-B, Response Time

Pump Flow Corrections, See Section 2 [3], (Temporary Flowmeter, TF-1/Step 6.6.2[2.6]).

Performed By Signature	Date
Verified By Signature	Date

Appendix OO
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Measuring and Test Equipment Log

Additional pages of this Appendix may be added if required.

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

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Measuring and Test Equipment Log

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

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Measuring and Test Equipment Log

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

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Measuring and Test Equipment Log

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

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Measuring and Test Equipment Log

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

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Measuring and Test Equipment Log

M&TE ID # TEMP ID #	DESCRIPTION RANGE/ACCURACY	CAL DUE DATE	POST CAL DATE	POST TEST CAL ACCEPT. INITIALS/DATE

Appendix PP
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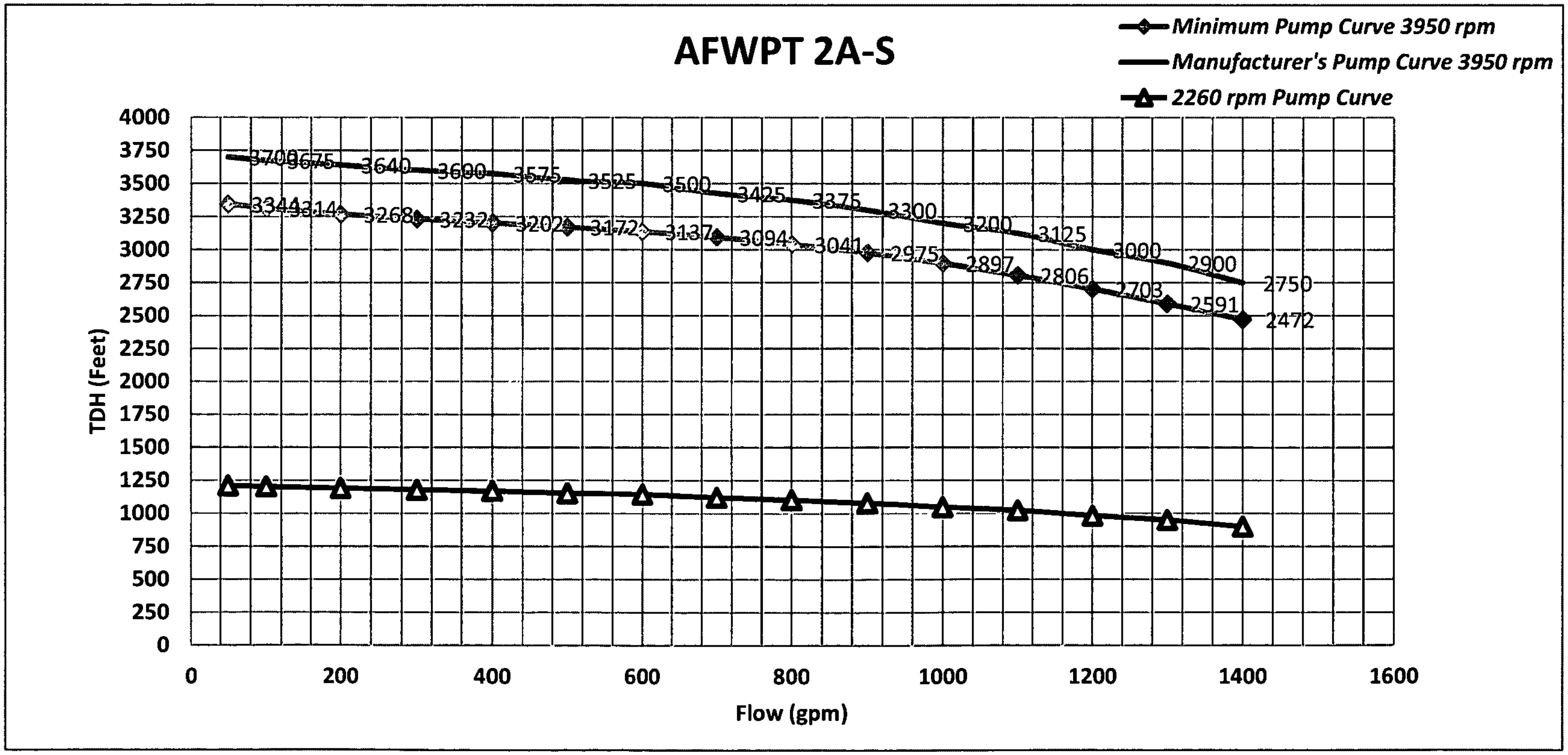
AFWP 2A-S Minimum Pump Curve

This page may be reproduced as necessary.

Step ________________

Flow__________ TDH__________



Appendix QQ
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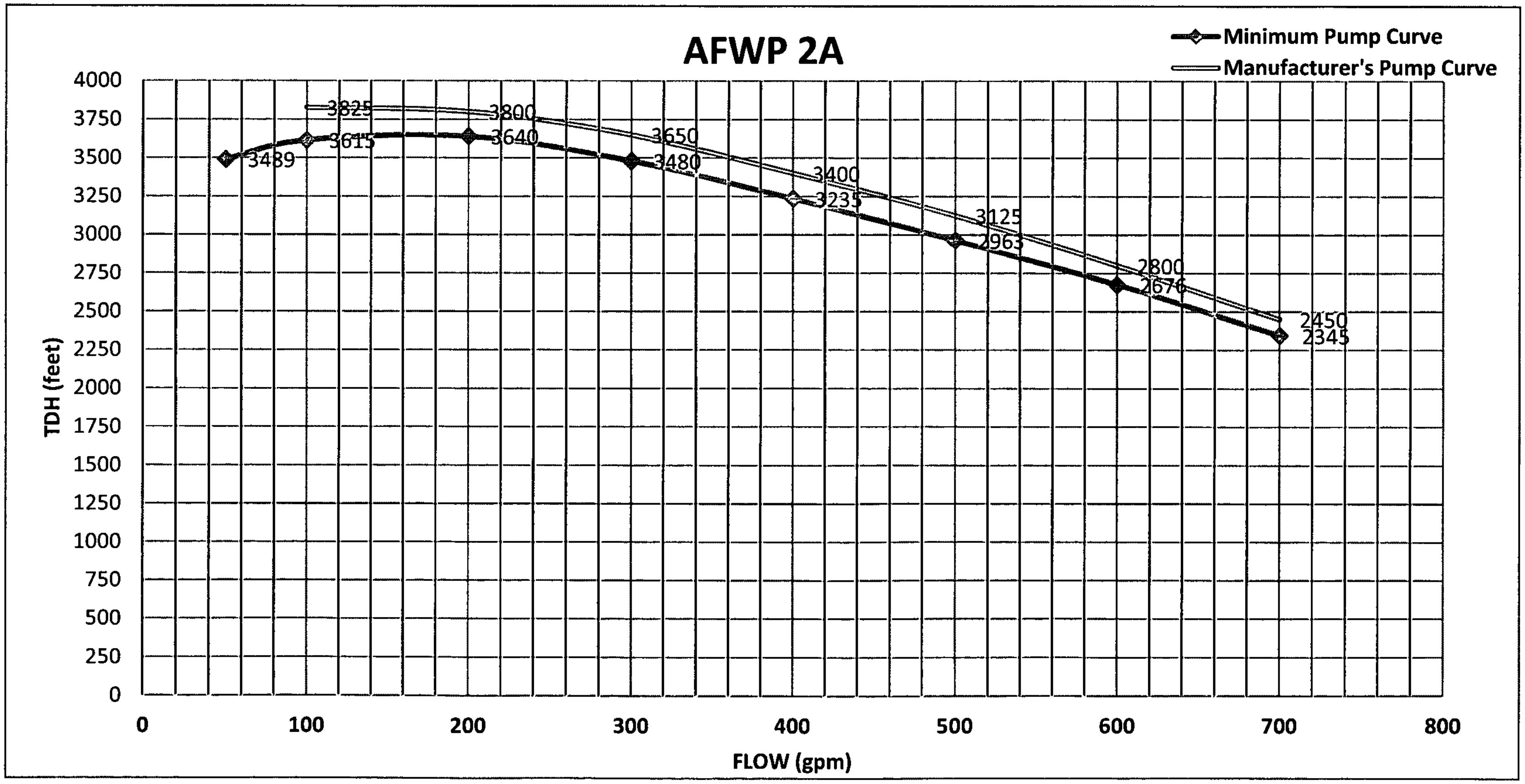
AFWP 2A Minimum Pump Curve

This page may be reproduced as necessary.

Step ________________

Flow__________ TDH__________



Appendix RR
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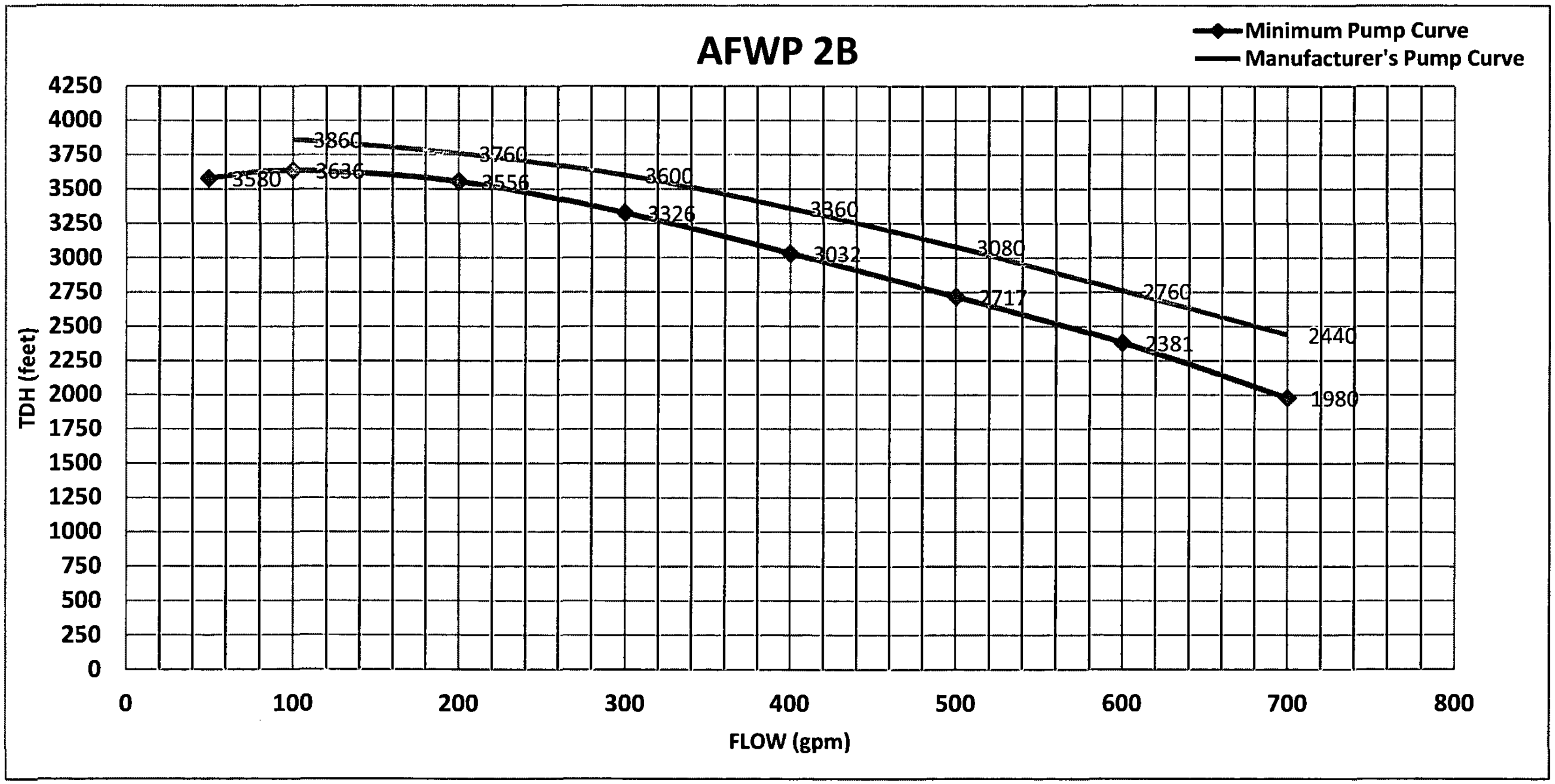
AFWP 2B Minimum Pump Curve

This page may be reproduced as necessary.

Step ________________

Flow__________ TDH__________



Source Notes
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Requirements Statement	Source Document	Implementing Statement
NONE		

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: RPS & ESFAS Response Times

2-PTI-099-01
Instruction No: ~~2-PTI-99-01~~ 7/18/13 RH
Revision No: 0000

PREPARED BY: Bryan T. Mack Bryan T Mack DATE: 5/9/13
PRINT NAME / SIGNATURE

REVIEWED BY: William C. Hinchcliff W. C. Hinchcliff DATE: 05-09-13
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-016

JTG CHAIRMAN: [signature] DATE: 7/18/13

APPROVED BY : [signature] DATE: 7/18/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: ______________

JTG CHAIRMAN: ______________ DATE: ______________

APPROVED BY : ______________ DATE: ______________
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	7/18/13	ALL	Initial issue. Created from PTI-099-01. Included CN-01 thru CN-08 as applicable to U-2 requirements.

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Test Objectives

A. Verify satisfactory response times for the Reactor Protection System (RPS).

B. Verify satisfactory response times for the Engineered Safety Features Actuation System (ESFAS).

C. Verify satisfactory response times for the containment isolation valves.

1.2 Scope

This test is intended to be a desktop performed instruction. No field testing is required since data will be obtained from completed Surveillance Instructions (SI's) and approved plant instructions. The scope of this instruction verifies the response times associated with RPS, ESFAS, and containment isolation valves.

A. The trips listed below are not required by Technical Specifications and will not be performed as part of this Preoperational Test Instruction (PTI). The System Description for Reactor Protection requires time response testing for baseline data only. Time Response testing of these trips will be performed in the noted instructions.

1. Intermediate Range High Flux Neutron Trip will be verified in instruction NC-PI-57

2. Power Range High Neutron Positive Flux Rate Trip will be verified in instruction NC-PI-57

3. Turbine Trip Reactor Trip will be verified in instruction NC-PI-62

4. High Pressurizer Level Trip will be verified in instruction NC-PI-62

2.0 REFERENCES

2.1 Performance References

A. Startup Manual Procedures

1. SMP-4.0, Watts Bar Nuclear Plant Unit 2 - System Completion and Turnover
2. SMP-9.0, Watts Bar Nuclear Plant Unit 2 - Conduct of Test

B. Preoperational Test Instructions and Project Instructions

1. 2-PTI-099-04, Safeguards System
2. 2-PTI-262-01, Unit 2 Integrated Safeguards Test Train A
3. 2-PTI-262-02, Unit 2 Integrated Safeguards Test Train B
4. NC-PI-57, Response Time Test of Nuclear Instrumentation System Generated Reactor Trips
5. NC-PI-62, Response Time Test of Turbine Trip and Pressurizer Level Generated Reactor Trips

C. Surveillance Instructions

1. 2-SI-1-1, 18 Month Channel Calibration SG 1 Main Steam Header Pressure Channel I Loop 2-LPP-1-2A (P-514)
2. 2-SI-1-2, 18 Month Channel Calibration SG 1 Main Steam Header Pressure Channel II Loop 2-LPP-1-2B (P-515)
3. 2-SI-1-3, 18 Month Channel Calibration SG 1 Main Steam Header Pressure Channel IV Loop 2-LPP-1-5 (P-516)
4. 2-SI-1-4, 18 Month Channel Calibration SG 2 Main Steam Header Pressure Channel 1 Loop 2-LPP-1-9A (P-524)
5. 2-SI-1-5, 18 Month Channel Calibration SG 2 Main Steam Header Pressure Channel II Loop 2-LPP-1-9B (P-525)
6. 2-SI-1-6, 18 Month Channel Calibration SG 2 Main Steam Header Pressure Channel III Loop 2-LPP-1-12 (P-526)

2.1 Performance References (continued)

7. 2-SI-1-7, 18 Month Channel Calibration SG 3 Main Steam Header Pressure Channel I Loop 2-LPP-1-20A (P-534)
8. 2-SI-1-8, 18 Month Channel Calibration SG 3 Main Steam Header Pressure Channel II Loop 2-LPP-2-20B (P-535)
9. 2-SI-1-9, 18 Month Channel Calibration SG 3 Main Steam Header Pressure Channel III Loop 2-LPP-1-23 (P-536)
10. 2-SI-1-10, 18 Month Channel Calibration SG 4 Main Steam Header Pressure Channel I Loop 2-LPP-1-27A (P-544)
11. 2-SI-1-11, 18 Month Channel Calibration SG 4 Main Steam Header Pressure Channel II Loop 2-LPP-1-27B (P-545)
12. 2-SI-1-12, 18 Month Channel Calibration SG 4 Main Steam Header Pressure Channel IV Loop 2-LPP-1-30 (P-546)
13. 2-SI-1-904, Full Stroke Exercising of MSIVs
14. 2-SI-3-1, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel II Loop 2-LPL-3-38 (L-519)
15. 2-SI-3-2, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel III Loop 2-LPL-3-39 (L-518)
16. 2-SI-3-3, 18 Month Channel Calibration Steam Generator 1 Narrow Range Level Channel IV Loop 2-LPL-3-42 (L-517)
17. 2-SI-3-4, 18 Month Channel Calibration Steam Generator 2 Narrow Range Level Channel II Loop 2-LPL-3-51 (L-529)
18. 2-SI-3-5, 18 Month Channel Calibration Steam Generator 2 Narrow Range Level Channel III Loop 2-LPL-3-52 (L-528)
19. 2-SI-3-6, 18 Month Channel Calibration Steam Generator 2 Narrow Range Level Channel IV Loop 2-LPL-3-55 (L-527)
20. 2-SI-3-7, 18 Month Channel Calibration Steam Generator 3 Narrow Range Level Channel II Loop 2-LPL-3-93 (L-539)
21. 2-SI-3-8, 18 Month Channel Calibration Steam Generator 3 Narrow Range Level Channel III Loop 2-LPL-3-94 (L-538)

2.1 Performance References (continued)

22. 2-SI-3-9, 18 Month Channel Calibration Steam Generator 3 Narrow Range Level Channel IV Loop 2-LPL-3-97 (L-537)
23. 2-SI-3-10, 18 Month Channel Calibration Steam Generator 4 Narrow Range Level Channel II Loop 2-LPL-3-106 (L-549)
24. 2-SI-3-11, 18 Month Channel Calibration Steam Generator 4 Narrow Range Level Channel III Loop 2-LPL-3-107 (L-548)
25. 2-SI-3-12, 18 Month Channel Calibration Steam Generator 4 Narrow Range Level Channel IV Loop 2-LPL-3-110 (L-547)
26. 2-SI-3-13, 184 Day Channel Operational Test and 18 Month Channel Calibration Steam Generator Level Trip Time Delay Channel II, Loop 2-LPL-3-38T (L-519-549)
27. 2-SI-3-14, 184 Day Channel Operational Test and 18 Month Channel Calibration Steam Generator Level Trip Time Delay Channel III, Loop 2-LPL-3-39T (L-518-548)
28. 2-SI-3-15, 184 Day Channel Operational Test and 18 Month Channel Calibration Steam Generator Level Trip Time Delay Channel IV, Loop 2-LPL-3-42T (L-517-547)
29. 2-SI-3-25, 18 Month Channel Calibration, TADOT and Response Time Test AFW Initiation From Main Feedpump Turbine 2A Trip
30. 2-SI-3-26, 18 Month Channel Calibration, TADOT and Response Time Test AFW Initiation From Main Feedpump Turbine 2B Trip
31. 2-SI-3-201-A, Response Time Test-Auxiliary Feedwater Pump 2A-A Suction Header Transfer-Train A
32. 2-SI-3-201-B, Response Time Test-Auxiliary Feedwater Pump 2B-B Suction Header Transfer-Train B
33. 2-SI-3-904, Main Feedwater System Valve Full Stroke Exercising During Refueling Outages
34. 2-SI-26-901, Valve Full Stroke Exercising During Plant Operation High Pressure Fire Protection System
35. 2-SI-30-42, 18 Month Channel Calibration Containment Pressure Channel IV Loop 2-LPP-30-42 (P-934)

2.1 Performance References (continued)

36. 2-SI-30-43, 18 Month Channel Calibration Containment Pressure Channel III Loop 2-LPP-30-43 (P-935)
37. 2-SI-30-44, 18 Month Channel Calibration Containment Pressure Channel II Loop 2-LPP-30-44 (P-936)
38. 2-SI-30-45, 18 Month Channel Calibration Containment Pressure Channel I Loop 2-LPP-30-45 (P-937)
39. 2-SI-30-901-A, Valve Full Stroke Exercising During Plant Operation - Ventilation (Train A)
40. 2-SI-30-901-B, Valve Full Stroke Exercising During Plant Operation - Ventilation (Train B)
41. 2-SI-30-26-A, Containment Air Return Fan 2A-A Quarterly Operability Test
42. 2-SI-30-26-B, Containment Air Return Fan 2B-B Quarterly Operability Test
43. 2-SI-31-901-A, Quarterly Valve Full Stroke Exercising During Plant Operation Chilling Water - Train A
44. 2-SI-31-901-B, Quarterly Valve Full Stroke Exercising During Plant Operation Chilling Water - Train B
45. 2-SI-32-901-A, Valve Full Stroke Exercising During Cold Shutdown Control Air (Train A)
46. 2-SI-32-901-B, Valve Full Stroke Exercising During Cold Shutdown Control Air (Train B)
47. 2-SI-61-901-A, Valve Full Stroke Exercising During Plant Operation Ice Condenser System (Train A)
48. 2-SI-61-901-B, Valve Full Stroke Exercising During Plant Operation Ice Condenser System (Train B)
49. 2-SI-62-907, Chemical Volume Control System Valve Position Indication Verification and Full Stroke Exercising
50. 2-SI-63-1, 18 Month Channel Calibration Containment Sump Level Channel I Loop 2-LPL-63-180 (L-920)
51. 2-SI-63-2, 18 Month Channel Calibration Containment Sump Level Channel II Loop 2-LPL-63-181 (L-921)

2.1 Performance References (continued)

52. 2-SI-63-3, 18 Month Channel Calibration Containment Sump Level Channel III Loop 2-LPL-63-182 (L-940)

53. 2-SI-63-4, 18 Month Channel Calibration Containment Sump Level Channel IV Loop 2-LPL-63-183 (L-941)

54. 2-SI-63-50, 18 Month Channel Calibration, RWST Level Channel I Loop 2-LPL-63-50 (L-913)

55. 2-SI-63-51, 18 Month Channel Calibration, RWST Level Channel II Loop 2-LPL-63-51 (L-914)

56. 2-SI-63-52, 18 Month Channel Calibration, RWST Level Channel III Loop 2-LPL-63-52 (L-915)

57. 2-SI-63-53, 18 Month Channel Calibration, RWST Level Channel IV Loop 2-LPL-63-53 (L-916)

58. 2-SI-63-903-A,Valve Full Stroke Exercising During Cold Shutdown Safety Injection (Train A)

59. 2-SI-63-915-A, Safety Injection System Valve Stroke & Position Verification (Train A)

60. 2-SI-63-915-B, Safety Injection System Valve Stroke & Position Verification (Train B)

61. 2-SI-67-907-A, Valve Full Stroke Exercising During Plant Operation Essential Raw Cooling Water (Train 2A)

62. 2-SI-67-907-B, Valve Full Stroke Exercising During Plant Operation Essential Raw Cooling Water (Train 2B)

63. 2-SI-67-908-A, Valve Full Stroke Exercising and Position Indication Verification During Cold SD - ERCW (Train A)

64. 2-SI-67-908-B, Valve Full Stroke Exercising and Position Indication Verification During Cold SD - ERCW (Train B)

65. 2-SI-68-1, 18 Month Channel Calibration, RCS Loop 1 Delta T/TAVG CH I Loop 2-LPT-68-2 (T-411/412)

66. 2-SI-68-2, 18 Month Channel Calibration, RCS Loop 2 Delta T/TAVG CH II Loop 2-LPT-68-25 (T-421/422)

2.1 Performance References (continued)

67. 2-SI-68-3, 18 Month Channel Calibration, RCS Loop 3 Delta T/TAVG CH III Loop 2-LPT-68-44 (T-431/432)

68. 2-SI-68-4, 18 Month Channel Calibration, RCS Loop 4 Delta T/TAVG CH IV, Loop 2-LPT-68-67 (T-441/442)

69. 2-SI-68-5, 18 Month Channel Calibration Pressurizer Pressure Channel I Loop 2-LPP-68-340 (P-455)

70. 2-SI-68-6, 18 Month Channel Calibration Pressurizer Pressure Channel II Loop 2-LPP-68-334 (P-456)

71. 2-SI-68-7, 18 Month Channel Calibration Pressurizer Pressure Channel III Loop-2-LPP-68-323 (P-457)

72. 2-SI-68-8, 18 Month Channel Calibration Pressurizer Pressure Channel IV Loop 2-LPP-68-322 (P-458)

73. 2-SI-68-12, 18 Month Channel Calibration Reactor Coolant Flow Loop 1 Channel I Loop 2-LPF-68-6A (F-414)

74. 2-SI-68-13, 18 Month Channel Calibration Reactor Coolant Flow Loop 1 Channel II, Loop 2-LPF-68-6B (F-415)

75. 2-SI-68-14, 18 Month Channel Calibration Reactor Coolant Flow Loop 1 Channel III, Loop 2-LPF-68-6D (F-416)

76. 2-SI-68-15, 18 Month Channel Calibration Reactor Coolant Flow Loop 2 Channel I Loop 2-LPF-68-29A (F-424)

77. 2-SI-68-16, 18 Month Channel Calibration Reactor Coolant Flow Loop 2 Channel II Loop 2-LPF-68-29B (F-425)

78. 2-SI-68-17, 18 Month Channel Calibration Reactor Coolant Flow Loop 2 Channel III, Loop 2-LPF-68-29D (F-426)

79. 2-SI-68-18, 18 Month Channel Calibration Reactor Coolant Flow Loop 3 Channel I, Loop 2-LPF-68-48A (F-434)

80. 2-SI-68-19, 18 Month Channel Calibration Reactor Coolant Flow Loop 3 Channel II, Loop 2-LPF-68-48B (F-435)

81. 2-SI-68-20, 18 Month Channel Calibration Reactor Coolant Flow Loop 3 Channel III, Loop 2-LPF-68-48D (F-436)

2.1 Performance References (continued)

82. 2-SI-68-21, 18 Month Channel Calibration Reactor Coolant Flow Loop 4 Channel I, Loop 2-LPF-68-71A (F-444)
83. 2-SI-68-22, 18 Month Channel Calibration Reactor Coolant Flow Loop 4 Channel II, Loop 2-LPF-68-71B (F-445)
84. 2-SI-68-23, 18 Month Channel Calibration Reactor Coolant Flow Loop 4 Channel III, Loop 2-LPF-68-71D (F-446)
85. 2-SI-68-36, 18 Month Reactor Coolant Pump 1 Underfrequency Relay Calibration
86. 2-SI-68-37, 18 Month Reactor Coolant Pump 2 Underfrequency Relay Calibration
87. 2-SI-68-38, 18 Month Reactor Coolant Pump 3 Underfrequency Relay Calibration
88. 2-SI-68-39, 18 Month Reactor Coolant Pump 4 Underfrequency Relay Calibration
89. 2-SI-68-40, 18 Month Reactor Coolant Pump 1 Undervoltage Channel Calibration
90. 2-SI-68-41, 18 Month Reactor Coolant Pump 2 Undervoltage Channel Calibration
91. 2-SI-68-42, 18 Month Reactor Coolant Pump 3 Undervoltage Channel Calibration
92. 2-SI-68-43, 18 Month Reactor Coolant Pump 4 Undervoltage Channel Calibration
93. 2-SI-68-904-A, Reactor Coolant System Valve Position Indication System Verification (Train A)
94. 2-SI-68-904-B, Reactor Coolant System Valve Position Indication System Verification (Train B)
95. 2-SI-70-908-A, Component Cooling System Valve Position Indication Verification (Train A)
96. 2-SI-70-908-B, Component Cooling System Valve Position Indication Verification (Train B)

2.1 Performance References (continued)

97. 2-SI-72-906-A, Containment Spray Valve Position Indication Verification/Full Stroke Exercising (Train A)
98. 2-SI-72-906-B, Containment Spray Valve Position Indication Verification/Full Stroke Exercising (Train B)
99. 2-SI-77-904-A, Waste Disposal System Valve Position Indication Verification and Valve Full Stroke Exercising (Train A)
100. 2-SI-77-904-B, Waste Disposal System Valve Position Indication Verification and Valve Full Stroke Exercising (Train B)
101. 2-SI-81-903, Primary Makeup Water System Valve Position Indication Verification
102. 2-SI-90-901-A, Valve Full Stroke Exercise During Plant Operation Radiation Monitoring System (Train A)
103. 2-SI-90-901-B, Valve Full Stroke Exercise During Plant Operation Radiation Monitoring System (Train B)
104. 2-SI-99-6, Unit 2 Reactor Coolant Pump 1 Undervoltage and Underfrequency Response Time Test
105. 2-SI-99-7, Unit 2 Reactor Coolant Pump 2 Undervoltage and Underfrequency Response Time Test
106. 2-SI-99-8, Unit 2 Reactor Coolant Pump 3 Undervoltage and Underfrequency Response Time Test
107. 2-SI-99-9, Unit 2 Reactor Coolant Pump 4 Undervoltage and Underfrequency Response Time Test
108. 2-SI-99-31, Source Range High Neutron Flux Level Trip Time Response Channel I
109. 2-SI-99-32, Source Range High Neutron Flux Level Trip Time Response Channel II
110. 2-SI-99-201-A, Response Time Test of Reactor Trip Train A
111. 2-SI-99-201-B, Response Time Test of Reactor Trip Train B
112. 2-SI-99-205-A, Response Time Test of Engineered Safety Features Actuation System Master Relays - Train A

2.1 Performance References (continued)

113. 2-SI-99-205-B, Response Time Test of Engineered Safety Features Actuation System Master Relays - Train B

114. 2-SI-99-206, Response Time SSPS Input Relays Cycle A

115. 2-SI-99-207, Response Time SSPS Input Relays Cycle B

116. 2-SI-99-208, Response Time SSPS Input Relays Cycle C

117. 2-SI-99-219, RTD Response Time Test RCS Loop 2 Channel II Loop 2-LPT-68-25 (T-421/422)

118. 2-SI-99-220, RTD Response Time Test RCS Loop 1 Channel I Loop 2-LPT-68-2 (T-411/412)

119. 2-SI-99-221, RTD Response Time Test RCS Loop 3 Channel III Loop 2-LPT-68-44 (T-431/432)

120. 2-SI-99-222, RTD Response Time Test RCS Loop 4 Channel IV Loop 2-LPT-68-67 (T-441/442)

121. 2-SI-99-223, Response Time Test of Reactor Protection and Engineered Safety Feature Actuation Systems Transmitters (ID-100 Method) For Cycle A

122. 2-SI-99-224, Response Time Test of Reactor Protection and Engineered Safety Feature Actuation Systems Transmitters (ID-100 Method) For Cycle B

123. 2-SI-99-225, Response Time Test of Reactor Protection and Engineered Safety Feature Actuation Systems Transmitters (ID-100 Method) For Cycle C

124. 2-SI-99-226, Response Time Test of Refueling Water Storage Tank and Containment Sump Transmitters (ID-100 Method) for Cycle A

125. 2-SI-99-227, Response Time Test of Refueling Water Storage Tank and Containment Sump Transmitters (ID-100 Method) for Cycle B

126. 2-SI-99-228, Response Time Test of Refueling Water Storage Tank and Containment Sump Transmitters (ID-100 Method) for Cycle C

127. 2-SI-99-241, 18 Month Reactor Trip - Power Range Neutron Flux Response Time Test Channel N41

2.1 Performance References (continued)

128. 2-SI-99-242, 18 Month Reactor Trip - Power Range Neutron Flux Response Time Test Channel N42
129. 2-SI-99-243, 18 Month Reactor Trip - Power Range Neutron Flux Response Time Test Channel N43
130. 2-SI-99-244, 18 Month Reactor Trip - Power Range Neutron Flux Response Time Test Channel N44
131. 2-SI-99-601-A, Response Time Test-Turbine Trip Slave Relay K621, Train A
132. 2-SI-99-601-B, Response Time Test-Turbine Trip Slave Relay K621, Train B
133. 2-SI-99-603-A, Response Time Test - Safety Injection Slave Relay K603-Train A
134. 2-SI-99-603-B, Response Time Test - Safety Injection Slave Relay K603-Train B
135. 2-SI-99-605-A, Response Time Test - Containment Isolation Phase A Slave Relay K605 - Train A
136. 2-SI-99-605-B, Response Time Test - Containment Isolation Phase A Slave Relay K605 - Train B
137. 2-SI-99-608-A, Response Time Test - Safety Injection Slave Relay K608-Train A
138. 2-SI-99-608-B, Response Time Test - Safety Injection Slave Relay K608-Train B
139. 2-SI-99-611-A, Response Time Test - Safety Injection Slave Relay K611 Train A
140. 2-SI-99-611-B, Response Time Test - Safety Injection Slave Relay K611 Train B
141. 2-SI-99-633-A, Response Time Test - Auxiliary Feedwater Slave Relay K633 Train A
142. 2-SI-99-633-B, Response Time Test - Auxiliary Feedwater Slave Relay K633 Train B

2.1 Performance References (continued)

143. 2-SI-99-634-A, Response Time Test - Auxiliary Feedwater Slave Relay K634 Train A

144. 2-SI-99-634-B, Response Time Test - Auxiliary Feedwater Slave Relay K634 Train B

145. 2-SI-99-648-A, Response Time Test - Containment Sump to RHR Pump 2A-A Slave Relay K648 Train A

146. 2-SI-99-648-B, Response Time Test of Containment Sump to RHR Pump 2B-B Slave Relay K648 Train B

2.2 Developmental References

A. Final Safety Analysis Report (FSAR) - Amendment 109

1. Table 14.2-1, Sheet 57 of 89, Reactor Protection System Test Summary
2. Section 7.2, Reactor Trip System
3. Section 7.3, Engineered Safety Features Actuation System

B. Technical Requirements Manual (TRM) - Revision B

1. Table 3.3.1-1, Reactor Trip System Instrumentation Response Times
2. Table 3.3.2-1, Engineered Safety Features Actuation System Response Times

C. Documents

1. PTI-99-01, Rev. 0, RPS & ESFAS Response Times
2. 2-TSD-99-01, Rev. 1, RPS & ESFAS Response Time
3. 2-SI-99-200, [DRAFT], Response Time Scheduling and Verification of Reactor Trip and Engineered Safety Features Systems
4. WBN2-99-4003, Rev. 0, System Description for Reactor Protection System
5. WBN2-26-4002, Rev. 1, System Description for High Pressure Fire Protection System

2.2 Developmental References (continued)

D. Vendor Documents

1. VTD-W120-3014, Rev 4
   Westinghouse Energy Systems Eagle 21™ Process Upgrade System Upgrade System Volume 1, Description

2. VTD-W120-2454, Rev 2
   Westinghouse Solid State Protection System Technical Manual

3.0 PRECAUTIONS AND LIMITATIONS

A. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

B. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

C. All times are expressed in seconds unless specifically stated otherwise.

D. System Description WBN2-99-4003, Reactor Protection System, provides the following exceptions:

1. The Reactor Coolant Pump (RCP) Bus Undervoltage Reactor Trip sensor response delay time includes the undervoltage relay and time delay relay.
2. The response time of neutron detectors is negligible.
3. A delay time of 0.150 seconds worst case for the gripper release time is assumed, the actual time delay will be measured in the Rod Drop Measurement Test.

E. Response Time Scheduling and Verification of Reactor Trip and Engineered Safety Features Systems Surveillance Instruction, 2-SI-99-200, provides the following exceptions:

1. A timer tolerance of 1.106 seconds is added to the Essential Raw Cooling Water System Emergency Power response time.
2. A timer tolerance of 1.210 seconds is added to the Component Cooling System Emergency Power response time.
3. A timer tolerance of 0.277 seconds is added to the Centrifugal Charging Pump (CCP) response time on a safety injection signal with emergency power.
4. A timer tolerance of 0.553 seconds is added to the SI pump response time on a safety injection signal with emergency power.
5. A timer tolerance of 0.830 seconds is added to the Residual Heat Removal (RHR) pump response time on a safety injection signal with emergency power.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

6. A timer tolerance of 1.383 seconds is added to the motor driven Auxiliary Feedwater (AFW) pump response time on emergency power.

F. The final value of all interim calculations and final response times will be three decimal places (i.e., 0.150).

G. The Maximum Acceptance Criteria listed in tables only contain two decimal places.

H. Measured Eagle 21 rack response time will be documented on Data Sheet 2 but not used in the overall response time calculation. A rack response time of 0.409 seconds, Reference 2.2C.4, will be used in the overall time response calculation with the exception of 0.410 seconds for the Nuclear Instrumentation System (NIS) flux input to OTΔT.

I. Solid State Protection System (SSPS) logic response time of 0.006 seconds is derived from a successful performance of the semi-automatic tester logic test in conjunction with verification that the semi-automatic tester board clock counter board pulse width is nominally 0.001 second, Figure 2-14 of Reference 2.2D.2. Since four logic boards are the longest string of logic for any safety function, the worst case delay time would be 0.004 second, assuming 0.001 seconds per board. Conservatism is applied by multiplying 0.004 second by 150% for an SSPS logic response time of 0.006 seconds.

J. A Power Range NIS rack response time of 0.065 seconds from Reference 2.2C.4 will be used in the power range reactor trips.

K. A sense line time response of 0.31 seconds is based on limiting case from Reference 2.2C.2.

L. A delay time of 6.5 seconds is added to containment spray response time based on Reference 2.2C.2.

M. If the response time of an individual component or rack exceeds a given time criteria (i.e. Acceptance Criteria or Desired Response Time) from the SI or PTI that it was taken from, notify the System Engineer for evaluation prior to including the response time in this PTI.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

N. Response time of actuated components recorded in Data Sheets 16 and 17 (excluding diesel generator times) starts after the associated K600 series slave relay has changed state and finishes once the end device reaches its safeguard state. Some components that do not have additional relay(s) between the SSPS output slave relay and the end device are timed in individual Surveillance Instructions (SI) which may time individual devices and not groups of devices simultaneously. Other components that do have additional relay(s) are timed during the Integrated Safeguards Test on Trains A & B (2-PTI-262-01 and 2-PTI-262-02) so as to include the response time of the intermediate relays.

If a component needs to be re-timed that was initially timed using a SI or does not contain additional relays between the SSPS output slave relay and the end device, actuation of the device may start at the handswitch in the control room.

If a component needs to be re-timed that was initially timed during one of the Integrated Safeguards Tests and contains intermediate relays between the SSPS output slave relay and the end device, actuation of the device should start at the SSPS output slave relay to capture the response time of intermediate relays.

O. Response times obtained during the Integrated Safeguards tests, 2-PTI-262-01 and 2-PTI-262-02, should reference the post-summary report as the Work Document, not the executed PTI. Component response times will be collected during the execution of these PTI's but will not be recorded in the executed PTI.

P. Response times obtained during the Safeguards System Operational Test, 2-PTI-099-04 should reference the post-summary report as the Work Document, not the executed PTI. Component response times will be collected during the PTI but will not be recorded in the executed PTI.

Date ________

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

[1] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision and as needed, each test person assisting in this test has the current revision including any change notices. ________

[2] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, **AND**

ATTACH to this PTI for use during the performance of this PTI. ________

[3] **ENSURE** changes to the references listed on Appendix A, have been reviewed, and determined not to adversely affect the test results. ________

[4] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL), and

ENSURE they will NOT adversely affect the test performance and results. ________

[5] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modifications (T-Mods) do NOT adversely impact testing, and

ATTACH documentation of DCN's, EDCR's and T-Mods's that were reviewed to the data package. ________

Date ________

4.1 Preliminary Actions (continued)

[6] **VERIFY** the following Surveillance Instruction have been submitted to the Joint Test Group (JTG) for concurrence that they adequately satisfy the requirements of this procedure:

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
1. 2-SI-1-1	6.2	________	________
2. 2-SI-1-2	6.2	________	________
3. 2-SI-1-3	6.2	________	________
4. 2-SI-1-4	6.2	________	________
5. 2-SI-1-5	6.2	________	________
6. 2-SI-1-6	6.2	________	________
7. 2-SI-1-7	6.2	________	________
8. 2-SI-1-8	6.2	________	________
9. 2-SI-1-9	6.2	________	________
10. 2-SI-1-10	6.2	________	________
11. 2-SI-1-11	6.2	________	________
12. 2-SI-1-12	6.2	________	________
13. 2-SI-1-904	6.10	________	________
14. 2-SI-3-1	6.2	________	________
15. 2-SI-3-2	6.2	________	________
16. 2-SI-3-3	6.2	________	________
17. 2-SI-3-4	6.2	________	________
18. 2-SI-3-5	6.2	________	________
19. 2-SI-3-6	6.2	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
20. 2-SI-3-7	6.2	________	________
21. 2-SI-3-8	6.2	________	________
22. 2-SI-3-9	6.2	________	________
23. 2-SI-3-10	6.2	________	________
24. 2-SI-3-11	6.2	________	________
25. 2-SI-3-12	6.2	________	________
26. 2-SI-3-13	6.2	________	________
27. 2-SI-3-14	6.2	________	________
28. 2-SI-3-15	6.2	________	________
29. 2-SI-3-25	6.12	________	________
30. 2-SI-3-26	6.12	________	________
31. 2-SI-3-201-A	6.10, 6.12	________	________
32. 2-SI-3-201-B	6.10, 6.12	________	________
33. 2-SI-3-904	6.10	________	________
34. 2-SI-26-901	6.10	________	________
35. 2-SI-30-42	6.2	________	________
36. 2-SI-30-43	6.2	________	________
37. 2-SI-30-44	6.2	________	________
38. 2-SI-30-45	6.2	________	________
39. 2-SI-30-901-A	6.10	________	________
40. 2-SI-30-901-B	6.10	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
41. 2-SI-30-26-A	6.10	________	________
42. 2-SI-30-26-B	6.10	________	________
43. 2-SI-31-901-A	6.10	________	________
44. 2-SI-31-901-B	6.10	________	________
45. 2-SI-32-901-A	6.10	________	________
46. 2-SI-32-901-B	6.10	________	________
47. 2-SI-61-901-A	6.10	________	________
48. 2-SI-61-901-B	6.10	________	________
49. 2-SI-62-907	6.10	________	________
50. 2-SI-63-1	6.2	________	________
51. 2-SI-63-2	6.2	________	________
52. 2-SI-63-3	6.2	________	________
53. 2-SI-63-4	6.2	________	________
54. 2-SI-63-50	6.2	________	________
55. 2-SI-63-51	6.2	________	________
56. 2-SI-63-52	6.2	________	________
57. 2-SI-63-53	6.2	________	________
58. 2-SI-63-915-A	6.10	________	________
59. 2-SI-63-915-B	6.10	________	________
60. 2-SI-67-907-A	6.10	________	________
61. 2-SI-67-907-B	6.10	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
62. 2-SI-67-908-A	6.10	________	________
63. 2-SI-67-908-B	6.10	________	________
64. 2-SI-68-1	6.2	________	________
65. 2-SI-68-2	6.2	________	________
66. 2-SI-68-3	6.2	________	________
67. 2-SI-68-4	6.2	________	________
68. 2-SI-68-5	6.2	________	________
69. 2-SI-68-6	6.2	________	________
70. 2-SI-68-7	6.2	________	________
71. 2-SI-68-8	6.2	________	________
72. 2-SI-68-12	6.2	________	________
73. 2-SI-68-13	6.2	________	________
74. 2-SI-68-14	6.2	________	________
75. 2-SI-68-15	6.2	________	________
76. 2-SI-68-16	6.2	________	________
77. 2-SI-68-17	6.2	________	________
78. 2-SI-68-18	6.2	________	________
79. 2-SI-68-19	6.2	________	________
80. 2-SI-68-20	6.2	________	________
81. 2-SI-68-21	6.2	________	________
82. 2-SI-68-22	6.2	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
83. 2-SI-68-23	6.2	________	________
84. 2-SI-68-36	6.1	________	________
85. 2-SI-68-37	6.1	________	________
86. 2-SI-68-38	6.1	________	________
87. 2-SI-68-39	6.1	________	________
88. 2-SI-68-40	6.1	________	________
89. 2-SI-68-41	6.1	________	________
90. 2-SI-68-42	6.1	________	________
91. 2-SI-68-43	6.1	________	________
92. 2-SI-68-904-A	6.10	________	________
93. 2-SI-68-904-B	6.10	________	________
94. 2-SI-70-908-A	6.10	________	________
95. 2-SI-70-908-B	6.10	________	________
96. 2-SI-72-906-A	6.10	________	________
97. 2-SI-72-906-B	6.10	________	________
98. 2-SI-77-904-A	6.10	________	________
99. 2-SI-77-904-B	6.10	________	________
100. 2-SI-81-903	6.10	________	________
101. 2-SI-90-901-A	6.10	________	________
102. 2-SI-90-901-B	6.10	________	________
103. 2-SI-99-6	6.3, 6.4	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
104. 2-SI-99-7	6.3, 6.4	________	________
105. 2-SI-99-8	6.3, 6.4	________	________
106. 2-SI-99-9	6.3, 6.4	________	________
107. 2-SI-99-31 (1)	6.1, 6.3, 6.4	________	________
108. 2-SI-99-32 (1)	6.1, 6.3, 6.4	________	________
109. 2-SI-99-201-A	6.5	________	________
110. 2-SI-99-201-B	6.5	________	________
111. 2-SI-99-205-A	6.7	________	________
112. 2-SI-99-205-B	6.7	________	________
113. 2-SI-99-206	6.3, 6.4	________	________
114. 2-SI-99-207	6.3, 6.4	________	________
115. 2-SI-99-208	6.3, 6.4	________	________
116. 2-SI-99-219	6.1	________	________
117. 2-SI-99-220	6.1	________	________
118. 2-SI-99-221	6.1	________	________
119. 2-SI-99-222	6.1	________	________
120. 2-SI-99-223	6.1	________	________
121. 2-SI-99-224	6.1	________	________
122. 2-SI-99-225	6.1	________	________
123. 2-SI-99-226	6.1	________	________
124. 2-SI-99-227	6.1	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
125. 2-SI-99-228	6.1	________	________
126. 2-SI-99-241	6.3, 6.4	________	________
127. 2-SI-99-242	6.3, 6.4	________	________
128. 2-SI-99-243	6.3, 6.4	________	________
129. 2-SI-99-244	6.3, 6.4	________	________
130. 2-SI-99-601-A	6.10	________	________
131. 2-SI-99-601-B	6.10	________	________
132. 2-SI-99-603-A	6.10	________	________
133. 2-SI-99-603-B	6.10	________	________
134. 2-SI-99-605-A	6.10	________	________
135. 2-SI-99-605-B	6.10	________	________
136. 2-SI-99-608-A	6.10	________	________
137. 2-SI-99-608-B	6.10	________	________
138. 2-SI-99-611-A	6.10	________	________
139. 2-SI-99-611-B	6.10	________	________
140. 2-SI-99-633-A	6.10	________	________
141. 2-SI-99-633-B	6.10	________	________
142. 2-SI-99-634-A	6.10	________	________
143. 2-SI-99-634-B	6.10	________	________
144. 2-SI-99-648-A	6.10	________	________
145. 2-PTI-99-04 (3)	6.8	________	________

Date ________

4.1 Preliminary Actions (continued)

SURVEILLANCE INSTRUCTION	SUBSECTION	JTG MEETING #	INITIAL/DATE
146. 2-SI-99-648-B	6.10	________	________
147. 2-PTI-262-1 (2)	6.8, 6.10, 6.11	________	________
148. 2-PTI-262-2 (2)	6.8, 6.10, 6.11	________	________

(1) 2-SI-99-31 should be field modified to include response time measurement of input relay K106 on Trains A and B. 2-SI-99-32 should be field modified to include response time measurement of input relay K206 on Trains A and B.

(2) Response times obtained during Integrated Safeguards tests, 2-PTI-262-1 and 2-PTI-262-2 will be taken from a summary report of the test, not from the executed PTI procedures.

(3) Response times obtained during the Safeguard System Operational Test, 2-PTI-99-04, will be taken from a summary report of the test, not the executed PTI procedures.

[7] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) in accordance with SMP-4.0. ________

[8] **ENSURE** required personnel have been notified and are available to support the test. ________

Date ________

4.2 Special Tools, Measuring and Test Equipment, Parts, and Supplies

This is a desktop performed instruction with no actual field testing. Measuring and Test Equipment or Permanent Plant Instrumentation Log is not required since the setpoint values obtained for this instruction are gathered from previously performed instructions.

4.3 Field Preparations

Administrative procedure only, no field work is performed in this PTI.

4.4 Approvals and Notifications

[1] Prior to start of the test, **OBTAIN** permission of the Preoperational Startup Manager to start the test.

_______________________________________ ____________

Preoperational Startup Manager Signature   Date

[2] Prior to start of the test, **OBTAIN** the Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization.

_______________________________________ ____________

US/SRO/SM Signature   Date

5.0 ACCEPTANCE CRITERIA

For performance of Acceptance Criteria verification it should be noted that unless a value is specifically identified as Acceptance Criteria it should be considered a maximum expected value. Time responses exceeding a maximum expected value do not represent a safety significant issue as those maximum expected values are based on design tolerances and measurement experience. Furthermore, failure to meet a maximum expected value does not imply failure to meet the overall acceptable completion of this PTI.

A. Steps which determine acceptance criteria are designated by **[ACC CRIT]** next to the signature/initial blank,

   OR

   Tables which determine acceptance criteria may be designated by [AC] for space saving.

B. Successful completion of the Response Time Instructions listed on the appropriate data sheets and/or documentation of the justification for accepting the recorded component response times by the Responsible System Engineer is required to satisfy Surveillance Requirements 3.3.1.15 and 3.3.2.10 and Technical Surveillance Requirements 3.3.1.1 and 3.3.2.1.

C. Reactor Protection System (RPS) Technical Specification/Technical Requirement response times are verified in the following locations:

TSR 3.3.1.1-	FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
2.a	Power Range High Neutron Flux Reactor Trip - High Setpoint	≤ 0.5	8 Page 1	9 Page 1
2.b	Power Range High Neutron Flux Reactor Trip - Low Setpoint	≤ 0.5	8 Page 1	9 Page 1
5	Source Range High Neutron Flux Reactor Trip	≤ 0.5	8 Page 1	9 Page 1

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.1.1-	FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
6	Overtemperature Delta-T Reactor Trip	≤ 8.0	8 Page 1	9 Page 1
	a. Temperature	≤ 8.0	8 Page 1	9 Page 1
	b. Pressure	≤ 2.0	8 Page 1	9 Page 1
	c. Delta-I	≤ 1.0	8 Page 1	9 Page 1
7	Overpower Delta-T Reactor Trip	≤ 8.0	8 Page 1	9 Page 1
8.a	Low Pressurizer Pressure Reactor Trip	≤ 2.0	8 Page 2	9 Page 2
8.b	High Pressurizer Pressure Reactor Trip	≤ 2.0	8 Page 2	9 Page 2
10	Reactor Coolant Flow Low Reactor Trip	≤ 1.2	8 Page 2	9 Page 2
11	RCP Undervoltage Reactor Trip	≤ 1.5	8 Page 2	9 Page 2
12	RCP Underfrequency Reactor Trip	≤ 0.6	8 Page 2	9 Page 2
13	SG Water Level Low-Low Reactor Trip	≤ 2	8 Page 2	9 Page 2

5.0 ACCEPTANCE CRITERIA (continued)

D. Engineered Safety Features Actuation System (ESFAS) Technical Specification/Technical Requirement response times are verified in the following locations:

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
2.	Containment Pressure - High			
	a. Safety Injection (ECCS)	≤ 27 (4) ≤ 32 (14) ≤ 37 (5)	20 Page 1 22 Page 1 22 Page 1	21 Page 1 23 Page 1 23 Page 1
	1) Reactor Trip (from SI)	≤ 2	8 Page 3	9 Page 3
	2) Feedwater Isolation	≤ 8 (3)	20 Page 1	21 Page 1
	3) Containment Isolation - Phase “A” (6)	≤ 12 (2) ≤ 22 (1)	20 Page 1 22 Page 2	21 Page 1 23 Page 2
	Exceptions (6):			
	A) Fire Protection CIVs	≤ 22 (2) ≤ 32 (1)	20 Page 1 22 Page 2	N/A
	B) Ice Condenser CIVs	≤ 32	20 Page 1	21 Page 1
	C) Excess Letdown Hx Supply CIV	≤ 68 (2) ≤ 78 (1)	20 Page 1 22 Page 2	N/A
	D) EGTS Fans	≤ 20 (2) ≤ 30 (1)	20 Page 1 22 Page 2	21 Page 1 23 Page 2

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
	E) Required for EGTS OPERABILITY			
	1. Fire Protection Secondary CIVs	≤ 20 (2) ≤ 30 (1)	N/A for Appendix R (16)	
	2. Secondary Containment Purge Isolation Valves	≤ 12.7 (2) ≤ 22.7(1)	20 Page 2 22 Page 2	21 Page 1 23 Page 2
	F) Steam Generator Blowdown CIVs	≤ 17 (2) ≤ 27 (1)	20 Page 12 22 Page 11	21 Page 11 23 Page 11
	4) Containment Ventilation Isolation	≤ 6.0 (2) ≤ 6.5 (11)	20 Page 2 20 Page 2	21 Page 2 21 Page 2
	5) Auxiliary Feedwater Pumps	≤ 60 (10)	20 Page 2 22 Page 3	21 Page 2 23 Page 3
	6) Essential Raw Cooling Water	≤ 47 (2) ≤ 57 (1)	20 Page 2 22 Page 3	21 Page 2 23 Page 3
	7) CREVS Actuation	N/A		
	8) Component Cooling System	≤ 50 (2) ≤ 60 (1)	20 Page 2 22 Page 3	21 Page 2 23 Page 3
	9) Start Diesel Generators	≤ 12 (12)	20 Page 2	21 Page 2

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
3.	Pressurizer Pressure - Low			
	a. Safety Injection (ECCS)	≤ 27 (4) ≤ 32 (14) ≤ 37 (5)	20 Page 3 22 Page 4 22 Page 4	21 Page 3 23 Page 4 23 Page 4
	1) Reactor Trip (from SI)	≤ 2	8 Page 3	9 Page 3
	2) Feedwater Isolation	≤ 8 (3)	20 Page 3	21 Page 3
	3) Containment Isolation - Phase "A" (6)	≤ 12 (2) ≤ 22 (1)	20 Page 3 22 Page 5	21 Page 3 23 Page 5
	Exceptions (6):			
	A) Fire Protection CIVs	≤ 22 (2) ≤ 32 (1)	20 Page 3 22 Page 5	N/A
	B) Ice Condenser CIVs	≤ 32	20 Page 3	21 Page 3
	C) Excess Letdown Hx Supply CIV	≤ 68 (2) ≤ 78 (1)	20 Page 3 22 Page 5	N/A
	D) EGTS Fans	≤ 20 (2) ≤ 30 (1)	20 Page 4 22 Page 5	21 Page 3 23 Page 5
	E) Required for EGTS OPERABILITY			
	1. Fire Protection Secondary CIVs	≤ 20 (2) ≤ 30 (1)	N/A for Appendix R (16)	
	2. Secondary Containment Purge Isolation Valves	≤ 12.7 (2) ≤ 22.7(1)	20 Page 4 22 Page 5	21 Page 3 23 Page 5

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
	F) Steam Generator Blowdown CIVs	≤ 17 (2) ≤ 27 (1)	20 Page 12 22 Page 11	21 Page 11 23 Page 11
	4) Containment Ventilation Isolation	≤ 6.0 (2) ≤ 6.5 (11)	20 Page 4 20 Page 4	21 Page 4 21 Page 4
	5) Auxiliary Feedwater Pumps	≤ 60 (10)	20 Page 4 22 Page 6	21 Page 4 23 Page 6
	6) Essential Raw Cooling Water	≤ 47 (2) ≤ 57 (1)	20 Page 5 22 Page 6	21 Page 4 23 Page 6
	7) CREVS Actuation	N/A		
	8) Component Cooling System	≤ 50 (2) ≤ 60 (1)	20 Page 5 22 Page 6	21 Page 4 23 Page 6
	9) Start Diesel Generators	≤ 12 (12)	20 Page 5	21 Page 4
4.	Steam Line Pressure Negative Rate - High			
	a. Steam Line Isolation	≤ 8	20 Page 5	21 Page 4

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
5.	Steam Line Pressure – Low			
	a. Safety Injection (ECCS)	≤ 27 (4) ≤ 32 (14) ≤ 37 (5)	20 Page 6 22 Page 7 22 Page 7	21 Page 5 23 Page 7 23 Page 7
	1) Reactor Trip (from SI)	≤ 2	8 Page 3	9 Page 3
	2) Feedwater Isolation	≤ 8 (3)	20 Page 6	21 Page 5
	3) Containment Isolation-Phase "A"(6)	≤ 12(2) ≤ 22(1)	20 Page 6 22 Page 8	21 Page 5 23 Page 8
	Exceptions: (6)			
	A) Fire Protection CIVs	≤ 22 (2) ≤ 32 (1)	20 Page 6 22 Page 8	N/A
	B) Ice Condenser CIVs	≤ 32	20 Page 6	21 Page 5
	C) Excess Letdown Hx Supply CIV	≤ 68 (2) ≤ 78 (1)	20 Page 6 22 Page 8	N/A
	D) EGTS Fans	≤ 20 (2) ≤ 30 (1)	20 Page 6 22 Page 8	21 Page 5 23 Page 8
	E) Required for EGTS OPERABILITY			
	1. Fire Protection Secondary CIVs	≤ 20 (2) ≤ 30 (1)	N/A for Appendix R (16)	
	2. Secondary Containment Purge Isolation Valves	≤ 12.7 (2) ≤ 22.7(1)	20 Page 7 22 Page 8	21 Page 5 23 Page 8

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
	F) Steam Generator Blowdown CIVs	≤ 17 (2) ≤ 27 (1)	20 Page 12 22 Page 11	21 Page 11 23 Page 11
	4) Containment Ventilation Isolation	≤ 6.0 (2) ≤ 6.5 (11)	20 Page 7 20 Page 7	21 Page 6 21 Page 6
	5) Auxiliary Feedwater Pumps	≤ 60 (10)	20 Page 7 22 Page 9	21 Page 6 23 Page 9
	6) Essential Raw Cooling Water	≤ 47 (2) ≤ 57 (1)	20 Page 7 22 Page 9	21 Page 6 23 Page 9
	7) CREVS Actuation	N/A		
	8) Component Cooling System	≤ 50 (2) ≤ 60 (1)	20 Page 8 22 Page 9	21 Page 6 23 Page 9
	9) Start Diesel Generators	≤ 12 (12)	20 Page 8	21 Page 6
	b. Steam Line Isolation	≤ 8	20 Page 8	21 Page 6
6.	Containment Pressure - High – High			
	a. Containment Spray	≤ 234 (13)	22 Page 10	23 Page 10
	b. Containment Isolation-Phase "B"	≤ 68 (2) ≤ 78 (1)	20 Page 8 22 Page 10	21 Page 7 23 Page 10
	c. Steam Line Isolation	≤ 8	20 Page 8	21 Page 7
	d. Containment Air Return Fans	480 ≤ RT ≤ 600	20 Page 8	21 Page 7

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
7.	Steam Generator Water Level - High – High			
	a. Turbine Trip	≤ 2.5	20 Page 9	21 Page 8
	b. Feedwater Isolation	≤ 8 (3)	20 Page 9	21 Page 8
8.	Steam Generator Water Level - Low – Low			
	a. Motor-driven Auxiliary Feedwater Pumps	≤ 60 (7)	20 Page 9	21 Page 8
	b. Turbine-driven Auxiliary Feedwater Pump	≤ 60 (8)	20 Page 9	21 Page 8
9.	DELETED			
10.	RWST Level-Low Coincident with Containment Sump Level - High and Safety Injection			
	Automatic Switchover to Containment Sump	≤ 234	20 Page 9	21 Page 8
11.	Loss-of-Offsite Power			
	Auxiliary Feedwater Pumps	≤ 60	24 Page 1	25 Page 1
12.	Trip of All Main Feedwater Pumps			
	Start Auxiliary Feedwater Pumps	≤ 60	20 Page 11	21 Page 10

5.0 ACCEPTANCE CRITERIA (continued)

TSR 3.3.2-1-	INITIATING SIGNAL AND FUNCTION	RESPONSE TIME	Train A Data Sheet #	Train B Data Sheet #
13.	Auxiliary Feedwater Pump Suction Transfer on Suction Pressure – Low			
	a. Motor-driven Auxiliary Feedwater Pumps	≤ 47	20 Page 10	21 Page 9
	b. Turbine-driven Auxiliary Feedwater Pumps	≤ 42	20 Page 10	21 Page 9
14.	Loss of Voltage/Degraded Voltage			
	6.9 kV Shutdown Board	≤ 12 (9)	22 Page 12	23 Page 12
15.	MSV Vault Room Water Level – High			
	Feedwater Isolation	≤ 8.5 (15)	20 Page 9	21 Page 8

Notes

[1] Diesel generator starting and sequence loading delays included.

[2] Diesel generator starting and sequence loading delay not included. Offsite power available.

[3] Air operated valves.

[4] Offsite power available - diesel generator starting and sequence loading delays not included. Response time limit includes the opening of valves to establish flowpath and bringing the pumps to full speed. The additional sequential transfer of CCP suction from the Volume Control Tank (VCT) to the Refueling Waster Storage Tank (RWST) (RWST valves open, then the VCT valves close) is included.

5.0 ACCEPTANCE CRITERIA (continued)

[5] Diesel generator starting and sequence loading delays included. Response time limit includes the opening of valves to establish flow path and bringing the pumps up to full speed. The additional sequential transfer of suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.

[6] Exceptions are noted in table.

[7] On 2/3 any steam generator and Trip Time Delay = 0 seconds.

[8] On 2/3 in 2/4 steam generators and Trip Time Delay = 0 seconds.

[9] The response time is measured from the time the 6.9 kV shutdown boards voltage exceeds the setpoint until the time full voltage is returned for the loss of voltage sensors; or from the time the degraded voltage timers generate a signal to trip the feeder breakers and shed loads until the time full voltage is returned for the degraded voltage sensors.

[10] The response time for motor-driven AFW pumps includes the diesel generator starting and sequence loading delays. The response time for (steam) turbine driven AFW pumps does not include diesel generator starting and sequence loading delays.

[11] Containment purge valves only. Containment radiation monitor valves have a response time of 6.5 seconds.

[12] Diesel generator start time includes a reactor trip response time of 2 seconds.

[13] Includes diesel generator starting, containment spray pump sequence loading-delay/breaker closure, plus stroke time of 2-FCV-72-2 and -39.*

* The containment integrity analysis of record was performed using 221 seconds for initiation of spray. However, Westinghouse document WATD-11264 has evaluated the initiation of spray at 234 seconds with the conclusion that the increase will have no effect on the results or conclusions of the Watts Bar Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) containment integrity analysis.

[14] Diesel generator starting and sequence loading delays included. Response time limit includes the opening of valves to establish flowpath and bring pumps to full speed. The additional sequential transfer of Emergency Core Cooling System (ECCS) pump suction from the VCT to the RWST (RWST valves open) is included.

5.0 ACCEPTANCE CRITERIA (continued)

[15] Feedwater Isolation Valve (motor) and Feedwater Regulating Valve (air operated) response time includes an ESFAS signal response time of 2 seconds.

[16] The Fire Protection Secondary Containment Isolation Valves (CIV's) are no longer response timed. To address Appendix R concerns, the Fire Protection Secondary CIV's have been depowered open, the breakers locked in the OFF position and the piping evaluated to address CIV concerns. See System 26 High Pressure Fire Protection System - System Description, Reference 2.2C.5.

E. In addition to the standard ESFAS Tech Spec response times, several quick sample valves move during Containment Isolation Phase A (from Containment Pressure High, Pressurizer Pressure Low or Steam Line Pressure Low) and have a tighter acceptance criteria as listed in 2-SI-99-200.

Power	CIA Initiating Signal	Train A Data Sheet #	Train B Data Sheet #	Response Time (sec)
Normal Power	Containment Pressure High	20 Page 1	21 Page 1	≤ 7.00
	Pressurizer Pressure Low	20 Page 3	21 Page 3	
	Steam Line Pressure Low	20 Page 6	21 Page 5	
Emergency Power	Containment Pressure High	22 Page 2	23 Page 2	≤ 17.00
	Pressurizer Pressure Low	22 Page 5	23 Page 5	
	Steam Line Pressure Low	22 Page 8	23 Page 8	

5.0 ACCEPTANCE CRITERIA (continued)

F. In addition to the standard ESFAS Tech Spec response times, several quick valves move during Containment Isolation Phase B on Containment Pressure High-High and have a tighter acceptance criteria as listed in Reference 2.2C.2.

Power	CIB Initiating Signal	Train A Data Sheet #	Train B Data Sheet #	Response Time (sec)
Normal Power	Containment Pressure High-High	20 Page 8	21 Page 7	≤ 12.00
Emergency Power	Containment Pressure High-High	22 Page 10	23 Page 10	≤ 22.00

Date ________

6.0 PERFORMANCE

NOTES

1) This is a desk-top performed instruction; no actual field testing is required. For completion purposes Sections should be performed in order.
2) A copy of the page from each Surveillance Instruction/Work Order/or PTI that verifies a time response will be attached to the end of this instruction.

6.1 Transducer (Transmitters, Resistance Temperature Detectors (RTDs), Sensing Relays, and Neutron Input Circuitry) Response Time Data Acquisition for Inputs to the RPS & ESFAS

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.1 have been completed. ________

NOTE

Neutron Instrument/Drawers and RCP Undervoltage/Underfrequency Protection Relays transducer response times are included in the SSPS Input Relay response time Data Sheets 3 and 4. RCP Undervoltage/Underfrequency Relay response times are recorded in Data Sheet 1.

[2] **OBTAIN** the response time for each Transducer from the procedures listed on Data Sheet 1, and **RECORD** the values and Work Documents utilized in the spaces allocated for each parameter in the "Actual" column. ________

[3] For the Overpower ΔT and Overtemperature ΔT RTDs, **PERFORM** the following:

A. **DETERMINE** the longest time from the “Actual” column and **RECORD** the value in the “Longest” column of Data Sheet 1. ________

B. **VERIFY** that the “Actual” RTD response times recorded on Data Sheet 1 are less than or equal to the “Max” values specified. ________

Date ________

6.1 Transducer (Transmitters, Resistance Temperature Detectors (RTDs), Sensing Relays, and Neutron Input Circuitry) Response Time Data Acquisition for Inputs to the RPS & ESFAS (continued)

[4] For all other transducers listed on Data Sheet 1, except the Undervoltage and Underfrequency relays, **PERFORM** the following:

A. **ADD** columns Transmitter Actual [A] and Sensing Line [B] together and **RECORD** the values in the "Sum [A+B]" column on Data Sheet 1. ________

B. **VERIFY** that the "Sum [A+B]" recorded on Data Sheet 1 is less than or equal to the "Max" values specified. ________

[5] **VERIFY** that for each Undervoltage and Underfrequency relay listed on Data Sheet 1, the "Actual" relay response times recorded are less than or equal to the "Max" values specified. ________

[6] **VERIFY** that all items on Data Sheet 1 are correctly filled out. ________
1st

____
IV

Date ________

6.2 Eagle 21 (Process Protection Instrumentation Racks) Response Time Data Acquisition for the RPS & ESFAS

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.2 have been completed. ________

NOTE

When extracting the Eagle 21 response times for each comparator output, the longest response time from every variable utilized is used (i.e., Pressuizer (PZR) Press, ΔT, and ΔI are variables utilized in the response time test of overpower and overtemperature comparators).

[2] **OBTAIN** the response time for each Eagle 21 comparator from the procedures listed on Data Sheet 2, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each Parameter. ________

[3] **VERIFY** each value entered in the "Times (Sec)" column, on Data Sheet 2 is less than or equal to the value specified in the "Max (Sec)" column. ________

[4] **VERIFY** that all items on Data Sheet 2 are correctly filled out. ________
1st

____
IV

Date ________

6.3 Solid State Protection System Input Relay & Logic Response Time Data Acquisition for the RPS & ESFAS

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.3 have been completed. ________

[2] **OBTAIN** the response time for each Train A, SSPS Input Relay from the procedures listed on Data Sheet 3, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each Parameter. ________

[3] **VERIFY** each value entered in the “Times (Sec)” column, on Data Sheet 3 is less than or equal to the value specified in the “Max” values specified. ________

[4] **OBTAIN** the response time for each Train B, SSPS Input Relay from the procedures listed on Data Sheet 4, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each Parameter. ________

[5] **VERIFY** each value entered in the “Times (Sec)” column, on Data Sheet 4 is less than or equal to the value specified in the “Max (Sec)” column. ________

[6] **RECORD** the SSPS Train A clock/counter pulse width from the following SI’s **AND**

VERIFY each is less than or equal to 0.002 seconds (2 msec).

Surveillance Instruction	Pulsewidth (msec)
2-SI-99-206	
2-SI-99-207	
2-SI-99-208	

____

Date ________

6.3 Solid State Protection System Input Relay & Logic Response Time Data Acquisition for the RPS & ESFAS (continued)

[7] **RECORD** the SSPS Train B clock/counter pulse width from the following SI's **AND**

VERIFY each is less than or equal to 0.002 seconds (2 msec).

Surveillance Instruction	Pulsewidth (msec)
2-SI-99-206	
2-SI-99-207	
2-SI-99-208	

____

[8] **VERIFY** that all items on Data Sheet 3 are correctly filled out. ________ 1st

________ IV

[9] **VERIFY** that all items on Data Sheet 4 are correctly filled out. ________ 1st

________ IV

Date ________

6.4 RPS & ESFAS Input Process Parameters Data Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.4 have been completed. ________

[2] **TRANSCRIBE** the Transducer "Actual" or "Longest" (as applicable) response times from Data Sheet 1 to the "Transducer" column on Data Sheet 5, [A]. ________

[3] **TRANSCRIBE** the SSPS Input Relay response "Times" from Data Sheet 3 to the "Input Relay" column on Data Sheet 5, [C]. ________

[4] **ADD** columns [A], [B], [C] and [D] together **AND**

RECORD the values in the "Sum [A+B+C+D]" column on Data Sheet 5. ________

[5] **DETERMINE** the longest time from the "Sum [A+B+C+D]" column for each Parameter **AND**

RECORD the values in the "Longest Time Train A" column on Data Sheet 5. ________

[6] **TRANSCRIBE** the Transducer "Actual" or "Longest" (as applicable) response times from Data Sheet 1 to the "Transducer" column on Data Sheet 6, [A]. ________

[7] **TRANSCRIBE** the SSPS Input Relay response "Times" from Data Sheet 4 to the "Input Relay" column on Data Sheet 6, [C]. ________

[8] **ADD** columns [A], [B], [C] and [D] together and

RECORD the values in the "Sum [A+B+C+D]" column on Data Sheet 6. ________

[9] **DETERMINE** the longest time from the "Sum [A+B+C+D]" column for each Parameter **AND**

RECORD the values in the "Longest Time Train B" column on Data Sheet 6. ________

Date ________

6.4 RPS & ESFAS Input Process Parameters Data Summary (continued)

[10] **VERIFY** that all items on Data Sheet 5 are correctly filled out. ________ 1st

________ IV

[11] **VERIFY** that all items on Data Sheet 6 are correctly filled out. ________ 1st

________ IV

Date ________

6.5 Reactor Trip Breaker Response Time Data Acquisition for the RPS & ESFAS

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.5 have been completed. ________

[2] **OBTAIN** the actual Breaker Trip response times for each Breaker listed below from 2-SI-99-201-A and 2-SI-99-201-B, **AND**

RECORD the times and Work Documents for Shunt and UV trips in the "Breaker Trip Actual", [A] column on Data Sheet 7:

A. 2-BKR-099-L116/2B, REACTOR TRIP BREAKER A ________

B. 2-BKR-099-L116/2C, REACTOR TRIP BREAKER B ________

[3] **VERIFY** each value entered in column, [A] on Data Sheet 7 is less than or equal to the "Max" values specified. ________

[4] **DETERMINE** the longest time for the Reactor Trip Breaker from the UV and Shunt Trips and

RECORD the values in the "Longest Time UV or Shunt" column on Data Sheet 7. ________

[5] **VERIFY** that all items on Data Sheet 7 are correctly filled out. ________
1st

____
IV

Date ________

6.6 Reactor Trip System Instrumentation Response Time Test Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.6 have been completed. ________

[2] **TRANSCRIBE** the "Longest Time Train A" time from Data Sheet 5 to the "Longest Input Function, Data Sheet 8, [A]" column, for each Parameter. ________

[3] **TRANSCRIBE** the "Longest RT Breaker" time from Data Sheet 7 to the "Longest RT Breaker, Data Sheet 8, [B]" column, for each Parameter. ________

[4] **ADD** columns [A] and [B] together **AND**

RECORD the values in the "Sum" column on Data Sheet 8. ________

[5] **ADD** 0.15 Sec to the value recorded in the "Sum" Column on Data Sheet 8, **AND**

TRANSCRIBE the total into the "Total = Sum + 0.15 Sec" Column. ________

[6] **VERIFY** that the "Total = Sum + 0.15 Sec" is less than or equal to the Acceptance Criteria for each Parameter on Data Sheet 8 for Train A. **[Acc Crit]** ________

[7] **TRANSCRIBE** the "Longest Time Train B" time from Data Sheet 6 to the "Longest Input Function, Data Sheet 9, [A]" column, for each Parameter. ________

[8] **TRANSCRIBE** the "Longest RT Breaker" time from Data Sheet 7 to the "Longest RT Breaker, Data Sheet 9, [B]" column, for each Parameter. ________

[9] **ADD** columns [A] and [B] together **AND**

RECORD the values in the "Sum" column on Data Sheet 9. ________

[10] **VERIFY** that the "Total = Sum + 0.15 Sec" is less than or equal to the Acceptance Criteria for each Parameter on Data Sheet 9 for Train B. **[Acc Crit]** ________

[11] **VERIFY** that all items on Data Sheet 8 are correctly filled out. ________

1st

____

IV

Date ________

6.6 Reactor Trip System Instrumentation Response Time Test Summary (continued)

[12] **VERIFY** that all items on Data Sheet 9 are correctly filled out. ________ 1st

________ IV

6.7 SSPS Master Relay Data Acquisition

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.7 have been completed. ________

[2] **OBTAIN** the response time for each Train A Master Relay from the procedures listed on Data Sheet 10, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[3] **VERIFY** each value entered in the "Master Relay" column, on Data Sheet 10 is less than or equal to the values in "Max Expected" column. ________

[4] **DETERMINE** the longest Train A Master Relay Time for each function **AND**

RECORD the value in the "Longest Master" column on Data Sheet 10, as required. ________

[5] **OBTAIN** the response time for each Train B Master Relay from the procedures listed on Data Sheet 11, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[6] **VERIFY** each value entered in the "Master Relay" column, on Data Sheet 11 is less than or equal to the values in "Max Expected" column. ________

[7] **DETERMINE** the longest Train B Master Relay Time for each function **AND**

RECORD the value in the "Longest Master" column on Data Sheet 11, as required. ________

Date ________

6.7 SSPS Master Relay Data Acquisition (continued)

[8] **VERIFY** that all items on Data Sheet 10 are correctly filled out.

________ 1st

________ IV

[9] **VERIFY** that all items on Data Sheet 11 are are correctly filled out.

________ 1st

________ IV

Date ________

6.8 Slave Relay Data Acquisition

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.8 have been completed. ________

[2] **OBTAIN** the response time for each Train A Slave Relay from the Procedures listed on Data Sheet 12, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[3] **VERIFY** each value entered in the “Slave Relay” column, on Data Sheet 12 is less than or equal to the values in “Max Expected” column. ________

[4] **DETERMINE** the longest Train A Slave Relay Time for each function, **AND**

RECORD the value in the “Longest Slave” column on Data Sheet 12, as required. ________

[5] **OBTAIN** the response time for each Train B Slave Relay from the Procedures listed on Data Sheet 13, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[6] **VERIFY** each value entered in the “Slave Relay” column, on Data Sheet 13 is less than or equal to the values in “Max Expected” column. ________

[7] **DETERMINE** the longest Train B Slave Relay Time for each function, **AND**
RECORD the value in the “Longest Slave” column on Data Sheet 13, as required. ________

[8] **VERIFY** that all items on Data Sheet 12 are correctly filled out.

____
1st

____
IV

[9] **VERIFY** that all items on Data Sheet 13 are correctly filled out.

____
1st

____
IV

Date ________

6.9 Engineered Safety Features Actuation System Instrumentation Response Time Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.9 have been completed. ________

[2] **TRANSCRIBE** the "Longest Time Train A" times for each Parameter from Data Sheet 5 to the "Longest Input Function" column on Data Sheet 14, [A]. ________

[3] **DETERMINE** and **TRANSCRIBE** the "Longest Master" or "Master Relay" Train A values of the functions listed, from Data Sheet 10 to the "Longest Master Relay" column on Data Sheet 14, [B]. ________

[4] **DETERMINE** and **TRANSCRIBE** the "Longest Slave" or "Slave Relay" Train A values of the functions listed, from Data Sheet 12 to the "Longest Slave Relay" column on Data Sheet 14, [C]. ________

[5] **ADD** columns [A], [B] and [C] together **AND**

RECORD the values in the "Actual Signal Initiation Sum [A+B+C]" column on Data Sheet 14. ________

[6] **VERIFY** that the "Actual Signal Initiation Sum [A+B+C]" is less than or equal to the "Max Expected" specified for each Parameter on Data Sheet 14, for Train A. ________

[7] **TRANSCRIBE** the "Longest Time Train B" times for each Parameter from Data Sheet 6 to the "Longest Input Function" column on Data Sheet 15, [A]. ________

[8] **DETERMINE** and **TRANSCRIBE** the "Longest Master" or "Master Relay" Train B values of the functions listed, from Data Sheet 11 to the "Longest Master Relay" column on Data sheet 15, [B]. ________

[9] **DETERMINE** and **TRANSCRIBE** the "Longest Slave" or "Slave Relay" Train B values of the functions listed, from Data Sheet 13 to the "Longest Slave Relay" column on Data Sheet 15, [C]. ________

[10] **ADD** columns [A], [B] and [C] together **AND**

RECORD the values in the "Actual Signal Initiation Sum [A+B+C]" column on Data Sheet 15. ________

Date ________

6.9 Engineered Safety Features Actuation System Instrumentation Response Time Summary (continued)

[11] **VERIFY** that the “Actual Signal Initiation Sum [A+B+C]“ is less than or equal to the "Max Expected" specified for each Parameter on Data Sheet 15, for Train B. ________

[12] **VERIFY** that all items on Data Sheet 14 are correctly filled out. ________
1st

____
IV

[13] **VERIFY** that all items on Data Sheet 15 are correctly filled out. ________
1st

____
IV

Date ________

6.10 ESFAS Actuated Component Data Acquisition

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.10 have been completed. ________

NOTE

When extracting valve stroke times from the individual instructions, use the longer of the local or remote response times for the actual time for the position specified.

[2] **OBTAIN** the response time for each component for the actual time for the ESFAS Position specified from the procedures listed on Data Sheet 16, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[3] **DETERMINE AND**

TRANSCRIBE the longest ESFAS Actuated component for each function, as required, to the “Longest” column on Data Sheet 16. ________

[4] **COMPLETE** Data Sheet 16 Page 15, as follows:

A. **TRANSCRIBE** the “Longest” time of 2-LCV-62-135 or 2-LCV-62-136 from Data Sheet 16, to the “RWST-CVCS Isolation [A]” column. ________

B. **TRANSCRIBE** the “Actual” time for 2-LCV-62-132 from Data Sheet 16, to the “VCT-CVCS Isolation [B]” column. ________

C. **ADD** columns [A] and [B] together, **AND**

RECORD the value in the “RWST/VCT Swapover Total Sum [A+B]” column. ________

Date ________

6.10 ESFAS Actuated Component Data Acquisition (continued)

NOTE

When extracting valve stroke times from the individual instructions, use the longer of the local or remote response times for the actual time for the position specified.

[5] **OBTAIN** the response time for each component for the actual time for the ESFAS Position specified from the procedures listed on Data Sheet 17, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function. ________

[6] **DETERMINE, AND**

TRANSCRIBE the longest ESFAS Actuated component for each function, as required, to the "Longest" column on Data Sheet 17. ________

[7] **COMPLETE** Data Sheet 17 Page 14, as follows:

A. **TRANSCRIBE** the "Longest" time of 2-LCV-62-135 or 2-LCV-62-136 from Data Sheet 17, to the "RWST-CVCS Isolation [A]" column. ________

B. **TRANSCRIBE** the "Actual" time for 2-LCV-62-133 from Data Sheet 17, to the "VCT-CVCS Isolation [B]" column. ________

C. **ADD** columns [A] and [B] together, **AND**

RECORD the value in the "RWST/VCT Swapover Total Sum [A+B]" column. ________

Date ________

6.10 ESFAS Actuated Component Data Acquisition (continued)

[8] **OBTAIN** the start to full air flow response time from 2-SI-30-26-A and 2-SI-30-26-B for each fan listed below **AND**

RECORD the response times:

A. 2-MTR-30-38, CONTAINMENT AIR RETURN FAN 2A-A from 2-SI-30-26-A

__________ Sec. ________

B. 2-MTR-30-39, CONTAINMENT AIR RETURN FAN 2B-B from 2-SI-30-26-B

__________ Sec. ________

[9] **OBTAIN** the "Actual" time delay start times from 2-SI-30-26-A and 2-SI-30-26-B for each fan listed below, **AND**

RECORD the times:

A. 2-MTR-30-38, CONTAINMENT AIR RETURN FAN 2A-A from 2-SI-30-26-A

__________ Sec. ________

B. 2-MTR-30-39, CONTAINMENT AIR RETURN FAN 2B-B from 2-SI-30-26-B

__________ Sec. ________

[10] **ADD** the time delay to the start to full air flow, for 2-MTR-30-38, CONTAINMENT AIR FAN 2A-A below, **AND** **RECORD** the sum in the Times (Sec.) Actual column on Data Sheet 16 and the"Actuated Component(s)" column on Data Sheets 20:

__________ Sec. + __________ Sec. = __________ Sec.
(Step 6.10[8]A) + (Step 6.10[9]A) = Sum

____
1st

____
IV

Date ________

6.10 ESFAS Actuated Component Data Acquisition (continued)

[11] **ADD** the time delay to the start to full air flow, for 2-MTR-30-39, CONTAINMENT AIR FAN 2B-B below, **AND RECORD** the sum in the Times (Sec.) Actual column on Data Sheet 17 and the"Actuated Component(s)" column on Data Sheets 21:

__________ Sec. + __________ Sec. = __________ Sec.
(Step 6.10[8]B) + (Step 6.10[9]B) = Sum

________ 1st

________ IV

[12] **VERIFY** that the “Longest” Actuated Component response times recorded for each ESFAS function on Data Sheet 16, is less than or equal to the “Max” specified values for the response times designated as Acceptance Criteria. **[Acc Crit]** ________

[13] **VERIFY** that the “Longest” Actuated Component response times recorded for each ESFAS function on Data Sheet 16, is less than or equal to the values specified in the “Max” column for the response times not designated as Acceptance Criteria. ________

[14] **VERIFY** that the “Longest” Actuated Component response times recorded for each ESFAS function on Data Sheet 17, is less than or equal to the values specified in the “Max” column for the response times designated as Acceptance Criteria. **[Acc Crit]** ________

[15] **VERIFY** that the “Longest” Actuated Component response times recorded for each ESFAS function on Data Sheet 17, is less than or equal to the values specified in the “Max” column for the response times not designated as Acceptance Criteria. ________

[16] **VERIFY** that all items on Data Sheet 16 are correctly filled out.

________ 1st

________ IV

[17] **VERIFY** that all items on Data Sheet 17 are correctly filled out.

________ 1st

________ IV

Date ________

6.11 Diesel Generator & Load Sequencer Time Delay Data

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.11 have been completed. ________

[2] **OBTAIN** the Diesel Generator Breaker Closure and Sequence Delay Times from Preoperational Test, 2-PTI-262-1, **AND**

RECORD for the components specified on Data Sheet 18 for Train A. ________

[3] **OBTAIN** the Diesel Generator Breaker Closure and Sequence Delay Times from Preoperational Test, 2-PTI-262-2, **AND**

RECORD for the components specified on Data Sheet 19 for Train B. ________

[4] **VERIFY** that all items on Data Sheet 18 are correctly filled out. ________ 1st

________ IV

[5] **VERIFY** that all items on Data Sheet 19 are correctly filled out. ________ 1st

________ IV

Date ________

6.12 ESFAS Normal Power Total Response Time Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.12 have been completed. ________

[2] **TRANSCRIBE** the "Actual Signal Initiation Sum [A+B+C]" times for each Parameter from Data Sheet 14 to the "Actual Signal Initiation" column on Data Sheet 20, [A]. ________

[3] **TRANSCRIBE** the "Actual" or "Longest" (as applicable) Component(s) times for each Function from Data Sheet 16 to the "Actuated Component(s)" column on Data Sheet 20, [B]. ________

[4] **ADD** columns [A] and [B] together and **RECORD** the values in the "Sum" column on Data Sheet 20. ________

[5] **VERIFY** that the "ESFAS Normal Power Total Sum [A+B]" is less than or equal to the Acceptance Criteria Values specified for each Function on Data Sheet 20 for Train A. **[Acc Crit]** ________

[6] **TRANSCRIBE** the "Actual Signal Initiation Sum [A+B+C]" times for each Parameter from Data Sheet 15 to the "Actual Signal Initiation" column on Data Sheet 21, [A]. ________

[7] **TRANSCRIBE** the "Actual" or "Longest" (as applicable) Component(s) times for each Function from Data sheet 17 to the "Actuated Component(s)" column on Data Sheet 21, [B]. ________

[8] **ADD** columns [A] and [B] together and

RECORD the values in the "Sum" column on Data Sheet 21. ________

[9] **VERIFY** that the "ESFAS Normal Power Total Sum [A+B] is less than or equal to the Acceptance Criteria Values specified for each Function on Data Sheet 21 for Train B. **[Acc Crit]** ________

Date ________

6.12 ESFAS Normal Power Total Response Time Summary (continued)

NOTE
Pages 10 and 11 of Data Sheet 20 and pages 9 and 10 of Data Sheet 21 will be completed in steps 6.12[10] through 6.12[18].

[10] **OBTAIN** the response time for each Auxiliary Feedwater Pump Suction Swapover pressure switch from the procedures listed for each Train, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function.

A. Data Sheet 20, Page 10 for Train A ________

B. Data Sheet 21, Page 9 for Train B ________

[11] **DETERMINE** the longest response time for each Auxiliary Feedwater Pump Suction Swapover pressure switch (MDAFW and TDAFW), **AND**

TRANSCRIBE those times, as required, to the "Longest [A]" column on:

A. Data Sheet 20, Page 10 for Train A ________

B. Data Sheet 21, Page 9 for Train B ________

[12] **OBTAIN** the "Longest " response time for each Auxiliary Feedwater Pump Suction Swapover Isolation Valve from the Data Sheet listed column [C], **AND**

RECORD the values in:

A. Data Sheet 20, Page 10 for Train A ________

B. Data Sheet 21, Page 9 for Train B ________

Date ________

6.12 ESFAS Normal Power Total Response Time Summary (continued)

[13] **ADD** columns [A] , [B], and [C] together, **AND**

RECORD the values in the "Total [A] + [B] + [C]" column on:

A. Data Sheet 20, page 10 for Train A ________

B. Data Sheet 21, Page 9 for Train B ________

[14] **VERIFY** that the "Total [A] + [B] + [C]" column" is less than or equal to the Acceptance Criteria Values specified for each Auxiliary Feedwater Pump Suction Swapover on:

A. Data Sheet 20, Page 10 for Train A. **[Acc Crit]** ________

B. Data Sheet 21, Page 9 for Train B. **[Acc Crit]** ________

[15] **OBTAIN** the response time for each Main Feedwater Trip from the procedures listed, as specified on the applicable Data Sheet, **AND**

RECORD the values and Work Documents utilized in the spaces allocated for each function.

A. Data Sheet 20, Page 11 for Train A ________

B. Data Sheet 21, Page 10 for Train B ________

[16] **OBTAIN** the applicable AFW Pump response time for the Data Sheets listed in the associated Note on the Data Sheets listed below, **AND**

RECORD the Values in column [B] on:

A. Data Sheet 20, Page 11 for Train A ________

B. Data Sheet 21, Page 10 for Train B ________

[17] **ADD** columns [A] and [B] together, **AND**

RECORD the values in the "Total [A] + [B] " column on:

A. Data Sheet 20, page 11 for Train A ________

B. Data Sheet 21, Page 10 for Train B ________

Date ________

6.12 ESFAS Normal Power Total Response Time Summary (continued)

[18] **VERIFY** that the "Total [A] + [B]" column" is less than or equal to the Acceptance Criteria Values specified on:

A. Data Sheet 20, Page 11 for Train A. **[Acc Crit]** ________

B. Data Sheet 21, Page 10 for Train B. **[Acc Crit]** ________

[19] **VERIFY** that all items on Data Sheet 20 are correctly filled out. ________ 1st

________ IV

[20] **VERIFY** that all items on Data Sheet 21 are correctly filled out. ________ 1st

________ IV

Date ________

6.13 ESFAS Emergency Power Total Response Time Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.13 have been completed. ________

[2] **TRANSCRIBE** the “Actual Signal Initiation Sum [A+B+C]” times for each Parameter from Data Sheet 14 to the “Actual Signal Initiation” column on Data sheet 22, [A]. ________

[3] **TRANSCRIBE** the “DG Breaker” closure times for each Function from Data Sheet 18 to the “DG Breaker Closure” column on Data Sheet 22, [B]. ________

[4] **TRANSCRIBE** the “Sequence Delay” times for each Function from Data Sheet 18 to the “Sequence Delay” column on Data Sheet 22, [C]. ________

[5] **TRANSCRIBE** the “Longest” actuated components(s) times for each Function from Data Sheet 16 to the “Actuated Components” column on Data Sheet 22, [D]. ________

[6] **ADD** columns [A], [B], [C], [D], and [E] (if applicable) together, **AND**

RECORD the values in the “Sum” column for each Function on Data Sheet 22. ________

[7] **OBTAIN** the response time for 2A-A 6900 Volt Shutdown Board for loss of Voltage/Degraded Voltage Condition from 2-PTI-262-1, **AND**

RECORD the values on Data Sheet 22. ________

[8] **VERIFY** that the “ESFAS Emergency Power Total Sum” is less than or equal to the Acceptance Criteria Values specified for each Function on Data Sheet 22 for Train A. **[Acc Crit]** ________

[9] **TRANSCRIBE** the “Actual Signal Initiation Sum [A+B+C]” times for each Parameter from Data Sheet 15 to the “Actual Signal Initiation” column on Data sheet 23, [A]. ________

[10] **TRANSCRIBE** the “DG Breaker” closure times for each Function from Data Sheet 19 to the “DG Breaker Closure” column on Data sheet 23, [B]. ________

Date ________

6.13 ESFAS Emergency Power Total Response Time Summary (continued)

[11] **TRANSCRIBE** the “Sequence Delay” times for each Function from Data Sheet 19 to the “Sequence Delay” column on Data Sheet 23, [C]. ________

[12] **TRANSCRIBE** the “Longest” actuated component(s) times for each Function from Data Sheet 17 to the “Actuated Component(s)” column on Data Sheet 23, [D]. ________

[13] **ADD** columns [A], [B], [C], [D], and [E] (if applicable) together, **AND**

RECORD the values in the “Sum” column for each Function on Data Sheet 23. ________

[14] **OBTAIN** the response time for 2B-B 6900 Volt Shutdown Board for loss of Voltage/Degraded Voltage Condition from 2-PTI-262-2, **AND**

RECORD the values on Data Sheet 23. ________

[15] **VERIFY** that the “ESFAS Emergency Power Total Sum” is less than or equal to the Acceptance Criteria Values specified for each Function on Data Sheet 23 for Train B. **[Acc Crit]** ________

[16] **VERIFY** that all items on Data Sheet 22 are correctly filled out.

________ 1st

________ IV

[17] **VERIFY** that all items on Data Sheet 23 are correctly filled out.

________ 1st

________ IV

Date ________

6.14 Auxiliary Feedwater Pump LOOP Start Response Time Summary

[1] **VERIFY** prerequisites listed in Section 4.0 that apply to Subsection 6.14 have been completed. ________

[2] **OBTAIN** the applicable AFW elapsed sequence response times from Preoperational Test, 2-PTI-262-1 Attachment 15 **AND**

RECORD the values in Data Sheet 24 column [A]. ________

[3] **OBTAIN** the applicable AFW elapsed sequence response times from Preoperational Test, 2-PTI-262-2 Attachment 15 **AND**

RECORD the values in Data Sheet 25 column [A]. ________

[4] **TRANSCRIBE** the Motor and Turbine Driven Auxiliary Feedwater Pump "Actual" times from Data Sheet 14, to the "Actuated Component" column on Data Sheet 24, [B]. ________

[5] **TRANSCRIBE** the Motor and Turbine Driven Auxiliary Feedwater Pump "Actual" times from Data Sheet 15, to the "Actuated Component" column on Data Sheet 25, [B]. ________

[6] **ADD** columns [A] and [B] together, **AND**

RECORD the values in the "Sum" column on Data Sheet 24. ________

[7] **ADD** columns [A] and [B] together, **AND**

RECORD the values in the "Sum" column on Data sheet 25. ________

[8] **VERIFY** that the "AFW-LOOP Start Total Sum [A+B]" is less than or equal to the Acceptance Criteria Values specified for each Parameter on Data Sheet 24 for Train A. **[Acc Crit]** ________

[9] **VERIFY** that the "AFW LOOP Start Total Sum [A+B]" is less than or equal to the Acceptance criteria Values specified for each Parameter on Data Sheet 25 for Train B. **[Acc Crit]** ________

[10] **VERIFY** that all items on Data Sheet 24 are correctly filled out. ________
1st

____
IV

Date ________

6.14 Auxiliary Feedwater Pump LOOP Start Response Time Summary (continued)

[11] **VERIFY** that all items on Data Sheet 25 are correctly filled out.

____
1st

____
IV

Date ________

7.0 POST PERFORMANCE ACTIVITY

[1] **ATTACH** copies of equivalent testing packages to this Test Package (for SIs, copies of the applicable data sheets with the Work Order number annotated, and for PTIs, copies of the pages which contain the required data). ________

[2] **NOTIFY** the Unit 2 US/SRO of the test completion. ________

[3] **PROVIDE** a copy of the complete test package to Unit 2 Engineer for future use in implementation of allocated time methodology for time response testing. ________

8.0 RECORDS

A. QA Records

Completed Test Package

Completed PTI Data Sheets

Completed Surveillance Instructions Data Sheets

B. Non-QA Records

None

Appendix A
(Page 1 of 1)

Test Procedures / Instructions Reference Review

Date ________

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE / INSTRUCTION	**REVISION / CHANGES**	**IMPACT YES / NO**	**INITIAL AND DATE** (N/A for no change)
U2 FSAR Table 14.2-1 Sheet 57 of 89			
U2 FSAR Section 7.2			
U2 FSAR Section 7.3			
U2 TRM Table 3.3.1-1			
U2 TRM Table 3.3.2-1			
PTI-99-01			
2-TSD-99-01			
2-SI-99-200			
WBN2-99-4003			
WBN2-26-4002			

Data Sheet 1
(Page 1 of 9)
TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

Reactor Trips-Temperature

Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transducer (RTD)	Procedure	Work Document	Times (Sec.)			Initial/Date
						Actual	Max	Longest	
Overpower ΔT & Overtemperature ΔT	1	2-TE-410B	2-TE-68-14B	2-SI-99-220			7.00		
	1	2-TE-411A1	2-TE-68-2B1	2-SI-99-220			7.00		
	1	2-TE-411A2	2-TE-68-2B2	2-SI-99-220			7.00		
	1	2-TE-411A3	2-TE-68-2B3	2-SI-99-220			7.00		
	1	2-TE-411B	2-TE-68-14A	2-SI-99-220			7.00		
	2	2-TE-420B	2-TE-68-37B	2-SI-99-219			7.00		
	2	2-TE-421A1	2-TE-68-25B1	2-SI-99-219			7.00		
	2	2-TE-421A2	2-TE-68-25B2	2-SI-99-219			7.00		
	2	2-TE-421A3	2-TE-68-25B3	2-SI-99-219			7.00		
	2	2-TE-421B	2-TE-68-37A	2-SI-99-219			7.00		
	3	2-TE-430B	2-TE-68-56B	2-SI-99-221			7.00		
	3	2-TE-431A1	2-TE-68-44B1	2-SI-99-221			7.00		
	3	2-TE-431A2	2-TE-68-44B2	2-SI-99-221			7.00		
	3	2-TE-431A3	2-TE-68-44B3	2-SI-99-221			7.00		
	3	2-TE-431B	2-TE-68-56A	2-SI-99-221			7.00		
	4	2-TE-440B	2-TE-68-79B	2-SI-99-222			7.00		
	4	2-TE-441A1	2-TE-68-67B1	2-SI-99-222			7.00		
	4	2-TE-441A2	2-TE-68-67B2	2-SI-99-222			7.00		
	4	2-TE-441A3	2-TE-68-67B3	2-SI-99-222			7.00		
	4	2-TE-441B	2-TE-68-79A	2-SI-99-222			7.00		

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

Reactor Trips-Pressure/DP — Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Pressurizer Pressure-High	1	P455	2-PT-68-340	2-SI-99-223			0.31		0.51	
	2	P456	2-PT-68-334	2-SI-99-224			0.31		0.51	
	3	P457	2-PT-68-323	2-SI-99-225			0.31		0.51	
	4	P458	2-PT-68-322	2-SI-99-225			0.31		0.51	
Pressurizer Pressure-Low	1	P455	2-PT-68-340	2-SI-99-223			0.31		0.51	
	2	P456	2-PT-68-334	2-SI-99-224			0.31		0.51	
	3	P457	2-PT-68-323	2-SI-99-225			0.31		0.51	
	4	P458	2-PT-68-322	2-SI-99-225			0.31		0.51	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

Reactor Trips-Pressure/DP Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Reactor Coolant Flow Low-Loop 1	1	F414	2-FT-68-6A	2-SI-99-223			0.028		0.23	
	2	F415	2-FT-68-6B	2-SI-99-224			0.028		0.23	
	3	F416	2-FT-68-6D	2-SI-99-225			0.028		0.23	
Reactor Coolant Flow Low-Loop 2	1	F424	2-FT-68-29A	2-SI-99-223			0.028		0.23	
	2	F425	2-FT-68-29B	2-SI-99-224			0.028		0.23	
	3	F426	2-FT-68-29D	2-SI-99-225			0.028		0.23	
Reactor Coolant Flow Low-Loop 3	1	F434	2-FT-68-48A	2-SI-99-223			0.028		0.23	
	2	F435	2-FT-68-48B	2-SI-99-224			0.028		0.23	
	3	F436	2-FT-68-48D	2-SI-99-225			0.028		0.23	
Reactor Coolant Flow Low-Loop 4	1	F444	2-FT-68-71A	2-SI-99-223			0.028		0.23	
	2	F445	2-FT-68-71B	2-SI-99-224			0.028		0.23	
	3	F446	2-FT-68-71D	2-SI-99-225			0.028		0.23	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

Reactor Trips-Pressure/DP

Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Steam Generator Low-Low Level Loop 1	2	L519	2-LT-3-38	2-SI-99-223			0.31		0.51	
	3	L518	2-LT-3-39	2-SI-99-224			0.31		0.51	
	4	L517	2-LT-3-42	2-SI-99-225			0.31		0.51	
Steam Generator Low-Low Level Loop 2	2	L529	2-LT-3-51	2-SI-99-223			0.31		0.51	
	3	L528	2-LT-3-52	2-SI-99-224			0.31		0.51	
	4	L527	2-LT-3-55	2-SI-99-225			0.31		0.51	
Steam Generator Low-Low Level Loop 3	2	L539	2-LT-3-93	2-SI-99-223			0.31		0.51	
	3	L538	2-LT-3-94	2-SI-99-224			0.31		0.51	
	4	L537	2-LT-3-97	2-SI-99-225			0.31		0.51	
Steam Generator Low-Low Level Loop 4	2	L549	2-LT-3-106	2-SI-99-223			0.31		0.51	
	3	L548	2-LT-3-107	2-SI-99-224			0.31		0.51	
	4	L547	2-LT-3-110	2-SI-99-225			0.31		0.51	

Data Sheet 1
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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

ESFAS-Pressure/DP   Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Containment Pressure High	2	P936	2-PDT-30-44	2-SI-99-223			0.31		0.51	
	3	P935	2-PDT-30-43	2-SI-99-224			0.31		0.51	
	4	P934	2-PDT-30-42	2-SI-99-225			0.31		0.51	
Pressurizer Low Pressure	1	P455	2-PT-68-340	2-SI-99-223			0.31		0.51	
	2	P456	2-PT-68-334	2-SI-99-224			0.31		0.51	
	3	P457	2-PT-68-323	2-SI-99-225			0.31		0.51	
Steam Line Pressure Negative Rate High Loop 1	1	P514	2-PT-1-2A	2-SI-99-223			0.31		0.51	
	2	P515	2-PT-1-2B	2-SI-99-224			0.31		0.51	
	4	P516	2-PT-1-5	2-SI-99-225			0.31		0.51	
Steam Line Pressure Negative Rate High Loop 2	1	P524	2-PT-1-9A	2-SI-99-223			0.31		0.51	
	2	P525	2-PT-1-9B	2-SI-99-224			0.31		0.51	
	3	P526	2-PT-1-12	2-SI-99-225			0.31		0.51	
Steam Line Pressure Negative Rate High Loop 3	1	P534	2-PT-1-20A	2-SI-99-223			0.31		0.51	
	2	P535	2-PT-1-20B	2-SI-99-224			0.31		0.51	
	3	P536	2-PT-1-23	2-SI-99-225			0.31		0.51	
Steam Line Pressure Negative Rate High Loop	1	P544	2-PT-1-27A	2-SI-99-223			0.31		0.51	
	2	P545	2-PT-1-27B	2-SI-99-224			0.31		0.51	
	4	P546	2-PT-1-30	2-SI-99-225			0.31		0.51	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

ESFAS-Pressure/DP

Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Steam Line Pressure Low Loop 1	1	P514	2-PT-1-2A	2-SI-99-223			0.31		0.51	
	2	P515	2-PT-1-2B	2-SI-99-224			0.31		0.51	
	4	P516	2-PT-1-5	2-SI-99-225			0.31		0.51	
Steam Line Pressure Low Loop 2	1	P524	2-PT-1-9A	2-SI-99-223			0.31		0.51	
	2	P525	2-PT-1-9B	2-SI-99-224			0.31		0.51	
	3	P526	2-PT-1-12	2-SI-99-225			0.31		0.51	
Steam Line Pressure Low Loop 3	1	P534	2-PT-1-20A	2-SI-99-223			0.31		0.51	
	2	P535	2-PT-1-20B	2-SI-99-224			0.31		0.51	
	3	P536	2-PT-1-23	2-SI-99-225			0.31		0.51	
Steam Line Pressure Low Loop 4	1	P544	2-PT-1-27A	2-SI-99-223			0.31		0.51	
	2	P545	2-PT-1-27B	2-SI-99-224			0.31		0.51	
	4	P546	2-PT-1-30	2-SI-99-225			0.31		0.51	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

ESFAS-Pressure/DP Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Containment Pressure High-High	1	P937	2-PDT-30-45	2-SI-99-223			0.31		0.51	
	2	P936	2-PDT-30-44	2-SI-99-223			0.31		0.51	
	3	P935	2-PDT-30-43	2-SI-99-224			0.31		0.51	
	4	P934	2-PDT-30-42	2-SI-99-225			0.31		0.51	
Steam Generator Water Level High High Loop 1	2	L519	2-LT-3-38	2-SI-99-223			0.31		0.51	
	3	L518	2-LT-3-39	2-SI-99-224			0.31		0.51	
	4	L517	2-LT-3-42	2-SI-99-225			0.31		0.51	
Steam Generator Water Level High High Loop 2	2	L529	2-LT-3-51	2-SI-99-223			0.31		0.51	
	3	L528	2-LT-3-52	2-SI-99-224			0.31		0.51	
	4	L527	2-LT-3-55	2-SI-99-225			0.31		0.51	
Steam Generator Water Level High High Loop 3	2	L539	2-LT-3-93	2-SI-99-223			0.31		0.51	
	3	L538	2-LT-3-94	2-SI-99-224			0.31		0.51	
	4	L537	2-LT-3-97	2-SI-99-225			0.31		0.51	
Steam Generator Water Level High High Loop 4	2	L549	2-LT-3-106	2-SI-99-223			0.31		0.51	
	3	L548	2-LT-3-107	2-SI-99-224			0.31		0.51	
	4	L547	2-LT-3-110	2-SI-99-225			0.31		0.51	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

ESFAS-Pressure/DP   Subsection 6.1

Parameter	Prot. Ch.	Vendor No.	Transmitter	Procedure	Work Document	Times (Sec)				Initial/Date
						Transmitter Actual [A]	Sensing Line [B]	Sum [A+B]	Max.	
Containment Sump Level	1	L920	2-LT-63-180	2-SI-99-226			0.00		0.51	
	2	L921	2-LT-63-181	2-SI-99-227			0.00		0.51	
	3	L940	2-LT-63-182	2-SI-99-228			0.00		0.51	
	4	L941	2-LT-63-183	2-SI-99-228			0.00		0.51	
RWST Level	1	L913	2-LT-63-50	2-SI-99-226			0.31		0.51	
	2	L914	2-LT-63-51	2-SI-99-226			0.31		0.51	
	3	L915	2-LT-63-52	2-SI-99-227			0.31		0.51	
	4	L916	2-LT-63-53	2-SI-99-228			0.31		0.51	

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TRANSDUCER DATA ACQUISITION/VERIFICATION

Date ________

Reactor Trips-Protective Relays — Subsection 6.1

Parameter	Prot. Ch.	Transmitter / Instruments	Instruction	Work Document	Times (Sec.) Relay / Rack Response		Initial/Date
					Actual	Max	
RCP #1 Undervoltage	1	2-27-68-8A	2-SI-68-40			0.52	
RCP #2 Undervoltage	2	2-27-68-31A	2-SI-68-41			0.52	
RCP #3 Undervoltage	3	2-27-68-50A	2-SI-68-42			0.52	
RCP #4 Undervoltage	4	2-27-68-73A	2-SI-68-43			0.52	
RCP #1 Underfrequency	1	2-27-68-8	2-SI-68-36			0.190	
RCP #2 Underfrequency	2	2-27-68-31	2-SI-68-37			0.190	
RCP #3 Underfrequency	3	2-27-68-50	2-SI-68-38			0.190	
RCP #4 Underfrequency	4	2-27-68-73	2-SI-68-39			0.190	
Source Range High Neutron Flux[1]	1	2-NI-92-131-D	2-SI-99-31			0.100	
	2	2-NI-92-132-E	2-SI-99-32			0.100	

1) Response time of neutron detectors is negligible. Response time includes NIS rack response, Reference 2.2C.4.

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

Reactor Trip Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Overpower ΔT [1]	1	TB-411G	2-SI-68-1			0.409	
	2	TB-421G	2-SI-68-2			0.409	
	3	TB-431G	2-SI-68-3			0.409	
	4	TB-441G	2-SI-68-4			0.409	
Overtemperature ΔT [2]	1	TB-411C	2-SI-68-1			0.410	
	2	TB-421C	2-SI-68-2			0.410	
	3	TB-431C	2-SI-68-3			0.410	
	4	TB-441C	2-SI-68-4			0.410	

1 Overpower ΔT response time is obtained from the ΔT input.
2 Overtemperature ΔT response time is obtained from longer response time of ΔI, Pressurizer Pressure, or ΔT input.

Data Sheet 2
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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

Reactor Trip Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Pressurizer Pressure-High	1	PB-455A	2-SI-68-5			0.409	
	2	PB-456A	2-SI-68-6			0.409	
	3	PB-457A	2-SI-68-7			0.409	
	4	PB-458A	2-SI-68-8			0.409	
Pressurizer Pressure-Low	1	PB-455C	2-SI-68-5			0.409	
	2	PB-456C	2-SI-68-6			0.409	
	3	PB-457C	2-SI-68-7			0.409	
	4	PB-458C	2-SI-68-8			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

Reactor Trip Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Reactor Coolant Flow Low-Loop 1	1	FB-414A	2-SI-68-12			0.409	
	2	FB-415A	2-SI-68-13			0.409	
	3	FB-416A	2-SI-68-14			0.409	
Reactor Coolant Flow Low-Loop 2	1	FB-424A	2-SI-68-15			0.409	
	2	FB-425A	2-SI-68-16			0.409	
	3	FB-426A	2-SI-68-17			0.409	
Reactor Coolant Flow Low-Loop 3	1	FB-434A	2-SI-68-18			0.409	
	2	FB-435A	2-SI-68-19			0.409	
	3	FB-436A	2-SI-68-20			0.409	
Reactor Coolant Flow Low-Loop 4	1	FB-444A	2-SI-68-21			0.409	
	2	FB-445A	2-SI-68-22			0.409	
	3	FB-446A	2-SI-68-23			0.409	

Data Sheet 2
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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

Reactor Trip Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (sec.)	Max (Sec.)	Initial/Date
Steam Generator Low Low Level-Loop 1	2	LB-519B	2-SI-3-13			0.409	
	3	LB-518B	2-SI-3-14			0.409	
	4	LB-517B	2-SI-3-15			0.409	
Steam Generator Low Low Level-Loop 2	2	LB-529B	2-SI-3-13			0.409	
	3	LB-528B	2-SI-3-14			0.409	
	4	LB-527B	2-SI-3-15			0.409	
Steam Generator Low Low Level-Loop 3	2	LB-539B	2-SI-3-13			0.409	
	3	LB-538B	2-SI-3-14			0.409	
	4	LB-537B	2-SI-3-15			0.409	
Steam Generator Low Low Level-Loop 4	2	LB-549B	2-SI-3-13			0.409	
	3	LB-548B	2-SI-3-14			0.409	
	4	LB-547B	2-SI-3-15			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Containment Pressure High	2	PB-936B	2-SI-30-44			0.409	
	3	PB-935B	2-SI-30-43			0.409	
	4	PB-934B	2-SI-30-42			0.409	
Pressurizer Low Pressure	1	PB-455D	2-SI-68-5			0.409	
	2	PB-456D	2-SI-68-6			0.409	
	3	PB-457D	2-SI-68-7			0.409	
Steam Line Pressure Negative Rate High Loop 1	1	PB-514C	2-SI-1-1			0.409	
	2	PB-515C	2-SI-1-2			0.409	
	4	PB-516C	2-SI-1-3			0.409	
Steam Line Pressure Negative Rate High Loop 2	1	PB-524C	2-SI-1-4			0.409	
	2	PB-525C	2-SI-1-5			0.409	
	3	PB-526C	2-SI-1-6			0.409	
Steam Line Pressure Negative Rate High Loop 3	1	PB-534C	2-SI-1-7			0.409	
	2	PB-535C	2-SI-1-8			0.409	
	3	PB-536C	2-SI-1-9			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Negative Rate High Loop 4	1	PB-544C	2-SI-1-10			0.409	
	2	PB-545C	2-SI-1-11			0.409	
	4	PB-546C	2-SI-1-127			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Low Loop 1	1	PB-514A	2-SI-1-1			0.409	
	2	PB-515A	2-SI-1-2			0.409	
	4	PB-516A	2-SI-1-3			0.409	
Steam Line Pressure Low Loop 2	1	PB-524A	2-SI-1-4			0.409	
	2	PB-525A	2-SI-1-5			0.409	
	3	PB-526A	2-SI-1-6			0.409	
Steam Line Pressure Low Loop 3	1	PB-534A	2-SI-1-7			0.409	
	2	PB-535A	2-SI-1-8			0.409	
	3	PB-536A	2-SI-1-9			0.409	
Steam Line Pressure Low Loop 4	1	PB-544A	2-SI-1-10			0.409	
	2	PB-545A	2-SI-1-11			0.409	
	4	PB-546A	2-SI-1-12			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Containment Pressure High-High	1	PB-937A	2-SI-30-45			0.409	
	2	PB-936A	2-SI-30-44			0.409	
	3	PB-935A	2-SI-30-43			0.409	
	4	PB-934A	2-SI-30-42			0.409	
Steam Generator Water Level High-High Loop 1	2	LB-519A	2-SI-3-1			0.409	
	3	LB-518A	2-SI-3-2			0.409	
	4	LB-517A	2-SI-3-3			0.409	
Steam Generator Water Level High-High Loop 2	2	LB-529A	2-SI-3-4			0.409	
	3	LB-528A	2-SI-3-5			0.409	
	4	LB-527A	2-SI-3-6			0.409	
Steam Generator Water Level High-High Loop 3	2	LB-539A	2-SI-3-7			0.409	
	3	LB-538A	2-SI-3-8			0.409	
	4	LB-537A	2-SI-3-9			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Steam Generator Water Level High-High Loop 4	2	LB-549A	2-SI-3-10			0.409	
	3	LB-548A	2-SI-3-11			0.409	
	4	LB-547A	2-SI-3-12			0.409	

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EAGLE 21 DATA ACQUISITION

Date ________

Subsection 6.2

ESFAS Parameter	Prot. Ch.	Vendor Bistable No.	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Containment Sump Level	1	LB-920A	2-SI-63-1			0.409	
	2	LB-921A	2-SI-63-2			0.409	
	3	LB-940A	2-SI-63-3			0.409	
	4	LB-941A	2-SI-63-4			0.409	
RWST Level	1	LB-913A	2-SI-63-50			0.409	
	2	LB-914A	2-SI-63-51			0.409	
	3	LB-915A	2-SI-63-52			0.409	
	4	LB-916A	2-SI-63-53			0.409	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Neutron Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.) [1]	Max (Sec.)	OTΔT Input Response Time[2] (Sec.)	Initial/Date
Power Range Neutron Flux-Low	1	K146	2-SI-99-241			0.065	N/A	
	2	K220	2-SI-99-242			0.065		
	3	K303	2-SI-99-243			0.065		
	4	K403	2-SI-99-244			0.065		
Power Range Neutron Flux-High [2]	1	K147	2-SI-99-241			0.065		
	2	K221	2-SI-99-242			0.065		
	3	K302	2-SI-99-243			0.065		
	4	K402	2-SI-99-244			0.065		
Source Range Flux - High[3]	1	K106	2-SI-99-31			0.100	N/A	
	2	K206	2-SI-99-32			0.100		

1 Times include the associated rack delay times and the input relay delay times.
2 **RECORD** the "Longest Time" from Upper or Lower Power Range Neutron Flux trips for use in Overtemperature ΔT trips.
3 2-SI-99-31 and 2-SI-99-32 should be one time field modified to include response time of the SSPS input relays.

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Temperature — Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Overpower ΔT	1	K111	2-SI-99-206			0.02	
	2	K235	2-SI-99-206			0.02	
	3	K322	2-SI-99-207			0.02	
	4	K422	2-SI-99-208			0.02	
Overtemperature ΔT	1	K112	2-SI-99-206			0.02	
	2	K236	2-SI-99-206			0.02	
	3	K323	2-SI-99-207			0.02	
	4	K421	2-SI-99-208			0.02	

Data Sheet 3
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Pressure/DP — Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Pressurizer Pressure-High	1	K130	2-SI-99-206			0.02	
	2	K212	2-SI-99-207			0.02	
	3	K316	2-SI-99-208			0.02	
	4	K415	2-SI-99-208			0.02	
Pressurizer Pressure-Low	1	K129	2-SI-99-206			0.02	
	2	K211	2-SI-99-207			0.02	
	3	K343	2-SI-99-208			0.02	
	4	K416	2-SI-99-208			0.02	

Data Sheet 3
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Pressure/DP   Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Reactor Coolant Flow Low-Loop 1	1	K125	2-SI-99-206			0.02	
	2	K213	2-SI-99-207			0.02	
	3	K312	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 2	1	K126	2-SI-99-206			0.02	
	2	K214	2-SI-99-207			0.02	
	3	K313	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 3	1	K127	2-SI-99-206			0.02	
	2	K227	2-SI-99-207			0.02	
	3	K314	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 4	1	K128	2-SI-99-206			0.02	
	2	K228	2-SI-99-207			0.02	
	3	K321	2-SI-99-208			0.02	

Data Sheet 3
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Pressure/DP

Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Generator Low-Low Level Loop 1	2	K230	2-SI-99-206			0.02	
	3	K331	2-SI-99-207			0.02	
	4	K407	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 2	2	K259	2-SI-99-206			0.02	
	3	K332	2-SI-99-207			0.02	
	4	K408	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 3	2	K260	2-SI-99-206			0.02	
	3	K333	2-SI-99-207			0.02	
	4	K409	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 4	2	K231	2-SI-99-206			0.02	
	3	K334	2-SI-99-207			0.02	
	4	K410	2-SI-99-208			0.02	

Data Sheet 3
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

Reactor Trips-Protective Relays Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.) [1]	Max (Sec.)	Initial/Date
RCP #1 Undervoltage	1	K124	2-SI-99-6			0.524	
RCP #2 Undervoltage	2	K239	2-SI-99-7			0.524	
RCP #3 Undervoltage	3	K328	2-SI-99-8			0.524	
RCP #4 Undervoltage	4	K413	2-SI-99-9			0.524	
RCP #1 Underfrequency	1	K151	2-SI-99-6			0.19	
RCP #2 Underfrequency	2	K251	2-SI-99-7			0.19	
RCP #3 Underfrequency	3	K336	2-SI-99-8			0.19	
RCP #4 Underfrequency	4	K426	2-SI-99-9			0.19	

1 Times include the associated sensing relay delay times and the input relay delay times to be used in the total reactor trip response time.

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP   Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Containment High Pressure	2	K217	2-SI-99-206			0.02	
	3	K330	2-SI-99-207			0.02	
	4	K430	2-SI-99-208			0.02	
Pressurizer Low Pressure	1	K131	2-SI-99-206			0.02	
	2	K201	2-SI-99-207			0.02	
	3	K344	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 1	1	K107	2-SI-99-206			0.02	
	2	K243	2-SI-99-207			0.02	
	4	K419	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 2	1	K115	2-SI-99-206			0.02	
	2	K246	2-SI-99-207			0.02	
	3	K319	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 3	1	K116	2-SI-99-206			0.02	
	2	K244	2-SI-99-207			0.02	
	3	K320	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP

Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Negative Rate High Loop 4	1	K117	2-SI-99-206			0.02	
	2	K245	2-SI-99-207			0.02	
	4	K420	2-SI-99-208			0.02	

Data Sheet 3
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Low Loop 1	1	K133	2-SI-99-206			0.02	
	2	K247	2-SI-99-207			0.02	
	4	K417	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 2	1	K134	2-SI-99-206			0.02	
	2	K203	2-SI-99-207			0.02	
	3	K317	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 3	1	K119	2-SI-99-206			0.02	
	2	K248	2-SI-99-207			0.02	
	3	K318	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 4	1	K118	2-SI-99-206			0.02	
	2	K204	2-SI-99-207			0.02	
	4	K418	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Containment Pressure High-High	1	K137	2-SI-99-206			0.02	
	2	K216	2-SI-99-206			0.02	
	3	K329	2-SI-99-207			0.02	
	4	K429	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 1	2	K218	2-SI-99-206			0.02	
	3	K308	2-SI-99-207			0.02	
	4	K431	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 2	2	K257	2-SI-99-206			0.02	
	3	K309	2-SI-99-207			0.02	
	4	K432	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Generator Water Level High-High Loop 3	2	K258	2-SI-99-206			0.02	
	3	K310	2-SI-99-207			0.02	
	4	K433	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 4	2	K219	2-SI-99-206			0.02	
	3	K311	2-SI-99-207			0.02	
	4	K434	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN A

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Containment Sump Level	1	K123	2-SI-99-206			0.02	
	2	K240	2-SI-99-207			0.02	
	3	K340	2-SI-99-208			0.02	
	4	K412	2-SI-99-208			0.02	
RWST Level	1	K150	2-SI-99-206			0.02	
	2	K250	2-SI-99-206			0.02	
	3	K335	2-SI-99-207			0.02	
	4	K425	2-SI-99-208			0.02	
Main Steam Vault Level High (South)	1	K114	2-SI-99-206			0.02	
	3	K354	2-SI-99-207			0.02	
	4	K439	2-SI-99-208			0.02	
Main Steam Vault Level High (North)	1	K113	2-SI-99-206			0.02	
	3	K355	2-SI-99-207			0.02	
	4	K440	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Neutron — Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.) [1]	Max (Sec.)	OTΔT Input Response Time[2] (Sec.)	Initial/Date
Power Range Neutron Flux-Low	1	K146	2-SI-99-241			0.065	N/A	
	2	K220	2-SI-99-242			0.065		
	3	K303	2-SI-99-243			0.065		
	4	K403	2-SI-99-244			0.065		
Power Range Neutron Flux-High [2]	1	K147	2-SI-99-241			0.065		
	2	K221	2-SI-99-242			0.065		
	3	K302	2-SI-99-243			0.065		
	4	K402	2-SI-99-244			0.065		
Source Range Flux High	1	K106	2-SI-99-31			0.100	N/A	
	2	K206	2-SI-99-32			0.100	N/A	

1 Times include the associated rack delay times and the input relay delay times.
2 **RECORD** the “Longest Time” from Upper or Lower Power Range Neutron Flux trips for use in Overtemperature ΔT trips.
3 2-SI-99-31 and 2-SI-99-32 should be field modified to include response time of the SSPS input relays.

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Temperature Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Overpower ΔT	1	K111	2-SI-99-206			0.02	
	2	K235	2-SI-99-206			0.02	
	3	K322	2-SI-99-207			0.02	
	4	K422	2-SI-99-208			0.02	
Overtemperature ΔT	1	K112	2-SI-99-206			0.02	
	2	K236	2-SI-99-206			0.02	
	3	K323	2-SI-99-207			0.02	
	4	K421	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Pressurizer Pressure-High	1	K130	2-SI-99-206			0.02	
	2	K212	2-SI-99-207			0.02	
	3	K316	2-SI-99-208			0.02	
	4	K415	2-SI-99-208			0.02	
Pressurizer Pressure-Low	1	K129	2-SI-99-206			0.02	
	2	K211	2-SI-99-207			0.02	
	3	K343	2-SI-99-208			0.02	
	4	K416	2-SI-99-208			0.02	

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Reactor Coolant Flow Low-Loop 1	1	K125	2-SI-99-206			0.02	
	2	K213	2-SI-99-207			0.02	
	3	K312	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 2	1	K126	2-SI-99-206			0.02	
	2	K214	2-SI-99-207			0.02	
	3	K313	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 3	1	K127	2-SI-99-206			0.02	
	2	K227	2-SI-99-207			0.02	
	3	K314	2-SI-99-208			0.02	
Reactor Coolant Flow Low-Loop 4	1	K128	2-SI-99-206			0.02	
	2	K228	2-SI-99-207			0.02	
	3	K321	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Pressure/DP — Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Generator Low-Low Level Loop 1	2	K230	2-SI-99-206			0.02	
	3	K331	2-SI-99-207			0.02	
	4	K407	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 2	2	K259	2-SI-99-206			0.02	
	3	K332	2-SI-99-207			0.02	
	4	K408	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 3	2	K260	2-SI-99-206			0.02	
	3	K333	2-SI-99-207			0.02	
	4	K409	2-SI-99-208			0.02	
Steam Generator Low-Low Level Loop 4	2	K231	2-SI-99-206			0.02	
	3	K334	2-SI-99-207			0.02	
	4	K410	2-SI-99-208			0.02	

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

Reactor Trips-Protective Relays — Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.) [1]	Max (Sec.)	Initial/Date
RCP #1 Undervoltage	1	K124	2-SI-99-6			0.524	
RCP #2 Undervoltage	2	K239	2-SI-99-7			0.524	
RCP #3 Undervoltage	3	K328	2-SI-99-8			0.524	
RCP #4 Undervoltage	4	K413	2-SI-99-9			0.524	
RCP #1 Underfrequency	1	K151	2-SI-99-6			0.19	
RCP #2 Underfrequency	2	K251	2-SI-99-7			0.19	
RCP #3 Underfrequency	3	K336	2-SI-99-8			0.19	
RCP #4 Underfrequency	4	K426	2-SI-99-9			0.19	

1 Times include the associated sensing relay delay times and the input relay delay times.

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Containment High Pressure	2	K217	2-SI-99-206			0.02	
	3	K330	2-SI-99-207			0.02	
	4	K430	2-SI-99-208			0.02	
Pressurizer Low Pressure	1	K131	2-SI-99-206			0.02	
	2	K201	2-SI-99-207			0.02	
	3	K344	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Times (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Negative Rate High Loop 1	1	K107	2-SI-99-206			0.02	
	2	K243	2-SI-99-207			0.02	
	4	K419	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 2	1	K115	2-SI-99-206			0.02	
	2	K246	2-SI-99-207			0.02	
	3	K319	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 3	1	K116	2-SI-99-206			0.02	
	2	K244	2-SI-99-207			0.02	
	3	K320	2-SI-99-208			0.02	
Steam Line Pressure Negative Rate High Loop 4	1	K117	2-SI-99-206			0.02	
	2	K245	2-SI-99-207			0.02	
	4	K420	2-SI-99-208			0.02	

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Steam Line Pressure Low Loop 1	1	K133	2-SI-99-206			0.02	
	2	K247	2-SI-99-207			0.02	
	4	K417	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 2	1	K134	2-SI-99-206			0.02	
	2	K203	2-SI-99-207			0.02	
	3	K317	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 3	1	K119	2-SI-99-206			0.02	
	2	K248	2-SI-99-207			0.02	
	3	K318	2-SI-99-208			0.02	
Steam Line Pressure Low Loop 4	1	K118	2-SI-99-206			0.02	
	2	K204	2-SI-99-207			0.02	
	4	K418	2-SI-99-208			0.02	

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP   Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Containment Pressure High-High	1	K137	2-SI-99-206			0.02	
	2	K216	2-SI-99-206			0.02	
	3	K329	2-SI-99-207			0.02	
	4	K429	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 1	2	K218	2-SI-99-206			0.02	
	3	K308	2-SI-99-207			0.02	
	4	K431	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 2	2	K257	2-SI-99-206			0.02	
	3	K309	2-SI-99-207			0.02	
	4	K432	2-SI-99-208			0.02	

Data Sheet 4
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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Steam Generator Water Level High-High Loop 3	2	K258	2-SI-99-206			0.02	
	3	K310	2-SI-99-207			0.02	
	4	K433	2-SI-99-208			0.02	
Steam Generator Water Level High-High Loop 4	2	K219	2-SI-99-206			0.02	
	3	K244	2-SI-99-207			0.02	
	4	K320	2-SI-99-208			0.02	

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SOLID STATE PROTECTION SYSTEM INPUT RELAYS DATA ACQUISITION -TRAIN B

Date ________

ESFAS-Pressure/DP Subsection 6.3

Parameter	Prot. Ch.	Input Relay	Procedure	Work Document	Time (Sec.)	Max (Sec.)	Initial/Date
Containment Sump Level	1	K123	2-SI-99-206			0.02	
	2	K240	2-SI-99-207			0.02	
	3	K340	2-SI-99-208			0.02	
	4	K412	2-SI-99-208			0.02	
RWST Level	1	K150	2-SI-99-206			0.02	
	2	K250	2-SI-99-206			0.02	
	3	K335	2-SI-99-207			0.02	
	4	K425	2-SI-99-208			0.02	
Main Steam Vault Level High (South)	1	K114	2-SI-99-206			0.02	
	3	K354	2-SI-99-207			0.02	
	4	K439	2-SI-99-208			0.02	
Main Steam Vault Level High (North)	1	K113	2-SI-99-206			0.02	
	3	K355	2-SI-99-207			0.02	
	4	K440	2-SI-99-208			0.02	

Data Sheet 5
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RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A] [1]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Power Range Neutron Flux-Low	1	0.065	N/A		0.006			
	2	0.065	N/A		0.006			
	3	0.065	N/A		0.006			
	4	0.065	N/A		0.006			
Power Range Neutron Flux-High	1	0.065	N/A		0.006			
	2	0.065	N/A		0.006			
	3	0.065	N/A		0.006			
	4	0.065	N/A		0.006			
Source Range Flux High	1		N/A		0.006			
	2		N/A		0.006			

1 Response time of neutron detectors is negligible. Response time includes NIS rack response, Reference 2.2C.4.

Data Sheet 5
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RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Overpower ΔT	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			
Overtemperature ΔT RTDs	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			

(1) Use "Longest Time" from Data Sheet 1 Page 1 for temperatures (RTD), for each protection channel.

Data Sheet 5
(Page 3 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Overtemperature ΔT Pressurizer Pressure	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			
Overtemperature ΔT ΔI	1	(2)	0.410		0.006			
	2	(2)	0.410		0.006			
	3	(2)	0.410		0.006			
	4	(2)	0.410		0.006			

(1) Use from Data Sheet 1 Page 2 for Pressurizer Pressure transmitter.
(2) Use "Longest Time" from Data Sheet 3 Page 1 for Power Range Neutron Flux input for OTΔT, for each protection channel.

Data Sheet 5
(Page 4 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Pressurizer Pressure-High	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Pressure Pressure-Low	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 5
(Page 5 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Reactor Coolant Flow Low-Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			

Data Sheet 5
(Page 6 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Steam Generator Low-Low Level Loop 1	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 2	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 3	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 4	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 5
(Page 7 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		EMF Decay [A]	Sensor Data Sheet 1 [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
RCP #1 Undervoltage	1	0.250			0.006			
RCP #2 Undervoltage	2	0.250			0.006			
RCP #3 Undervoltage	3	0.250			0.006			
RCP #4 Undervoltage	4	0.250			0.006			
RCP #1 Underfrequency	1	N/A			0.006			
RCP #2 Underfrequency	2	N/A			0.006			
RCP #3 Underfrequency	3	N/A			0.006			
RCP #4 Underfrequency	4	N/A			0.006			

Data Sheet 5
(Page 8 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Containment Pressure High	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Pressurizer Low Pressure	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			

Data Sheet 5
(Page 9 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Steam Line Pressure Low Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			
Steam Line Pressure Low Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Low Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Low Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			

Data Sheet 5
(Page 10 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Containment Pressure High-High	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 1	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 2	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 3	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 4	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 5
(Page 11 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN A

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 3 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train A	
Containment Sump Level	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
RWST Level	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Main Steam Vault Level High (South)	1	N/A	N/A		0.006			
	3	N/A	N/A		0.006			
	4	N/A	N/A		0.006			
Main Steam Vault Level High (North)	1	N/A	N/A		0.006			
	3	N/A	N/A		0.006			
	4	N/A	N/A		0.006			

Data Sheet 6
(Page 1 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A] [1]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Power Range Neutron Flux-Low	1	0.065	N/A		0.006			
	2	0.065	N/A		0.006			
	3	0.065	N/A		0.006			
	4	0.065	N/A		0.006			
Power Range Neutron Flux-High	1	0.065	N/A		0.006			
	2	0.065	N/A		0.006			
	3	0.065	N/A		0.006			
	4	0.065	N/A		0.006			
Source Range Flux High	1		N/A					
	2		N/A					

1 Response time of neutron detectors is negligible. Response time includes NIS rack response, Reference 2.2C.4.

Data Sheet 6
(Page 2 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Overpower ΔT	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			
Overtemperature ΔT RTDs	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			

(1) Use "Longest Time" from Data Sheet 1 Page 1 for temperatures (RTD), for each protection channel.

Data Sheet 6
(Page 3 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 Page 2[C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Overtemperature ΔT Pressurizer Pressure	1	(1)	0.409		0.006			
	2	(1)	0.409		0.006			
	3	(1)	0.409		0.006			
	4	(1)	0.409		0.006			
Overtemperature ΔT ΔI	1	(2)	0.410		0.006			
	2	(2)	0.410		0.006			
	3	(2)	0.410		0.006			
	4	(2)	0.410		0.006			

(1) Use from Data Sheet 1 Page 2 for Pressurizer Pressure transmitter.
(2) Use "Longest Time" from Data Sheet 4 Page 1 for Power Range Neutron Flux input for OTΔT, for each protection channel.

Data Sheet 6
(Page 4 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Pressurizer Pressure-High	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Pressure Pressure-Low	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 6
(Page 5 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Reactor Coolant Flow Low-Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Reactor Coolant Flow Low-Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			

Data Sheet 6
(Page 6 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trip Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Steam Generator Low-Low Level Loop 1	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 2	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 3	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Low-Low Level Loop 4	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 6
(Page 7 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

Reactor Trips Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		EMF Decay [A]	Sensor Data Sheet 1 [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
RCP #1 Undervoltage	1	0.250			0.006			
RCP #2 Undervoltage	2	0.250			0.006			
RCP #3 Undervoltage	3	0.250			0.006			
RCP #4 Undervoltage	4	0.250			0.006			
RCP #1 Underfrequency	1	N/A			0.006			
RCP #2 Underfrequency	2	N/A			0.006			
RCP #3 Underfrequency	3	N/A			0.006			
RCP #4 Underfrequency	4	N/A			0.006			

Data Sheet 6
(Page 8 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Containment Pressure High	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Pressurizer Low Pressure	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Negative Rate High Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			

Data Sheet 6
(Page 9 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Steam Line Pressure Low Loop 1	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			
Steam Line Pressure Low Loop 2	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Low Loop 3	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
Steam Line Pressure Low Loop 4	1		0.409		0.006			
	2		0.409		0.006			
	4		0.409		0.006			

Data Sheet 6
(Page 10 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Containment Pressure High-High	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 1	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 2	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 3	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Steam Generator Water Level High-High Loop 4	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			

Data Sheet 6
(Page 11 of 11)

RPS & ESFAS INPUT PROCESS PARAMETERS DATA SUMMARY - TRAIN B

Date ________

Subsection 6.4

ESFAS Parameter	Prot. Ch.	Times (Sec.)						Initial/Date
		Transducer Data Sheet 1 [A]	Eagle 21 Delay [B]	Input Relay Data Sheet 4 [C]	SSPS Logic [D]	Sum [A+B+C+D]	Longest Time Train B	
Containment Sump Level	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
RWST Level	1		0.409		0.006			
	2		0.409		0.006			
	3		0.409		0.006			
	4		0.409		0.006			
Main Steam Vault Level High (South)	1	N/A	N/A		0.006			
	3	N/A	N/A		0.006			
	4	N/A	N/A		0.006			
Main Steam Vault Level High (North)	1	N/A	N/A		0.006			
	3	N/A	N/A		0.006			
	4	N/A	N/A		0.006			

Data Sheet 7
(Page 1 of 1)

REACTOR TRIP BREAKERS DATA ACQUISITION & SUMMARY

Date ________

Subsection 6.5

Breaker	Trip Device	Train	Procedure	Work Document	Times (Sec.)			Initial/Date
					Breaker Trip Actual [A]	Breaker Trip Expected Max.	Longest Time UV or Shunt	
2-BKR-099-L116/2B REACTOR TRIP BREAKER A (RTA)	UV	A	2-SI-99-201-A		(1)	0.15		
	SHUNT	A	2-SI-99-201-A		(2)	0.15		
2-BKR-099-L116/2C REACTOR TRIP BREAKER B (RTB)	UV	B	2-SI-99-201-B		(1)	0.15		
	SHUNT	B	2-SI-99-201-B		(2)	0.15		
RECORD the Longest RT Breaker (UV or Shunt) and its associated time from the Longest Time UV or SHUNT column above:					Longest Reactor Trip Breaker Time		Sec.	

(1) UV trip time response includes logic + UV board + UV Coil
(2) Shunt trip time response includes logic + UV board + Shunt Coil

Data Sheet 8
(Page 1 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Power Range Neutron Flux-Low					0.50 Max	[AC]
Power Range Neutron Flux-High					0.50 Max	[AC]
Source Range Flux High					0.50 Max	[AC]

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Overpower ΔT					8.00 Max	[AC]
Overtemperature ΔT					8.00 Max	[AC]
Overtemperature (ΔI)					1.00 Max	[AC]
Overtemperature (Pressure)					2.00 Max	[AC]

Data Sheet 8
(Page 2 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Pressurizer Pressure-High					2.00 Max	[AC]
Pressurizer Pressure-Low					2.00 Max	[AC]

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Reactor Coolant Flow Low					1.20 Max	[AC]
Steam Generator Low-Low Level					2.00 Max	[AC]
RCP Undervoltage					1.50 Max	[AC]
RCP Underfrequency					0.60 Max	[AC]

Data Sheet 8
(Page 3 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.6

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Containment Pressure High					2.00 Max	[AC]
Pressurizer Low Pressure					2.00 Max	[AC]
Steam Line Pressure Low					2.00 Max	[AC]

Data Sheet 9
(Page 1 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Power Range Neutron Flux-Low					0.50 Max	[AC]
Power Range Neutron Flux-High					0.50 Max	[AC]
Source Range Flux High					0.50 Max	[AC]

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Overpower ΔT					8.00 Max	[AC]
Overtemperature ΔT					8.00 Max	[AC]
Overtemperature (ΔI)					1.00 Max	[AC]
Overtemperature (Pressure)					2.00 Max	[AC]

Data Sheet 9
(Page 2 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Pressurizer Pressure-High					2.00 Max	[AC]
Pressurizer Pressure-Low					2.00 Max	[AC]

Subsection 6.6

Reactor Trip Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Reactor Coolant Flow Low					1.20 Max	[AC]
Steam Generator Low-Low Level					2.00 Max	[AC]
RCP Undervoltage					1.50 Max	[AC]
RCP Underfrequency					0.60 Max	[AC]

Data Sheet 9
(Page 3 of 3)

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.6

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest RT Breaker Data Sheet 7 [B]	Sum [A + B]	Total = [Sum + 0.15 sec.]	Acceptance Criteria	
Containment Pressure High					2.00 Max	[AC]
Pressurizer Low Pressure					2.00 Max	[AC]
Steam Line Pressure Low					2.00 Max	[AC]

Data Sheet 10
(Page 1 of 1)

SSPS MASTER RELAY DATA ACQUISITION-TRAIN A

Date ________

Subsection 6.7

Function	Master Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Master Relay	Max Expected	Longest Master	
SI	K501	2-SI-99-205-A			0.026		
	K521	2-SI-99-205-A			0.026		
CIA	K502	2-SI-99-205-A			0.026		
	K522	2-SI-99-205-A			0.026		
CVI	K503	2-SI-99-205-A			0.026	N/A	
MSLI	K504	2-SI-99-205-A			0.026	N/A	
CSS	K505	2-SI-99-205-A			0.026		
	K519	2-SI-99-205-A			0.026		
CIB	K506	2-SI-99-205-A			0.026	N/A	
FWI	K507	2-SI-99-205-A			0.026	N/A	
MDAFWP	K515	2-SI-99-205-A			0.026	N/A	
TDAFWP	K516	2-SI-99-205-A			0.026	N/A	
SWP	K523	2-SI-99-205-A			0.026	N/A	

Data Sheet 11
(Page 1 of 1)

SSPS MASTER RELAY DATA ACQUISITION TRAIN B

Date ________

Subsection 6.7

Function	Master Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Master Relay	Max Expected	Longest Master	
SI	K501	2-SI-99-205-B			0.026		
	K521	2-SI-99-205-B			0.026		
CIA	K502	2-SI-99-205-B			0.026		
	K522	2-SI-99-205-B			0.026		
CVI	K503	2-SI-99-205-B			0.026	N/A	
MSLI	K504	2-SI-99-205-B			0.026	N/A	
CSS	K505	2-SI-99-205-B			0.026		
	K519	2-SI-99-205-B			0.026		
CIB	K506	2-SI-99-205-B			0.026	N/A	
FWI	K507	2-SI-99-205-B			0.026	N/A	
MDAFWP	K515	2-SI-99-205-B			0.026	N/A	
TDAFWP	K516	2-SI-99-205-B			0.026	N/A	
SWP	K523	2-SI-99-205-B			0.026	N/A	

Data Sheet 12
(Page 1 of 3)

SSPS SLAVE RELAY DATA ACQUISITION TRAIN A

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
SI	K601	2-PTI-262-1			0.036		
	K603	2-PTI-262-1			0.036		
	K608	2-PTI-262-1			0.036		
	K610	2-PTI-262-1			0.036		
	K609	2-PTI-262-1			0.036		
	K604	2-PTI-262-1			0.036		
	K611	2-PTI-262-1			0.036		
CIA	K605	2-PTI-262-1			0.036		
	K607	2-PTI-262-1			0.036		
	K613	2-PTI-262-1			0.036		
	K606	2-PTI-262-1			0.036		
	K612	2-PTI-262-1			0.036		
	K614	2-PTI-262-1			0.036		
	K630	2-PTI-262-1			0.036		
CVI	K615	2-PTI-262-1			0.036		
	K622	2-PTI-262-1			0.036		

Data Sheet 12
(Page 2 of 3)

SSPS SLAVE RELAY DATA ACQUISITION TRAIN A

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
MSLI	K616	2-PTI-99-04			0.036		
	K623	2-PTI-99-04			0.036		
CSS	K643	2-PTI-262-1			0.036		
	K644	2-PTI-262-1			0.036		
CIB	K618	2-PTI-262-1			0.036		
	K619	2-PTI-262-1			0.036		
	K625	2-PTI-262-1			0.036		
	K626	2-PTI-262-1			0.036		
FWI	K601	2-PTI-262-1			0.036		
	K620	2-PTI-99-04			0.036		
	K636	2-PTI-99-04			0.036		
	K610	2-PTI-262-1			0.036		
	K649	2-PTI-99-04			0.036		
	K621	2-PTI-99-04			0.036		

Data Sheet 12
(Page 3 of 3)

SSPS SLAVE RELAY DATA ACQUISITION TRAIN A

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
MDAFWP	K611	2-PTI-262-1			0.036		
	K633	2-PTI-99-04			0.036		
TDAFWP	K611	2-PTI-262-1			0.036		
	K634	2-PTI-99-04			0.036		
SWP	K648	2-PTI-99-04			0.036		
	K647	2-PTI-262-1			0.036		

Data Sheet 13
(Page 1 of 3)

SSPS SLAVE RELAY DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
SI	K601	2-PTI-262-2			0.036		
	K603	2-PTI-262-2			0.036		
	K608	2-PTI-262-2			0.036		
	K610	2-PTI-262-2			0.036		
	K609	2-PTI-262-2			0.036		
	K604	2-PTI-262-2			0.036		
	K611	2-PTI-262-2			0.036		
CIA	K605	2-PTI-262-2			0.036		
	K607	2-PTI-262-2			0.036		
	K613	2-PTI-262-2			0.036		
	K606	2-PTI-262-2			0.036		
	K612	2-PTI-262-2			0.036		
	K614	2-PTI-262-2			0.036		
	K630	2-PTI-262-2			0.036		
CVI	K615	2-PTI-262-2			0.036		
	K622	2-PTI-262-2			0.036		

Data Sheet 13
(Page 2 of 3)

SSPS SLAVE RELAY DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
MSLI	K616	2-PTI-99-04			0.036		
	K623	2-PTI-99-04			0.036		
CSS	K643	2-PTI-262-2			0.036		
	K644	2-PTI-262-2			0.036		
CIB	K618	2-PTI-262-2			0.036		
	K619	2-PTI-262-2			0.036		
	K625	2-PTI-262-2			0.036		
	K626	2-PTI-262-2			0.036		
FWI	K601	2-PTI-262-2			0.036		
	K620	2-PTI-99-04			0.036		
	K636	2-PTI-99-04			0.036		
	K610	2-PTI-262-2			0.036		
	K649	2-PTI-99-04			0.036		
	K621	2-PTI-99-04			0.036		

Data Sheet 13
(Page 3 of 3)

SSPS SLAVE RELAY DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.8

Function	Slave Relay	Procedure	Work Document	Times (Sec.)			Initial/Date
				Slave Relay	Max Expected	Longest Slave	
MDAFWP	K611	2-PTI-262-2			0.036		
	K633	2-PTI-99-04			0.036		
TDAFWP	K611	2-PTI-262-2			0.036		
	K634	2-PTI-99-04			0.036		
SWP	K648	2-PTI-99-04			0.036		
	K647	2-PTI-262-2			0.036		

Data Sheet 14
(Page 1 of 2)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.9

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest Master Relay Data Sheet 10 [B]	Longest Slave Relay Data Sheet 12 [C]	Actual Signal Initiation Sum [A+B+C]	Max Expected	
Containment Pressure High		________ (SI, CIA, CVI, FWI)	________ (SI, CIA, CVI, FWI)		2.00	
Pressurizer Pressure Low		________ (SI, CIA, CVI, FWI)	________ (SI, CIA, CVI, FWI)		2.00	
Steam Line Pressure Negative Rate High		________ (MSLI)	________ (MSLI)		2.00	
Steam Line Pressure Low		________ (SI, CIA, CVI, FWI, MSLI)	________ (SI, CIA, CVI, FWI, MSLI)		2.00	
Containment Pressure High-High		________ (CSS, CIB)	________ (CSS, CIB)		2.00	
		________ (MSLI)	________ (MSLI)		2.00	
Steam Generator Water Level High-High		________ (FWI)	________ (FWI)		2.50	
Steam Generator Water Level Low-Low		________ (MDAFW, TDAFW)	________ (MDAFW, TDAFW)		2.00	

Data Sheet 14
(Page 2 of 2)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.9

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 5 [A]	Longest Master Relay Data Sheet 10 [B]	Longest Slave Relay Data Sheet 12 [C]	Actual Signal Initiation Sum [A+B+C]	Max Expected	
RWST Level-Low CNTMT Sump Level-High	________ (Longest RWST or CNTMT Sump Lvl)	________ (SWP)	________ (SWP)		N/A	
Main Steam Vault Level High		________ (FWI)	________ (FWI)		2.00	

Data Sheet 15
(Page 1 of 2)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.9

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest Master Relay Data Sheet 11 [B]	Longest Slave Relay Data Sheet 13 [C]	Actual Signal Initiation Sum [A+B+C]	Max Expected	
Containment Pressure High		________ (SI, CIA, CVI, FWI)	________ (SI, CIA, CVI, FWI)		2.00	
Pressurizer Pressure Low		________ (SI, CIA, CVI, FWI)	________ (SI, CIA, CVI, FWI)		2.00	
Steam Line Pressure Negative Rate High		________ (MSLI)	________ (MSLI)		2.00	
Steam Line Pressure Low		________ (SI, CIA, CVI, FWI, MSLI)	________ (SI, CIA, CVI, FWI, MSLI)		2.00	
Containment Pressure High-High		________ (CSS, CIB)	________ (CSS, CIB)		2.00	
		________ (MSLI)	________ (MSLI)		2.00	
Steam Generator Water Level High-High		________ (FWI)	________ (FWI)		2.50	
Steam Generator Water Level Low-Low		________ (MDAFW, TDAFW)	________ (MDAFW, TDAFW)		2.00	

Data Sheet 15
(Page 2 of 2)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.9

ESFAS Parameters	Times (Sec.)					Initial/Date
	Longest Input Function Data Sheet 6 [A]	Longest Master Relay Data Sheet 11 [B]	Longest Slave Relay Data Sheet 13 [C]	Actual Signal Initiation Sum [A+B+C]	Max Expected	
RWST Level-Low CNTMT Sump Level-High	________ (Longest RWST or CNTMT Sump Lvl)	________ (SWP)	________ (SWP)		N/A	
Main Steam Vault Level High		________ (FWI)	________ (FWI)		2.00	

Data Sheet 16
(Page 1 of 15)

ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Safety Injection (SI-ECCS)	OPEN	2-LCV-62-135	Charging Pump Flow from RWST	2-SI-62-907			15.00		
	OPEN	2-LCV-62-136	RWST CVCS SUPPLY HDR ISOLATION	2-SI-62-907			15.00		
	CLOSED	2-LCV-62-132	VOLUME CONTROL TANK OUTLET ISOLATION	2-SI-62-907			10.00		
	CLOSED	2-FCV-62-90	Charging Flow Isolation	2-SI-62-907			10.00		[AC]
	OPEN	2-FCV-63-26	SIS BORON INJ TANK OUTLET ISOLATION	2-SI-63-915-A			20.00		[AC]
	OPEN	2-FCV-74-16	RHR HEAT EXCHANGER A OUTLET FLOW CONTROL	2-SI-99-603-A			10.00		
	Running	2-PMP-62-108	CNTFGL CHRG PMP 2A-A (CCP 2A-A)	2-SI-99-608-A			5.00		
	Running	2-PMP-63-10	SAFETY INJECTION PMP 2A-A (SIP 2A-A)	2-SI-99-608-A			5.00		
	Running	2-PMP-74-10	RHR MTR 2A-A (RHRP 2A-A)	2-SI-99-608-A			3.60		

Data Sheet 16
(Page 2 of 15)

ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date
						Actual	Max.	Longest	
Feedwater Isolation (FWI)	CLOSED	2-FCV-3-33	SG #1 MFW ISOL VLV	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-87	SG #3 MFW ISOL VLV	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-35	SG 1 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-48	SG 2 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-90	SG 3 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-103	SG 4 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-48A	SG 2 MFW BYPASS REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-103A	SG 4 MFW BYPASS REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-236	SG 1 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-239	SG 2 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-242	SG 3 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-245	SG 4 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-186	SG 2 MFW BACKFLUSH WARMING	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-188	SG 4 MFW BACKFLUSH WARMING	2-SI-3-904			6.50		

Data Sheet 16
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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA) - SG Blowdown	CLOSED	2-FCV-1-14	STEAM GENERATOR 2 BLOWDOWN CONTROL	2-SI-99-605-A			15.00		[AC]
	CLOSED	2-FCV-1-32	STEAM GENERATOR 4 BLOWDOWN CONTROL	2-SI-99-605-A			15.00		[AC]
Containment Isolation Phase A (CIA) - Quick Sample Vlvs	CLOSED	2-FCV-43-3	PRESSURIZER GAS SAMPLE ISOL	2-SI-99-605-A			5.00		[AC]
	CLOSED	2-FCV-43-12	PRESSURIZER LIQUID SAMPLE ISOL	2-SI-99-605-A			5.00		[AC]
	CLOSED	2-FCV-43-35	ACCUM TANK SAMPLE HDR ISOL	2-SI-99-605-A			5.00		[AC]
Containment Isolation Phase A (CIA)	CLOSED	2-FCV-31-306	INCORE INSTR RM AHU 2A CWR ISOL	2-SI-31-901-A			10.00		[AC]
	CLOSED	2-FCV-31-308	INCORE INSTR RM AHU 2A CWS ISOL	2-SI-31-901-A			10.00		[AC]
	CLOSED	2-FCV-31-326	INCORE INSTR RM AHU 2B CWR ISOL	2-SI-31-901-B			10.00		[AC]
	CLOSED	2-FCV-31-330	INCORE INSTR RM AHU 2B CWS ISOL	2-SI-31-901-B			10.00		[AC]

Data Sheet 16
(Page 4 of 15)

ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA)	CLOSED	2-FCV-43-23	HOT LEGS 1/3 SAMPLE ISOL	2-SI-99-605-A			10.00		[AC]
	CLOSED	2-FCV-43-55	STEAM GEN 1 DRUM/BLDN SAMPLE ISOL	2-SI-99-605-A			10.00		[AC]
	CLOSED	2-FCV-43-58	STEAM GEN 2 DRUM/BLDN SAMPLE ISOL	2-SI-99-605-A			10.00		[AC]
	CLOSED	2-FCV-43-61	STEAM GEN 3 DRUM/BLDN SAMPLE ISOL	2-SI-99-605-A			10.00		[AC]
	CLOSED	2-FCV-43-64	STEAM GEN 4 DRUM/BLDN SAMPLE ISOL	2-SI-99-605-A			10.00		[AC]
	CLOSED	2-FCV-62-63	CVCS SEAL WATER RETURN HEADER ISOL	2-SI-62-907			10.00		[AC]
	CLOSED	2-FCV-62-72	CVCS LETDOWN ORIFICE A ISOLATION	2-SI-62-907			10.00		[AC]
	CLOSED	2-FCV-62-73	CVCS LETDOWN ORIFICE B ISOLATION	2-SI-62-907			10.00		[AC]
	CLOSED	2-FCV-62-74	CVCS LETDOWN ORIFICE C ISOLATION	2-SI-62-907			10.00		[AC]

Data Sheet 16
(Page 5 of 15)

ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA)	CLOSED	2-FCV-62-76	CVCS LETDOWN ORIFICE 5 GPM ISOLATION	2-SI-62-907			10.00		[AC]
	CLOSED	2-FCV-63-64	SIS ACCUM TANK N2 HDR INLET VALVE	2-SI-63-915-A			10.00		[AC]
	CLOSED	2-FCV-63-71	SIS CHECK VLV TEST LINE HOLDUP TANK ISOL	2-SI-63-915-A			10.00		[AC]
	CLOSED	2-FCV-63-185	RHR SUPPLY 2-FCV-74-2 LEAK TEST LINE ISOL	2-SI-63-915-A			10.00		[AC]
	CLOSED	2-FCV-68-305	RCS FLOW CONT VLV WDS N2 MAN TO PRT	2-SI-68-904-A			10.00		[AC]
	CLOSED	2-FCV-68-307	PRESSURIZER RELIEF TANK GAS ANALYZER SUPPLY	2-SI-68-904-A			10.00		[AC]
	CLOSED	2-FCV-77-10	RCDT PUMP DISCHARGE FLOW CONTROL	2-SI-77-904-A			10.00		[AC]
	CLOSED	2-FCV-77-17	RCDT TO GAS ANALYZER FLOW CONTROL	2-SI-77-904-A			10.00		[AC]
	CLOSED	2-FCV-77-19	RCDT TO VENT HDR FLOW CONTROL	2-SI-77-904-A			10.00		[AC]
	CLOSED	2-FCV-77-20	RCDT N2 SUPPLY FLOW CONTROL	2-SI-77-904-A			10.00		[AC]
	CLOSED	2-FCV-77-128	RB SUMP DISCHARGE FLOW CONTROL	2-SI-77-904-A			10.00		[AC]
	CLOSED	2-FCV-81-12	PW RCS PRESS RELF TNK & RCP STANDPIPES	2-SI-81-903			10.00		[AC]

Data Sheet 16
(Page 6 of 15)

ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
CIA-Fire Prot.	CLOSED	2-FCV-26-240	REACTOR BLDG STANDPIPE ISOL	2-SI-26-901			20.00		[AC]
	CLOSED	2-FCV-26-243	REACTOR COOLANT PUMP SPRINKLER HDR ISOL	2-SI-26-901			20.00		[AC]
CIA-Ice Cond.	CLOSED	2-FCV-61-96	GLYCOL COOLED FLOOR SUPPLY HEADER ISOL	2-SI-61-901-A			30.00		[AC]
	CLOSED	2-FCV-61-110	GLYCOL COOLED FLOOR RETURN HEADER ISOL	2-SI-61-901-A			30.00		[AC]
	CLOSED	2-FCV-61-191	GLYCOL SUPPLY TO AHUS CONTAINMENT ISOLATION	2-SI-61-901-A			30.00		[AC]
	CLOSED	2-FCV-61-193	GLYCOL RETURN AUX BLDG ISOLATION	2-SI-61-901-A			30.00		[AC]
CIA-CCS	CLOSED	2-FCV-70-143	EXCESS LETDOWN HX CCS SUPPLY	2-SI-70-908-A			66.00	N/A	[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase B (CIB)	CLOSED	2-FCV-67-87	LOWER CNTMT CLR HDR A ERCW RET ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-89	LWR CNTMT A CLRS SUP ISOL VLV INSIDE CNTMT	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-95	LOWER CNTMT CLR HDR C ERCW RET ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-97	LWR CNTMT A CLRS SUP ISOL VLV INSIDE CNTMT	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-99	LOWER CNTMT CLR HDR B ERCW SUP ISOL	2-SI-67-908-B			66.00		[AC]
	CLOSED	2-FCV-67-104	LOWER CNTMT CLR HDR B ERCW RET ISOL	2-SI-67-908-B			66.00		[AC]
	CLOSED	2-FCV-67-107	LOWER CNTMT CLR HDR D ERCW SUP ISOL	2-SI-67-908-B			66.00		[AC]
	CLOSED	2-FCV-67-112	LOWER CNTMT CLR HDR D ERCW RET ISOL	2-SI-67-908-B			66.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase B (CIB)	CLOSED	2-FCV-67-130	UPPER CNTMT VENT CLR 2A ERCW SUP HDR ISOL	2-SI-67-907-A			66.00		[AC]
	CLOSED	2-FCV-67-133	UPPER CNTMT VENT CLR 2C ERCW SUP HDR ISOL	2-SI-67-907-A			66.00		[AC]
	CLOSED	2-FCV-67-139	UPPER CNTMT VENT CLR 2B ERCW RET HDR ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-67-142	UPPER CNTMT VENT CLR 2D ERCW RET HDR ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-67-295	UPPER CNTMT VENT CLR 2A ERCW RET ISOL	2-SI-67-907-A			66.00		[AC]
	CLOSED	2-FCV-67-296	UPPER CNTMT VENT CLR 2C ERCW RET ISOL	2-SI-67-907-A			66.00		[AC]
	OPEN	2-FCV-70-90	THERMAL BARRIER CCS RETURN	2-SI-70-908-A			66.00		[AC]
	OPEN	2-FCV-70-92	RCP OIL COOLER CCS RETURN	2-SI-70-908-A			66.00		[AC]
	OPEN	2-FCV-70-100	RCP OIL COOLER CCS SUPPLY	2-SI-70-908-A			66.00		[AC]
CIB - Quick Vlvs	CLOSED	2-FCV-32-81-A	ESSENT CONTROL AIR TR A CNTMT ISOL	2-SI-32-901-A			10.00	N/A	[AC]
	CLOSED	2-FCV-32-111-B	NON-ESSENT CONTROL AIR TR A CNTMT ISOL	2-SI-32-901-A			10.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

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Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Ventilation Isolation	CLOSED	2-FCV-30-7	CNTMT UPPER COMPARTMENT PURGE SUPPLY	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-10	UPPER COMPT PURGE ISOL VALVE	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-14	LOWER COMPT PURGE ISOL VALVE	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-17	CNTMT LOWER COMPARTMENT PURGE SUPPLY	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-20	INCORE INSTR RM PURGE ISOL VLV	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-40	CNTMT LOWER COMPARTMENT PURGE EXH PRESS RELIEF	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-51	CNTMT UPPER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-52	CNTMT UPPER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-56	CNTMT LOWER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-A			4.00		[AC]
	CLOSED	2-FCV-30-59	CNTMT INSTRUMENT RM EXHAUST ISOLATION	2-SI-30-901-A			4.00		[AC]

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Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
CIA-Secondary Containment Purge Isolation Supports EGTS	CLOSED	2-FCV-30-2	CONTAINMENT PURGE AIR SUPPLY FAN 2A DISCHARGE	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-5	CONTAINMENT PURGE AIR SUPPLY FAN 2B DISCHARGE	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-12	CNTMT ANNULUS PURGE SUPPLY	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-54	CNTMT ANNULUS PURGE EXHAUST	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-61	CNTMT PURGE AIR EXHAUST FAN 2A SUCTION	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-62	CNTMT PURGE AIR EXHAUST FAN 2B SUCTION	2-SI-30-901-A			10.70		[AC]
CVI-Rad. Mon.	CLOSED	2-FCV-90-107	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	2-SI-90-901-A			5.00		[AC]
	CLOSED	2-FCV-90-111	CNTMT BLDG LOWER COMPT AIR RAD MON RETURN	2-SI-90-901-A			5.00		[AC]
	CLOSED	2-FCV-90-113	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	2-SI-90-901-A			5.00		[AC]
	CLOSED	2-FCV-90-117	CNTMT BLDG UPPER COMPT AIR RAD MON RETURN	2-SI-90-901-A			5.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Spray	OPEN	2-FCV-72-39	CNTMT SPRAY HDR A ISOLATION	2-SI-72-906-A			21.50	N/A	
	Running	2-PMP-72-27	CONTAINMENT SPRAY PUMP 2A-A MOTOR	2-PTI-072-01			5.00	N/A	
Main Steamline Isolation	CLOSED	2-FCV-1-4	MAIN STEAM ISOL VLV LOOP 1	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-11	MAIN STEAM ISOL VLV LOOP 2	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-22	MAIN STEAM ISOL VLV LOOP 3	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-29	MAIN STEAM ISOL VLV LOOP 4	2-SI-1-904			6.00		

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
AFW Pump (MD)	Running	2-MTR-3-118	AUX FEEDWATER PMP 2A-A	2-SI-99-633-A[(5)]			19.00		
	OPEN	2-LCV-3-156	SG 2 SUPPLY FRM PMP A-A	2-SI-99-633-A			19.00		
	OPEN	2-LCV-3-164	SG 1 SUPPLY FRM PMP A-A	2-SI-99-633-A			19.00		
	OPEN	2-PCV-3-122	AFWP A-A DISCH PRESS CONTROL	2-SI-99-633-A			19.00		
	CLOSED	2-FCV-3-355	AFWP 2A-A RECIR C FLOW CONTROL	2-SI-99-633-A			19.00		
AFW Pump (TD)	Running	2-PMP-3-2A-S	TD AUX FEEDWATER PUMP 2A-S	2-SI-99-634-A[(6)]			55.58		
	OPEN	2-LCV-3-172	SG 3 SUPPLY FROM TD PUMP	2-SI-99-634-A			55.58		
	OPEN	2-LCV-3-173	SG 2 SUPPLY FROM TD PUMP	2-SI-99-634-A			55.58		
	OPEN	2-LCV-3-174	SG 1 SUPPLY FROM TD PUMP	2-SI-99-634-A			55.58		
	OPEN	2-LCV-3-175	SG 4 SUPPLY FROM TD PUMP	2-SI-99-634-A			55.58		

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

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Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
ERCW	Running	0-MTR-67-28	ERCW PMP MTR A-A	2-SI-99-611-A			44.84		
	Running	0-MTR-67-32	ERCW PMP MTR B-A	2-SI-99-611-A			44.84		
	Running	0-MTR-67-36	ERCW PMP MTR C-A	2-SI-99-611-A			44.84		
	Running	0-MTR-67-40	ERCW PMP MTR D-A	2-SI-99-611-A			44.84		
CCS System - Normal Power	Running	2-PMP-70-46	COMPONENT COOLING SYSTEM PUMP 2A-A MOTOR (Normal Power)	2-SI-99-608-A			18.00		
	Running	0-PMP-70-51	COMPONENT COOLING SYSTEM PUMP C-S MOTOR (Normal Power)	2-SI-99-608-A			18.00		
CCS System - Emergency Power	Running	2-PMP-70-46	COMPONENT COOLING SYSTEM PUMP 2A-A MOTOR (Emergency Power)	2-SI-99-608-A			10.00		
	Running	0-PMP-70-51	COMPONENT COOLING SYSTEM PUMP C-S MOTOR (Emergency Power)	2-SI-99-608-A			10.00		
DG Start	START	DG 2A-A	DIESEL GENERATOR 2A-A	2-PTI-262-1[(2)(3)]			10.00	N/A	
Air Rm Fan	START	2-MTR-30-38	CONTAINMENT AIR RETURN FAN 2A-A	2-SI-30-26-A[(4)]			≥480.00 ≤600.00	N/A	

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Turbine Trip	CLOSED	2-ZS-47-28	TURBINE STEAM STOP VLV	2-SI-99-601-A			0.75		
	CLOSED	2-ZS-47-30	TURBINE STEAM STOP VLV	2-SI-99-601-A			0.75		
	CLOSED	2-ZS-47-32	TURBINE STEAM STOP VLV	2-SI-99-601-A			0.75		
	CLOSED	2-ZS-47-34	TURBINE STEAM STOP VLV	2-SI-99-601-A			0.75		
RWST/Sump Swapover	OPEN	2-FCV-63-72	CONTAINMENT SUMP TO RHR PUMP 2A-A ISOL	2-SI-63-903-A			60.00		
	CLOSED	2-FCV-74-3	RHR PUMP 2A-A SUCTION	2-SI-99-648-A			60.00		
EGTS	Running	0-MTR-65-23	EMERGENCY GAS TREATMENT SYS (A-A)	2-PTI-262-1			18.00	N/A	

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN A

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date
						Actual	Max. [1]	Longest	
MDAFW 2A-A Suction Swapover	CLOSED	2-FCV-3-116A	ERCW HDR A ISOLATION VALVE	2-SI-3-201-A			10		
	CLOSED	2-FCV-3-116B	ERCW HDR A ISOLATION VALVE	2-SI-3-201-A			10		
TDAFW 2A-S Suction Swapover	CLOSED	2-FCV-3-136A	ERCW HDR A ISOLATION VALVE	2-SI-3-201-A			15		
	CLOSED	2-FCV-3-136B	ERCW HDR A ISOLATION VALVE	2-SI-3-201-A			15		

	Times (Sec.)				Initial/Date [1]
	RWST-CVCS Isolation [A]	VCT-CVCS Isolation [B]	RWST/VCT Swapover Total Sum [A+B]	Max. [1]	
RWST/VCT Swapover	________ (Longest 2-LCV-62-135 or -136)	________ (2-LCV-62-132)		25.00	

1 For components with [AC] in the associated Initial/date column, the listed Max. time(s) are Acceptance Criteria; all other listed Max. time(s) are expected values.
2 DG 2A-A start time is recorded from 2-PTI-262-1 Attachment 15, DG 2A-A EMERG FDR BKR CLOSED elapsed time.
3 Diesel Start Time on Actuation of ESF - Offsite Power Available
4 Response time of Containment Air Return Fan 2A-A is taken from calculation done in Step 6.10[10]
5 Time includes MDAFW pump at full pressure and a fixed factor of 5.54 seconds included from the applicable Surveillance Instruction
6 Time includes TDAFW pump at full pressure and a fixed factor of 8.7 seconds included from the applicable Surveillance Instruction

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Safety Injection (SI-ECCS)	OPEN	2-LCV-62-135	RWST CVCS SUPPLY HDR ISOLATION	2-SI-62-907			15.00		
	OPEN	2-LCV-62-136	Charging Pump Flow from RWST	2-SI-62-907			15.00		
	CLOSED	2-LCV-62-133	VOLUME CONTROL TANK OUTLET ISOLATION	2-SI-62-907			10.00		
	CLOSED	2-FCV-62-91	CVCS CHARGING HEADER ISOLATION	2-SI-62-907			10.00		[AC]
	OPEN	2-FCV-63-25	SIS BORON INJ TANK OUTLET ISOLATION	2-SI-63-915-B			20.00		[AC]
	OPEN	2-FCV-74-28	RHR HEAT EXCHANGER B OUTLET FLOW CONTROL	2-SI-99-603-B			10.00		
	Running	2-PMP-62-104	CNTFGL CHRG PMP 2B-B (CCP 2B-B)	2-SI-99-608-B			5.00		
	Running	2-PMP-63-15	SAFETY INJECTION PMP 2B-B (SIP 2B-B)	2-SI-99-608-B			5.00		
	Running	2-PMP-74-20	RHR MTR 2B-B (RHRP 2B-B)	2-SI-99-608-B			3.60		

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Feedwater Isolation (FWI)	CLOSED	2-FCV-3-47	SG #2 MFW ISOL VLV	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-100	SG #4 MFW ISOL VLV	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-35	SG 1 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-48	SG 2 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-90	SG 3 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-103	SG 4 MFW REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-35A	SG 1 MFW BYPASS REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-90A	SG 3 MFW BYPASS REG VALVE	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-236	SG 1 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-239	SG 2 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-242	SG 3 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-245	SG 4 MFW BYPASS LINE ISOL	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-185	SG 1 MFW BACKFLUSH WARMING	2-SI-3-904			6.50		
	CLOSED	2-FCV-3-187	SG 3 MFW BACKFLUSH WARMING	2-SI-3-904			6.50		

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA) - SG Blowdown	CLOSED	2-FCV-1-7	STEAM GENERATOR 1 BLOWDOWN CONTROL	2-SI-99-605-B			15.00		[AC]
	CLOSED	2-FCV-1-25	STEAM GENERATOR 3 BLOWDOWN CONTROL	2-SI-99-605-B			15.00		[AC]
Containment Isolation Phase A (CIA) - Quick Sample Vlvs	CLOSED	2-FCV-43-2	PRESSURIZER GAS SAMPLE ISOL	2-SI-99-605-B			5.00		[AC]
	CLOSED	2-FCV-43-11	PRESSURIZER LIQUID SAMPLE ISOL	2-SI-99-605-B			5.00		[AC]
	CLOSED	2-FCV-43-34	ACCUM TANK SAMPLE HDR ISOL	2-SI-99-605-B			5.00		[AC]
CIA-Ice Cond.	CLOSED	2-FCV-61-97	GLYCOL COOLED FLOOR SUPPLY HEADER ISOL	2-SI-61-901-B			30.00		[AC]
	CLOSED	2-FCV-61-122	GLYCOL COOLED FLOOR RETURN HEADER ISOL	2-SI-61-901-B			30.00		[AC]
	CLOSED	2-FCV-61-192	GLYCOL SUPPLY TO AHUS CONTAINMENT ISOLATION	2-SI-61-901-B			30.00		[AC]
	CLOSED	2-FCV-61-194	GLYCOL RETURN CONTAINMENT ISOLATION	2-SI-61-901-B			30.00		[AC]

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA)	CLOSED	2-FCV-31-329	INCORE INSTR RM AHU 2B CWS ISOL	2-SI-31-901-B			10.00		[AC]
	CLOSED	2-FCV-43-22	HOT LEGS 1/3 SAMPLE ISOL	2-SI-99-605-B			10.00		[AC]
	CLOSED	2-FCV-31-305	INCORE INSTR RM AHU 2A CWR ISOL	2-SI-31-901-A			10.00		[AC]
	CLOSED	2-FCV-31-309	INCORE INSTR RM AHU 2A CWS ISOL	2-SI-31-901-A			10.00		[AC]
	CLOSED	2-FCV-31-327	INCORE INSTR RM AHU 2B CWR ISOL	2-SI-31-901-B			10.00		[AC]
	CLOSED	2-FCV-62-61	CVCS SEAL WATER RETURN HEADER ISOL	2-SI-62-907			10.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase A (CIA)	CLOSED	2-FCV-62-77	CVCS LP LETDOWN ISOL	2-SI-62-907			10.00		[AC]
	CLOSED	2-FCV-63-23	COLD LEG ACCUMULATOR FILL FROM SIP 2A-A ISV	2-SI-63-915-B			10.00		[AC]
	CLOSED	2-FCV-63-84	SIS CHECK VLV LEAK TEST HOLDUP TANK ISOL	2-SI-63-915-B			10.00		[AC]
	CLOSED	2-FCV-68-308	PRESSURIZER RELIEF TANK GAS ANALYZER SUPPLY	2-SI-68-904-B			10.00		[AC]
	CLOSED	2-FCV-70-85	EXCESS LTDN HX CCS OUTLET	2-SI-70-908-B			10.00		[AC]
	CLOSED	2-FCV-77-9	RCDT PUMP DISCHARGE FLOW CONTROL	2-SI-77-904-B			10.00		[AC]
	CLOSED	2-FCV-77-16	RCDT TO GAS ANALYZER FLOW CONTROL	2-SI-77-904-B			10.00		[AC]
	CLOSED	2-FCV-77-18	RCDT TO VENT HDR	2-SI-77-904-B			10.00		[AC]
	CLOSED	2-FCV-77-127	RB SUMP DISCHARGE FLOW CONTROL	2-SI-77-904-B			10.00		[AC]

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ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase B (CIB)	CLOSED	2-FCV-67-83	LOWER CNTMT CLR HDR A ERCW SUP ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-88	LOWER CNTMT CLR HDR A ERCW RET ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-91	LOWER CNTMT CLR HDR C ERCW SUP ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-96	LOWER CNTMT CLR HDR C ERCW RET ISOL	2-SI-67-908-A			66.00		[AC]
	CLOSED	2-FCV-67-103	LOWER CNTMT CLR HDR B ERCW RET ISOL	2-SI-67-908-B			66.00		[AC]
	CLOSED	2-FCV-67-105	LWR CNTMT B CLRS SUP ISOL VLV INSIDE CNTMT	2-SI-67-908-B			66.00		
	CLOSED	2-FCV-67-111	LOWER CNTMT CLR HDR D ERCW RET ISOL	2-SI-67-908-B			66.00		
	CLOSED	2-FCV-67-113	LWR CNTMT D CLRS SUP ISOL VLV INSIDE CNTMT	2-SI-67-908-B			66.00		
	CLOSED	2-FCV-67-131	UPPER CNTMT VENT CLR 2A ERCW RET HDR ISOL	2-SI-67-907-A			66.00		
	CLOSED	2-FCV-67-134	UPPER CNTMT VENT CLR 2C ERCW RET HDR ISOL	2-SI-67-907-A			66.00		

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Isolation Phase B (CIB)	CLOSED	2-FCV-67-138	UPPER CNTMT VENT CLR 2B ERCW SUP HDR ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-67-141	UPPER CNTMT VENT CLR 2D ERCW SUP HDR ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-67-297	UPPER CNTMT VENT CLR 2B ERCW RET ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-67-298	UPPER CNTMT VENT CLR 2D ERCW RET ISOL	2-SI-67-907-B			66.00		[AC]
	CLOSED	2-FCV-70-87	THERMAL BARRIER CCS RETURN	2-SI-70-908-B			66.00		[AC]
	CLOSED	2-FCV-70-89	RCP OIL CLR RET CNTMT ISOL VLV	2-SI-70-908-B			66.00		[AC]
	CLOSED	2-FCV-70-134	THERMAL BARRIER CCS SUPPLY	2-SI-70-908-B			66.00		[AC]
	CLOSED	2-FCV-70-140	RCP OIL COOLER CCS SUPPLY	2-SI-70-908-B			66.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
CIB- - Quick Vlvs	CLOSED	2-FCV-32-103-B	REACTOR BUILDING ISOL VLV	2-SI-32-901-B			10.00		[AC]
Containment Ventilation Isolation	CLOSED	2-FCV-30-8	UPPER COMPT PURGE ISOL VALVE	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-9	UPPER COMPT PURGE ISOL VALVE	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-15	LOWER COMPT PURGE ISOL VALVE	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-16	CNTMT LOWER COMPARTMENT PURGE SUPPLY	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-19	CNTMT INCORE INSTR ROOM PURGE SUPPLY	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-37	CNTMT LOWER COMPARTMENT PURGE EXH PRESS RELIEF	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-50	CNTMT UPPER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-B			4.00		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Containment Ventilation Isolation	CLOSED	2-FCV-30-53	CNTMT UPPER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-57	CNTMT LOWER COMPARTMENT EXHAUST ISOLATION	2-SI-30-901-B			4.00		[AC]
	CLOSED	2-FCV-30-58	CNTMT INSTRUMENT ROOM EXHAUST ISOLATION	2-SI-30-901-B			4.00		[AC]
CIA-Secondary Containment Purge Isolation Supports EGTS	CLOSED	2-FCV-30-2	CONTAINMENT PURGE AIR SUPPLY FAN 2A DISCHARGE	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-5	CONTAINMENT PURGE AIR SUPPLY FAN 2B DISCHARGE	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-12	CNTMT ANNULUS PURGE SUPPLY	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-54	CNTMT ANNULUS PURGE EXHAUST	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-61	CNTMT PURGE AIR EXHAUST FAN 2A SUCTION	2-SI-30-901-A			10.70		[AC]
	CLOSED	2-FCV-30-62	CNTMT PURGE AIR EXHAUST FAN 2B SUCTION	2-SI-30-901-A			10.70		[AC]

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
CVI-Rad. Mon.	CLOSED	2-FCV-90-108	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	2-SI-30-901-B			5.00		[AC]
	CLOSED	2-FCV-90-109	CNTMT BLDG LOWER COMPT AIR RAD MON SUPPLY	2-SI-30-901-B			5.00		[AC]
	CLOSED	2-FCV-90-110	CNTMT BLDG UPPER COMPT AIR RAD MON RETURN	2-SI-30-901-B			5.00		[AC]
	CLOSED	2-FCV-90-114	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	2-SI-30-901-B			5.00		[AC]
	CLOSED	2-FCV-90-115	CNTMT BLDG UPPER COMPT AIR RAD MON SUPPLY	2-SI-30-901-B			5.00		[AC]
	CLOSED	2-FCV-90-116	CNTMT BLDG UPPER COMPT AIR RAD MON RETURN	2-SI-30-901-B			5.00		[AC]
Containment Spray	OPEN	2-FCV-72-2	CNTMT SPRAY HDR B ISOLATION	2-SI-72-906-B			21.50	N/A	
	Running	2-PMP-72-10	CONTAINMENT SPRAY PUMP 2B-B MOTOR	2-PTI-072-01			5.00	N/A	

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Main Steamline Isolation	CLOSED	2-FCV-1-4	MAIN STEAM ISOL VLV LOOP 1	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-11	MAIN STEAM ISOL VLV LOOP 2	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-22	MAIN STEAM ISOL VLV LOOP 3	2-SI-1-904			6.00		
	CLOSED	2-FCV-1-29	MAIN STEAM ISOL VLV LOOP 4	2-SI-1-904			6.00		
AFW Pump (MD)	Running	2-MTR-3-128	AUX FEEDWATER PMP 2B-B	2-SI-99-633-B[(5)]			19.00		
	OPEN	2-LCV-3-148	SG 3 SUPPLY FRM PMP B-B	2-SI-99-633-B			19.00		
	OPEN	2-LCV-3-171	SG 4 SUPPLY FRM PMP B-B	2-SI-99-633-B			19.00		
	OPEN	2-PCV-3-132	AFWP B-B DISCH PRESS CONTROL	2-SI-99-633-B			19.00		
	CLOSED	2-FCV-3-359	AFWP 2-B-B RECIR C FLOW CONTROL	2-SI-99-633-B			19.00		
AFW Pump (TD)	Running	2-PMP-3-2A-S	TD AUX FEEDWATER PUMP 2A-S	2-SI-99-634-B[(6)]			58.58		
	OPEN	2-LCV-3-172	SG 3 SUPPLY FROM TD PUMP	2-SI-99-634-B			58.58		
	OPEN	2-LCV-3-173	SG 2 SUPPLY FROM TD PUMP	2-SI-99-634-B			58.58		
	OPEN	2-LCV-3-174	SG 1 SUPPLY FROM TD PUMP	2-SI-99-634-B			58.58		
	OPEN	2-LCV-3-175	SG 4 SUPPLY FROM TD PUMP	2-SI-99-634-B			58.58		

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
ERCW	Running	0-MTR-67-47	ERCW PMP MTR E-B	2-SI-99-611-B			44.84		
	Running	0-MTR-67-51	ERCW PMP MTR F-B	2-SI-99-611-B			44.84		
	Running	0-MTR-67-55	ERCW PMP MTR G-B	2-SI-99-611-B			44.84		
	Running	0-MTR-67-59	ERCW PMP MTR H-B	2-SI-99-611-B			44.84		
CCS System - Normal Power	Running	2-PMP-70-33	COMPONENT COOLING SYSTEM PUMP 2B-B MOTOR (Normal Power)	2-SI-99-608-B			18.00		
	Running	0-PMP-70-51	COMPONENT COOLING SYSTEM PUMP C-S MOTOR (Normal Power)	2-SI-99-608-B			18.00		
CCS System - Emergency Power	Running	2-PMP-70-33	COMPONENT COOLING SYSTEM PUMP 2B-B MOTOR (Emergency Power)	2-SI-99-608-B			10.00		
	Running	0-PMP-70-51	COMPONENT COOLING SYSTEM PUMP C-S MOTOR (Emergency Power)	2-SI-99-608-B			10.00		
DG Start	START	DG 2B-B	DIESEL GENERATOR 2B-B	2-PTI-262-2[(2) (3)]			10.00	N/A	
Air Return Fan	START	2-MTR-30-39	CONTAINMENT AIR RETURN FAN 2B-B	2-SI-30-26-B[(4)]			≥480.00 ≤600.00	N/A	

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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date [1]
						Actual	Max. [1]	Longest	
Turbine Trip	CLOSED	2-ZS-47-28	TURBINE STEAM STOP VLV	2-SI-99-601-B			0.75		
	CLOSED	2-ZS-47-30	TURBINE STEAM STOP VLV	2-SI-99-601-B			0.75		
	CLOSED	2-ZS-47-32	TURBINE STEAM STOP VLV	2-SI-99-601-B			0.75		
	CLOSED	2-ZS-47-34	TURBINE STEAM STOP VLV	2-SI-99-601-B			0.75		
RWST/Sump Swapover	OPEN	2-FCV-63-73	CONTAINMENT SUMP TO RHR PUMP 2B-B ISOL	2-SI-63-903-A			60.00		
	CLOSED	2-FCV-74-21	RHR PUMP 2B-B SUCTION	2-SI-99-648-B			60.00		
EGTS	Running	0-MTR-65-42	EMERGENCY GAS TREATMENT SYS (B-B)	2-PTI-262-2			18.00	N/A	

Data Sheet 17
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ESFAS ACTUATED COMPONENT DATA ACQUISITION - TRAIN B

Date ________

Subsection 6.10

ESFAS Function	ESFAS Position	Component ID	Nomenclature	Procedure	Work Document	Times (Sec.)			Initial/Date
						Actual	Max. [1]	Longest	
MDAFW 2B-B Suction Swapover	CLOSED	2-FCV-3-126A	ERCW HDR B ISOLATION VALVE	2-SI-3-201-B			10		
	CLOSED	2-FCV-3-126B	ERCW HDR B ISOLATION VALVE	2-SI-3-201-B			10		
TDAFW 2A-S Suction Swapover	CLOSED	2-FCV-3-179A	ERCW HDR B ISOLATION VALVE	2-SI-3-201-B			15		
	CLOSED	2-FCV-3-179B	ERCW HDR B ISOLATION VALVE	2-SI-3-201-B			15		

ESFAS Function	Times (Sec.)				Initial/Date [1]
	RWST-CVCS Isolation [A]	VCT-CVCS Isolation [B]	RWST/VCT Swapover Total Sum [A+B]	Max. [1]	
RWST/VCT Swapover	________ (Longest 2-LCV-62-135 or -136)	________ (2-LCV-62-133)		25.00	

1 For components with [AC] in the associated Initial/date column, the listed Max. time(s) are Acceptance Criteria; all other listed Max. time(s) are expected values.
2 DG 2B-B start time is recorded from 2-PTI-262-2 Attachment 15, DG 2B-B EMERG FDR BKR CLOSED elapsed time.
3 Diesel Start Time on Actuation of ESF - Offsite Power Available
4 Response time of Containment Air Return Fan 2B-B is taken from calculation done in Step 6.10[10]
5 Time includes MDAFW pump at full pressure and a fixed factor of 5.54 seconds included from the applicable Surveillance Instruction
6 Time includes TDAFW pump at full pressure and a fixed factor of 8.7 seconds included from the applicable Surveillance Instruction

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DIESEL GENERATOR & LOAD SEQUENCE TIME DELAY DATA ACQUISITION-TRAIN A

Date ________

DG 2A-A

Subsection 6.11

DG Function	ESFAS Position	Component ID	Nomenclature	2-PTI-262-1 Attachment	Seq. Start Elapsed Time (Sec.)	Initial/Date
DG Breaker	CLOSED	2-BKR-211-A/6	2A-A 6900 DG BKR 1922	17		
Sequence Relays	START	2-MTR-62-108	CNTFLG CHRG PMP (CCP) 2A-A	17		
	START	2-MTR-63-10	SAFETY INJECTION (SI) PMP 2A-A	17		
	START	2-MTR-74-10	RESIDUAL HEAT REMOVAL (RHR) PMP 2A-A	17		
	START	0-MTR-67-36	ERCW PMP C-A	17		
	START	2-MTR-3-118	AUX FEEDWATER PMP (AFW) 2A-A	17		
	START	2-MTR-70-46	COMPONENT COOLING SYSTEM (CCS) PUMP 2A-A	17		
	START	0-MTR-70-51-S	COMPONENT COOLING SYSTEM (CCS) PUMP C-S	17		
	START	2-MTR-72-27	CONTAINMENT SPRAY (CS) PUMP 2A-A MOTOR	17		
	START	2-MTR-30-38	CONTAINMENT AIR RETURN FAN 2A-A	17		
	START	0-MTR-67-40	ERCW PMP D-A	15		
	ENERGIZED	27D	DG 2A-A UV RELAY (27D)	15		

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DIESEL GENERATOR & LOAD SEQUENCE TIME DELAY DATA ACQUISITION-TRAIN B

Date ________

DG 2B-B — Subsection 6.11

DG Function	ESFAS Position	Component ID	Nomenclature	2-PTI-262-2 Attachment	Seq. Start Elapsed Time (Sec.)	Initial/Date
DG Breaker	CLOSED	2-BKR-211-B/6	2B-B 6900 DG BKR 1924	17		
Sequence Relay	START	2-MTR-62-104	CNTFLG CHRG PMP (CCP) 2B-B	17		
	START	2-MTR-63-15	SAFETY INJECTION PMP (SI) 2B-B	17		
	START	2-MTR-74-20	RESIDUAL HEAT EXCHANGER (RHR) PMP 2B-B	17		
	START	0-MTR-67-55	ERCW PMP G-B	17		
	START	2-MTR-3-128	AUX FEEDWATER PMP (AFW) 2B-B	17		
	START	2-MTR-70-38	COMPONENT COOLING SYSTEM (CCS) PUMP 2B-B	17		
	START	0-MTR-70-51-S	COMPONENT COOLING SYSTEM (CCS) PUMP C-S	17		
	START	2-MTR-72-10	CONTAINMENT SPRAY (CS) PUMP 2B-B MOTOR	17		
	START	2-MTR-30-39	CONTAINMENT AIR RETURN FAN 2B-B	17		
	START	0-MTR-67-59	ERCW PMP H-B	15		
	ENERGIZED	27D	DG 2B-B UV RELAY (27D)	15		

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High		Safety Injection (SI-ECCS)	____________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	____________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	____________ (Longest CIA)		12.00 Max.	[AC]
			____________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			____________ (Longest CIA-Fire Prot.)		22.00 Max.	[AC]
			____________ (Longest CIA-Ice Cond.)		32.00Max.	[AC]
			____________ (CIA-CCS)		68.00 Max.	[AC]
			____________ (EGTS FAN 2A-A)		20.00 Max.	[AC]

Data Sheet 20
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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
		Containment Isolation Phase A (CIA)	________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]
		Containment Ventilation Isolation (CVI)	________ (Longest CVI)		6.00 Max.	[AC]
			________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)	________ (Longest ERCW PMP)		47.00 Max.	[AC]
		Component Cooling System (CCS)	________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	________ (Longest DG Start)		12.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Pressurizer Low Pressure		Safety Injection (SI-ECCS)	________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	________ (Longest CIA)		12.00 Max.	[AC]
			________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			________ (Longest CIA-Fire Prot.)		22.00 Max.	[AC]
			________ (Longest CIA-Ice Cond.)		32.00 Max.	[AC]
			________ (CIA-CCS)		68.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)	________ (EGTS FAN 2A-A)		20.00 Max.	[AC]
			________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]
		Containment Ventilation Isolation (CVI)	________ (Longest CVI)		6.00 Max.	[AC]
			________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Pressurizer Low Pressure		Essential Raw Cooling Water (ERCW)	___________ (Longest ERCW PMP)		47.00 Max.	[AC]
		Component Cooling System (CCS)	___________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	___________ (Longest DG Start)		12.00 Max.	[AC]
Steam Line Pressure Negative Rate High		Main Steamline Isolation (MSLI)	___________ (Longest MSLI)		8.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Line Pressure Low		Safety Injection (SI-ECCS)	________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	________ (Longest CIA)		12.00 Max.	[AC]
			________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			________ (Longest CIA-Fire Prot.)		22.00 Max.	[AC]
			________ (Longest CIA-Ice Cond.)		32.00 Max.	[AC]
			________ (CIA-CCS)		68.00 Max.	[AC]
			________ (EGTS FAN 2A-A)		20.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
		Containment Isolation Phase A (CIA)	___________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]
		Containment Ventilation Isolation (CVI)	___________ (Longest CVI)		6.00 Max.	[AC]
			___________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	___________ (TD AFW 2A-S)		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)	___________ (Longest ERCW PMP)		47.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Line Pressure Low		Component Cooling System (CCS)	________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	________ (Longest DG Start)		12.00 Max.	[AC]
		Main Steamline Isolation (MSLI)	________ (Longest MSLI)		8.00 Max.	[AC]
Containment Pressure High-High		Containment Isolation Phase B (CIB)	________ (Longest-CIB)		68.00 Max.	[AC]
		Containment Isolation Phase B (CIB)	________ (Longest-CIB - Quick Vlvs)		12.00 Max.	[AC]
		Main Steamline Isolation (MSLI)	________ (Longest MSLI)		8.00 Max.	[AC]
		Containment Air Return Fan	________ (Fan 2A-A)		480.00 Min. 600.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Generator Water Level High-High		Turbine Trip	________ (Longest-Turbine Steam SV)		2.50 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
Steam Generator Water Level Low-Low		AFW Pump (MD)	________ (MD AFW 2A-A)		60.00 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]
RWST Level-Low Cntmt Sump Level-High		RWST/Sump Swapover (SWP)	________ (Longest SWP)		234.00 Max.	[AC]
Main Steam Vault Level High		Feedwater Isolation (FWI)	________ (Longest FWI)		8.50 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Function	PS-3-	Procedure	Work Document	Times (Sec.)	Longest [A]	Sense Lines [B]	Longest Valve Data Sheet 16 [C]	Total [A]+[B]+[C]	Acceptance Criteria Value	Initial/Date
MDAFW 2A-A Suction Swapover	139A	2-SI-3-201-A				0.31			47.00 Max.	[AC]
	139B	2-SI-3-201-A								
	139D	2-SI-3-201-A								
TDAFW 2A-S Suction Swapover	139A	2-SI-3-201-A				0.31			42.00 Max.	[AC]
	139B	2-SI-3-201-A								
	139D	2-SI-3-201-A								

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Function	Procedure	Work Document	Times (Sec.) [A]	AFW Pump [B] [1]	Total [A]+[B]	Acceptance Criteria Value	Initial/Date
MFPT A TRIP, START MDAFW 2A-A	2-SI-3-25					60.00 Max	[AC]
MFPT A TRIP, START MDAFW 2B-B	2-SI-3-25					60.00 Max	[AC]
MFPT A TRIP, START TDAFW 2A-S	2-SI-3-25					60.00 Max	[AC]

1 MDAFWP 2A-A and TDAFWP 2A-S times obtained from Data Sheet 16. MDAFWP 2B-B time obtained from Data Sheet 17.

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	Actuated Component(s) Data Sheet 16 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High		Containment Isolation Phase A (CIA)	________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)	________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]
Steam Line Pressure Low		Containment Isolation Phase A (CIA)	________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High		Safety Injection (SI-ECCS)	________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	________ (Longest CIA)		12.00 Max.	[AC]
			________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			________ (Longest CIA-Ice Cond.)		32.00 Max.	[AC]
			________ (EGTS FAN 2B-B)		20.00 Max.	[AC]
			________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High		Containment Ventilation Isolation (CVI)	____________ (Longest CVI)		6.00 Max.	[AC]
			____________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	____________ (TD AFW 2A-S)		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)	____________ (Longest ERCW PMP)		47.00 Max.	[AC]
		Component Cooling System (CCS)	____________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	____________ (Longest DG Start)		12.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Pressurizer Low Pressure		Safety Injection (SI-ECCS)	________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	________ (Longest CIA)		12.00 Max.	[AC]
			________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			________ (Longest CIA-Ice Cond.)		32.00 Max.	[AC]
			________ (EGTS FAN 2B-B)		20.00 Max.	[AC]
			________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Pressurizer Low Pressure		Containment Ventilation Isolation (CVI)	________ (Longest CVI)		6.00 Max.	[AC]
			________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)	________ (Longest ERCW PMP)		47.00 Max.	[AC]
		Component Cooling System (CCS)	________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	________ (Longest DG Start)		12.00 Max.	[AC]
Steam Line Pressure Negative Rate High		Main Steamline Isolation (MSLI)	________ (Longest MSLI)		8.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Line Pressure Low		Safety Injection (SI-ECCS)	________ (Longest RWST/VCT Swapover or SI-ECCS)		27.00 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
		Containment Isolation Phase A (CIA)	________ (Longest CIA)		12.00 Max.	[AC]
			________ (Longest CIA-Quick Sample Vlvs)		7.00 Max	[AC]
			________ (Longest CIA-Ice Cond.)		32.00 Max.	[AC]
			________ (EGTS FAN 2B-B)		20.00 Max.	[AC]
			________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		12.70 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Line Pressure Low		Containment Ventilation Isolation (CVI)	________ (Longest CVI)		6.00 Max.	[AC]
			________ (Longest CVI-Rad. Mon.)		6.50 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)	________ (Longest ERCW PMP)		47.00 Max.	[AC]
		Component Cooling System (CCS)	________ (Longest CCS System - Normal Power)		50.00 Max.	[AC]
		Diesel Generators	________ (Longest DG Start)		12.00 Max.	[AC]
		Main Steamline Isolation (MSLI)	________ (Longest MSLI)		8.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High-High		Containment Isolation Phase B (CIB)	________ (Longest-CIB)		68.00 Max.	[AC]
		Containment Isolation Phase B (CIB)	________ (Longest-CIB - Quick Vlvs)		12.00 Max.	[AC]
		Main Steamline Isolation (MSLI)	________ (Longest MSLI)		8.00 Max.	[AC]
		Containment Air Return Fan	________ (Fan 2B-B)		480.00 Min. 600.00 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Steam Generator Water Level High-High		Turbine Trip	________ (Longest-Turbine Steam SV)		2.50 Max.	[AC]
		Feedwater Isolation (FWI)	________ (Longest FWI)		8.00 Max.	[AC]
Steam Generator Water Level Low-Low		AFW Pump (MD)	________ (MD AFW 2B-B)		60.00 Max.	[AC]
		AFW Pump (TD)	________ (TD AFW 2A-S)		60.00 Max.	[AC]
RWST Level-Low Cntmt Sump Level-High		RWST/Sump Swapover (SWP)	________ (Longest SWP)		234.00 Max.	[AC]
Main Steam Vault Level High		Feedwater Isolation (FWI)	________ (Longest FWI)		8.50 Max.	[AC]

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Function	PS-3-	Procedure	Work Document	Times (Sec.)	Longest [A]	Sense Lines [B]	Longest Valve Data Sheet 17 [C]	Total [A]+[B]+[C]	Acceptance Criteria Value	Initial/Date
MDAFW 2B-B Suction Swapover	144A	2-SI-3-201-B				0.31			47.00 Max.	[AC]
	144B	2-SI-3-201-B								
	144D	2-SI-3-201-B								
TDAFW 2A-S Suction Swapover	144A	2-SI-3-201-B				0.31			42.00 Max.	[AC]
	144B	2-SI-3-201-B								
	144D	2-SI-3-201-B								

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Function	Procedure	Work Document	Times (Sec.) [A]	AFW Pump [B] [1]	Total [A]+[B]	Acceptance Criteria Value	Initial/Date
MFPT B TRIP, START MDAFW 2A-A	2-SI-3-26					60.00 Max	[AC]
MFPT B TRIP, START MDAFW 2B-B	2-SI-3-26					60.00 Max	[AC]
MFPT B TRIP, START TDAFW 2A-S	2-SI-3-26					60.00 Max	[AC]

1 MDAFWP 2B-B and TDAFWP 2A-S times obtained from Data Sheet 17. MDAFWP 2A-A time obtained from Data Sheet 16.

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ESFAS NORMAL POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.12

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	Actuated Component(s) Data Sheet 17 [B]	ESFAS Normal Power Total Sum [A+B]	Acceptance Criteria Value	
Containment Pressure High		Containment Isolation Phase A (CIA)	__________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)	__________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]
Steam Line Pressure Low		Containment Isolation Phase A (CIA)	__________ (Longest CIA-SG Blowdown)		17.00 Max	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Containment Pressure High		Safety Injection (SI-ECCS)		N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]
				________ (CCP 2A-A)	________ (CCP 2A-A)	0.277		32.00 Max.	[AC]
				________ (SIP 2A-A)	________ (SIP 2A-A)	0.553		32.00 Max.	[AC]
				________ (RHRP 2A-A)	________ (RHRP 2A-A)	0.830		32.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

Times (Sec.)								Initial/Date
ESFAS Parameters	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Containment Pressure High		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA)		22.00 Max.	[AC]
				N/A	________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	________ (Longest CIA-Fire Prot.)		32.00 Max.	[AC]
				N/A	________ (CIA-CCS)		78.00 Max.	[AC]
				N/A	________ (EGTS FAN 2A-A)		30.00 Max.	[AC]
				N/A	________ (Longest Secondary Cont. Purge Isol. Valve Support EGTS)		22.70 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Containment Pressure High		AFW Pump (MD)		________ (AFWP 2A-A)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP C-A)	________ (ERCWP C-A)	1.106		57.00 Max.	[AC]
				________ (ERCWP D-A)	________ (ERCWP D-A)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2A-A)	________ (CCSP 2A-A - Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S - Emergency Power)	1.210		60.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Pressurizer Low Pressure		Safety Injection (SI-ECCS)		________ (CCP 2A-A)	________ (CCP 2A-A)	0.277		32.00 Max.	[AC]
				________ (SIP 2A-A)	________ (SIP 2A-A)	0.553		32.00 Max.	[AC]
				________ (RHRP 2A-A)	________ (RHRP 2A-A)	0.830		32.00 Max.	[AC]
				N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA)		22.00 Max.	[AC]
				N/A	________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	________ (Longest CIA-Fire Prot.)		32.00 Max.	[AC]
				N/A	________ (CIA-CCS)		78.00 Max.	[AC]
				N/A	________ (EGTS FAN 2A-A)		30.00 Max.	[AC]
				N/A	________ (Longest Secondary Cont. Purge Isol. Valve Support EGTS)		22.70 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Pressurizer Low Pressure		AFW Pump (MD)		________ (AFWP 2A-A)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP C-A)	________ (ERCWP C-A)	1.106		57.00 Max.	[AC]
				________ (ERCWP D-A)	________ (ERCWP D-A)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2A-A)	________ (CCSP 2A-A-Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S-Emergency Power)	1.210		60.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Steam Line Pressure Low		Safety Injection (SI-ECCS)		________ (CCP 2A-A)	________ (CCP 2A-A)	0.277		32.00 Max.	[AC]
				________ (SIP 2A-A)	________ (SIP 2A-A)	0.553		32.00 Max.	[AC]
				________ (RHRP 2A-A)	________ (RHRP 2A-A)	0.830		32.00 Max.	[AC]
				N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Steam Line Pressure Low		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA)		22.00 Max.	[AC]
				N/A	________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	________ (Longest CIA-Fire Prot.)		32.00 Max.	[AC]
				N/A	________ (CIA-CCS)		78.00 Max.	[AC]
				N/A	________ (EGTS FAN 2A-A)		30.00 Max.	[AC]
				N/A	________ (Longest Secondary Cont. Purge Isol. Valve Support EGTS)		22.70 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Steam Line Pressure Low		AFW Pump (MD)		________ (AFWP 2A-A)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP C-A)	________ (ERCWP C-A)	1.106		57.00 Max.	[AC]
				________ (ERCWP D-A)	________ (ERCWP D-A)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2A-A)	________ (CCSP 2A-A-Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S-Emergency Power)	1.210		60.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	Delay Time [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Containment Pressure High-High		Containment Spray (CSS)		________ (CSP 2A-A)	________ (2-FCV-72-39)	6.50		234.00 Max.	[AC]
		Containment Isolation Phase B (CIB)		N/A	________ (Longest CIB)	N/A		78.00 Max.	[AC]
		Containment Isolation Phase B (CIB)		N/A	________ (Longest CIB - Quick Vlvs)	N/A		22.00 Max.	[AC]

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ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

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Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 14 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	Sequence Delay Data Sheet 18 [C]	Actuated Component(s) Data Sheet 16 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Containment Pressure High		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]
Steam Line Pressure Low		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]

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(Page 12 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 18 [A]	ESFAS Function	DG 2A-A Breaker Closure Data Sheet 18 [B]	ESFAS Emergency Power Total Sum [A+B]	Acceptance Criteria Value	
Loss of Voltage/ Degraded Voltage	________ 27D	6900V Shutdown Bd 2A-A			12.00 Max.	[AC]

Data Sheet 23
(Page 1 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Containment Pressure High		Safety Injection (SI-ECCS)		N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]
				________ (CCP 2B-B)	________ (CCP 2B-B)	0.277		32.00 Max.	[AC]
				________ (SIP 2B-B)	________ (SIP 2B-B)	0.553		32.00 Max.	[AC]
				________ (RHRP 2B-B)	________ (RHRP 2B-B)	0.830		32.00 Max.	[AC]

Data Sheet 23
(Page 2 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	Initial/Date
Containment Pressure High		Containment Isolation Phase A (CIA)		N/A	__________ (Longest CIA)		22.00 Max.	[AC]
				N/A	__________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	__________ (EGTS FAN 2B-B)		30.00 Max.	[AC]
				N/A	__________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		22.70 Max.	[AC]

Data Sheet 23
(Page 3 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Containment Pressure High		AFW Pump (MD)		________ (AFWP 2B-B)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP G-B)	________ (ERCWP G-B)	1.106		57.00 Max.	[AC]
				________ (ERCWP H-B)	________ (ERCWP H-B)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2B-B)	________ (CCSP 2B-B-Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S-Emergency Power)	1.210		60.00 Max.	[AC]

Data Sheet 23
(Page 4 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Pressurizer Low Pressure		Safety Injection (SI-ECCS)		N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]
				________ (CCP 2B-B)	________ (CCP 2B-B)	0.277		32.00 Max.	[AC]
				________ (SIP 2B-B)	________ (SIP 2B-B)	0.553		32.00 Max.	[AC]
				________ (RHRP 2B-B)	________ (RHRP 2B-B)	0.830		32.00 Max.	[AC]

Data Sheet 23
(Page 5 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA)		22.00 Max.	[AC]
				N/A	________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	________ (EGTS FAN 2B-B)		30.00 Max.	[AC]
				N/A	________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		22.70 Max.	[AC]

Data Sheet 23
(Page 6 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Pressurizer Low Pressure		AFW Pump (MD)		________ (AFWP 2B-B)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP G-B)	________ (ERCWP G-B)	1.106		57.00 Max.	[AC]
				________ (ERCWP H-B)	________ (ERCWP H-B)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2B-B)	________ (CCSP 2B-B-Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S-Emergency Power)	1.210		60.00 Max.	[AC]

Data Sheet 23
(Page 7 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Steam Line Pressure Low		Safety Injection (SI-ECCS)		N/A	________ (RWST/VCT Swapover)	N/A		37.00 Max.	[AC]
				________ (CCP 2B-B)	________ (CCP 2B-B)	0.277		32.00 Max.	[AC]
				________ (SIP 2B-B)	________ (SIP 2B-B)	0.553		32.00 Max.	[AC]
				________ (RHRP 2B-B)	________ (RHRP 2B-B)	0.830		32.00 Max.	[AC]

Data Sheet 23
(Page 8 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Steam Line Pressure Low		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA)		22.00 Max.	[AC]
				N/A	________ (Longest CIA-Quick Sample Vlvs)		17.00 Max	[AC]
				N/A	________ (EGTS FAN 2B-B)		30.00 Max.	[AC]
				N/A	________ (Longest Secondary Cont. Purge Isolation Valve Support EGTS)		22.70 Max.	[AC]

Data Sheet 23
(Page 9 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Timer Tolerance [E]	ESFAS Emergency Power Total Sum [A+B+C+D+E]	Acceptance Criteria Value	
Steam Line Pressure Low		AFW Pump (MD)		________ (AFWP 2B-B)	________ (Longest AFW (MD) Function)	1.383		60.00 Max.	[AC]
		Essential Raw Cooling Water (ERCW)		________ (ERCWP G-B)	________ (ERCWP G-B)	1.106		57.00 Max.	[AC]
				________ (ERCWP H-B)	________ (ERCWP H-B)	1.106		57.00 Max.	[AC]
		Component Cooling System (CCS)		________ (CCSP 2B-B)	________ (CCSP 2B-B-Emergency Power)	1.210		60.00 Max.	[AC]
				________ (CCSP C-S)	________ (CCSP C-S-Emergency Power)	1.210		60.00 Max.	[AC]

Data Sheet 23
(Page 10 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)								Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	Delay Time [E]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Containment Pressure High-High		Containment Spray (CSS)		________ (CSP 2B-B)	________ (2-FCV-72-2)	6.50		234.00 Max.	[AC]
		Containment Isolation Phase B (CIB)		N/A	________ (Longest CIB)	N/A		78.00 Max.	[AC]
		Containment Isolation Phase B (CIB)		N/A	________ (Longest CIB - Quick Vlvs)	N/A		22.00 Max.	[AC]

Data Sheet 23
(Page 11 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)							Initial/Date
	Actual Signal Initiation Data Sheet 15 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	Sequence Delay Data Sheet 19 [C]	Actuated Component(s) Data Sheet 17 [D]	ESFAS Emergency Power Total Sum [A+B+C+D]	Acceptance Criteria Value	
Containment Pressure High		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]
Pressurizer Low Pressure		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]
Steam Line Pressure Low		Containment Isolation Phase A (CIA)		N/A	________ (Longest CIA-SG Blowdown)		27.00 Max.	[AC]

Data Sheet 23
(Page 12 of 12)

ESFAS EMERGENCY POWER TOTAL RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.13

ESFAS Parameters	Times (Sec.)					Initial/Date
	Actual Signal Initiation Data Sheet 19 [A]	ESFAS Function	DG 2B-B Breaker Closure Data Sheet 19 [B]	ESFAS Emergency Power Total Sum [A+B]	Acceptance Criteria Value	
Loss of Voltage/ Degraded Voltage	________ 27D	6900V Shutdown Bd 2B-B			12.00 Max.	[AC]

Data Sheet 24
(Page 1 of 1)

AUXILIARY FEEDWATER PUMP LOOP START RESPONSE TIME SUMMARY - TRAIN A

Date ________

Subsection 6.14

2-PTI-262-1	Times (Sec.)				Initial/Date
LOOP Event Description	Elapsed Sequence Time (Sec.) 2-PTI-262-1 Attachment 15 [A] [1]	Actuated Component Data Sheet 14 [B]	AFW LOOP Start Total Sum [A+B]	Acceptance Criteria Value	
Shutdown Board 2A-A LOOP To MD AFWP 2A-A Breaker Closure	____________ (SEQ START AFWP 2A-A)	____________ (MD AFWP 2A-A)		60.00 Max.	[AC]
Shutdown Board 2A-A LOOP To 2-FCV-1-51 Open Signal	____________ (AFWP 2-FCV-1-51 OPEN)	____________ (MD AFWP 2A-S)		60.00 Max.	[AC]

1 Actual time will be extracted from 2-PTI-262-1 (Attachment 15 Elapsed Time Calculations).

Data Sheet 25
(Page 1 of 1)

AUXILIARY FEEDWATER PUMP LOOP START RESPONSE TIME SUMMARY - TRAIN B

Date ________

Subsection 6.14

2-PTI-262-2	Times (Sec.)				Initial/Date
LOOP Event Description	Elapsed Sequence Time (Sec.) 2-PTI-262-1 Attachment 15 [A] [1]	Actuated Component Data Sheet 15 [B]	AFW LOOP Start Total Sum [A+B]	Acceptance Criteria Value	
Shutdown Board 2B-B LOOP To MD AFWP 2B-B Breaker Closure	____________ (SEQ START AFWP 2B-B)	____________ (MD AFWP 2B-B)		60.00 Max.	[AC]
Shutdown Board 2B-B LOOP To 2-FCV-1-51 Open Signal	____________ (AFWP 2-FCV-1-51 OPEN)	____________ (MD AFWP 2A-S)		60.00 Max.	[AC]

1 Actual time will be extracted from 2-PTI-262-2 (Attachment 15 Elapsed Time Calculations).

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: _FUEL TRANSFER SYSTEM

Instruction No: 2-PTI-079-01
Revision No: 0

PREPARED BY: _Johann Reiter [signature] DATE: 10/30/13
PRINT NAME / SIGNATURE

REVIEWED BY: _Jimmy Kiker Jimmy Kiker DATE: 10/30/13
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-025

JTG CHAIRMAN: Nick A Welch DATE: 10/31/13

APPROVED BY : Nick A Welch DATE: 10/31/13
PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: ____________

JTG CHAIRMAN: ____________ DATE: ____________

APPROVED BY : ____________ DATE: ____________
PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0	10/31/13		Initial issue

Table of Contents

Table of Contents (continued)

1.0 INTRODUCTION

1.1 Test Objectives

The purpose of this Test Instruction is to verify the performance and the operability of tools and equipment used in fuel transfer operations.

To provide the opportunity for training fuel handlers prior to actual fuel loading by performance of Unit 2 fuel handling procedures under test control.

1.2 Scope

A. Demonstrates proper operation of system interlocks and limit switches.

B. Demonstrate proper operation of hoist controls including overloads, travel limits, and warning devices.

C. Demonstrate proper manual and automatic operation of Fuel Transfer System by PaR Nuclear, Inc. representatives performing the Site Acceptance Test Procedure 70587992.

D. Utilize operations personnel and operating procedure 2-FHI-3, Fuel Transfer System, to provide familiarization with the plant installation and demonstrate the adequacy of the operating procedure under test control.

E. Utilize operations and maintenance personnel and procedures 2-MI-79.001, Fuel Handling Equipment Periodic Inspection to provide familiarization with the plant installation and demonstrate the adequacy of the maintenance procedure under test control.

2.0 REFERENCES

2.1 Performance References

A. 70588609, PaR Nuclear, Inc. Site Initialization Procedure, Fuel Transfer System, Watts Bar Unit 2

B. 70587992, PaR Nuclear, Inc. Site Acceptance Test Procedure (SAT) Fuel Transfer System

C. 70584784, PaR Nuclear, Inc. GE Fanuc Servo Drive Setup / Installation / Modification Procedure

D. 70588477, PaR Nuclear, Inc. Load Weighing Calibration Procedure Carriage Drive Fuel Transfer System

E. 70588478, PaR Nuclear, Inc. Load Weighing Calibration Procedure - Frame Winch (Upender) Fuel Transfer System

F. 0-FHI-2, Spent Fuel Pit and Spent Fuel Handling Tool

G. 2-FHI-3, Fuel Transfer System

H. 2-MI-79.001, Unit 2 Fuel Handling Equipment Periodic Inspection and Testing

I. 0-MI-79.001, Common Fuel Handling Equipment Periodic Inspection and Testing

J. NPG-SPP-01.3, Housekeeping

K. NPG-SPP-05.4, Chemical Traffic Control

L. NPG-SPP-06.4, Measuring and Test Equipment

M. NPG-SPP-06.5, Foreign Material Control

N. NPG-SPP-09.17, Temporary Equipment Control

O. RCI-128, ALARA Program Implementation

P. SMI-68.Q, Reactor Pressure Vessel Tensioning for Hot Functional Testing

Q. TVA Safety Manual, Chapter 2, Section 10, Electrical - General

R. TVA Safety Manual, Procedure 305, Fall Protection Systems

2.1 Performance References (continued)

S. TVA Safety Manual, Procedure 801, Confined Space Entry

T. TVA Safety Manual Procedure 1021, Working on/or Near Energized Electrical Equipment

2.2 Developmental References

2.2.1 Final Safety Analysis Report, Amendment 110

A. Table 14.2-1, Sheets 74 and 75 of 89 Fuel Handling Equipment Test Summary

B. Chapter 9, Section 9.1.4, Fuel Handling System

C. Chapter 9, Section 9.1.1, New Fuel Storage

2.2.2 Test Scoping Documents

A. 2-TSD-079-01, Rev. 1, Fuel Transfer System

B. 2-TSD-079-03, Rev. 1, Fuel Handling Manipulating Crane

2.2.3 Drawings

A. Flow Diagrams

None

B. Electrical

1. 2-45W743-2, Rev. 0, Wiring Diagram 480V Fuel & Waste Handling BD B Single Line
2. 2-45W755-2, Rev. 1, Wiring Diagram 480V Reactor Vent BD 2A-A Single Line - Sheet 2
3. 45W787-1, Rev. 15, Wiring Diagram 480V Fuel & Waste Handling BD B Connection Diagram
4. 45W787-2, Rev. 7, Wiring Diagram 480V Fuel & Waste Handling BD B Connection Diagram
5. 2-45W787-3, Rev. 0, 480V Fuel & Waste Handling Board External Connection Diagram

2.2.3 Drawings (continued)

6. 45B787-0, Rev. K, Wiring Diagram 480V Fuel & Waste Handling BD B Front View

7. 45W2755-3, Rev. 2, Wiring Diagram 480V Reactor Vent BD 2A-A Connection Diagram

8. 45B787-4F, Rev. F, Wiring Diagram 480V Fuel & Waste Handling BD B Conn Diag - Compt 4F, 2-HST-79-W2, U2 Reactor Side Upending Winch

9. 45B787-5F, Rev. 1, Wiring Diagram 480V Fuel & Waste Handling BD B Conn Diag - Compt 5F, 2-HST-79-W1, U2 Fuel Pit Side Upending Winch

10. 45B1411-23, Rev. 3, Lighting, Circuit Schedule LC-256, CKT No. 2 Fuel Pit Side Upending Winch Heaters

11. 2-45B1413-4, Rev. 0, Lighting Circuit Schedule LC-281, CKT No. 3 Reactor Side Upending Winch Heaters Mechanical - see Vendor drawings and documents

C. Logic/Control - see Vendor drawings and documents

D. Vendor Drawings

1. 1098E58, Rev. 3, Westinghouse, 4 LOOP LIFTING RIG HEAD GENERAL ASSY

2. C-07440502-D, Rev. 3, PaR Nuclear, Inc. Watts Bar U2 Fuel Transfer System, Schematic, Sheets 1 thru 15

3. C-07440601-D, Rev. 3, PaR Nuclear, Inc. Watts Bar U2 RX Manipulator Crane, Schematic Sheets 1 thru 10 Vendor Documents

E. 70587990, Rev. 1, PaR Nuclear, Inc. Software Requirements Specification (SRS), Fuel Transfer System, Watts Bar Unit 2

2.2.4 Other Documents

A. WBN2-79-4001, Rev. 2, System Description for Fuel Handling and Storage System

3.0 PRECAUTIONS AND LIMITATIONS

WARNING

Voltages up to 480 VAC are present in these controls at terminal strips and at individual components.

Exercise extreme caution when working near these voltage sources.

CAUTIONS

1) System grounding inspection will be performed prior to energizing any equipment.
2) Verify the load cell rating. Block the load cell or cells if there is any chance for exceeding load cell capacity during load testing. Blocking must be used to prevent load cell deflection

3.1 Standard

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021, Working on/or Near Energized Electrical Equipment.

B. Standard precautions shall be followed for working at the edge of the Refueling Cavity in accordance with TVA Safety Manual Procedure 305, Fall Protection Systems.

C. Standard precautions shall be followed for working inside the Refueling Cavity in accordance with TVA Safety Manual Procedure 801, Confined Space Entry.

D. All chemicals are to be approved and controlled per NPG-SPP-05.4.

E. Applicable Foreign Material Exclusion (FME) requirements are to be implemented per NPG-SPP-06.5.

F. When not in use for prolonged periods, the equipment should be protected in a manner that the mating surfaces are not damaged.

G. Observe all Radiation Protection (RP) requirements when working in or near radiological areas.

3.1 Standard (continued)

H. All terminal points and connections are to be considered energized. Instrumentation must be used to determine if the circuits are de-energized.

I. Ensure there are no adverse effects to the operation of Unit 1 structures, systems, or components.

J. Test personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.

K. System water chemistry is within system specifiable parameters especially for fluids supplied from external sources.

3.2 Test Administration

A. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.

B. Discrepancies between component ID tags and the description given in a procedure/instruction do not require a Test Deficiency Notice, TDN, in accordance with SMP-14.0, if the UNIDs match, exclusive of place-keeping zeros and train designators (e.g. 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.

C. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.

D. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.

E. Problems identified during the test shall be annotated on the Chronological Test Log (CTL) from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.

F. Test personnel on the RX Side and POOL Side must maintain communications with sound powered headsets or radios.

3.2 Test Administration (continued)

G. All nuts, bolts, washers, studs, and any disassembled parts are to be suitably identified and stored to ensure proper orientation and reinstallation.

H. Interlocks are to be bypassed only as directed by this procedure

I. No hardware devices (i.e., laptops, portable hard drives, USB thumb drives, etc.) are to be connected to the refueling equipment unless verified free of viruses and malware. Likewise for software additions.

3.3 Technical

A. Visual verification that the transfer cart is in the proper location for upending must be performed before EACH upending operation.

B. Transfer System may be operated "dry" for brief periods under load since Luberite Bearings are installed in the system.

C. Before raising the Reactor or Pool side Upenders, the position of the Conveyor Cart may be checked with an underwater camera or by checking the painted slot in the track.

D. To help prevent inadvertent movement of conveyor, Conveyor Selector should not be switched to anticipated location (Rx or Pool side) UNTIL ready to move cart.

E. When Upender frame is moved DOWN, it should be confirmed completely down by checking that frame lifting cable is slack (slack relative to load).

F. Upender console heater is ON when the fuel transfer consoles are off.

G. The Main Power Switches at the Fuel Transfer System Fuel Pool Side and Reactor Side Control Panels do not feed the panel heater circuits. The heater circuits have separate power supplies and must be individually turned off to interrupt power to the entire control cabinet.

H. The Fuel Assembly must be handled by the specified tools and in the vertical position only to preclude damage to the assembly or other fuel handling equipment. The Dummy Fuel Assembly will be handled in accordance with FHI-2, Spent Fuel Pit and Spent Fuel Handling Tool.

3.3 Technical (continued)

I. Clearances between the bottom of the Dummy Fuel Assembly and the top of the structures in the Spent Fuel Pool and Transfer Canal are very tight. Exercise caution while moving the Dummy Fuel Assembly suspended from the Spent Fuel Assembly Handling Tool, within the Fuel Pool area, as any hoist cable drift could affect these clearances.

J. During hoist Operations, ensure that any slack cable is taken up gradually to prevent snapping the cable taut.

K. The capacity of the Spent Fuel Pool Bridge Crane is 4000 pounds. Ensure the Hoist Load Monitor is operating properly when handling loads and do not exceed hoist capacity.

L. The Aux Building Crane is interlocked to prevent travel directly over the Spent Fuel Pool. Exercise caution when operating this crane around the Fuel Pool and do not bypass the travel interlocks with a heavy load suspended from the crane. The weight of one fuel assembly plus the handling tool is not considered a heavy load.

M. Interlocks and limit switches should not be relied upon for protection of equipment during initial operation. Visual observation should be maintained during the first of each type of operation.

Date ________

4.0 PREREQUISITE ACTIONS

4.1 Preliminary Actions

NOTES

1) Perform steps 4.1[1] and 4.1[2] as far in advance as possible to allow adequate time for ALARA preplanning, RWP generation, and Clearance preparation.
2) Prerequisite steps may be performed in any order unless otherwise stated.

[1] **INITIATE** ALARA Preplan Reports (APRs) per RCI-128 to cover the scope of this test instruction, and

RECORD APR Nos.:________. ________

[2] **OBTAIN** Clearances to support test performance, as applicable. ________

[3] **VERIFY** the Unit 1 Auxiliary Building Secondary Containment Envelope (ABSCE) has been moved to encompass the Unit 2 Containment, since the fuel transfer tube will need to be open during performance of most of this test. ________

[4] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. ________

[5] **ENSURE** special environmental conditions are available for testing if required. ________

[6] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0 and **ATTACH** to this PTI for use during the performance of this PTI. ________

[7] **ENSURE** changes to the references listed on "Drawings and References", Appendix A, have been reviewed, and determined **NOT** to adversely affect the test results. ________

Date ________

4.1 Preliminary Actions (continued)

[8] **ENSURE** unincorporated change paper on Appendix A has been reviewed to current revisions and determined **NOT** to adversely affect the test results. ________

[9] **ENSURE** a review of outstanding Clearances has been coordinated with Operations for impact to the test performance. If required, items will be recorded in Appendix B, Temporary Condition Log. ________

[10] **VERIFY** plant instruments required for test performance, listed on Appendix C, Permanent Plant Instrumentation Log, have been filled, vented, (as required) placed in service and are within their calibration interval. ________

[11] **VERIFY** Measuring and Test Equipment (M&TE) required for test performance has been recorded on Measuring and Test Equipment (M&TE) Log. ________

[12] **VERIFY** Measuring and Test Equipment (M&TE) calibration due dates will support the completion of this test performance. ________

[13] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) in accordance with SMP-4.0. ________

[14] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL), and

ENSURE that they will **NOT** adversely affect the test results. ________

[15] **ENSURE** Component Test Matrix Generic Tracking Report has been evaluated and outstanding component test exceptions will **NOT** impact test start. ________

[16] **REVIEW** preventive maintenance for system/components covered by this test, and **VERIFY** no conditions exist that will impact test performance. ________

[17] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Modifications (T-Mods) do NOT adversely impact testing, and

ATTACH documentation of DCN's, EDCR's and T-Mods's that were reviewed to the data package. ________

Date ________

4.1 Preliminary Actions (continued)

[18] **ENSURE** test personnel have been notified and are available to support the test. ________

[19] **ESTABLISH** communications between the RX Side Fuel Transfer Console and the Pool Side Fuel Transfer Console. ________

[20] **ENSURE** the following systems are operational and have been placed in service to the extent necessary to perform this test:

A. System 216, 480V Fuel & Waste Handling Boards A and B ________

B. System 232, 480V Reactor Vent Board 2B-B ________

C. System 33, Service Air System ________

D. System 228, Auxiliary Building Lighting Boards and Auxiliary Building Standby and Emergency Lighting ________

E. Unit 2 Manipulator crane ________

F. Spent Fuel Handling Machine ________

[21] **COORDINATE** performance of this test with Radiation Protection and **OBTAIN** a Radiation Work Permit (RWP), if required. ________

[22] **COORDINATE** performance of this test with Reactor Engineering and **OBTAIN** transfer sheets as necessary to control movement of the Dummy Fuel Assembly with Dummy Standard Rod Cluster Control Assembly (RCCA) installed. ________

[23] **VERIFY** PER Corrective Action 201778-004 (NCR 3844), Fuel Transfer Carriage Track misalignment / failure to meet specification for straightness has been resolved as required in preparation for this test. ________

[24] **PERFORM** a pretest walkdown on equipment to be tested to ensure no conditions exist that will impact test performance. ________

Date ________

4.1 Preliminary Actions (continued)

[25] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0 for performance of Section 4 and

ENSURE the briefing discusses the Unit 1 Auxiliary Building Secondary Containment Envelope (ABSCE) and the opening of the fuel transfer tube during this test. ________

[26] **RECORD** the printed names, signatures, and initials of all test personnel on SMP-9.0, Signature Log. ________

Date ________

4.2 Special Tools, Measuring and Test Equipment, Parts, and Supplies

[1] **ENSURE** a Dummy Fuel Assembly with Dummy Standard RCCA installed is available. ________

[2] **VERIFY** the Programmable Logic Controller (PLC) Override Keys for Spent Fuel Pool (SFP) side and Reactor (RX) side are available. ________

NOTES

1) Reactor Vessel Head and Internals lifting rigs appear in this section only since FSAR Table 14.2-1 (Sheet 74 of 89) Fuel handling Equipment Test Summary, requires their inspection as a prerequisite for this test.

2) The lifting rigs are **NOT** used in 2-PTI-079-01.

[3] Reactor Vessel Head Lifting Rig Inspection

[3.1] **RECORD** work order used to inspect the Reactor Vessel Head Lifting Rig and to lift the Reactor Vessel Head and **ATTACH** a copy to this instruction.

WO No.______________ **(ACC CRIT 5.0[3.9])** ________

[3.2] **PERFORM** a visual inspection of the Reactor Vessel Head Lifting Rig and **VERIFY** that the lifting rig is assembled correctly and mechanically complete in accordance with Westinghouse Drawing 1098E58.

(ACC CRIT 5.0[3.8]) ________

[3.3] **RECORD** the work order that was used to satisfactorily load test the Reactor Vessel Head Lifting Rig and **ATTACH** a copy to this instruction.

WO No.______________ **(ACC CRIT 5.0[3.13])** ________

Date ________

4.2 Special Tools, Measuring and Test Equipment, Parts, and Supplies (continued)

[4] Internals Lifting Rig Operation Verification

[4.1] **RECORD** work order used to inspect the Internals Lifting Rig and lift the internals and **ATTACH** a copy to this instruction.

WO No.______________ **(ACC CRIT 5.0[3.10])** ________

[4.2] **VERIFY** that the proper operation of the Internals Lifting Rig, including the three pickup assemblies, adaptors, rotolock tools, and hook adapter pin travel was demonstrated.

(ACC CRIT 5.0[3.11]) ________

[4.3] **RECORD** the work order that was used to satisfactorily load test the Internals Lifting Rig and **ATTACH** a copy to this instruction.

WO No.______________ **(ACC CRIT 5.0[3.13])** ________

Date ________

4.3 Field Preparations

4.3.1 Generic Testing

[1] **ENSURE** 70588609 Site Initialization Procedure has been performed and a copy attached. ________

[2] **ENSURE** 70587992 Site Acceptance Test Procedure has been performed and a copy attached. ________

[3] **ENSURE** GTE-15 testing has been completed for the following:

A. Breaker 2-BKR-079-W1, FH PIT SIDE UPENDING WINCH (1-HST-79-W1) 0-MCC-216-B, 480V Fuel and Waste Handling BD B, Compartment 5F1. ________

B. Breaker 2-BKR-079-W2, FH RX SIDE UPENDING WINCH, 0-MCC-216-B, 480V Fuel and Waste Handling BD B, Compartment 4F. ________

C. Lighting Cabinet 0-LAC-228-256, Breaker 2A, Supply to Pool Side Upender Heaters located at AUX BLDG ELE 757 A15V. ________

D. Lighting Cabinet 0-LAC-228-281, Breaker 3B, Supply to RX Side Upender Heaters located at EL 756.63 ICE COND END WALL AZ 245°-00'. ________

[4] **ENSURE** GTE-02, Scheme Verification, has been completed for the following:

A. 2-HST-79-W1, POOL SIDE UPENDING WINCH, motor, breakers, transformers and controls (reference drawings C-07440502-D, Sheets 1 through 6 and 8). ________

B. CARRIAGE MOTOR DRIVE, motor, breakers, transformers and controls (reference drawings C-07440502-D, Sheet 7). ________

Date ________

4.3.1 Generic Testing (continued)

C. 2-HST-79-W2, RX SIDE UPENDING WINCH, motor, breakers, transformers and controls (reference drawings C-07440502-D, Sheets 9 through 15). ________

[5] **VERIFY** Pool Side nominal system voltages +/- 10% as recorded in 70588609 Site Initialization Procedure:

A. 480 VAC (432-528 VAC) **(ACC CRIT 5.0[4.3]A)** ________

B. 240 VAC (216-264 VAC) **(ACC CRIT 5.0[4.3]B)**

C. 120 VAC (108-132 VAC) **(ACC CRIT 5.0[4.3]C)** ________

D. 24 VDC (21.6-26.4 VDC) **(ACC CRIT 5.0[4.3]D)** ________

E. 5 VDC (4.5-5.5 VDC) **(ACC CRIT 5.0[4.3]E)** ________

[6] **VERIFY** RX Side nominal system voltages +/- 10% as recorded in 70588609 Site Initialization Procedure:

A. 480 VAC (432-528 VAC) **(ACC CRIT 5.0[4.3]A)** ________

B. 120 VAC (108-132 VAC) **(ACC CRIT 5.0[4.3]C)** ________

C. 24 VDC (21.6-26.4 VDC) **(ACC CRIT 5.0[4.3]D)** ________

D. 5 VDC (4.5-5.5 VDC) **(ACC CRIT 5.0[4.3]E)** ________

Date ________

4.3.2 Calibrations and Setup

[1] **ENSURE** the carriage drive has been set up in accordance with PaR Nuclear, Inc. procedure 70584784. ________

[2] **ENSURE** the Carriage Load Weighing System was calibrated in accordance with PaR Nuclear, Inc. procedure 7058477. ________

[2.1] **VERIFY** the Carriage Brake set and released while performing the load weighing system calibration. **(ACC CRIT 5.0[3.6])** ________

[3] **ENSURE** the SFP Frame Load Weighing System has been calibrated in accordance with PaR Nuclear, Inc. procedure 7058478. ________

[3.1] **VERIFY** the SFP Frame Brake set and released while performing the load weighing system calibration. **(ACC CRIT 5.0[3.6])** ________

[4] **ENSURE** the RX Frame Load Weighing System has been calibrated in accordance with PaR Nuclear, Inc. procedure 7058478. ________

[4.1] **VERIFY** the RX Frame Brake set and released while performing the load weighing system calibration. **(ACC CRIT 5.0[3.6])** ________

[5] **ENSURE** the Fuel Transfer Canal is empty. ________

[6] **ENSURE** the ABSCE Boundary has been changed to include Unit 2 Reactor Building. ________

[6.1] **VERIFY** the Fuel Transfer Tube Blind Flange between the Unit 2 Reactor Cavity and Auxiliary Building is removed. ________

[6.2] **ENSURE** 2-ISV-78-600, Fuel Transfer Tube Isolation Valve is OPEN. ________

[7] **ENSURE** the refueling cavity, refueling canal, and spent fuel pool are clean and areas adjacent to the Fuel Transfer System are clear. ________

Date ________

4.3.3 Basic Motion

[1] **TRANSCRIBE** the following date from the completed Site Initialization Procedure, 70588609:

[1.1] **RECORD** Carriage Speeds during transfer to RX side:

Maximum - 80 feet/min and 2528 RPM

Maximum_____feet/min and _____RPM

Normal - 50 feet/min and 1580 RPM

Normal_____feet/min and _____RPM

Interlock Override - 10 feet/min and 316 RPM

Interlock Override_____feet/min and _____RPM

Slow Zone - 5 feet/min and 158 RPM

Slow Zone_____feet/min and _____RPM
(ACC CRIT 5.0[4.2]A) ________

[1.2] **RECORD** RX Upender Speed in the UP direction:

Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

Normal_____feet/min and _____RPM
(ACC CRIT 5.0[4.2]C) ________

[1.3] **RECORD** RX Upender Speed in the DOWN direction:

Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

Normal_____feet/min and _____RPM
(ACC CRIT 5.0[4.2]C) ________

Date ________

4.3.3 **Basic Motion (continued)**

[1.4] **RECORD** Carriage Speeds during transfer to Pool side:

Maximum - 80 feet/min and 2528 RPM:

Maximum_____feet/min and _____RPM

Normal - 50 feet/min and 1580 RPM

Normal_____feet/min and _____RPM

Interlock Override - 10 feet/min and 316 RPM

Interlock Override_____feet/min and _____RPM

Slow Zone - 5 feet/min and 158 RPM

Slow Zone_____feet/min and _____RPM
(ACC CRIT 5.0[4.2]A) ________

[1.5] **RECORD** SFP Upender Speed in the UP direction:

Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

Normal_____feet/min and _____RPM

(ACC CRIT 5.0[4.2]B) ________

[1.6] **RECORD** SFP Upender Speed in the DOWN direction:

Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

Normal_____feet/min and _____RPM

(ACC CRIT 5.0[4.2]B) ________

[2] **VERIFY** the Transfer Canal Gate is installed and the Transfer Canal has been drained. ________

[3] **PERFORM** all Fuel Transfer System and Upender sections of 2-MI-79.001, Fuel Handing Equipment Periodic Inspection and Testing for Unit 2 under test control in preparation for the start of this test and **ATTACH** applicable data sheets to this instruction. **(ACC CRIT 5.0[2.2]B)** ________

Date ________

4.3.3 Basic Motion (continued)

[4] **VERIFY** 0-MI-79.001, Common Fuel Handling Equipment Periodic Inspection and Testing, has been performed. ________

[5] **VERIFY** successful completion of section 4.3. **(ACC CRIT 5.0[2.1])** ________

[6] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0 for performance of Section 6. ________

[7] **RECORD** the printed names, signatures, and initials of all test personnel on SMP-9.0, Signature Log. ________

4.4 Approvals and Notifications

[1] **OBTAIN** the Preoperational Startup Manager's authorization prior to start of the test.

______________________________	__________
Preoperational Startup Manager Signature	Date

[2] **OBTAIN** Unit 1 Supervisor's (US/SRO) or Shift Manager's (SM) authorization prior to start of the test.

______________________________	__________
US/SRO/SM Signature	Date

[3] **OBTAIN** Unit 2 Supervisor's (US/SRO) or Shift Manager's (SM) authorization prior to start of the test.

______________________________	__________
US/SRO/SM Signature	Date

Date ________

5.0 ACCEPTANCE CRITERIA

[1] Steps which determine acceptance criteria are designated by **(ACC CRIT).**

[2] Regulatory Guide 1.68 requires the following being included in the Test Program:

[2.1] Refueling equipment tests, including hand tools, power equipment, bridge and overhead cranes, and grapples. Testing should demonstrate the operability of protective interlocks and devices.

Successful completion of Section 4.3 satisfies the acceptance criteria, except for fuel handling tools which were previously tested and are in use on Unit 1 or which will be tested in 2-PTI-079-03, Manipulator Crane. 4.3.3[5]

[2.2] Plant operating and emergency procedures should, to the extent practical, be developed, trial-tested, and corrected during the initial test program prior to fuel loading to establish their adequacy.

A. Step 6.6[14] performs trial testing of operating procedure 2-FHI-3, Fuel Transfer System both normal and emergency operating sections.

B. Step 4.3.3[3] performs trial testing of all Fuel Transfer System and Upender sections of maintenance procedure 2-MI-79.001, Fuel Handling Equipment Periodic Inspection

[3] FSAR and Test Scoping Documents requires the following:

[3.1] Transfer Carriage cannot be moved unless 2-ISV-78-600, Fuel Transfer Tube Isolation Valve, is OPEN (Step 6.2.3[2]).

[3.2] Fuel Pool side Upender will NOT operate when the Spent Fuel Pit Bridge is in the lifting frame area (Step 6.2.4[3]).

[3.3] Reactor side Upender will NOT operate when the manipulator crane is in the lifting frame area and the crane gripper is below its top limit position (Step 6.2.5[8]).

[3.4] Upenders will NOT operate unless the Carriage is at its end travel stop (Steps 6.3.1[7] and 6.3.2[2]).

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[3.5] Transfer Carriage cannot be moved unless both Upenders are in their FULL DOWN position (Steps 6.3.3[4] and 6.3.4[5]).

[3.6] Verify operation of the Hoist Braking Systems for the Fuel Transfer System. (Steps 4.3.2[2.1], 4.3.2[3.1], and 4.3.2[4.1]

[3.7] The Dummy Fuel Assembly can be transferred from the Spent Fuel Pool to the Reactor Building and Reactor Building to Spent Fuel Pool (Step 6.6[13]).

[3.8] The Reactor Vessel Head Lifting Rig is assembled correctly and mechanically complete in accordance with Westinghouse Drawing 1098E58 (Step 4.2[3.2]).

[3.9] The Reactor Vessel Head Lifting Rig was inspected and used to lift the Reactor Vessel Head (Step 4.2[3.1]).

[3.10] The Internals Lifting Rig was inspected (Step 4.2[4.1]).

[3.11] The proper operation of the Internals Lifting Rig, including the three pickup assemblies, adaptors, rotolock tools, and hook adapter pin travel was demonstrated. (Step 4.2[4.2]).

[3.12] The proper operation of the Reactor Vessel Stud Tensioners was demonstrated (Step 6.7[2]).

[3.13] Load testing of the rector head and internals lifting fixtures has been completed. (Steps 4.2[3.3] and 4.2[4.3])

[4] Fuel Transfer System vendor requires the following:

[4.1] Demonstrate proper manual and automatic operation of Fuel Transfer System (Steps 6.4[12] and 6.5[9])

Date ________

5.0 ACCEPTANCE CRITERIA (continued)

[4.2] Carriage and upender speeds match the corresponding RPM values within +0%, -5%:

A. Carriage Speeds (Steps 4.3.3[1.1] and 4.3.3[1.4])

- Maximum - 80 feet/min and 2528 RPM
- Normal - 50 feet/min and 1580 RPM
- Interlock Override - 10 feet/min and 316 RPM
- Slow Zone - 5 feet/min and 158 RPM

B. SFP Upender Speed (Steps 4.3.3[1.6] and 4.3.3[1.5])

- Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

C. RX Upender Speed (Steps 4.3.3[1.2] and 4.3.3[1.3])

- Normal (Maximum) - 40 feet/min and 1584 RPM (1675 RPM Maximum at 60 Hz)

[4.3] Verify measured system voltages are +/- 10% of nominal voltages:

A. 480 VAC (432-528 VAC) (Steps 4.3.1[5]A and 4.3.1[6]A)

B. 240 VAC (216-264 VAC) (Step 4.3.1[5]B)

C. 120 VAC (108-132 VAC) (Steps 4.3.1[5]C and 4.3.1[6]B)

D. 24 VDC (21.6-26.4 VDC) (Steps 4.3.1[5]D and 4.3.1[6]C)

E. 5 VDC (4.5-5.5 VDC) (Steps 4.3.1[5]E and 4.3.1[6]D)

Date ________

6.0 PERFORMANCE

NOTES
1) As used in this procedure the term **'INITIATE a command',** means, using the appropriate spring loaded switch, deflect the switch to the prescribed position and **hold for at least one second,** then allow the switch to return.
2) Indicating lights on the Pool Side and RX Side Fuel Transfer Operating Panels are provided with a LIGHT TEST button. If proper indication is NOT achieved in any of the following steps, test the lamp bulb prior to commencing with further troubleshooting.
3) After initially powering both Control Panels (POOL SIDE and RX SIDE), The EMERGENCY STOP RESET buttons at the upper right corner of each Control Panel must be pressed to 'RESET' to allow system motion.
4) System Power should be turned OFF anytime the system is unattended.

6.1 Power Up Checks

[1] **ENSURE** Switches are aligned per Table 1, SWITCH LINEUPS. ________

[2] **ENSURE** Circuit Breakers are aligned per Table 2, CIRCUIT BREAKER LINEUPS. ________

[3] **PRESS** SYSTEM POWER button at top left on front of Pool Side Control Panel **THEN**

PRESS EMERGENCY STOP RESET. ________

[4] **PRESS** SYSTEM POWER button at top left on front of RX side Control Panel **THEN**

PRESS EMERGENCY STOP RESET. ________

[5] **VERIFY** the following at the Pool Side Fuel Transfer Control Panel, located at A11-W, EL 757:

A. RX SIDE POWER ON (Red) LIT ☐

B. CARRIAGE AT RX SIDE (Green) **NOT** LIT ☐

C. RX SIDE FRAME UP (Green) **NOT** LIT ☐

Date ________

6.1 Power Up Checks (continued)

D. RX SIDE FRAME DOWN (Green) LIT ☐

E. CABLE OVERLOAD (Red) **NOT** LIT ☐

F. POOL SIDE FRAME UP Lamp (Green) **NOT** LIT ☐

G. AUTORUN ACTIVE (White) **NOT** LIT ☐

H. CARRIAGE AT POOL SIDE (Green) LIT ☐

I. POOL SIDE FRAME DOWN Lamp (Green) LIT ☐

J. CARRIAGE TRAVERSING (White) **NOT** LIT ☐

K. FRAME WINCH OVERLOAD (Red) **NOT** LIT ☐

L. UPENDER CLEAR (Green) LIT ☐

M. BYPASS ACTIVATED (Red) **NOT** LIT ☐

N. DRIVE FAULT (Red) **NOT** LIT ☐

O. PLC BYPASS (Red) **NOT** LIT ☐

P. GATE VALVE OPEN (WHITE) LIT ☐

Q. NETWORK ACTIVE (WHITE) LIT ☐

R. FRAME RUN/JOG Switch at RUN ☐

S. PROX SWITCH BYPASS Switch at NORMAL ☐

T. NETWORK SELECT Switch at NETWORK ☐

U. All four PROX SELECT Switches on 'A' (Left Side of Panel) ☐

V. LOCAL/REMOTE Selector Switch (Left side of Panel) on LOCAL ________

[6] **VERIFY** online connection and logic equal using Proficy when connected to the POOL SIDE PLC and **ENSURE NO** forces enabled. ________

Date ________

6.1 Power Up Checks (continued)

[7] **VERIFY** the following at the RX Side Control Panel, located at AZ-260, EL756:

A. POOL SIDE POWER ON (Red) LIT ☐

B. CARRIAGE AT POOL SIDE (Green) **NOT** LIT ☐

C. POOL SIDE FRAME UP (Green) **NOT** LIT ☐

D. POOL SIDE FRAME DOWN (Green) LIT ☐

E. CABLE OVERLOAD (Red) **NOT** LIT ☐

F. RX SIDE FRAME UP Lamp (Green) **NOT** LIT ☐

G. AUTORUN ACTIVE (White) **NOT** LIT ☐

H. CARRIAGE AT RX SIDE (Green) LIT ☐

I. RX SIDE FRAME DOWN Lamp (Green) LIT ☐

J. CARRIAGE TRAVERSING (White) **NOT** LIT ☐

K. FRAME WINCH OVERLOAD (Red) **NOT** LIT ☐

L. UPENDER CLEAR (Green) LIT ☐

M. BYPASS ACTIVATED (Red) **NOT** LIT ☐

N. GATE VALVE OPEN (WHITE) LIT ☐

O. PLC BYPASS (Red) **NOT** LIT ☐

P. DRIVE FAULT (Red) **NOT** LIT ☐

Q. NETWORK ACTIVE (WHITE) LIT ☐

R. FRAME RUN/JOG Switch at RUN ☐

S. PROX SWITCH BYPASS Switch at NORMAL ☐

T. NETWORK SELECT Switch at NETWORK ☐

U. All three PROX SELECT Switches on 'A' (Left Side of Panel) ☐

Date ________

6.1 Power Up Checks (continued)

V. LOCAL/REMOTE Selector Switch (Left side of Panel) on LOCAL ________

[8] **VERIFY** online connection and logic equal using Proficy when connected to the RX SIDE PLC and **ENSURE NO** forces enabled. ________

Date ________

6.2 Network / Local Mode Bypass Tests

NOTES

1) All required functions are tested in NETWORK / LOCAL Mode. Normal operation of the system is this mode. Only functions that are NOT bounded by testing in this mode will be tested in other modes.
2) Functions tested by the PaR Nuclear, Inc. Site Acceptance Test will NOT be retested by this Instruction except to prove the required scope of test functions as defined in the Test Scoping Documents for system 79.
3) After initially powering both Control Panels (POOL SIDE and RX SIDE), The EMERGENCY STOP RESET buttons at the upper right corner of each Control Panel must be pressed to 'RESET' to allow system motion.
4) Beginning position for this section is: Carriage at POOL SIDE and both RX and POOL SIDE Upender Frames DOWN.

6.2.1 Basic Function

[1] **ENSURE** Switches are aligned per Table 1, SWITCH LINEUPS. ________

[2] **ENSURE** Circuit Breakers are aligned per Table 2, CIRCUIT BREAKER LINEUPS. ________

[3] **INITIATE** a FRAME UP command at the Pool Side Control Panel, then **VERIFY**:

A. Pool Side Upender RISES. ________

B. FRAME DOWN Lamp (Green) on Pool Side Control Panel **NOT** LIT ________

[4] **WHEN** Upender is approximately at mid-travel, **THEN**

DEPRESS the FRAME STOP Pushbutton at the Pool Side Control Panel and **VERIFY** the Pool Side Upender STOPS. ________

[5] **INITIATE** a TRAVERSE to RX command at the Pool Side Control Panel, and **VERIFY** the Transfer Carriage DOES **NOT** MOVE. ________

Date ________

6.2.1 Basic Function (continued)

[6] **PLACE** the FRAME- JOG/RUN Switch at Pool Side Control Panel to JOG. ________

[7] **INITIATE** a FRAME- UP command at the Pool Side Control Panel, and **VERIFY** the Pool Side Upender JOGS UP. ________

[8] **INITIATE** a FRAME- DOWN command at the Pool Side Control Panel, and **VERIFY** the Pool Side Upender JOGS DOWN. ________

[9] **PLACE** the FRAME- JOG/RUN Switch at the Pool Side Control Panel to RUN. ________

[10] **INITIATE** a FRAME UP command at the Pool Side Control Panel and **VERIFY:**

A. Pool Side Upender RAISES to FULL UP position and winch STOPS. ________

B. FRAME DOWN Lamp (Green) at Pool Side Control Panel **NOT** LIT ________

C. FRAME UP Lamp (Green) at Pool Side Control Panel LIT ________

[11] **INITIATE** a FRAME DOWN command at the Pool Side Control Panel and **VERIFY:**

A. Pool Side Upender LOWERS to FULL DOWN position and winch STOPS. ________

B. FRAME UP Lamp (Green) at Pool Side Control Panel **NOT LIT** ________

C. FRAME DOWN Lamp (Green) at Pool Side Control Panel LIT ________

Date ________

6.2.2 Winch Handwheel Switches

[1] **REMOVE** the Carriage Drive Handwheel located at Elevation 757, adjacent to the U2 Spent Fuel Pool Transfer Canal, and **VERIFY** DRIVE FAULT lamp is LIT on POOL SIDE Control Panel. ________

[2] **INITIATE** a TRAVERSE to RX SIDE command at the POOL SIDE Control Panel and **VERIFY** the Carriage Does **NOT** MOVE. ________

[3] **REPLACE** the Carriage Drive Handwheel to the storage location and **VERIFY** DRIVE FAULT lamp is **NOT** LIT on the POOL SIDE Control Panel. ________

[4] **REMOVE** the POOL SIDE UPENDER FRAME WINCH Drive Handwheel located at Elevation 757, adjacent to the U2 Spent Fuel Pool Transfer Canal, and **VERIFY** DRIVE FAULT lamp is LIT on POOL SIDE Control Panel. ________

[5] **INITIATE** a FRAME UP command at the POOL SIDE Control Panel and **VERIFY** the Upender FRAME DOES **NOT** MOVE. ________

[6] **REPLACE** the POOL SIDE UPENDER FRAME WINCH Drive Handwheel to the storage location and **VERIFY** DRIVE FAULT lamp is **NOT** LIT on the POOL SIDE Control Panel. ________

[7] **REMOVE** the RX SIDE UPENDER FRAME WINCH Drive Handwheel located at Elevation 757, adjacent to the U2 Spent Fuel Pool Transfer Canal, and **VERIFY** DRIVE FAULT lamp is LIT on POOL SIDE Control Panel. ________

[8] **INITIATE** a FRAME UP command at the RX SIDE Control Panel and **VERIFY** the Upender FRAME DOES **NOT** MOVE. ________

[9] **REPLACE** the RX SIDE UPENDER FRAME WINCH Drive Handwheel to the storage location and **VERIFY** DRIVE FAULT lamp is **NOT** LIT on the POOL SIDE Control Panel. ________

6.2.3 Gate Valve OPEN Bypass

WARNING

Prior to placing any Fuel Handling System safety interlock feature in BYPASS, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

NOTES

1) To SET a Proximity Switch Bypass, requires actuation of the PROX SWITCH BYPASS Key Switch while simultaneously pressing the push button indicator for the specific bypass.
2) A Proximity Switch cannot be set to bypass if the condition is present. If a Proximity Switch is preventing a movement and it is desired to bypass the switch, the condition must be cleared, and then the Proximity Switch may be bypassed.
3) A bypassed Proximity Switch can be CLEARED by pressing and releasing the associated flashing function indicator light. (It is NOT necessary to actuate the PROX SWITCH BYPASS key switch to CLEAR the bypass.)
4) ALL bypassed Proximity Switches on either Control Panel will be cleared if the main power to the control panel is cycled OFF and back ON.
5) ALL bypassed Proximity Switches will be cleared if the PLC OVERRIDE key switch is cycled to CLEAR. ALL Proximity interlocks processed by the PLC are bypassed in the PLC OVER RIDE mode.
6) The following Proximity Bypasses CLEAR automatically when the listed events occur:
   - Frame UP Bypass - Clears when Frame moves toward LOWER
   - Frame DOWN Bypass - Clears When Frame begins to RAISE
   - Carriage At RX/POOL Bypass - Clear when a Carriage Traverse starts

Date ________

6.2.3 Gate Valve OPEN Bypass (continued)

[1] **ENSURE** the following conditions exist:

Carriage at the POOL position,

Both Upender Frames DOWN, and

No indicated faults, **THEN**

OPERATE the Transfer Tube Gate Valve toward CLOSED until the GATE VALVE OPEN light at the POOL SIDE Control Panel extinguishes. ________

[2] **INITIATE** a TRAVERSE to RX command at the POOL SIDE Control Panel and **VERIFY** the Carriage Does **NOT** MOVE. **(ACC CRIT 5.0[3.1])** ________

[3] **SET** a BYPASS of the GATE VALVE OPEN PROX SWITCH at the POOL SIDE Control Panel. ________

NOTE
In the next step, the CARRIAGE STOP Pushbutton must be pressed in rapid succession to prevent carriage contact with the gate valve.

[4] **INITIATE** a TRAVERSE to RX SIDE command at the POOL SIDE Control Panel and **VERIFY** the hoist brake releases and the motor starts to turn **THEN**

IMMEDIATELY DEPRESS the CARRIAGE STOP Pushbutton. ________

[5] **INITIATE** a TRAVERSE to POOL SIDE command at the POOL SIDE Control Panel and **VERIFY** the CARRIAGE AT POOL SIDE lamp illuminates. ________

[6] **DEPRESS** the GATE VALVE OPEN Pushbutton at the POOL SIDE Control Panel and **VERIFY** the BYPASS is CLEARED at both Control Panels. ________

[7] **NOTIFY** OPS to OPEN the Transfer Tube Gate Valve and **VERIFY** the GATE VALVE OPEN light at the POOL SIDE Control Panel illuminates. ________

Date ________

6.2.4 Pool Side Upender Clear Bypass

WARNING

Prior to placing any Fuel Handling System safety interlock feature in BYPASS, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

[1] **POSITION** Rocker Arms on SFP Crane position switches 2-SW-79-1 and 2-SW-79-2, EL757 under Spent Fuel Pool Bridge Crane, to indicate Pool Bridge Crane at Upender. ________

[2] **ENSURE** the SFP Crane Hoist is lowered enough so that 'UPENDER CLEAR' Lamp is **NOT** LIT. ________

[3] **INITIATE** a FRAME UP command at the Pool Side Control Panel and **VERIFY** the Pool Side Upender DOES **NOT** MOVE (UPENDER CLEAR - Lamp **NOT** LIT) - **(ACC CRIT 5.0[3.2])** ________

[4] **SET** a BYPASS of the UPENDER CLEAR PROX SWITCH at the POOL SIDE Control Panel and **VERIFY**

A. BYPASS ACTIVATED (Red) light is LIT. ________

B. UPENDER CLEAR (Green) light is FLASHING ________

[5] **ENSURE** the SFP Crane Hoist is CLEAR of the Upender, **THEN**

INITIATE a FRAME UP command at the Pool Side Control Panel. ________

A. **VERIFY** Pool Side Upender RAISES to its FULL UP position and the winch STOPS. ________

B. **VERIFY** FRAME DOWN Lamp (Green) at Pool Side Control Panel **NOT** LIT. ________

C. **VERIFY** FRAME UP Lamp (Green) at Pool Side Control Panel LIT. ________

[6] **DEPRESS** and **RELEASE** the flashing UPENDER CLEAR light (Green) on the Pool Side Control Panel to CLEAR the Proximity Switch Bypass. ________

Date ________

6.2.4 Pool Side Upender Clear Bypass (continued)

[7] **INITIATE** a FRAME DOWN command at the Pool Side Control Panel and **VERIFY** the Pool Side Upender DOES **NOT** MOVE. ('UPENDER CLEAR' Lamp **NOT** LIT) ________

[8] **RAISE** the SFP Crane Hoist to the FULL UP position and **MOVE** the SFP Crane away from the Pool Side Upender. ________

6.2.5 Emergency Stop and RX Side Upender Clear Bypass

WARNING

Prior to placing any Fuel Handling System safety interlock feature in BYPASS, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel.

[1] **DEPRESS** the POWER OFF Pushbutton at the RX SIDE Control Panel and **VERIFY** the REACTOR SIDE POWER ON Lamp (Red) at the Pool Side Control Panel is **NOT** LIT. ________

[2] **INITIATE** a TRAVERSE to RX command at the Fuel POOL SIDE Control Panel and **VERIFY** the Carriage DOES **NOT** MOVE. ________

[3] **DEPRESS** the SYSTEM POWER Pushbutton at the RX SIDE Control Panel and **VERIFY** the REACTOR SIDE POWER ON Lamp (Red) at the Pool Side Control Panel is LIT. ________

[4] **DEPRESS** the EMERGENCY STOP RESET pushbutton at the RX Control Panel to activate the system. ________

[5] **INITIATE** a TRAVERSE to RX command at the Pool Side Control Panel, **THEN**

[5.1] **MONITOR** the conveyor position indicator and **VERIFY**:

A. CARRIAGE POSITION Indicator at POOL SIDE Control Panel tracks Carriage position. ________

B. Carriage traverses to its End Stop at the RX SIDE ________

C. CARRIAGE AT RX SIDE Lamp (Green) at RX Side Control Panel is LIT. ________

Date ________

6.2.5 Emergency Stop and RX Side Upender Clear Bypass (continued)

D. CARRIAGE AT RX lamp (Green) at POOL SIDE Control Panel is LIT. ________

[5.2] **RECORD** the highest reading observed at the CARRIAGE POSITION Indicator.__________ ________

[6] **INITIATE** a FRAME UP command at the RX Side Control Panel and **VERIFY**:

A. RX SIDE Upender RISES. ________

B. RX SIDE FRAME DOWN Lamp (Green) at RX SIDE Control Panel is **NOT** LIT. ________

[7] **POSITION** the Manipulator Crane over the RX SIDE Upender and **LOWER** the Fuel Gripper to a level below the GRIPPER UP, DISENGAGED (GUD) position but higher than the Upender FULL UP position. ________

[8] **INITIATE** a FRAME DOWN command at the RX Side Control Panel and **VERIFY** the RX Side Upender DOES **NOT** MOVE.

(ACC CRIT 5.0[3.3]) ________

[9] **ACTIVATE** a BYPASS of the PROX SWITCH for UPENDER CLEAR at the RX SIDE Control Panel and **VERIFY:**

A. BYPASS ACTIVATED (Red) light is LIT. ________

B. UPENDER CLEAR (Green) light is FLASHING ________

[10] **INITIATE** a FRAME DOWN command at the RX Side Upender and **VERIFY**:

A. Reactor Side Upender LOWERS to its FULL DOWN position and the winch STOPS. ________

B. FRAME DOWN Lamp (Green) at RX Side Control Panel is LIT. ________

C. FRAME UP Lamp (Green) at RX Side Control Panel is **NOT** LIT. ________

[11] **DEPRESS** and **RELEASE** the Flashing UPENDER CLEAR light (Green) on the RX SIDE Control Panel to CLEAR the Proximity Switch Bypass. ________

Date ________

6.2.5 Emergency Stop and RX Side Upender Clear Bypass (continued)

[12] **INITIATE** a FRAME UP command at the RX Side Upender and **VERIFY** the Reactor Side Upender DOES **NOT** MOVE. ________

Date ________

6.3 Network / Local Mode Plc Override Test

6.3.1 Carriage Not At Pool Override

WARNING

Prior to placing any Fuel Handling System safety interlock feature in OVERRIDE, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

[1] **ENSURE** Switches are aligned per Table 1, SWITCH LINEUPS. ________

[2] **ENSURE** Circuit Breakers are aligned per Table 2, CIRCUIT BREAKER LINEUPS. ________

[3] **INITIATE** a FRAME DOWN command at the Pool Side Control Panel and **VERIFY:**

A. Pool Side Upender Lowers to its FULL DOWN position and the winch STOPS. ________

B. FRAME DOWN Lamp (Green) at Pool Side Control Panel is LIT. ________

C. FRAME UP Lamp (GREEN) at Pool Side Control Panel is **NOT** LIT. ________

[4] **INITIATE** a TRAVERSE to RX Command at the POOL Side Control Panel, then **VERIFY**:

A. Fuel Transfer Carriage MOVES toward the Reactor Building. ________

B. CARRIAGE AT POOL SIDE Lamp (Green) at Pool Side Control Panel is **NOT** LIT. ________

C. CARRIAGE POSITION indicator at Pool Side Control Panel is COUNTING. ________

Date ________

6.3.1 Carriage Not At Pool Override (continued)

[5] **WHEN** the Carriage has traversed to approximately mid travel (clear of the Upender lifting frame), **THEN**

DEPRESS the CARRIAGE STOP Pushbutton at the Pool Side Control Panel and **VERIFY** the Carriage STOPS. ________

[6] **ENSURE** the Upender Basket is clear of the Upender Frame. ________

[7] **INITIATE** a FRAME UP command at the POOL SIDE Control Panel, and **VERIFY** FRAME DOES **NOT** MOVE. (CARRIAGE AT POOL light **NOT** ON) **(ACC CRIT 5.0[3.4])** ________

[8] **SET** a PLC OVERRIDE at the POOL SIDE Control Panel ________

NOTE

In the next step, the FRAME STOP Pushbutton must be pressed in rapid succession

[9] **INITIATE** a FRAME UP command at the POOL SIDE Control Panel and **VERIFY** the hoist brake releases and the motor starts to turn, **THEN**

IMMEDIATELY DEPRESS the FRAME STOP Pushbutton. ________

[10] **RETURN** the POOL SIDE FRAME to the FULL DOWN position ________

[11] **CLEAR** the 'PLC OVERRIDE' at the POOL SIDE Control Panel. ________

6.3.2 Carriage Not At RX Override

WARNING

Prior to placing any Fuel Handling System safety interlock feature in OVERRIDE, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

[1] **ENSURE** the Upender Basket is clear of the Upender Frame. ________

[2] **INITIATE** a FRAME UP command at the RX SIDE Control Panel, and **VERIFY** the FRAME DOES **NOT** MOVE. (CARRIAGE AT RX light **NOT** LIT) **(ACC CRIT 5.0[3.4])** ________

[3] **SET** a PLC OVERRIDE at the RX SIDE Control Panel. ________

Date ________

6.3.2 Carriage Not At RX Override (continued)

NOTE
In the next step, the FRAME STOP Pushbutton must be pressed in rapid succession

[4] **INITIATE** a FRAME UP command at the RX SIDE Control Panel and **VERIFY** the hoist brake releases and the motor starts to turn, **THEN**

IMMEDIATELY DEPRESS the FRAME STOP Pushbutton. ________

[5] **RETURN** the RX SIDE FRAME to the FULL DOWN position ________

[6] **CLEAR** the 'PLC Override' at the RX SIDE Control Panel. ________

[7] **INITIATE** a TRAVERSE to POOL SIDE Command at the RX SIDE Control Panel, and **VERIFY** the Carriage DOES **NOT** MOVE. (CARRIAGE AT RX Lamp **NOT** LIT) ________

[8] **SET** a PLC OVERRIDE at the RX SIDE Control Panel. ________

[9] **INITIATE** a TRAVERSE to POOL command and **VERIFY** the carriage moves to the POOL SIDE stop and CARRIAGE AT POOL SIDE (Green) lamp is LIT. ________

6.3.3 RX Side Frame UP / DOWN Override

WARNING
Prior to placing any Fuel Handling System safety interlock feature in OVERRIDE, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

[1] **INITIATE** a FRAME UP command at the RX Side Control Panel and **VERIFY**:

A. Reactor Side Upender RAISES. (Without Basket) ________

B. RX SIDE FRAME DOWN Lamps (Green) at BOTH Control Panels are **NOT** LIT. ________

[2] **WHEN** the Upender is at approximately mid-travel, **THEN**

DEPRESS the FRAME STOP Pushbutton at the RX Side Control Panel and **VERIFY:**

Date ________

6.3.3 RX Side Frame UP / DOWN Override (continued)

A. RX Side Upender STOPPED (Without Basket). ________

B. RX SIDE FRAME UP Lamps (Green) at BOTH Control Panels are **NOT** LIT. ________

C. RX SIDE FRAME DOWN Lamps (Green) at BOTH Control Panels are **NOT** LIT. ________

[3] **CLEAR** the 'PLC Override' at the RX SIDE Control Panel. ________

[4] **INITIATE** a TRAVERSE to RX Command at the POOL Side Control Panel and **VERIFY:**

A. CARRIAGE DOES **NOT** MOVE. **(ACC CRIT 5.0[3.5])** ________

B. UPENDER CLEAR Lamp at RX SIDE Control Panel is **NOT** LIT. ________

[5] **SET** a PLC OVERRIDE at the RX SIDE Control Panel. ________

[6] **INITIATE** a FRAME DOWN command at the RX Side Control Panel, and **VERIFY:**

A. RX Side Upender Lowers to its FULL DOWN position and the winch STOPS. ________

B. RX SIDE FRAME DOWN Lamps (Green) at BOTH Control Panels are LIT. ________

C. RX SIDE FRAME UP Lamps (GREEN) at BOTH Control Panels are **NOT** LIT. ________

[7] **CLEAR** the PLC OVERRIDE at the RX Control Panel. ________

[8] **INITIATE** a TRAVERSE to RX command at the Pool Side Control Panel and **VERIFY**:

A. CARRIAGE POSITION Indicator at POOL SIDE Control Panel tracks Carriage position. ________

B. Carriage traverses to its End Stop at the RX SIDE. ________

C. CARRIAGE AT RX SIDE Lamp (Green) at RX Side Control Panel is LIT. ________

Date ________

6.3.3 RX Side Frame UP / DOWN Override (continued)

D. CARRIAGE AT RX lamp (Green) at POOL SIDE Control Panel is LIT. ________

6.3.4 Pool Side Frame UP / DOWN Override

WARNING

Prior to placing any Fuel Handling System safety interlock feature in OVERRIDE, the Test Director MUST fully understand the design purpose for the interlock and accept responsibility for protection of personnel and equipment.

[1] **SET** a PLC OVERRIDE at the POOL SIDE Control Panel. ________

[2] **INITIATE** a FRAME UP command at the POOL SIDE Control Panel and **VERIFY**:

A. POOL Side Upender RISES. (Without Basket) ________

B. POOL SIDE FRAME DOWN Lamp (Green) at both sides Control Panels **NOT** LIT. ________

[3] **WHEN** the Upender is at approximately mid-travel, **THEN**

DEPRESS the FRAME STOP Pushbutton at the POOL Side Control Panel and **VERIFY:**

A. POOL SIDE Upender STOPPED (Without Basket). ________

B. POOL SIDE FRAME UP Lamps (Green) at BOTH Control Panels are **NOT** LIT. ________

C. POOL SIDE FRAME DOWN Lamps (Green) at BOTH Control Panels are **NOT** LIT. ________

[4] **CLEAR** the 'PLC Override' at the POOL SIDE Control Panel. ________

[5] **INITIATE** a TRAVERSE to POOL Command at the POOL Side Control Panel and **VERIFY:**

A. CARRIAGE DOES **NOT** MOVE. **(ACC CRIT 5.0[3.5])** ________

B. UPENDER CLEAR Lamp at POOL SIDE Control Panel is **NOT** LIT. ________

[6] **SET** a PLC OVERRIDE at the POOL SIDE Control Panel. ________

Date ________

6.3.4 Pool Side Frame UP / DOWN Override (continued)

[7] **INITIATE** a FRAME DOWN command at the POOL Side Control Panel, and **VERIFY:**

A. POOL Side Upender Lowers to its FULL DOWN position and the winch STOPS. ________

B. POOL SIDE FRAME DOWN Lamps (Green) at BOTH Control Panels are LIT. ________

C. POOL SIDE FRAME UP Lamps (GREEN) at BOTH Control Panels are **NOT** LIT. ________

[8] **CLEAR** the PLC OVERRIDE at the POOL SIDE Control Panel. ________

[9] **INITIATE** a TRAVERSE to POOL command at the POOL SIDE Control Panel and **VERIFY**:

A. Carriage traverses to its End Stop at the POOL Side Upender. ________

B. CARRIAGE AT POOL Lamp at POOL Side Control Panel is LIT. ________

C. CARRIAGE AT RX Lamp at POOL Side Control Panel is **NOT** LIT. ________

D. CARRIAGE AT RX Lamp at RX Side Control Panel is **NOT** LIT. ________

Date ________

6.4 Network / Remote Mode

> **NOTE**
>
> In the REMOTE mode the AUTO TRANSFER feature is available from the Manipulator Crane (Refueling Machine) Control Panel.

[1] **ENSURE** BOTH Fuel Handling Control Panels are powered and the Fuel Transfer System is ready to operate. ________

[2] **SELECT** REMOTE on the LOCAL/REMOTE selector switch on the left side of BOTH RX SIDE and POOL SIDE Control Panels. ________

[3] **SELECT** NETWORK on the NETWORK/DISCRETE selector switch on the left side of BOTH RX SIDE and POOL SIDE Control Panels. ________

[4] **VERIFY** the following at the POOL Side Control Panel, located at A11-W, EL757:

A. FRAME DOWN Lamp is LIT. ________

B. FRAME UP Lamp is **NOT** LIT. ________

C. CONVEYOR AT RX SIDE Lamp is **NOT** LIT. ________

D. CARRIAGE AT POOL SIDE Lamp is LIT. ________

E. GATE VALVE OPEN Lamp is LIT. ________

[5] **VERIFY** the following at the RX Side Control Panel, located at AZ-260, EL756:

A. FRAME UP Lamp is **NOT** LIT. ________

B. FRAME DOWN Lamp is LIT. ________

C. CARRIAGE AT RX Lamp is **NOT** LIT. ________

[6] **ENSURE** the POOL Side Upender is in the FULL DOWN position. ________

Date ________

6.4 Network / Remote Mode (continued)

[7] **INITIATE** a TRAVERSE TO RX command at the POOL SIDE Control Panel and **VERIFY**:

A. Carriage traverses to its End Stop at the RX Side Upender. ________

B. CARRIAGE AT POOL Lamp at POOL SIDE Control Panel is **NOT** LIT. ________

C. CARRIAGE AT RX Lamp at POOL SIDE Control Panel is LIT. ________

D. CARRIAGE AT RX Lamp at RX SIDE Control Panel is LIT. ________

[8] **INITIATE** a FRAME UP command at the RX SIDE Control Panel, then **VERIFY**:

A. RX SIDE Upender RISES. ________

B. FRAME DOWN Lamp (Green) on RX SIDE and POOL SIDE Control Panels are **NOT** LIT. ________

C. RX SIDE FRAME UP Lamp (Green) at RX SIDE and POOL SIDE Control Panels are LIT. ________

[9] **VERIFY** the Pool Side Upender in the FRAME DOWN position as indicated by visual observation and panel indicating lamps. ________

[10] **ENSURE** the Manipulator Crane is OUT of the CLEAR zone or **RAISE** the FUEL GRAPPLE to the FULL UP position so that the UPENDER CLEAR lamp on the RX SIDE Control Panel is LIT. ________

[11] **INITIATE** an AUTO TRANSFER command at the MANIPULATOR CRANE Control Panel, and **VERIFY:**

A. The RX Side UPENDER LOWERS to full down position. ________

B. The TRANSFER CARRIAGE travels toward POOL SIDE and the CARRIAGE AT RX SIDE Lamp extinguishes at BOTH Control Panels. ________

C. Carriage traverses to POOL SIDE and CARRIAGE AT POOL SIDE Lamps are LIT at BOTH Control Panels. ________

Date ________

6.4 Network / Remote Mode (continued)

D. POOL SIDE Upender Frame Rises and POOL SIDE FRAME UP Lamps are LIT at BOTH Control Panels. ________

E. FRAME UP Lamp (Green) at Pool Side Control Panel is LIT. ________

[12] **VERIFY** successful completion of section 6.4 which satisfies Acceptance Criteria for automatic operation of the system.

(ACC CRIT 5.0[4.1]) ________

Date ________

6.5 Discrete / Local Mode

NOTES

1) In DISCRETE mode the FUEL TRANSFER SYSTEM is functional ONLY in LOCAL mode from the POOL SIDE and RX SIDE Control Panels. AUTO TRANSFER feature is NOT available. (Fiber Optic Communication is NOT available.)
2) In DISCRETE mode the POOL SIDE and RX SIDE Control Panels function independently. Indicator Lamps for the opposite SIDE are NOT active and are to be disregarded. (Communication is limited to a hard wired interface between the POOL SIDE and RX SIDE Control Panels.)
3) In DISCRETE mode the RX SIDE can only command the transfer carriage to traverse to the POOL SIDE and NOT from the POOL SIDE to the RX SIDE. The POOL SIDE can still command traverse in both directions.

[1] **ENSURE** BOTH Fuel Handling Control Panels are powered and the Fuel Transfer System is ready to operate. ________

[2] **SELECT** DISCRETE on the NETWORK/DISCRETE selector switch on the left side of BOTH RX SIDE and POOL SIDE Control Panels. ________

[3] **ENSURE** LOCAL/REMOTE selector switches on the left side of BOTH RX SIDE and POOL SIDE Control Panels are set to LOCAL. ________

[4] **ENSURE** Transfer Carriage is against stop at POOL side with frame down. ________

[5] **VERIFY** the POOL SIDE Upender is in the FRAME DOWN position as indicated by visual observation and POOL SIDE Control Panel indicating lamp.

[6] **ENSURE** the Manipulator Crane is OUT of the CLEAR zone or **RAISE** the FUEL GRAPPLE to the FULL UP position so that the UPENDER CLEAR lamp is LIT on the RX SIDE Control Panel. ________

[7] **INITIATE** a TRAVERSE to RX command at the RX SIDE Control Panel and **VERIFY** the Carriage does **NOT** move. ________

Date ________

6.5 Discrete / Local Mode (continued)

[8] **INITIATE** a TRAVERSE to RX command at the POOL SIDE Control Panel and **VERIFY:**

A. Carriage traverses to its End Stop at the RX SIDE Upender and STOPS. ________

B. Carriage Position Indicator at RX SIDE Control Panel Tracks Carriage Position. ________

C. CARRIAGE AT RX SIDE Lamp (Green) at Pool Side Control Panel LIT. ________

[9] **VERIFY** successful completion of section 6.5 which satisfies vendor acceptance criteria to demonstrate proper manual operation. **(ACC CRIT 5.0[4.1])** ________

Date ________

6.6 Fuel Transfer System Demonstration

NOTE
Fuel Transfer Tube Track misalignment was identified by NCR 3844. Do NOT attempt to travel conveyor car through the transfer tube unless this issue has been resolved. Refer to PER 201778 for details.

[1] **ENSURE** Switches are aligned per Table 1, SWITCH LINEUPS. ________

[2] **ENSURE** Circuit Breakers are aligned per Table 2, CIRCUIT BREAKER LINEUPS. ________

[3] **VERIFY** the following at the POOL Side Control Panel, located at A11-W, EL757:

A. FRAME DOWN Lamp is LIT. ________

B. FRAME UP Lamp is **NOT** LIT. ________

C. CONVEYOR AT RX SIDE Lamp is **NOT** LIT. ________

D. CARRIAGE AT POOL SIDE Lamp is LIT. ________

E. GATE VALVE OPEN Lamp is LIT. ________

[4] **VERIFY** the following at the RX Side Control Panel, located at AZ-260, EL756:

A. FRAME UP Lamp is **NOT** LIT. ________

B. FRAME DOWN Lamp is LIT. ________

C. CARRIAGE AT RX Lamp is **NOT** LIT. ________

[5] **INITIATE** a FRAME UP command at the POOL Side Control Panel and **VERIFY** the POOL Side Upender RISES to its FULL UP position. ________

Date ________

6.6 Fuel Transfer System Demonstration (continued)

[6] **IF** necessary, **THEN**

INSTALL the Dummy Fuel Assembly with Rod Control Cluster into the Pool Side Upender per FHI-2, Spent Fuel Pit Bridge and Spent Fuel Pit Handling Tool. ________

[7] **INITIATE** a FRAME DOWN command at the POOL Side Control Panel and **VERIFY** the POOL Side Upender LOWERS to its FULL DOWN position. ________

[8] **INITIATE** a TRAVERSE TO RX command at the POOL SIDE Control Panel and **VERIFY**:

A. Carriage traverses to its End Stop at the RX Side Upender. ________

B. CARRIAGE AT POOL Lamp at POOL SIDE Control Panel is **NOT** LIT. ________

C. CARRIAGE AT RX Lamp at POOL SIDE Control Panel is LIT. ________

D. CARRIAGE AT RX Lamp at RX SIDE Control Panel is LIT. ________

[9] **INITIATE** a FRAME UP command at the RX SIDE Control Panel to RAISE the RX Side Upender and **VERIFY**:

A. RX Side Upender RISES to its FULL UP position. ________

B. FRAME UP Lamp at RX Side Control Panel is LIT. ________

C. FRAME DOWN Lamp at RX Side Control Panel is **NOT** LIT. ________

[10] **INITIATE** a FRAME DOWN command at the RX Side Control Panel and **LOWER** the RX Side Upender to its FULL DOWN position. ________

Date ________

6.6 Fuel Transfer System Demonstration (continued)

[11] **INITIATE** a TRAVERSE to POOL command at the POOL SIDE Control Panel and **VERIFY**:

A. Carriage traverses to its End Stop at the POOL Side Upender. ________

B. CARRIAGE AT POOL Lamp at POOL Side Control Panel is LIT. ________

C. CARRIAGE AT RX Lamp at POOL Side Control Panel is **NOT** LIT. ________

D. CARRIAGE AT RX Lamp at RX Side Control Panel is **NOT** LIT. ________

[12] **INITIATE** a FRAME UP command at the POOL SIDE Control Panel and **VERIFY** Pool Side Upender RISES to its FULL UP position. ________

[13] **VERIFY** that steps 6.6[1] - 6.6[12] were satisfactorily completed demonstrating successful transfer of the Dummy Fuel Assembly from the Spent Fuel Pool to the Rx Building and from the Rx Building to the Spent Fuel Pool.

(ACC CRIT 5.0[3.7]) ________

[14] **EXERCISE** the Fuel Transfer System by trial performance of all sections in 2-FHI-3, Fuel Transfer System, using the dummy fuel assembly, under test control.
(ACC CRIT 5.0[2.2]A) ________

[15] **DEPRESS** the Power OFF Switch at the Fuel Pool Side control Panel. ________

[16] **VERIFY** the HEATER POWER ON Lamp at the Fuel Pool Side Control Panel is LIT. ________

[17] **DEPRESS** the Power OFF Switch at the RX SIDE Control Panel. ________

[18] **VERIFY** the HEATER POWER ON Lamp at the RX SIDE Control Panel is LIT. ________

[19] **ENSURE** Switches are aligned per Table 1, SWITCH LINEUPS. ________

Date ________

6.7 Reactor Vessel Stud Tensioner Operation Verification

[1] **OBTAIN** a copy of the completed Work Order which performed SMI-68.Q, Reactor Pressure Vessel Tensioning for Hot Functional Testing, and **ATTACH** the work order to this procedure.

WO No.______________ ________

[2] **VERIFY** that during performance of Subsection 6.3 of SMI-68.Q, the proper operation of the Reactor Vessel Stud Tensioners was demonstrated.

(ACC CRIT 5.0[3.12]) ________

Date ________

7.0 POST-PERFORMANCE ACTIVITIES

[1] **ENSURE** Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed and the test results recorded in Measuring and Test Equipment (M&TE) Log. ________

[2] **MOVE** the Dummy Fuel Assembly to the storage location selected by the Fuel Handling Supervisor. ________

[3] **REPLACE** the covers on the Transfer Canal, unless directed otherwise by the Unit 2 Supervisor (US/SRO). ________

[4] **NOTIFY** the Unit 2 Supervisor (US/SRO) of the test completion and system alignment. ________

8.0 RECORDS

A. QA Records

Completed Test Package.

B. Non-QA Records

None

Appendix A
(Page 1 of 1)

DRAWINGS AND REFERENCES

Date ________

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE (N/A for no change)
Final Safety Analysis Report, Amendment 110 Table 14.2-1, Sheets 74 and 75 of 89 Fuel Handling Equipment Test Summary Chapter 9, Section 9.1.4, Fuel Handling System Chapter 9, Section 9.1.1, New Fuel Storage			
2-TSD-079-01, Fuel Transfer System, Rev 1			
2-TSD-079-03, Fuel Handling Manipulating Crane, Rev 1			
WBN2-79-400, System Description for Fuel Handling and Storage System, Rev 2			

Reviewed By: ____________

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

Date ________

NOTE
These steps will be N/A'd if no temporary condition existed. Additional copies of this table may be made as necessary.

ITEM NUMBER	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step Number	Perf. By/Date CV By/Date	Step Number	Returned By/Date CV By/Date

Appendix C
(Page 1 of 1)

PERMANENT PLANT INSTRUMENTATION LOG

Date ________

INSTRUMENT OR INSTRUMENT LOOP NO.	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTANCE INITIAL/DATE
		INITIAL/DATE	INITIAL/DATE	YES	NO		

1 These items may be initialed and dated by personnel performing the task. Instrumentation **NOT** required to be filled and vented may be identified as Not Applicable (N/A).

2 May be identified as Not Applicable (N/A) if instrument was **NOT** used to verify/record quantitative acceptance criteria data.

Table 1
(Page 1 of 1)
SWITCH LINEUPS

Date ________

Step No. __________

POOL -SIDE CONTROL PANEL, A11-W, EL757

SWITCH / Lamp	POSITION	INITIALS
LOCAL / REMOTE	LOCAL	
FRAME RUN / JOG	RUN	
PLC OVERRIDE	CLEAR	
PROX SWITCH BYPASS	NORMAL	
NETWORK / DISCRETE SWITCH	NETWORK	
PROX SELECT SWITCHES	A	

RX-SIDE CONTROL PANEL, AZ-260, EL756

SWITCH	POSITION	INITIALS
LOCAL / REMOTE	LOCAL	
FRAME RUN / JOG	RUN	
PLC OVERRIDE	CLEAR	
PROX SWITCH BYPASS	NORMAL	
NETWORK / DISCRETE SWITCH	NETWORK	
PROX SELECT SWITCHES	A	

Make copies of this table as necessary.

Table 2
(Page 1 of 2)
CIRCUIT BREAKER LINEUPS

Date ________

Step No. __________

POOL -SIDE, A11-W, EL757

CIRCUIT BREAKER	POSITION	INITIALS
MAIN DISCONNECT SWITCH, DISC_M	ON	
AIR CONDITIONER, CB_AC	ON	
BRAKE POWER, CB_BP	ON	
CARRIAGE DRIVE, CB-CD	ON	
DRIVE POWER, CB_DP	ON	
CONTROL POWER, CB_CP	ON	
CONTROL POWER FILTERED, CB_CPF	ON	
LOAD CELL AMP, CB_LC	ON	
CABINET LIGHT POOL SIDE, CB_LT_P	ON	
MONITORING SAFETY RELAY, CB_MSR	ON	
DC POWER SUPPLIES, CB_PS	ON	
PROGRAMMABLE LOGIC CONTROLLER, CB_PLC	ON	
POOL SIDE WINCH POWER, CB_PWP	ON	
POOL SIDE HEATERS, CB_PHTR	ON	
RECEPTICAL POWER, CB_RP	ON	

Table 2
(Page 2 of 2)

CIRCUIT BREAKER LINEUPS

Date ________

RX-SIDE, AZ-260, EL756

CIRCUIT BREAKER	POSITION	INITIALS
MAIN DISCONNECT SWITCH, DISC_M	ON	
BRAKE POWER, CB_BP	ON	
CONTROL POWER, CB_CP	ON	
LOAD CELL AMP, CB_LC	ON	
CABINET LIGHT RX SIDE, CB_LT_R	ON	
MONITORING SAFETY RELAY, CB_MSR	ON	
DC POWER SUPPLIES, CB_PS	ON	
PROGRAMMABLE LOGIC CONTROLLER, CB_PLC	ON	
RX SIDE HEATERS, CB_RHTR	ON	
RECEPTICAL POWER, CB_RP	ON	
RX SIDE WINCH POWER, CB_RWP	ON	
CONTROL POWER FILTERED, CB_CPF	ON	

Make copies of this table as necessary