Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

CNL-15-047

February 27, 2015

10 CFR 50.4

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

Watts Bar Nuclear Plant, Unit 2
Construction Permit No. CPPR-92
NRC Docket No. 50-391

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

The following approved WBN Unit 2 Pre-operational Test Instruction (PTI) is enclosed.

PTI NUMBER	Rev.	TITLE
2-PTI-062-03	0	HFT - Charging and Letdown

There are no new regulatory commitments associated with this submittal. If you have any questions, please contact Nick Welch at (423) 365-7820.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosure: Watts Bar Nuclear Plant, Unit 2 Preoperational Test

cc: See Page 2

cc (Enclosure):

U.S. Nuclear Regulatory Commission
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245 Peachtree Center Ave., NE Suite 1200
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NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
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Enclosure

Watts Bar Nuclear Plant

Unit 2 Preoperational Test

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: HFT - Charging and Letdown

Instruction No: 2-PTI-062-03

Revision No: 0000

PREPARED BY: Ross Horvat Ross Horvat DATE: 7-24-13
PRINT NAME / SIGNATURE

REVIEWED BY: BILL BRYANT / Bill Bryant DATE: 7-24-13
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-15-011

JTG CHAIRMAN: S R Smith DATE: 2-24-15

APPROVED BY : S R Smith DATE: 2-24-15
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	2/24/15	ALL	Initial Issue based on Unit 1 PTI-062-03 Rev 0, CN-1 through CN-31.

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Table of Contents (continued)

1.0 INTRODUCTION

1.1 Test Objectives

The Chemical and Volume Control System (CVCS) will be tested to verify charging and letdown flows can be achieved and maintained according to design requirements. Seal water injection flow to the Reactor Coolant pumps is also verified to meet design performance requirements. Filter differential pressures at maximum design flow is tested, and boric acid transfer flow to the Charging Pump suction is verified to be in accordance with design specifications. Additionally, testing of the Excess Letdown Heat Exchanger is performed to verify design specifications are met.

1.2 Scope

The objectives are achieved by testing alarm functions related to RCP standpipe level, seal injection flow, seal bypass, seal differential pressure, seal leakoff and RCP miscellaneous temperature alarms by manipulating CVCS system valves and hand switches, and using Foxboro to simulate alarm conditions. The miscellaneous CVCS temperature and pressure alarms are tested in like fashion. Charging and letdown flow and pressure control is tested by adjusting related controllers for different flows and pressures and verifying design flow and pressure are achieved per corresponding Computer Point read-out. RCP design seal water flow and filter differential pressure is verified as components are placed in service. The Excess Letdown Heat Exchanger is flow tested by manipulating its flow controller to verify RCP seal water design flows can be maintained while Excess Letdown Heat Exchanger design flow is achievable. CVCS mixed bed demineralizer temperature, flow and differential pressure testing is performed using operation procedure and system controllers to verify all parameters can be achieved. Charging pump capability to deliver seal water is performed using operation procedure and surveillance instructions to verify function meets design requirements. The borate subsystem control function is tested using system hand switches and controllers to verify emergency and normal borate design requirements and required filter differential pressures are achievable.

2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, Conduct of Test.

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

C. 2-SI-68-33, Measurement of Controlled Leakage of the Reactor Coolant Pump Seals.

D. 2-SOI-62.01, CVCS - Charging And Letdown

E. 2-SOI-62.02, Boron Concentration Control

F. 2-SOI-62.04, CVCS Purification System

G. SOI-62.05, Boric Acid Batching, Transfer, And Storage

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

2.2 Developmental References

A. Final Safety Analysis Report

FSAR-Amendment 112

a. Section 9.3, Table 9.3-4, 5

b. Table 14.2-1 Sheets 18 and 19, Chemical and Volume Control System Test Summary

B. Test Scoping Documents

1. 2-TSD-62-01 Rev 3, Test Scoping Document.

2. 2-TSD-62-02 Rev 2, Test Scoping Document.

3. 2-TSD-62-03 Rev 4, Test Scoping Document.

2.2 Developmental References (continued)

C. Drawings

1. Flow Diagrams

   a. 2-47W809-1, Rev 35, Flow Diagram Chemical & Volume Control System

   b. 2-47W809-2, Rev 15, Flow Diagram Chemical and Volume Control System (Boron Recovery)

   c. 2-47W809-5, Rev 8, Flow Diagram Chemical and Volume Control System (Boric Acid)

   d. 2-47W813-1, Rev 31, Flow Diagram Reactor Coolant System

   e. 2-47W859-1, Rev 17, Mechanical Flow Diagram Component Coolant System

   f. 2-47W859-3, Rev 27, Mechanical Flow Diagram Component Coolant System

2. Mechanical Drawings

   a. 2-47W600-117 Rev 2, Electrical Instruments and Controls.

   b. 2-47W600-311 Rev 3, Electrical Instruments and Controls.

   c. 2-47W600-290 Rev 3, Electrical Instruments and Controls.

   d. 2-47W600-316 Rev 3, Electrical Instruments and Controls.

   e. 2-47W600-312 Rev 4, Electrical Instruments and Controls

   f. 2-47W600-310 Rev 4, Electrical Instruments and Controls.

   g. 2-47W600-181 Rev 4, Electrical Instruments and Controls.

3. Electrical Diagrams

   a. 2-47W610-62-1 Rev 10, Electrical Control Diagram Chemical & Volume Control Sys

   b. 2-47W610-62-2 Rev 14, Electrical Control Diagram Chemical & Volume Control Sys

2.2 Developmental References (continued)

c. 2-47W610-62-3 Rev 13, Electrical Control Diagram Chemical & Volume Control Sys

d. 1-47W610-62-6 Rev 21, Electrical Control Diagram Chemical & Volume Cont Sys

e. 2-47W610-62-6 Rev 9, Electrical Control Diagram Chemical & Volume Cont Sys

f. 2-47W610-68-3, Rev 14, Electrical Control Diagram Reactor Coolant System

g. 2-47W610-68-5, Rev 12, Electrical Control Diagram Reactor Coolant System

h. 2-47W610-68-5A, Rev 10, Electrical Control Diagram Reactor Coolant System

i. 2-47W610-70-2, Rev 12, Electrical Control Diagram Component Cooling Water System

j. 2-47W610-70-3, Rev 10, Electrical Control Diagram Component Cooling Water Sys

k. 2-45W600-62-1 Rev 7, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

l. 2-45W600-62-2 Rev 10, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

m. 2-45W600-62-3 Rev 8, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

n. 2-45W600-62-4 Rev 8, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

o. 2-45W600-62-5 Rev 10, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

p. 2-45W600-70, Rev 6, Wiring Diagrams Component Cooling System Schematic Diagrams

q. 2-45W760-62-1 Rev 8, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

2.2 Developmental References (continued)

r. 2-45W760-62-2 Rev 11, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

s. 2-45W760-62-3 Rev 8, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

t. 2-45W760-62-4 Rev 1, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

u. 2-45W760-62-5 Rev 7, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

v. 2-45W760-62-6 Rev 6, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

w. 2-45W760-62-7 Rev 6, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

x. 2-45W760-62-8 Rev 1, Wiring Diagrams Chemical & Volume Control Sys Schematic Diagrams

y. 2-45B601-55-65 Rev 0, Electrical Instrument Tabulation

z. 2-45B655-5B Rev 3, Main Control Room Annunciator Inputs Window Box XA-55-5B.

aa. 2-45B655-E5B Rev 3, Electrical Annunciator Window Box XA-55-5B Engraving.

bb. 2-45B655-5C Rev 3, Main Control Room Annunciator Inputs Window Box XA-55-5C.

cc. 2-45B655-E5C Rev 3, Electrical Annunciator Window Box XA-55-5C Engraving

dd. 2-45B655-6A Rev 3, Main Control Room Annunciator Inputs Window Box XA-55-6A.

ee. 2-45B655-E6A Rev 3, Electrical Annunciator Window Box XA-55-5B Engraving.

ff. 2-47A615-0 Rev 3, Mechanical Plant Computer Termination List and I/O List

2.2 Developmental References (continued)

gg. 2-45N2665-2, Rev 1, Wiring Diagram Process Instr Control Group 1 & 12 Connection Diagrams - Sheet 2

hh. 45N2667-2, Rev 9, Process Instr Cntrl Grp 3 C/D-SH 2

DRA 52378-77, Rev 6

ii. 45N1686-4, Rev 10, Turbo-Gen Aux Rel Pnl 1-R-71 CD SH 4

jj. 45N2686-3, Rev 7, Turbo-Gen Aux Rel Pnl 2-R-71 CD SH 3

4. Vendor Drawings

a. 2-69247-08F802403-FD-2607-1, Rev 3, ELECTRICAL - CVCS LETDOWN HEAT EXCHANGER PRESSURE

b. 2-69247-08F802403-FD-2608-1 Rev 2, ELECTRICAL CVCS LETDOWN HX TEMPERATURE OUTLET

c. 2-69247-08F802403-FD-2609-1 Rev 1, ELECTRICAL - CVCS LETDOWN TEMPERATURES

d. 2-69247-08F802403-FD-2610-1 Rev 3, Electrical-CVCS Seal Temperatures

e. 2-69247-08F802403-FD-2611-1 Rev 1, Electrical-CVCS Seal Temperatures

f. 2-69247-08F802403-FD-2612-1 Rev 2, ELECTRICAL CVCS SEAL FLOWS

g. 2-69247-08F802403-FD-2619-1 Rev 1, ELECTRICAL CVCS VOLUME CONTROL TANK PRESSURE

h. 2-69247-08F802403-FD-2620-1 Rev 3, ELECTRICAL CVCS RCP BEARING TEMPERATURES

i. 2-69247-08F802403-FD-2621-1 Rev 1, ELECTRICAL CVCS RCP BEARING TEMPERATURES

j. 2-69247-08F802403-FD-2601-1 Rev 3, ELECTRICAL CVCS EXCESS LETDOWN TEMPERATURE

k. 2-69247-08F802403-FD-2956-4 Rev 1, ELECTRICAL - CVCS LETDOWN HX OUTLET TEMP ACR A

2.2 Developmental References (continued)

l. 2-69247-08F802403-FD-2616-1 Rev 1, ELECTRICAL - CVCS LETDOWN FLOW

m. 2-69247-08F802403-FD-2605-1 Rev 3, ELECTRICAL CVCS CHARGING FLOW TO PRESSURIZER

n. 2-69247-08F802403-FD-2961-1 Rev 3, ELECTRICAL CVCS CHARGING FLOW CTRL HAND INTERFACE ACR B

D. Documents

a. 2-ARI-109-115, Rev 004U2, CVCS & RHR -RPS & ESF

b. ARI-102-108, Rev 003U2, HVAC & CVCS

c. 2-PTI-068-01, Rev 0000, Preoperational Test - HFT Heatup and Cooldown

d. 2-T-68-60, Rev 0, Setpoint and Scaling Document RCS WR Cold Leg Temperature.

e. SSD-2-LPF-62-1, Rev 1, RCP 1 Seal Water Flow.

f. SSD-2-LPF-62-14, Rev 1, RCP 2 SEAL WATER FLOW.

g. SSD-2-LPF-62-27, Rev 1, RCP 3 Seal Water Flow.

h. SSD-2-LPF-62-40, Rev 1, RCP 4 Seal Water Flow.

i. SSD-2-LPP-62-8, Rev 0, RCP 1 DP Across No 1 Seal.

j. SSD-2-LPP-62-21, Rev 0, RCP 2 DP Across No 1 Seal.

k. SSD-2-LPP-62-34, Rev 2, RCP 3 DP Across No 1 Seal.

l. SSD-2-LPP-62-47, Rev 0, RCP 3 DP Across No 1 Seal.

m. SSD-2-LPT-62-78, Rev 0, Letdown HTX Outlet Temp.

n. SSD-2-LPF-62-56, Rev 2, Excess Letdown Flow Control.

o. SSD-2-LPP-62-81, Rev 1, Letdown Heat Exchanger Pressure Control

p. SSD-2-LPF-62-82-S Rev 0, Letdown Heat Exch Flow

2.2 Developmental References (continued)

q. SSD-2-LPF-62-93A, Rev 3, Charging Header Flow

r. SSD-2-LPL-68-339A, Rev 3, Pressurizer Level Control

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure TVA-TSP-18.1021.

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. After any significant change in Reactor Coolant pressure, letdown or charging flow, the RCP seal injection flows should be checked and adjusted as required.

O. To avoid thermal shock of the RCS piping, the charging flow must be preheated in the Regenerative Heat Exchanger. The letdown flow should NOT be stopped intentionally without also stopping the charging flow when the Reactor Coolant temperature is greater than 350°F.

P. When operating at a minimum charging flow rate, check that the letdown flow is being cooled below 380°F. If **NOT**, raise charging and/or reduce letdown flow to lower letdown temperature.

Q. Monitor Pressurizer level and maintain level above the letdown isolation setpoint.

R. Always allow the hand switches in the procedure to return to their SPRING RETURN position after a particular instruction unless the procedure step specifically directs to HOLD in place.

S. Filters are designed to accept upgraded cartridges with a micron rating equal to or less than the nominal rating within the existing housings. This provision allows a stepwise reduction in the filter cartridge micron rating to achieve progressively finer particulate removal.

T. RCP seal damage can occur if VCT press is below 15 psig with RCPs running.

U. Operating CCPs on mini-flow for extended periods could cause pump damage due to the small amount of water being re-circulated at high pressure.

V. After each start of a CCP, ensure ACB closing spring recharges.

W. Explosive mixtures of hydrogen and oxygen in the VCT and the HUTs must be avoided at all times. The oxygen content in the tanks must **NOT** exceed 2% by volume when hydrogen concentration in the tanks exceeds 4% by volume. Nitrogen gas may be used for purging.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

X. Pressure downstream of the letdown orifices must remain high enough to preclude flashing.

Y. A minimum charging flow of 15 gpm through the regenerative HX should be maintained at all times Charging and Normal Letdown is in service.

Z. Valve 2-FCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, will begin to position to Hold Up Tanks and annunciate at Volume Control Tank Level greater than 63%.

AA. No combination of one small and one large normal letdown orifice provides a flow greater than 120 gpm at RCS normal operating pressure.

BB. Engineering has mandated that a standard uncertainty of 2% shall be added to uncertainty values obtained from the SSD for flow Acceptance Criteria taken from a plant Flow Element.

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 practical 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.

Subsection 6.1 _____

Subsection 6.2 _____

Subsection 6.3 _____

Subsection 6.4 _____

Subsection 6.5 _____

Subsection 6.6 _____

Subsection 6.7 _____

Subsection 6.8 _____

Subsection 6.9 _____

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

Subsection 6.17 _____

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

4.1 Preliminary Actions (continued)

[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.

Subsection 6.1 _____

Subsection 6.2 _____

Subsection 6.3 _____

Subsection 6.4 _____

Subsection 6.5 _____

Subsection 6.6 _____

Subsection 6.7 _____

Subsection 6.8 _____

Subsection 6.9 _____

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

Subsection 6.17 _____

[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. _____

4.1 Preliminary Actions (continued)

[6] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Release (EDCR's) or Temporary Modifications (TMods) do NOT adversely impact testing, **AND**

ATTACH documentation of DCN's, EDCR's and TMods that were reviewed to the data package. _____

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

Subsection 6.1 _____

Subsection 6.2 _____

Subsection 6.3 _____

Subsection 6.4 _____

Subsection 6.5 _____

Subsection 6.6 _____

Subsection 6.7 _____

Subsection 6.8 _____

Subsection 6.9 _____

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

Subsection 6.17 _____

4.1 Preliminary Actions (continued)

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

[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** the following computer points are available to support testing:

A. F0125A _____

B. F0127A _____

C. F0128A _____

D. F0129A _____

E. F0131A _____

F. F0134A _____

G. F1018A _____

H. F1020A _____

I. F1022A _____

J. F1024A _____

K. P0139A _____

L. P0142A _____

M. T0122A _____

4.1 Preliminary Actions (continued)

N. T0127A _____

O. T0446A _____

[14] **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/95-C _____

B. 2-XA-55-5B/96-C _____

C. 2-XA-55-5B/97-C _____

D. 2-XA-55-5B/98-C _____

E. 2-XA-55-5B/99-C _____

F. 2-XA-55-5B/100-C _____

G. 2-XA-55-5B/99-D _____

H. 2-XA-55-5B/100-D _____

I. 2-XA-55-5B/99-E _____

J. 2-XA-55-5B/100-E _____

K. 2-XA-55-5B/101-E _____

L. 2-XA-55-5C/108-A _____

M. 2-XA-55-5C/108-B _____

N. 2-XA-55-6A/109-C _____

O. 2-XA-55-6A/110-A _____

P. 2-XA-55-6A/110-B _____

Q. 2-XA-55-6A/110-C _____

R. 2-XA-55-6A/110-D _____

4.1 Preliminary Actions (continued)

[15] **ENSURE** water chemistry for systems/components with water sources other than normal water sources is appropriate for testing. _____

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

[17] **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. _____

[18] **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. _____

[19] **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 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.16 _____

[20] **VERIFY** Measuring and Test Equipment (M&TE) calibration due dates will support the completion of this test performance.

Subsection 6.9 _____

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.16 _____

[21] **PERFORM** a pretest walkdown on equipment to be tested to ensure no conditions exist that will impact test performance. _____

4.1 Preliminary Actions (continued)

Subsection 6.1 _____

Subsection 6.2 _____

Subsection 6.3 _____

Subsection 6.4 _____

Subsection 6.5 _____

Subsection 6.6 _____

Subsection 6.7 _____

Subsection 6.8 _____

Subsection 6.9 _____

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

Subsection 6.17 _____

[22] **REVIEW** preventive maintenance for system/components covered by this test, **AND**

VERIFY no conditions exist that will impact test performance. _____

[23] **VERIFY** the Boric Acid Storage Tank B is filled to ≥75% with water or Boric Acid of a quality suitable for use in the Reactor Coolant System and adequate (temporary or permanent) level indication is available (Subsection 6.16). _____

4.1 Preliminary Actions (continued)

[24] **VERIFY** the Reactor Coolant System is at the 350°F plateau per 2-PTI-068-01, HFT Heatup and Cooldown, and RCS pressure is 325-370 psig:

Subsection 6.6 _____

Subsection 6.7 _____

[25] **VERIFY** the Reactor Coolant System is at the 350°F plateau per 2-PTI-068-01, HFT Heatup and Cooldown, and RCS pressure is 500-1000 psig:

Subsection 6.8 _____

[26] **VERIFY** the Reactor Coolant System is at the 557°F plateau per 2-PTI-068-01, HFT Heatup and Cooldown, and RCS pressure is 2220-2250 psig:

Subsection 6.11 _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

4.2 Special Tools, Measuring and Test equipment, Parts and Supplies

A. Three Ultrasonic flow meters, 0-100 gpm

B. Ultrasonic flow meter, 0-250 gpm

C. Pressure Gauge, 0-500 psi

D. Three Differential Pressure Gauges with a maximum range of 0-50 psid

E. Pressure Source 0-100 psi

F. Pressure Source 0-20 inWC

4.3 Field Preparations

[1] **INSTALL** an Ultrasonic Flowmeter (0-250 gpm range) on charging piping near 2-CKV-62-543, NOR CHRG CHECK [RXB, 716, AC4]. (Subsection 6.11)

M&TE ID# _____ _____

[2] **INSTALL** a Differential Pressure Gauge (0-50psid range) for the Reactor Coolant Filter to read differential pressure between 2-PI-62-116 and 2-PI-62-117 per SMP-19.0, (Subsection 6.11)

M&TE ID# _____ **AND**

LABEL Differential Pressure Gauge DPG-1 _____

[3] **INSTALL** an Ultrasonic Flowmeter (0-100 gpm range) on letdown piping near letdown isolation valves, (Subsection 6.11)

M&TE ID# _____ **AND**

LABEL Differential Ultrasonic Flowmeter UF-1 _____

[4] **INSTALL** an Ultrasonic Flowmeter (0-100 gpm range) on charging piping near 2-FCV-62-93, CVCS CHARGING HEADER FLOW / PZR LEVEL CONTROL [Aux,692,A12U]. (Subsection 6.12)

M&TE ID# _____ _____

[5] **INSTALL** an Ultrasonic Flowmeter (0-100 gpm range) on seal return piping near 2-ISV-62-642, CVCS SEAL WTR RETURN FILTER INLET ISOL [Aux,713, A10T]. (Subsection 6.12)

M&TE ID# _____ _____

[6] **INSTALL** a Differential Pressure Gauge (0-50psid range) for the Seal Water Return to read differential pressure between 2-PI-62-64 and 2-PI-62-65 per SMP-19.0, (Subsection 6.12)

M&TE ID# _____ **AND**

LABEL Differential Pressure Gauge DPG-2 _____

4.3 Field Preparations (continued)

[7] **INSTALL** an Ultrasonic Flowmeter (0-100 gpm range) on excess letdown piping near 2-FCV-62-56, CVCS EXCESS LETDOWN FLOW CONTROL [RXB, 716, Az 114]. (Subsection 6.13)

M&TE ID# _____ _____

[8] **INSTALL** an Ultrasonic Flowmeter (0-250 gpm range) on seal return piping near 2-ISV-62-650, CVCS SEAL WATER HX OUTLET ISOL [Aux, 713, A10U]. (Subsection 6.13)

M&TE ID# _____ _____

[9] **INSTALL** an Ultrasonic Flowmeter (0-250 gpm range) on boration piping near 2-ISV-62-1061, BORIC ACID FILTER B OUTLET, [Aux, 713, A13Q] near Filter 2-FLTR-62-1B, BORIC ACID FILTER B (Subsection 6.16).

M&TE ID# _____ _____

[10] **INSTALL** a Differential Pressure Gauge (0-50psid range) for the Boric Acid Filter to read differential pressure between 2-PI-62-234 and 2-PI-62-235 per SMP-19.0, (Subsection 6.16)

M&TE ID# _____ **AND**

LABEL Differential Pressure Gauge DPG-3 _____

[11] **ENSURE** the CVCS system is aligned, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[12] **ENSURE** the Primary Makeup Water System, System 81, is available to support this test, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[13] **ENSURE** Mixed Bed Demineralizer 2-DEMIN-62-2/1A, CVCS MIXED BED DEMINERALIZER 2A, or 2-DEMIN-62-2/1B, CVCS MIXED BED DEMINERALIZER 2B, is loaded with resin to support Hot Functional Testing. _____

4.3 Field Preparations (continued)

[14] **ENSURE** Reactor Coolant Filter 2-FLTR-62-117 has been loaded with a 25 micron or better filter element.

Work Order No. _____ _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

[15] **ENSURE** Seal Water Injection Filters 2-FLTR-62-96 and 2-FLTR-62-97 have been loaded with 5 micron or better filter elements.

Work Order No. _____ _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

[16] **ENSURE** Seal Water Return Filter 2-FLTR-62-65 has been loaded with a 25 micron or better filter element .

Work Document No. _____ _____

Subsection 6.12 _____

Subsection 6.13 _____

Subsection 6.14 _____

Subsection 6.15 _____

Subsection 6.16 _____

4.3 Field Preparations (continued)

[17] **ENSURE** Boric Acid Filter 2-FLTR-62-1B has been loaded with a 25 micron or better filter element. (Subsection 6.16)

Work Document No. _____ _____

4.4 Approvals and Notifications

[1] **OBTAIN** permission from the Preoperational Startup Manager to begin testing.

_____ _____
Preoperational Startup Manage Date

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

_____ _____
SM/Unit SRO Signature Date

5.0 ACCEPTANCE CRITERIA

[1] **VERIFY** the Following Heat Exchangers maintain the following parameters during Normal Operations:

UNID	Description	Flow Rate	ΔT	Verification Step
2-HTX-62-121	Excess Letdown Heat Exchanger	≥12,340 lb/hr	≥362.3°F	6.13[14], 6.13[15]
2-HTX-62-124	Letdown Heat Exchanger	≥37,050 lb/hr	≥163°F	6.11[55], 6.11[57]
2-HTX-62-120	Regenerative Heat Exchanger Shell Side	≥37,020 lb/hr	≥267.3°F	6.11[49], 6.11[51]
2-HTX-62-120	Regenerative Heat Exchanger Tube Side	≥27,148 lb/hr	N/A	6.11[46]
2-HTX-62-66	Seal Water Heat Exchanger Tube Side	≥47,879 lb/hr	≥30.4°F	6.13[19], 6.13[20]

[2] **VERIFY** sum of RCP seal injection flow ≤40 gpm (6-13 gpm for each RCP). 6.12[3], 6.12[5], 6.12[27], 6.12[30]

5.0 ACCEPTANCE CRITERIA (continued)

[3] **VERIFY** the differential pressure across the following components at the given flowrate:

UNID	Description	Flow Rate	ΔP (Clean)	Verification Step
2-FLTR-62-117	Reactor Coolant Filter	120-150 gpm	≤5 psid	6.11[83]
2-FLTR-62-65	Seal Water Return Filter	25-35 gpm	≤5 psid	6.12[72]
2-FLTR-62-96	Seal Injection Filter B	16-32 gpm	≤7 psid	6.12[8]
2-FLTR-62-97	Seal Injection Filter A	16-32 gpm	≤7 psid	6.12[33]
2-DEMN-62-113	Cation Bed	≥75 gpm	≤12.8 psid	6.14[27]
2-DEMN-62-1/2A	Mixed Bed A	≥120 gpm	≤25 psid	6.14[10]
2-DEMN-62-1/2B	Mixed Bed B	≥120 gpm	≤25 psid	6.14[18]
2-FLTR-62-1B	BORIC ACID FILTER B (25 Micron or Smaller)	150 gpm	≤5 psid	6.16[56]

[4] **VERIFY** Letdown orifices meet the following flow criteria:

UNID	Description	Flow Rate	Verification Step
2-OR-62-72	LETDOWN ORIFICE	≥45 gpm	6.11[10]
2-OR-62-73	LETDOWN ORIFICE	≥75 gpm	6.11[26]
2-OR-62-74	LETDOWN ORIFICE	≥75 gpm	6.11[42]
2-OR-62-76	5 GPM ORIFICE	≥3 gpm	6.11[32], 6.11[96]

[5] **VERIFY** 2-FM-62-93E prevents 2-FCV-62-93 from going fully closed to ensure Seal Water flow rate of 33.5 ±1.5 gpm (32 - 35gpm). 6.12[59]

[6] **VERIFY** 2-PCV-62-81 modulates to maintain ≥200 psig downstream of the Letdown Orifices to prevent flashing. 6.11[89]

5.0 ACCEPTANCE CRITERIA (continued)

[7] **VERIFY** the following valves maintain the following pressures in the VCT:

UNID	Description	Pressure	Verification Step
2-PCV-62-119	VOL CONT TANK N2 BLANKET	15-20 psig	6.5[20]
2-PCV-62-120	VOL CONT TANK H2 BLANKET	15-20 psig	6.5[40]
2-PCV-62-126	VCT PRESS. CONT TO VH	18-23 psig	6.5[24]

[8] **VERIFY** Main Control Room annunciator alarms:

UNID	Alarm Description	Verification Step
2-PDS-62-8	Low RCP #1 No. 1 Seal differential pressure	6.7.1[5]
2-PDS-62-21	Low RCP #2 No. 1 Seal differential pressure	6.7.2[5]
2-PDS-62-34	Low RCP #3 No. 1 Seal differential pressure	6.7.3[5]
2-PDS-62-47	Low RCP #4 No. 1 Seal differential pressure	6.7.4[5]
2-PS-62-81	High Letdown Heat Exchanger Outlet Pressure	6.3[16]D
2-PDIS-62-96	High RCP Seal Injection Filter differential pressure	6.12[17]
2-PDIS-62-97	High RCP Seal Injection Filter differential pressure	6.12[42]
2-PS-62-122A	High Volume Control Tank Pressure	6.3[5]D
2-PS-62-122B	Low Volume Control Tank Pressure	6.3[6]D
2-TS-62-3	High RCP #1 Lower Bearing temperature	6.1[7]D
2-TS-62-16	High RCP #2 Lower Bearing temperature	6.1[8]D
2-TS-62-29	High RCP #3 Lower Bearing temperature	6.1[9]D
2-TS-62-42	High RCP #4 Lower Bearing temperature	6.1[10]D
2-TS-62-4	High RCP #1 No 1 Seal outlet Temperature	6.1[3]D
2-TS-62-17	High RCP #2 No 1 Seal outlet Temperature	6.1[4]D

5.0 ACCEPTANCE CRITERIA (continued)

UNID	Alarm Description	Verification Step
2-TS-62-30	High RCP #3 No 1 Seal outlet Temperature	6.1[5]D
2-TS-62-43	High RCP #4 No 1 Seal outlet Temperature	6.1[6]D
2-TS-62-58	High Excess Letdown Heat Exchanger outlet Temperature	6.3[7]D
2-TS-62-71	High Regenerative Heat Exchanger outlet Temperature	6.3[9]D
2-TS-62-75	High temperature in Letdown Relief Line to PRT	6.3[8]D
2-TS-62-78	High Letdown Heat Exchanger outlet Temperature	6.3[12]D
2-TS-62-131	High VCT outlet temperature	6.3[4]D
2-LS-62-6A	High RCP #1 Standpipe level	6.2[4]J
2-LS-62-19A	High RCP #2 Standpipe level	6.2[5]J
2-LS-62-32A	High RCP #3 Standpipe level	6.2[6]J
2-LS-62-45A	High RCP #4 Standpipe level	6.2[7]J
2-LS-62-6B	Low RCP #1 Standpipe level	6.2[4]D
2-LS-62-19B	Low RCP #2 Standpipe level	6.2[5]D
2-LS-62-32B	Low RCP #3 Standpipe level	6.2[6]D
2-LS-62-45B	Low RCP #4 Standpipe level	6.2[7]D
2-FIS-62-12	Alarms when #1 Seal Bypass flow control valve 2-FCV-62-53 is fully open and bypass flow to any RCP is low.	6.9.1[11]
2-FIS-62-25	Alarms when #1 Seal Bypass flow control valve 2-FCV-62-53 is fully open and bypass flow to any RCP is low.	6.9.2[11]
2-FIS-62-38	Alarms when #1 Seal Bypass flow control valve 2-FCV-62-53 is fully open and bypass flow to any RCP is low.	6.9.3[11]
2-FIS-62-51	Alarms when #1 Seal Bypass flow control valve 2-FCV-62-53 is fully open and bypass flow to any RCP is low.	6.9.4[11]

5.0 ACCEPTANCE CRITERIA (continued)

UNID	Alarm Description	Verification Step
2-FCV-62-53	Alarms when #1 Seal Bypass flow control valve 2-FCV-62-53 is fully open and bypass flow to any RCP is low.	6.9.1[17]
2-FS-62-10	Low RCP #1 No. 1 Seal Leakoff flow	6.8.1[6]
2-FS-62-23	Low RCP #2 No. 1 Seal Leakoff flow	6.8.2[6]
2-FS-62-36	Low RCP #3 No. 1 Seal Leakoff flow	6.8.3[6]
2-FS-62-49	Low RCP #4 No. 1 Seal Leakoff flow	6.8.4[6]
2-FS-62-11	High RCP #1 No. 1 Seal Leakoff flow	6.8.1[15]
2-FS-62-24	High RCP #2 No. 1 Seal Leakoff flow	6.8.2[15]
2-FS-62-37	High RCP #3 No. 1 Seal Leakoff flow	6.8.3[15]
2-FS-62-50	High RCP #4 No. 1 Seal Leakoff flow	6.8.4[15]
2-FS-62-1	Low RCP #1 Seal Injection flow	6.6.1[5]
2-FS-62-14	Low RCP #2 Seal Injection flow	6.6.2[5]
2-FS-62-27	Low RCP #3 Seal Injection flow	6.6.3[5]
2-FS-62-40	Low RCP #4 Seal Injection flow	6.6.4[5]
2-FS-62-82	High Letdown Flow	6.3[11]D
2-FS-62-93A	High Charging Flow	6.3[13]D
2-LS-62-238A	High Boric Acid Tank B Level	6.4[3]E
2-LS-62-238B	LOW Boric Acid Tank B Level	6.4[3]M
2-TS-62-239B	Boric Acid Tank B Temperature HI/ LO	6.4[2]L
2-TS-62-239D	Boric Acid Tank B Temperature HI/ LO	6.4[2]E
2-LS-62-242A	High Boric Acid Tank C Level	6.4[4]E
2-LS-62-242B	LOW Boric Acid Tank C Level	6.4[4]L

5.0 ACCEPTANCE CRITERIA (continued)

[9] **VERIFY** Auxiliary Control Room annunciator alarms:

UNID	Alarm Description	Verification Step
2-TS-62-80C	High Letdown Heat Exchanger outlet Temperature	6.3[10]C
2-FS-62-93C	Low Charging Flow	6.3[15]C

[10] **VERIFY** 2-TCV-70-192 modulates to control discharge temperature of Letdown Heat Exchanger. 6.11[23].

[11] **VERIFY** 2-HTR-62-228/3, BORIC ACID BATCHING TANK HTR 3, Local indicating lights indicate correct heater status. 6.4[5]C, 6.4[5]E

[12] **VERIFY** each Unit 2 Boric Acid Transfer Pump is capable of providing >35 gpm flow from the 2B Boric Acid Tank through either the Emergency Boration flow path or Alternate Boration to the Charging Pump Suction:

UNID	Description	Verification Step
2-PMP-62-230	Boric Acid Transfer Pump 2A-A	6.16[11], 6.16[26]
2-PMP-62-232	Boric Acid Transfer Pump 2B-B	6.16[35], 6.16[47]

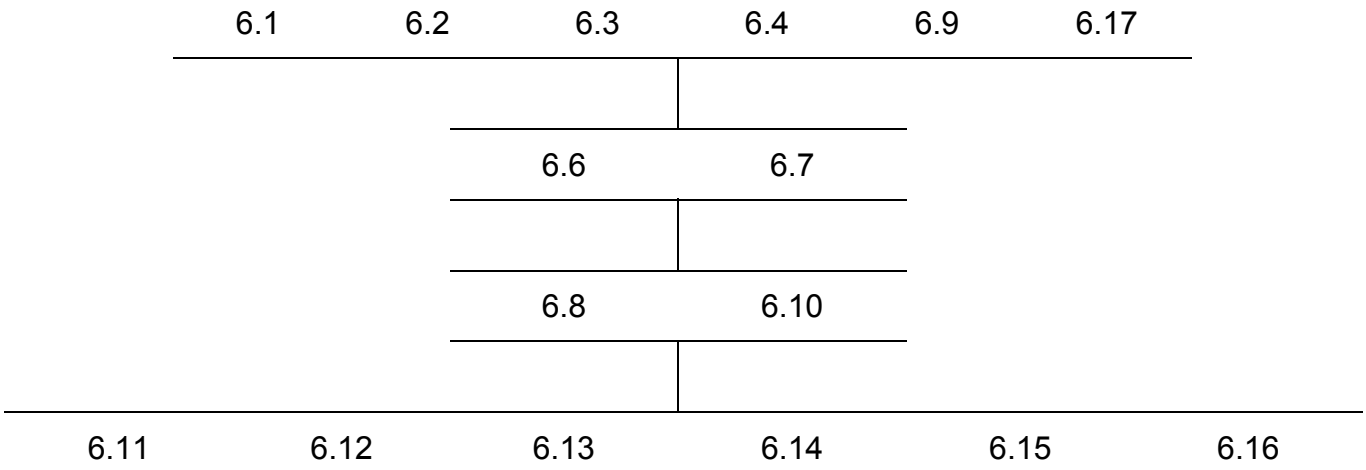
[13] The Following Valves Fail Closed on Loss of Air

UNID	Verification Step
2-PCV-62-119	6.5[8]
2-PCV-62-126	6.5[13]
2-PCV-62-120	6.5[35]

[14] Indicating light 2-XI-62-93 in MCR illuminates when Charging Header pressure is greater than setpoint and 2-HIC-62-93B is in manual, 6.12[65]

6.0 PERFORMANCE

- Subsections of this test shall be performed per the flow diagram below.



- Quantitative Values from permanent plant instrumentation used for Acceptance Criteria have been modified to include tolerance values. See Appendix F for calculation Basis.

- If an implementing procedure other than what is listed in the performance references is used a CTL entry should be made to document the reason.

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests

NOTE

Foxboro I/A workstations will be used to help perform some of the following steps. A Foxboro I/A Engineer or equivalent will need to be available to perform this portion of the test.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.1 have been completed. _____

[2] **PLACE** the following blocks in MANUAL **AND**

TOGGLE to the desired state:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-03	W213CP	W2RCPTEMP	2TS0620003	0	
2-TS-62-04	W213CP	W2SEALTEMP	2TS0620004	0	
2-TS-62-16	W213CP	W2RCPTEMP	2TS0620016	0	
2-TS-62-17	W213CP	W2SEALTEMP	2TS0620017	0	
2-TS-62-29	W213CP	W2RCPTEMP	2TS0620029	0	
2-TS-62-30	W213CP	W2SEALTEMP	2TS0620030	0	
2-TS-62-42	W213CP	W2CRCPTEMP	2TS0620042	0	
2-TS-62-43	W213CP	W2SEALTEMP	2TS0620043	0	

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[3] **PERFORM** the following steps to verify 2-XA-55-5B/100C from 2-TS-62-4, RCP1 #1 SEAL OUTLET TEMP HI:

A. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 1 #1 SEAL OUTLET TEMP HI (TS-62-4) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-04	W213CP	W2SEALTEMP	2TS0620004	1	

D. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 1 #1 SEAL OUTLET TEMP HI (TS-62-4) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-04	W213CP	W2SEALTEMP	2TS0620004	0	

G. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 1 #1 SEAL OUTLET TEMP HI (TS-62-4) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[4] **PERFORM** the following steps to verify 2-XA-55-5B/100C from 2-TS-62-17, RCP 2 #1 SEAL OUTLET TEMP HI:

A. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 2 #1 SEAL OUTLET TEMP HI (TS-62-17) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-17	W213CP	W2SEALTEMP	2TS0620017	1	

D. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 2 #1 SEAL OUTLET TEMP HI (TS-62-17) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-17	W213CP	W2SEALTEMP	2TS0620017	0	

G. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 2 #1 SEAL OUTLET TEMP HI (TS-62-17) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[5] **PERFORM** the following steps to verify 2-XA-55-5B/100C from 2-TS-62-30, RCP 3 #1 SEAL OUTLET TEMP HI:

A. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 3 #1 SEAL OUTLET TEMP HI (TS-62-30) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-30	W213CP	W2SEALTEMP	2TS0620030	1	

D. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 ALARMS.**(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 3 #1 SEAL OUTLET TEMP HI (TS-62-30) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-30	W213CP	W2SEALTEMP	2TS0620030	0	

G. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 3 #1 SEAL OUTLET TEMP HI (TS-62-30) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[6] **PERFORM** the following steps to verify 2-XA-55-5B/100C from 2-TS-62-43, RCP 4 #1 SEAL OUTLET TEMP HI:

A. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEARS. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 4 #1 SEAL OUTLET TEMP HI (TS-62-43) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-43	W213CP	W2SEALTEMP	2TS0620043	1	

D. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 4 #1 SEAL OUTLET TEMP HI (TS-62-43) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-43	W213CP	W2SEALTEMP	2TS0620043	0	

G. **VERIFY** 2-XA-55-5B/100C, RCP #1 SEAL OUTLET TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 100-C RCP 4 #1 SEAL OUTLET TEMP HI (TS-62-43) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[7] **PERFORM** the following steps to verify 2-XA-55-5B/99C from 2-TS-62-3, RCP 1 LWR RADIAL BEARING TEMP HI:

A. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 1 LWR RADIAL BEARING TEMP HI (TS-62-3) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-03	W213CP	W2RCPTEMP	2TS0620003	1	

D. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 1 LWR RADIAL BEARING TEMP HI (TS-62-3) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-03	W213CP	W2RCPTEMP	2TS0620003	0	

G. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 1 LWR RADIAL BEARING TEMP HI (TS-62-3) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[8] **PERFORM** the following steps to verify 2-XA-55-5B/99C from 2-TS-62-16, RCP 2 LWR RADIAL BEARING TEMP HI:

A. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 2 LWR RADIAL BEARING TEMP HI (TS-62-16) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-16	W213CP	W2RCPTEMP	2TS0620016	1	

D. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 2 LWR RADIAL BEARING TEMP HI (TS-62-16) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-16	W213CP	W2RCPTEMP	2TS0620016	0	

G. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 2 LWR RADIAL BEARING TEMP HI (TS-62-16) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[9] **PERFORM** the following steps to verify 2-XA-55-5B/99C from 2-TS-62-29, RCP 3 LWR RADIAL BEARING TEMP HI (TS-62-29):

A. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 3 LWR RADIAL BEARING TEMP HI (TS-62-29) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-29	W213CP	W2RCPTEMP	2TS0620029	1	

D. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 3 LWR RADIAL BEARING TEMP HI (TS-62-29) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-29	W213CP	W2RCPTEMP	2TS0620029	0	

G. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 3 LWR RADIAL BEARING TEMP HI (TS-62-29) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[10] **PERFORM** the following steps to verify 2-XA-55-5B/99C from 2-TS-62-42, RCP 4 LWR RADIAL BEARING TEMP HI:

A. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEARS. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 4 LWR RADIAL BEARING TEMP HI (TS-62-42) is NORMAL. _____

C. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-42	W213CP	W2RCPTEMP	2TS0620042	1	

D. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 4 LWR RADIAL BEARING TEMP HI (TS-62-42) is in ALARM. _____

F. **TOGGLE** the following Block to the listed state using Foxboro I/A:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-42	W213CP	W2RCPTEMP	2TS0620042	0	

G. **VERIFY** 2-XA-55-5B/99C, RCP LWR BEARING TEMP HI, at 2-M-5 CLEARS. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates 99-C RCP 4 LWR RADIAL BEARING TEMP HI (TS-62-42) is NORMAL. _____

6.1 Reactor Coolant Pump (RCP) Miscellaneous Temperature Alarm Tests (continued)

[11] **RESTORE** the following blocks to MANUAL

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-03	W213CP	W2RCPTEMP	2TS0620003	AUTO	
2-TS-62-04	W213CP	W2SEALTEMP	2TS0620004	AUTO	
2-TS-62-16	W213CP	W2RCPTEMP	2TS0620016	AUTO	
2-TS-62-17	W213CP	W2SEALTEMP	2TS0620017	AUTO	
2-TS-62-29	W213CP	W2RCPTEMP	2TS0620029	AUTO	
2-TS-62-30	W213CP	W2SEALTEMP	2TS0620030	AUTO	
2-TS-62-42	W213CP	W2CRCPTEMP	2TS0620042	AUTO	
2-TS-62-43	W213CP	W2SEALTEMP	2TS0620043	AUTO	

6.2 Standpipe Level Alarm Tests

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.2 have been completed. _____

[2] **ENSURE** the CVCS system valves for the Reactor Coolant Pump Seal Standpipes have been aligned for normal operation, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **ENSURE** Primary Makeup Water is in service, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **PERFORM** the following steps to verify 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO:

A. **VERIFY** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates, 95-C RCP 1 STANDPIPE LEVEL HI/LO (2-LS-62-6A/B) is CLEAR. _____

C. **OPEN** Valve 2-DRV-62-632 (RXB 702, Az 64), RCP 1 STANDPIPE DRAIN _____

D. **VERIFY** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates, 95-C RCP 1 STANDPIPE LEVEL HI/LO (2-LS-62-6A/B) is in ALARM. _____

F. **CLOSE** Valve 2-DRV-62-632, RCP 1 STANDPIPE DRAIN. _____

G. **PLACE** Handswitch 2-HS-81-13, RCP NO. 1 STANDPIPE MAKEUP WATER, at 2-M-5 to the OPEN position. _____

6.2 Standpipe Level Alarm Tests (continued)

H. **VERIFY** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, is CLEAR. _____

I. **VERIFY** Unit 2 Ronan Annunciator System indicates, 95-C RCP 1 STANDPIPE LEVEL HI/LO (2-LS-62-6A/B) is CLEAR. _____

J. **VERIFY** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, ALARMS. **(Acc Crit)** _____

K. **PLACE** Handswitch 2-HS-81-13, RCP NO. 1 STANDPIPE MAKEUP WATER, to the CLOSE position. _____

NOTES

1) The following step verifies 2-XA-55-5B/95C clears by allowing the high level in the standpipe to drain through the RCP #1 Standpipe Orifice.
2) If the alarm does not clear in a reasonable amount of time, then the orifice may be obstructed . Opening the Standpipe Drain will allow the standpipe to drain and clear the alarm, and initiating a WO will facilitate orifice inspection.

L. **VERIFY** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, CLEARS. _____

M. **IF** 2-XA-55-5B/95C, RCP 1 STANDPIPE LEVEL HI/LO, does **NOT** CLEAR, **THEN**

OPEN 2-DRV-62-632 until 2-XA-55-5B/95C Clears **AND**

INITIATE WO to inspect orifice. _____

[5] **PERFORM** the following steps to verify 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO:

A. **VERIFY** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates, 96-C RCP 2 STANDPIPE LEVEL HI/LO (2-LS-62-19A/B) is CLEAR. _____

C. **OPEN** Valve 2-DRV-62-633 (RXB 702, Az 136), RCP 2 STANDPIPE DRAIN _____

6.2 Standpipe Level Alarm Tests (continued)

D. **VERIFY** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates, 96-C RCP 2 STANDPIPE LEVEL HI/LO (2-LS-62-19A/B) is in ALARM. _____

F. **CLOSE** Valve 2-DRV-62-633, RCP 2 STANDPIPE DRAIN. _____

G. **PLACE** Handswitch 2-HS-81-14, RCP NO.2 STANDPIPE MAKEUP WATER, at 2-M-5 to the OPEN position. _____

H. **VERIFY** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System indicates, 96-C RCP 2 STANDPIPE LEVEL HI/LO (2-LS-62-19A/B) is CLEAR. _____

J. **VERIFY** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, ALARMS. **(Acc Crit)** _____

K. **PLACE** Handswitch 2-HS-81-14, RCP NO.2 STANDPIPE MAKEUP WATER, at 2-M-5 to the CLOSE position. _____

NOTES

1) The following step verifies 2-XA-55-5B/96C clears by allowing the high level in the standpipe to drain through the RCP #2 Standpipe Orifice.
2) If the alarm does not clear in a reasonable amount of time, then the orifice may be obstructed . Opening the Standpipe Drain will allow the standpipe to drain and clear the alarm, and initiating a WO will facilitate orifice inspection.

L. **VERIFY** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, CLEARS. _____

M. **IF** 2-XA-55-5B/96C, RCP 2 STANDPIPE LEVEL HI/LO, does **NOT** CLEAR, **THEN**

OPEN 2-DRV-62-633 until 2-XA-55-5B/96C Clears **AND**

INITIATE WO to inspect orifice.. _____

6.2 Standpipe Level Alarm Tests (continued)

[6] **PERFORM** the following steps to verify 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO:

A. **VERIFY** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, at 2-M-5 CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates, 97-C RCP 3 STANDPIPE LEVEL HI/LO (2-LS-62-32A/B) is CLEAR. _____

C. **OPEN** Valve 2-DRV-62-634 (Rxb 702, Az 240), RCP 3 STANDPIPE DRAIN, _____

D. **VERIFY** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates, 97-C RCP 3 STANDPIPE LEVEL HI/LO (2-LS-62-32A/B) is in ALARM. _____

F. **CLOSE** Valve 2-DRV-62-634, RCP 3 STANDPIPE DRAIN. _____

G. **PLACE** Handswitch 2-HS-81-15, RCP NO.3 STANDPIPE MAKEUP WATER, to the OPEN position. _____

H. **VERIFY** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, at 2-M-5 CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System indicates, 97-C RCP 3 STANDPIPE LEVEL HI/LO (2-LS-62-32A/B) is CLEAR. _____

J. **VERIFY** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

K. **PLACE** Handswitch 2-HS-81-15, RCP NO.3 STANDPIPE MAKEUP WATER, to the CLOSE position. _____

6.2 Standpipe Level Alarm Tests (continued)

NOTES

1) The following step verifies 2-XA-55-5B/97C clears by allowing the high level in the standpipe to drain through the RCP #3 Standpipe Orifice.
2) If the alarm does not clear in a reasonable amount of time, then the orifice may be obstructed . Opening the Standpipe Drain will allow the standpipe to drain and clear the alarm, and initiating a WO will facilitate orifice inspection.

L. **VERIFY** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, at 2-M-5 CLEARS. _____

M. **IF** 2-XA-55-5B/97C, RCP 3 STANDPIPE LEVEL HI/LO, does **NOT** CLEAR, **THEN**

OPEN 2-DRV-62-634 until 2-XA-55-5B/97C Clears **AND**

INITIATE WO to inspect orifice. _____

[7] **PERFORM** the following steps to verify 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO:

A. **VERIFY** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates, 98-C RCP 4 STANDPIPE LEVEL HI/LO (2-LS-62-45A/B) is CLEAR. _____

C. **OPEN** Valve 2-DRV-62-635 (RXB 702, Az 315), RCP 4 STANDPIPE DRAIN, _____

D. **VERIFY** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates, 98-C RCP 4 STANDPIPE LEVEL HI/LO (2-LS-62-45A/B) is in ALARM. _____

F. **CLOSE** Valve 2-DRV-62-635, RCP 4 STANDPIPE DRAIN. _____

G. **PLACE** Handswitch 2-HS-81-16, RCP NO.4 STANDPIPE MAKEUP WATER, at 2-M-5 to the OPEN position. _____

6.2 Standpipe Level Alarm Tests (continued)

H. **VERIFY** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System indicates, 98-C RCP 4 STANDPIPE LEVEL HI/LO (2-LS-62-45A/B) is CLEAR. _____

J. **VERIFY** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, ALARMS. **(Acc Crit)** _____

K. **PLACE** Handswitch 2-HS-81-16, RCP NO.4 STANDPIPE MAKEUP WATER, at 2-M-5 to the CLOSE position. _____

NOTES

1) The following step verifies 2-XA-55-5B/98C clears by allowing the high level in the standpipe to drain through the RCP #4 Standpipe Orifice.
2) If the alarm does not clear in a reasonable amount of time, then the orifice may be obstructed . Opening the Standpipe Drain will allow the standpipe to drain and clear the alarm, and initiating a WO will facilitate orifice inspection.

L. **VERIFY** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, CLEARS. _____

M. **IF** 2-XA-55-5B/98C, RCP 4 STANDPIPE LEVEL HI/LO, does **NOT** CLEAR, **THEN**

OPEN 2-DRV-62-635 until 2-XA-55-5B/98C Clears **AND**

INITIATE WO to inspect orifice. _____

6.3 Miscellaneous CVCS Alarm Tests

NOTE

Foxboro I/A workstations will be used to help perform some of the following steps. A Foxboro I/A Engineer or equivalent will need to be available to perform this portion of the test.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.3 have been completed. _____

[2] **ENSURE** the following Control Elements are in Manual

UNID	PROCESSOR	COMPOUND	ELEMENT	INITIALS
2-TS-62-131	W213CP	W2LTDNTEMP	2TS0620131	
2-PS-62-122A	W213CP	W2VCTPRESS	2PS0620122A	
2-PS-62-122B	W213CP	W2VCTPRESS	2PS0620122B	
2-TS-62-58	W213CP	W2LTDNTEMP	2TS0620058	
2-TS-62-75	W213CP	W2LTDNTEMP	2TS0620075	
2-TS-62-71	W213CP	W2LTDNTEMP	2TS0620071	
2-TS-62-80C	W214CP	W2ACR1LDNTMP	2TS0620080C	
2-FS-62-82	W213CP	W2LTDNFLOW	2FS0620082	
2-TS-62-78	W213CP	W2LTDNTEMP	2TS0620078	
2-FS-62-93A	W213CP	W2CHARGE	2FS0620093A	
2-FS-62-93B	W213CP	W2CHARGE	2FS0620093B	
2-FS-62-93C	W215CP	W2ACRCHARGE	2FS0620093C	
2-PS-62-81	W215CP	W2LTDNPRESS	2PS0620081	

6.3 Miscellaneous CVCS Alarm Tests (continued)

[3] **ENSURE** the following Control Element Status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-131	W213CP	W2LTDNTEMP	2TS0620131	0	
2-PS-62-122A	W213CP	W2VCTPRESS	2PS0620122A	0	
2-PS-62-122B	W213CP	W2VCTPRESS	2PS0620122B	0	
2-TS-62-58	W213CP	W2LTDNTEMP	2TS0620058	0	
2-TS-62-75	W213CP	W2LTDNTEMP	2TS0620075	0	
2-TS-62-71	W213CP	W2LTDNTEMP	2TS0620071	0	
2-TS-62-80C	W214CP	W2ACR1LDNTMP	2TS0620080C	0	
2-FS-62-82	W213CP	W2LTDNFLOW	2FS0620082	0	
2-TS-62-78	W213CP	W2LTDNTEMP	2TS0620078	0	
2-FS-62-93A	W213CP	W2CHARGE	2FS0620093A	0	
2-FS-62-93B	W213CP	W2CHARGE	2FS0620093B	0	
2-FS-62-93C	W215CP	W2ACRCHARGE	2FS0620093C	0	
2-PS-62-81	W215CP	W2LTDNPRESS	2PS0620081	0	

[4] **PERFORM** the following steps to verify 2-XA-55-6A/109C, VCT TEMP HI:

A. **VERIFY** 2-XA-55-6A/109C, VCT TEMP HI, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 109-C VCT TEMP HI (TS-62-131), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TE-62-131	W213CP	W2LTDNTEMP	2TS0620131	1	

D. **VERIFY** 2-XA-55-6A/109C, VCT TEMP HI, ALARMS. **(Acc Crit)** _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

E. **VERIFY** Unit 2 Ronan Annunciator System, 109-C VCT TEMP HI (TS-62-131), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TE-62-131	W213CP	W2LTDNTEMP	2TS0620131	0	

G. **VERIFY** 2-XA-55-6A/109C, VCT TEMP HI, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 109-C VCT TEMP HI (TS-62-131), is CLEAR. _____

[5] **PERFORM** the following steps to verify 2-XA-55-6A/109B, VCT PRESS HI/LO, at 2-M-6, is CLEAR:

A. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS HI (PS-62-122A), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-122A	W213CP	W2VCTPRESS	2PS0620122A	1	

D. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS HI (PS-62-122A), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-122A	W213CP	W2VCTPRESS	2PS0620122A	0	

G. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, is CLEAR. _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

H. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS HI (PS-62-122A), is CLEAR. _____

[6] **PERFORM** the following steps to verify 2-XA-55-6A/109B, VCT PRESS HI/LO:

A. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS LO (PS-62-122B), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-122B	W213CP	W2VCTPRESS	2PS0620122B	1	

D. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS LO (PS-62-122B), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-122B	W213CP	W2VCTPRESS	2PS0620122B	0	

G. **VERIFY** 2-XA-55-6A/109B, VCT PRESS HI/LO, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 109-B VCT PRESS LO (PS-62-122B), is CLEAR. _____

[7] **PERFORM** the following steps to verify 2-XA-55-5C/108B, EXC LTDN HX TEMP HI:

A. **VERIFY** 2-XA-55-5C/108B, EXC LTDN HX TEMP HI, at 2-M-5, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 108-B EXC LTDN HX TEMP HI, is CLEAR. _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-58	W212CP	W2LETDOWN	2TS0620058	1	

D. **VERIFY** 2-XA-55-5C/108B, EXC LTDN HX TEMP HI, at 2-M-5, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 108-B EXC LTDN HX TEMP HI, is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-58	W212CP	W2LETDOWN	2TS0620058	0	

G. **VERIFY** 2-XA-55-5C/108B, EXC LTDN HX TEMP HI, at 2-M-5, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 108-B EXC LTDN HX TEMP HI, is CLEAR. _____

[8] **PERFORM** the following steps to verify 2-XA-55-6A/110C, LO PRESS LTDN RELIEF LINE TEMP HI:

A. **VERIFY** 2-XA-55-6A/110C, LO PRESS LTDN RELIEF LINE TEMP HI, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 110-C LO PRESS LTDN RELIEF LINE TEMP HI (TS-62-75), CLEARS. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-75	W213CP	W2LTDNTEMP	2TS0620075	1	

D. **VERIFY** 2-XA-55-6A/110C, LO PRESS LTDN RELIEF LINE TEMP HI, at 2-M-6 ALARMS. **(Acc Crit)** _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

E. **VERIFY** Unit 2 Ronan Annunciator System, 110-C LO PRESS LTDN RELIEF LINE TEMP HI (TS-62-75), ALARMS. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-75	W213CP	W2LTDNTEMP	2TS0620075	0	

G. **VERIFY** 2-XA-55-6A/110C, LO PRESS LTDN RELIEF LINE TEMP HI, at 2-M-6, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 110-C LO PRESS LTDN RELIEF LINE TEMP HI (TS-62-75), CLEARS. _____

[9] **PERFORM** the following steps to verify 2-XA-55-6A/110A, REGEN HX LTDN TEMP HI:

A. **VERIFY** 2-XA-55-6A/110A, REGEN HX LTDN TEMP HI, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System indicates, 110-A REGEN HX LTDN TEMP HI (TS-62-71), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-71	W213CP	W2LTDNTEMP	2TS0620071	1	

D. **VERIFY** 2-XA-55-6A/110A, REGEN HX LTDN TEMP HI, at 2-M-6, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System indicates, 110-A REGEN HX LTDN TEMP HI (TS-62-71), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-71	W213CP	W2LTDNTEMP	2TS0620071	0	

6.3 Miscellaneous CVCS Alarm Tests (continued)

G. **VERIFY** 2-XA-55-6A/110A, REGEN HX LTDN TEMP HI, at 2-M-6, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System indicates, 110-A REGEN HX LTDN TEMP HI (TS-62-71), is CLEAR. _____

[10] **PERFORM** the following steps to verify 2-XA-55-L10/305B, LETDN TO DEMIN TEMP HI.

A. **VERIFY** 2-XA-55-L10/305B, LETDN TO DEMIN TEMP HI, at 2-L-10, is CLEAR. _____

B. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-80C	W214CP	W2ACR1LDNTMP	2TS0620080C	1	

C. **VERIFY** 2-XA-55-L10/305B, LETDN TO DEMIN TEMP HI, at 2-L-10, ALARMS. **(Acc Crit)** _____

D. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-80C	W214CP	W2ACR1LDNTMP	2TS0620080C	0	

E. **VERIFY** 2-XA-55-L10/305B, LETDN TO DEMIN TEMP HI, at 2-L-10, is CLEAR. _____

[11] **PERFORM** the following steps to verify 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI:

A. **VERIFY** 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI, at 2-M-5, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP LTDN FLOW HI (FS-62-82), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-82	W213CP	W2LTDNFLOW	2FS0620082	1	

6.3 Miscellaneous CVCS Alarm Tests (continued)

D. **VERIFY** 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI, at 2-M-5, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP LTDN FLOW HI (FS-62-82), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-82	W213CP	W2LTDNFLOW	2FS0620082	0	

G. **VERIFY** Annunciator Window110-B, LO PRESS LTDN FLOW/PRESS HI, at 2-M-5, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP LTDN FLOW HI (FS-62-82), is CLEAR. _____

[12] **PERFORM** the following steps to verify 2-XA-55-6A/110D, LTDN TO DEMINS TEMP HI:

A. **VERIFY** 2-XA-55-6A/110D, LTDN TO DEMINS TEMP HI, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 110-D LTDN TO DEMINS TEMP HI (TS-62-78), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-78	W213CP	W2LTDNTEMP	2TS0620078	1	

D. **VERIFY** 2-XA-55-6A/110D, LTDN TO DEMINS TEMP HI, at 2-M-6, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 110-D LTDN TO DEMINS TEMP HI (TS-62-78), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-TS-62-78	W213CP	W2LTDNTEMP	2TS0620078	0	

6.3 Miscellaneous CVCS Alarm Tests (continued)

G. **VERIFY** 2-XA-55-6A/110D, LTDN TO DEMINS TEMP HI, at 2-M-6, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 110-D LTDN TO DEMINS TEMP HI (TS-62-78) is CLEAR. _____

[13] **PERFORM** the following steps to verify 2-XA-55-5C/108A from 2-FS-62-93A, CVCS CHARGING FLOW HI:

A. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW HI (FS-62-93A), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93A	W213CP	W2CHARGE	2FS0620093A	1	

D. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW HI (FS-62-93A), ALARMS. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93A	W213CP	W2CHARGE	2FS0620093A	0	

G. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW HI (FS-62-93A), is CLEAR. _____.

[14] **PERFORM** the following steps to verify 2-XA-55-5C/108A from 2-FS-62-93B, CVCS CHARGING FLOW LO:

A. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, is CLEAR. _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

B. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW LO (FS-62-93B), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93B	W213CP	W2CHARGE	2FS0620093B	1	

D. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, ALARMS. _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW LO (FS-62-93B), ALARMS. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93B	W213CP	W2CHARGE	2FS0620093B	0	

G. **VERIFY** 2-XA-55-5C/108A, CHARGING FLOW HI/LO, at 2-M-5, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 108-A CVCS CHARGING FLOW LO (FS-62-93B), is CLEAR. _____

[15] **PERFORM** the following steps to verify 2-XA-55-L10/304A, CHARGING FLOW LO:

A. **VERIFY** 2-XA-55-L10/304A, CHARGING FLOW LO, at 2-L-10, is CLEAR. _____

B. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93C	W215CP	W2ACRCHARGE	2FS0620093C	1	

C. **VERIFY** 2-XA-55-L10/304A, CHARGING FLOW LO, at 2-L-10, ALARMS. **(Acc Crit)** _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

D. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-FS-62-93C	W215CP	W2ACRCHARGE	2FS0620093C	0	

E. **VERIFY** 2-XA-55-L10/304A, CHARGING FLOW LO, at 2-L-10, is CLEAR. _____

[16] **PERFORM** the following steps to verify 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI:

A. **VERIFY**2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI, at 2-M-6, is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP PRESS HI (PS-62-81), is CLEAR. _____

C. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-81	W215CP	W2LTDNPRESS	2PS0620081	1	

D. **VERIFY** 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI, ALARMS. **(Acc Crit)** _____

E. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP PRESS HI (PS-62-81), is in ALARM. _____

F. **ENSURE** the following Control Element status:

UNID	PROCESSOR	COMPOUND	ELEMENT	STATUS	INITIALS
2-PS-62-81	W215CP	W2LTDNPRESS	2PS0620081	0	

G. **VERIFY** 2-XA-55-6A/110B, LO PRESS LTDN FLOW/PRESS HI, is CLEAR. _____

H. **VERIFY** Unit 2 Ronan Annunciator System, 110-B LP PRESS HI (PS-62-81), is CLEAR. _____

6.3 Miscellaneous CVCS Alarm Tests (continued)

[17] **RESTORE** the following Control Element status to AUTO:

UNID	PROCESSOR	COMPOUND	ELEMENT	INITIALS
2-TS-62-131	W213CP	W2LTDNTEMP	2TS0620131	
2-PS-62-122A	W213CP	W2VCTPRESS	2PS0620122A	
2-PS-62-122B	W213CP	W2VCTPRESS	2PS0620122B	
2-TS-62-58	W212CP	W2LETDOWN	2TS0620058	
2-TS-62-75	W213CP	W2LTDNTEMP	2TS0620075	
2-TS-62-71	W213CP	W2LTDNTEMP	2TS0620071	
2-TS-62-80C	W214CP	W2ACR1LDNTMP	2TS0620080C	
2-FS-62-82	W213CP	W2LTDNFLOW	2FS0620082	
2-TS-62-78	W213CP	W2LTDNTEMP	2TS0620078	
2-FS-62-93A	W213CP	W2CHARGE	2FS0620093A	
2-FS-62-93B	W213CP	W2CHARGE	2FS0620093B	
2-FS-62-93C	W215CP	W2ACRCHARGE	2FS0620093C	
2-PS-62-81	W215CP	W2LTDNPRESS	2PS0620081	

6.4 Miscellaneous Tests of Unit 1 Components.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.4 have been completed. _____

[2] **PERFORM** the following steps to verify 2-XA-55-6A/111B, BAT B TEMP HI/LO:

A. **VERIFY** 2-XA-55-6A/111B, BAT B TEMP HI/LO, at 2-M-6 is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 111-B BAT B TEMP HI/LO (TS-62-239D), is CLEAR. _____

C. **LOCATE** 2-TIT-62-239 on 2-L-303, BORIC ACID TK B PANEL, points 11 and 13. _____

_____
CV

D. **PLACE AND HOLD** a jumper across points 11 and 13 on 2-L-303, BORIC ACID TK B PANEL, to simulate BAT B TEMP LO. _____

E. **VERIFY** 2-XA-55-6A/111B, BAT B TEMP HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

F. **VERIFY** Unit 2 Ronan Annunciator System, 111-B BAT B TEMP HI/LO (TS-62-239D), ALARMS. _____

G. **REMOVE** jumper across points 11 and 13 on 2-L-303, BORIC ACID TK B PANEL. _____

_____
CV

H. **VERIFY** 2-XA-55-6A/111B, BAT B TEMP HI/LO, at 2-M-6 CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System, 111-B BAT B TEMP HI/LO (TS-62-239D), is CLEAR. _____

6.4 Miscellaneous Tests of Unit 1 Components. (continued)

J. **LOCATE** 2-TIT-62-239 on 2-L-303, BORIC ACID TK B PANEL, points 14 and 16. _____

_____
CV

K. **PLACE AND HOLD** a jumper across points 14 and 16 on 2-L-303, BORIC ACID TK B PANEL, to simulate BAT B TEMP HI. _____

L. **VERIFY** 2-XA-55-6A/111B, BAT B TEMP HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

M. **VERIFY** Unit 2 Ronan Annunciator System, 111-B BAT B TEMP HI/LO (TS-62-239B), shows ALARM. _____

N. **REMOVE** jumper across points 14 and 16 on 2-L-303, BORIC ACID TK B PANEL. _____

_____
CV

O. **VERIFY** 2-XA-55-6A/111B, BAT B TEMP HI/LO, at 2-M-6 CLEARS. _____

[3] **PERFORM** the following steps to verify 2-XA-55-6A/111A, BAT B LEVEL HI/LO:

A. **VERIFY** 2-XA-55-6A/111A, BAT B LEVEL HI/LO, at 2-M-6 is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL HI (LS-62-238A), is CLEAR. _____

C. **LOCATE** on 2-R-21 TB21L points 9 and 10. _____

_____
CV

D. **PLACE AND HOLD** a jumper across TB21L points 9 and 10 in 2-R-21 to simulate BAT B LEVEL HI/LO. _____

E. **VERIFY** 2-XA-55-6A/111A, BAT B LEVEL HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

6.4 Miscellaneous Tests of Unit 1 Components. (continued)

F. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL HI (LS-62-238A), ALARMS. _____

G. **REMOVE** jumper across TB21L points 9 and 10 in 2-R-21. _____

_____
CV

H. **VERIFY** 2-XA-55-6A/111A, BAT B LEVEL HI/LO, at 2-M-6 CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL HI (LS-62-238A), is CLEAR. _____

J. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL LO (LS-62-238B), is CLEAR. _____

K. **LOCATE** on 2-R-21 TB21L points 11 and 12. _____

_____
CV

L. **PLACE AND HOLD** a jumper across TB21L points 11 and 12 in 2-R-21 to simulate BAT B LEVEL HI/LO. _____

M. **VERIFY** 2-XA-55-6A/111A, BAT B LEVEL HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

N. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL LO (LS-62-238B), ALARMS. _____

O. **REMOVE** jumper across TB21L points 11 and 12 in 2-R-21. _____

_____
CV

P. **VERIFY** 2-XA-55-6A/111A, BAT B LEVEL HI/LO, at 2-M-6 CLEARS. _____

Q. **VERIFY** Unit 2 Ronan Annunciator System, 111-A BAT B LEVEL LO (LS-62-238B), is CLEAR. _____

6.4 Miscellaneous Tests of Unit 1 Components. (continued)

[4] **PERFORM** the following steps to verify 2-XA-55-6A/112A, BAT C LEVEL HI/LO:

A. **VERIFY** 2-XA-55-6A/112A, BAT C LEVEL HI/LO, at 2-M-6 is CLEAR. _____

B. **VERIFY** Unit 2 Ronan Annunciator System, 112-A BAT C LEVEL HI (LS-62-242A), is CLEAR. _____

C. **LOCATE** on 2-R-15 TB15L points 9 and 10. _____

_____
CV

D. **PLACE AND HOLD** a jumper across TB15L points 9 and 10 in 2-R-15 to simulate BAT C LEVEL HI/LO. _____

E. **VERIFY** 2-XA-55-6A/112A, BAT C LEVEL HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

F. **VERIFY** Unit 2 Ronan Annunciator System, 112-A BAT C LEVEL HI (LS-62-242A), ALARMS. _____

G. **REMOVE** jumper across TB15L points 9 and 10 in 2-R-15. _____

_____
CV

H. **VERIFY** 2-XA-55-6A/112A, BAT C LEVEL HI/LO, at 2-M-6 CLEARS. _____

I. **VERIFY** Unit 2 Ronan Annunciator System, 112-A BAT C LEVEL HI (LS-62-242A), is CLEAR. _____

J. **LOCATE** on 2-R-15 TB15L points 11 and 12. _____

_____
CV

K. **PLACE AND HOLD** a jumper across TB15L points 11 and 12 in 2-R-15 to simulate BAT C LEVEL HI/LO. _____

L. **VERIFY** 2-XA-55-6A/112A, BAT C LEVEL HI/LO, at 2-M-6 ALARMS. **(Acc Crit)** _____

6.4 Miscellaneous Tests of Unit 1 Components. (continued)

M. **VERIFY** Unit 2 Ronan Annunciator System, 112-A BAT C LEVEL LO (LS-62-242B), ALARMS. _____

N. **REMOVE** jumper across TB15L points 11 and 12 in 2-R-15. _____

_____
CV

O. **VERIFY** 2-XA-55-6A/112A, BAT C LEVEL HI/LO, at 2-M-6 CLEARS. _____

P. **VERIFY** Unit 2 Ronan Annunciator System, 112-A BAT C LEVEL LO (LS-62-242B), is CLEAR. _____

[5] **PERFORM** the following steps to verify operation of 2-HTR-62-228/3, BORIC ACID BATCHING TANK HTR 3, Local indicating lights:

A. **RECORD** Initial Position of 0-HS-62-228 (Aux 713, A13R), BORIC ACID BATCH TANK HEATER CONTROL.

Initial Position: ON OFF AUTO _____
(circle one)

B. **ENSURE** 0-HS-62-228 in the OFF Position. _____

C. **VERIFY** the following light indication for 2-HTR-62-228/3 at 0-HS-62-228 : **(Acc Crit)**

- Red Light OFF _____
- Green Light ON _____

D. **PLACE** 0-HS-62-228 in the ON Position. _____

E. **VERIFY** the following light indication for 2-HTR-62-228/3 at 0-HS-62-228: **(Acc Crit)**

- Red Light ON _____
- Green Light OFF _____

F. **PLACE** 0-HS-62-228 in the Initial Position recorded in step 6.4[5]A. _____

6.4 Miscellaneous Tests of Unit 1 Components. (continued)

G. **RECORD** the As-Left Position.

As-Left Position: ON OFF AUTO _____
(circle one)

H. **VERIFY** component test 2-062-12824-E02-000 has been satisfactorily completed. _____

6.5 VCT Pressure Tests

NOTE

The accuracy of Computer point P0139A from 2-LPP-62-122 is ±0.6625% of full scale (90 psig). This is equal to ±0.596 psig which is rounded up to ±0.6 psig and applied to the acceptance criteria values from section 5.0.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.5 have been completed. _____

[2] **ENSURE** Waste Gas system and N_2 system available. _____

[3] **NOTIFY** Radwaste Operator to manually start a Waste Gas Compressor prior to venting VCT. _____

[4] **PLACE** 2-HS-62-118A, LETDOWN DIVERT TO HUT [2-M-6], to VCTK. _____

[5] **ESTABLISH** VCT N_2 Atmosphere, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[6] **ENSURE** 2-PCV-62-119, VOLUME CONTROL TANK N2 SUPPLY PRESS CNTL, is **NOT** fully CLOSED. _____

[7] **CLOSE** 2-ISV-32-4945 CONTROL AIR ISOLATION VALVE TO 2-PCV-62-119. **AND**

OPEN PREG petcock for valve 2-PCV-62-119. _____

[8] **VERIFY** 2-PCV-62-119 is fully closed. (**Acc Crit**) _____

[9] **CLOSE** PREG petcock for valve 2-PCV-62-119, **AND**

OPEN 2-ISV-32-4945 _____

[10] **ENSURE** 2-PCV-62-119 is **NOT** fully CLOSED. _____

[11] **ENSURE** 2-PCV-62-126, VCT WASTE GAS VENT PRESSURE CONTROL, is **NOT** fully CLOSED. _____

6.5 VCT Pressure Tests (continued)

[12] **CLOSE** 2-ISV-32-3102, CONTROL AIR ISOLATION VALVE TO 2-PCV-62-126, **AND**

OPEN PREG petcock for valve 2-PCV-62-126. _____

[13] **VERIFY** 2-PCV-62-126 is fully closed. (**Acc Crit**) _____

[14] **CLOSE** PREG petcock for valve 2-PCV-62-126, **AND**

OPEN 2-ISV-32-3102 _____

[15] **ENSURE** 2-PCV-62-126 is **NOT** fully CLOSED. _____

[16] **ENSURE** VCT Level >90%.

_____ % _____

[17] **ADJUST** the following Pressure Control Valves so that between 18 and 19 psig is maintained in the VCT:

A. 2-PCV-62-119 (Aux 713, A12U), VOLUME CONTROL TANK N_2 SUPPLY PRESS CNTL, to maintain between 18 and 19 psig. _____

B. 2-PCV-62-126 (Aux 713, A12U), VCT WASTE GAS VENT PRESSURE CONTROL, to maintain between 18 and 19 psig. _____

[18] **ENSURE** 2-HS-62-125 [2-M-6], VCT VENT TO WDS VENT HDR, in the CLOSE position. _____

[19] **RECORD** VCT Pressure on Computer Point P0139A.

_____ psig _____

[20] **VERIFY** VCT Pressure on Computer Point P0139A is between 15.6-19.4 psig. **(Acc Crit)** _____

[21] **PLACE** 2-HS-62-125, VCT VENT TO WDS VALVE CONTROL, in the OPEN position. _____

[22] **CLOSE** 2-ISV-62-692 (Aux 713, A12U), VCT NITROGEN ISLN. _____

6.5 VCT Pressure Tests (continued)

[23] **RECORD** VCT Pressure on Computer Point P0139A.

_____ psig _____

[24] **VERIFY** VCT Pressure on Computer Point P0139A is between 18.6-22.4 psig. **(Acc Crit)** _____

[25] **OPEN** 2-ISV-62-692, VCT NITROGEN ISLN. _____

[26] **REQUEST** Chemistry to sample VCT O_2. _____

[27] **RECORD** VCT O_2 Concentration

_____ $\%O_2$ _____

[28] **NOTIFY** MCR UO of VCT O_2 sample results _____

[29] **VERIFY** VCT O_2 < 2%. _____

CAUTIONS

1) The Following steps introduce H_2 into the VCT then re-establishes a N_2 atmosphere.
2) VCT O_2 concentration must **NOT** exceed 2% by volume when establishing or maintaining H_2 atmosphere.

[30] **CLOSE** 2-ISV-62-692, VCT NITROGEN ISLN. _____

[31] **OPEN** 2-ISV-62-693 (Aux 713, A12U), VCT HYDROGEN ISLN. _____

[32] **ADJUST** 2-PCV-62-120 (Aux 713, A13U), VOL CONT TANK H2 BLANKET, to maintain between 15 and 20 psig. _____

[33] **ENSURE** 2-PCV-62-120, VOLUME CONTROL TANK H2 SUPPLY PRESS CNTL, is **NOT** fully CLOSED. _____

[34] **CLOSE** 2-ISV-32-3100 CONTROL AIR ISOLATION VALVE TO 2-PCV-62-120, **AND**

OPEN PREG petcock for valve 2-PCV-62-120, **AND** _____

[35] **VERIFY** 2-PCV-62-120 is fully closed. (**Acc Crit**) _____

[36] **CLOSE** PREG petcock for valve 2-PCV-62-120, **AND**

6.5 VCT Pressure Tests (continued)

OPEN 2-ISV-32-3100 _____

[37] **ENSURE** 2-PCV-62-120 is **NOT** fully CLOSED. _____

[38] **PLACE** 2-HS-62-125, VCT VENT TO WDS VALVE CONTROL, in the CLOSE position. _____

[39] **RECORD** VCT Pressure on Computer Point P0139A.

_____ psig _____

[40] **VERIFY** VCT Pressure on Computer Point P0139A is between 15.6-19.4 psig. **(Acc Crit)** _____

[41] **PLACE** 2-HS-62-125, VCT VENT TO WDS VALVE CONTROL, in the OPEN position. _____

[42] **CLOSE** 2-ISV-62-693, VCT HYDROGEN ISLN. _____

[43] **ESTABLISH** VCT N_2 Atmosphere, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[44] **REQUEST** Chemistry to sample VCT O_2 and H_2. _____

[45] **RECORD** VCT O_2 Concentration

_____ % _____

[46] **RECORD** VCT H_2 Concentration

_____ % _____

[47] **NOTIFY** MCR UO of VCT sample results _____

[48] **ENSURE** 2-ISV-62-692, VCT NITROGEN ISLN, is CLOSED. _____

6.6 Reactor Coolant Pump (RCP) Seal Injection Flow Tests

NOTE

Having balanced seal flows for all four RCPs prior to initiating each subsection will facilitate section performance.

6.6.1 Reactor Coolant Pump 1

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/101E, RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 1 Seal Supply Flow from the following flow indicators (approximately 8-13 gpm):

A. 2-FI-62-1A (2-M-5), RCP NO. 1 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-1B (2-L-348), RCP 1 SEAL INJECTION FLOW = _____ gpm _____

CAUTION

While RCP #1 is running the minimum seal injection flow rate is 6 gpm. The setpoint for 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO is 6.5 there for caution is to be exercised while performing the following step.

[5] **SLOWLY CLOSE** Throttle Valve 2-INJ-62-556 (Aux 713, Pipe Chase), RCP 1 SEAL WATER INJECTION FLOW BAL, until 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, ALARMS. **(Acc Crit)** _____

6.6.1 Reactor Coolant Pump 1 (continued)

[6] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 1 SEAL SUPPLY FLOW LO (FS-62-1), is in ALARM. _____

[7] **RECORD** RCP 1 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-1A (2-M-5), RCP NO. 1 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-1B (2-L-348), RCP 1 SEAL INJECTION FLOW = _____ gpm _____

[8] **SLOWLY OPEN** Throttle Valve 2-INJ-62-556, RCP 1 SEAL WATER INJECTION FLOW BAL, and REESTABLISH approximately 8-9 gpm seal supply flow to RCP 1 as read on indicator 2-FI-62-1A (2-M-5), RCP NO. 1 SEAL SUP FLOW. _____

[9] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[10] **VERIFY** Unit 2 Ronan Annunciator System 101-E RCP 1 SEAL SUPPLY FLOW LO (FS-62-1) is CLEAR. _____

[11] **RECORD** RCP 1 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-1A (2-M-5), RCP NO. 1 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-1B (2-L-348), RCP 1 SEAL INJECTION FLOW = _____ gpm _____

6.6.2 Reactor Coolant Pump 2

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 2 Seal Supply Flow from the following flow indicators (8-13 gpm):

A. 2-FI-62-14A (2-M-5), RCP 2 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-14B (2-L-348), RCP 2 SEAL INJECTION FLOW = _____ gpm _____

CAUTION

While RCP #2 is running the minimum seal injection flow rate is 6 gpm. The setpoint for 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO is 6.5 there for caution is to be exercised while performing the following step.

[5] **SLOWLY CLOSE** Throttle Valve 2-INJ-62-557 (Aux 713, Pipe Chase), RCP 2 SEAL WATER INJECTION FLOW BAL, until 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 2 SEAL SUPPLY FLOW LO (FS-62-14) is in ALARM. _____

[7] **RECORD** RCP 2 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-14A (2-M-5), RCP 2 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-14B (2-L-348), RCP 2 SEAL INJECTION FLOW = _____ gpm _____

6.6.2 Reactor Coolant Pump 2 (continued)

[8] **SLOWLY OPEN** Throttle Valve 2-INJ-62-557, RCP 2 SEAL WATER INJECTION FLOW BAL, and REESTABLISH approximately 8-9 gpm seal supply flow to RCP 2 as read on indictor 2-FI-62-14A (2-M-5), RCP 2 SEAL SUP FLOW. _____

[9] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[10] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 2 SEAL SUPPLY FLOW LO (FS-62-14) is CLEAR. _____

[11] **RECORD** RCP 2 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-14A (2-M-5), RCP 2 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-14B (2-L-348), RCP 2 SEAL INJECTION FLOW = _____ gpm _____

6.6.3 Reactor Coolant Pump 3

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 3 Seal Supply Flow from the following flow indicators (8-13 gpm):

A. 2-FI-62-27A (2-M-5), RCP 3 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-27B (2-L-348), RCP 3 SEAL INJECTION FLOW = _____ gpm _____

CAUTION

While RCP #3 is running the minimum seal injection flow rate is 6 gpm. The setpoint for 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO is 6.5 there for caution is to be exercised while performing the following step.

[5] **SLOWLY CLOSE** Throttle Valve 2-INJ-62-558 (Aux 713, Pipe Chase), RCP 3 SEAL WATER INJECTION FLOW BAL, until 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 3 SEAL SUPPLY FLOW LO (FS-62-27) is in ALARM. _____

[7] **RECORD** RCP 3 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-27A (2-M-5), RCP 3 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-27B (2-L-348), RCP 3 SEAL INJECTION FLOW = _____ gpm _____

6.6.3 Reactor Coolant Pump 3 (continued)

[8] **SLOWLY OPEN** Throttle Valve 2-INJ-62-558, RCP 3 SEAL WATER INJECTION FLOW BAL, and REESTABLISH approximately 8-9 gpm seal supply flow to RCP 3 as read on indicator 2-FI-62-27A (2-M-5), RCP 3 SEAL SUP FLOW. _____

[9] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, is CLEAR. _____

[10] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 3 SEAL SUPPLY FLOW LO (FS-62-27) is CLEAR. _____

[11] **RECORD** RCP 3 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-27A (2-M-5), RCP 3 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-27B (2-L-348), RCP 3 SEAL INJECTION FLOW = _____ gpm _____

6.6.4 Reactor Coolant Pump 4

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.6 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 4 Seal Supply Flow from the following flow indicators (8-13 gpm):

A. 2-FI-62-40A (2-M-5), RCP 4 SEAL WTR = _____ gpm _____

B. 2-FI-62-40B (2-L-348), RCP 4 SEAL INJECTION FLOW = _____ gpm _____

CAUTION

While RCP #4 is running the minimum seal injection flow rate is 6 gpm. The setpoint for 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO is 6.5 there for caution is to be exercised while performing the following step.

[5] **SLOWLY CLOSE** Throttle Valve 2-INJ-62-559 (Aux 713, Pipe Chase), RCP 4 SEAL WATER INJECTION FLOW BAL, until 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System, 101-E RCP 4 SEAL SUPPLY FLOW LO (FS-62-40) is in ALARM. _____

[7] **RECORD** RCP 4 Seal Supply Flow from the following locations:

A. 2-FI-62-40A (2-M-5), RCP 4 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-40B (2-L-348), RCP 4 SEAL INJECTION FLOW = _____ gpm _____

6.6.4 Reactor Coolant Pump 4 (continued)

[8] **SLOWLY OPEN** Throttle Valve 2-INJ-62-559, RCP 4 SEAL WATER INJECTION FLOW BAL, and REESTABLISH approximately 8-9 gpm seal supply flow to RCP 4 as read on indicator 2-FI-62-40A (2-M-5), RCP 4 SEAL SUP FLOW. _____

[9] **VERIFY** 2-XA-55-5B/101E (2-M-5), RCP SEAL SUPPLY FLOW LO, at 2-M-5 is CLEAR. _____

[10] **VERIFY** Unit 2 Ronan Annunciator System 101-E RCP 4 SEAL SUPPLY FLOW LO (FS-62-40) is CLEAR. _____

[11] **RECORD** RCP 4 Seal Supply Flow from the following flow indicators:

A. 2-FI-62-40A (2-M-5), RCP 4 SEAL SUP FLOW = _____ gpm _____

B. 2-FI-62-40B (2-L-348), RCP 4 SEAL INJECTION FLOW = _____ gpm _____

6.7 Seal No. 1 ΔP Alarm Tests

6.7.1 Reactor Coolant Pump 1

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 1 #1 SEAL ΔP from the following ΔP indicators:

A. 2-PDI-62-8A (2-M-5), RCP 1 #1 SEAL ΔP = _____ psid (>222 psid) _____

B. 2-PDI-62-8B (Aux 713, A12V), RCP 1 DP ACROSS NO 1 SEAL = _____ psid (>222 psid) _____

[5] **SLOWLY OPEN** 2-EQIV-62-305F (RXB 716, AC1), EQUALIZING VLV TO 2-PDT-62-8, to SIMULATE a low differential pressure until 2-XA-55-5B/99D, RCP SEAL ΔP LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 1 SEAL DP LO (PDS-62-8) is in ALARM. _____

[7] **CLOSE** 2-EQIV-62-305F, EQUALIZING VLV TO 2-PDT-62-8. _____

[8] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 1 SEAL DP LO (PDS-62-8) is CLEAR. _____

[9] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

6.7.2 Reactor Coolant Pump 2

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. _____

[2] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, at 2-M-5 is CLEAR. _____

[3] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **RECORD** RCP 2 # 1 SEAL ΔP from the following ΔP indicators:

A. 2-PDI-62-21A (2-M-5), RCP 2 #1 SEAL ΔP = _____ psid (>222psid) _____

B. 2-PDI-62-21B (Aux 713, A12V), RCP 2 #1 SEAL DIFF PRESS = _____ psid (>222psid) _____

[5] **SLOWLY OPEN** 2-EQIV-62-313F (RXB 716, AC2), EQUALIZING VLV TO 2-PDT-62-21, to SIMULATE a low seal differential pressure until 2-XA-55-5B/99D, RCP SEAL ΔP LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 2 SEAL DP LO (PDS-62-21) is in ALARM. _____

[7] **CLOSE** 2-EQIV-62-313F, EQUALIZING VLV TO 2-PDT-62-21. _____

[8] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 2 SEAL DP LO (PDS-62-21) is CLEAR. _____

[9] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

6.7.3 Reactor Coolant Pump 3

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. _____

[2] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

[3] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **RECORD** RCP 3 #1 SEAL ΔP from the following ΔP indicators:

A. 2-PDI-62-34A, RCP 3 #1 SEAL ΔP = _____ psid (>222psid) _____

B. 2-PDI-62-34B (Aux 713, A12V), RCP 3 #1 SEAL DIFF PRESS = _____ psid (>222psid) _____

[5] **SLOWLY OPEN** 2-EQIV-62-321F (RXB 716, AC3), EQUALIZING VALVE FOR 2-PDT-62-34, to SIMULATE a LOW seal differential pressure until 2-XA-55-5B/99D, RCP SEAL ΔP LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 3 SEAL DP LO (PDS-62-34) is in ALARM. _____

[7] **CLOSE** 2-EQIV-62-321F, EQUALIZING VALVE FOR 2-PDT-62-34. _____

[8] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 3 SEAL DP LO (PdS-62-34) is NORMAL. _____

[9] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

6.7.4 Reactor Coolant Pump 4

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.7 have been completed. _____

[2] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

[3] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **RECORD** RCP 4 #1 SEAL ΔP from the following ΔP indicators:

A. 2-PDI-62-47A, RCP 4 #1 SEAL ΔP = _____ psid (>222psid) _____

B. 2-PDI-62-47B (Aux 713, A12V), RCP 4 #1 SEAL DIFF PRESS = _____ psid (>222psid) _____

[5] **SLOWLY OPEN** 2-EQIV-62-329F (RXB 716, AC4), EQUALIZING VLV TO 2-PDT-62-47, to SIMULATE a low seal differential pressure until 2-XA-55-5B/99D, RCP SEAL ΔP LO, ALARMS. **(Acc Crit)** _____

[6] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 4 SEAL DP LO (PDS-62-47) is in ALARM. _____

[7] **CLOSE** 2-EQIV-62-329F, EQUALIZING VLV TO 2-PDT-62-47. _____

[8] **VERIFY** Unit 2 Ronan Annunciator System indicates 99-D RCP 4 SEAL DP LO (PDS-62-47) is NORMAL. _____

[9] **VERIFY** 2-XA-55-5B/99D, RCP SEAL ΔP LO, is CLEAR. _____

6.8 Seal Leakoff Alarm Tests

6.8.1 Reactor Coolant Pump 1

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 is CLEAR. _____

[4] **RECORD** RCP 1 Seal Leakoff Low Range flow indications from 2-FR-62-23, SEAL LEAKOFF - LOW RANGE - GPM flow recorder = _____ gpm _____

[5] **OPEN** 2-EQIV-62-436E/1 (RXB 702, AZ40), EQUALIZING VLV TO 2-FT-62-10, to SIMULATE a low flow condition. _____

[6] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

[7] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 1 SEAL LEAKOFF FLOW LO (FS-62-10) in ALARM. _____

[8] **CLOSE** 2-EQIV-62-436E/1, EQUALIZING VLV TO 2-FT-62-10. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 1 SEAL LEAKOFF FLOW LO (FS-62-10) is NORMAL. _____

[10] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, is CLEAR. _____

[11] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is CLEAR. _____

6.8.1 Reactor Coolant Pump 1 (continued)

[12] **RECORD** RCP 1 Seal Leakoff High Range flow indications from 2-FR-62-24, SEAL LEAKOFF - HI RANGE - GPM flow recorder = _____ gpm _____

[13] **CLOSE** 2-ISIV-62-435B/2 (RXB 702, AZ40), ISOL VLV TO 2-FT-62-11. _____

[14] **OPEN** 2-DRIV-62-435D/2 (RXB 702, AZ40), DRAIN VLV TO 2-FT-62-11, to SIMULATE a high flow condition. _____

[15] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

[16] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 1 SEAL LEAKOFF FLOW HI (FS-62-11) is in ALARM. _____

[17] **CLOSE** 2-DRIV-62-435D/2 (RXB 702, AZ40), DRAIN VLV TO 2-FT-62-11. _____

[18] **OPEN** 2-ISIV-62-435B/2, ISOL VLV TO 2-FT-62-11. _____

[19] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 1 SEAL LEAKOFF FLOW HI (FS-62-11) is NORMAL. _____

[20] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, is CLEAR. _____

[21] **ENSURE** instrument lines to 2-FT-62-11 are properly vented. _____

6.8.2 Reactor Coolant Pump 2

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, is CLEAR. _____

[4] **RECORD** RCP 2 Seal Leakoff Low Range flow indications from 2-FR-62-23, SEAL LEAKOFF - LOW RANGE- GPM flow recorder = _____ gpm _____

[5] **OPEN** 2-EQIV-62-430E/1 (RXB 702, AZ140), EQUALIZING VLV TO 2-FT-62-23, equalizing valve to SIMULATE a low flow condition. _____

[6] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

[7] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 2 SEAL LEAKOFF FLOW LO (FS-62-23) is in ALARM. _____

[8] **CLOSE** 2-EQIV-62-430E/1, EQUALIZING VLV TO 2-FT-62-23. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 2 SEAL LEAKOFF FLOW LO (FS-62-23) is NORMAL. _____

[10] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 is CLEAR. _____

[11] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is CLEAR. _____

[12] **RECORD** RCP 2 Seal Leakoff High Range flow indications from 2-FR-62-24 SEAL LEAKOFF - HI RANGE - GPM flow recorder = _____ gpm _____

6.8.2 Reactor Coolant Pump 2 (continued)

[13] **CLOSE** 2-ISIV-62-429B/2 (RXB 702, AZ140), ISOL VLV TO 2-FT-62-24. _____

[14] **OPEN** 2-DRIV-62-430D/2 (RXB 702, AZ140), DRAIN VLV TO 2-FT-62-24, on Panel 2-L-559, to SIMULATE a high flow condition. _____

[15] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is in ALARM. **(Acc Crit)** _____

[16] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 2 SEAL LEAKOFF FLOW HI (FS-62-24) is in ALARM. _____

[17] **CLOSE** 2-DRIV-62-430D/2 (RXB 702, AZ140) _____

[18] **OPEN** 2-ISIV-62-430B/2, ISOL VLV TO 2-FT-62-24. _____

[19] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 2 SEAL LEAKOFF FLOW HI (FS-62-24) is NORMAL. _____

[20] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, is CLEAR. _____

[21] **ENSURE** instrument lines to 2-FT-62-24 are properly vented. _____

6.8.3 Reactor Coolant Pump 3

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, is CLEAR. _____

[4] **RECORD** RCP 3 Seal Leakoff Low Range flow indications from 2-FR-62-49, SEAL LEAKOFF - LOW RANGE - GPM flow recorder = _____ gpm _____

[5] **OPEN** 2-EQIV-62-424E/1 (RXB 702, AZ140), EQUALIZING VLV TO 2-FT-62-36, to SIMULATE a low flow condition. _____

[6] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 is in ALARM. **(Acc Crit)** _____

[7] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 3 SEAL LEAKOFF FLOW LO (FS-62-36) is in ALARM. _____

[8] **CLOSE** 2-EQIV-62-424E/1, EQUALIZING VLV TO 2-FT-62-36. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 3 SEAL LEAKOFF FLOW LO (FS-62-36) is NORMAL. _____

[10] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 is CLEAR. _____

[11] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is CLEAR. _____

[12] **RECORD** RCP 3 Seal Leakoff High Range flow indications from 2-FR-62-50, SEAL LEAKOFF - HI RANGE - GPM flow recorder = _____ gpm _____

[13] **CLOSE** 2-ISIV-62-423B/2 (RXB 702, AZ140), ISOL VLV TO 2-FT-62-37. _____

6.8.3 Reactor Coolant Pump 3 (continued)

[14] **OPEN** 2-DRIV-62-423D/2 (RXB 702, AZ140), DRAIN VLV TO 2-FT-62-37, on Panel 2-L-559, to SIMULATE a high flow condition. _____

[15] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is in ALARM. **(Acc Crit)** _____

[16] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 3 SEAL LEAKOFF FLOW HI (FS-62-37) is in ALARM. _____

[17] **CLOSE** 2-DRIV-62-423D/2, DRAIN VLV TO 2-FT-62-37. _____

[18] **OPEN** 2-ISIV-62-423B/2, ISOL VLV TO 2-FT-62-37. _____

[19] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 3 SEAL LEAKOFF FLOW HI (FS-62-37) is NORMAL. _____

[20] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, is CLEAR. _____

[21] **ENSURE** instrument lines to 2-FT-62-37 are properly vented. _____

6.8.4 Reactor Coolant Pump 4

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.8 have been completed. _____

[2] **ENSURE** seal flow has been established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[3] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, is CLEAR. _____

[4] **RECORD** RCP 4 Seal Leakoff Low Range flow indications from 2-FR-62-49, SEAL LEAKOFF - LOW RANGE - GPM flow recorder = _____ gpm _____

[5] **OPEN** 2-EQIV-62-442E/1 (RXB 702, AZ315), EQUALIZING VLV TO 2-FT-62-49, to SIMULATE a low flow condition. _____

[6] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 ALARMS. **(Acc Crit)** _____

[7] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 4 SEAL LEAKOFF FLOW LO (FS-62-49) is in ALARM. _____

[8] **CLOSE** 2-EQIV-62-442E/1, EQUALIZING VLV TO 2-FT-62-49. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-E RCP 4 SEAL LEAKOFF FLOW LO (FS-62-49) is NORMAL. _____

[10] **VERIFY** 2-XA-55-5B/100E, RCP SEAL LEAK OFF FLOW LO, at 2-M-5 is CLEAR. _____

[11] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 is CLEAR. _____

[12] **RECORD** RCP 4 Seal Leakoff High Range flow indications from 2-FR-62-50, SEAL LEAKOFF - HI RANGE - GPM flow recorder= _____ gpm _____

[13] **CLOSE** 2-ISIV-62-441B/2 (RXB 702, AZ315), ISOL VLV TO 2-FT-62-50. _____

6.8.4 Reactor Coolant Pump 4 (continued)

[14] **OPEN** 2-DRIV-62-441D/2 (RXB 702, AZ315), DRAIN VLV TO 2-FT-62-50. _____

[15] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, at 2-M-5 ALARMS. **(Acc Crit)** _____

[16] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 4 SEAL LEAKOFF FLOW HI (FS-62-50) is in ALARM. _____

[17] **CLOSE** 2-DRIV-62-441D/2, DRAIN VLV TO 2-FT-62-50, on Panel 2-L-561. _____

[18] **OPEN** 2-ISIV-62-441B/2, ISOL VLV TO 2-FT-62-50. _____

[19] **VERIFY** Unit 2 Ronan Annunciator System indicates 100-D RCP 4 SEAL LEAKOFF FLOW HI (FS-62-50) is NORMAL. _____

[20] **VERIFY** 2-XA-55-5B/100D, RCP SEAL LEAK OFF FLOW HI, is CLEAR. _____

[21] **ENSURE** instrument lines to 2-FT-62-50 are properly vented. _____

6.9 Reactor Coolant Pump (RCP) Seal No. 1 Bypass Alarm Tests

6.9.1 2-FIS-62-12, RCP #1 Seal Bypass Flow

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. _____

[2] **ENSURE** Seal Injection is out of service. _____

[3] **ENSURE** 2-FCV-62-53 is OPEN. _____

[4] **CLOSE** 2-ISIV-62-433C, ISOL VLV TO 2-FIS-62-12. _____

[5] **CLOSE** 2-ISIV-62-432C, ISOL VLV TO 2-FIS-62-12. _____

[6] **INSTALL** a pressure source (min range 0-20 inWC) at 2-L-271 on 2-FIS-62-12 to simulate Low Seal Bypass Flow. _____

[7] **ENSURE** pressure source is set to 10 inWC. _____

[8] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[10] **ENSURE** pressure source is set to 0 inWC. _____

[11] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" is in ALARM. **(Acc Crit)** _____

[12] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" ALARM. _____

[13] **PLACE** 2-HS-62-53A in CLOSE. _____

[14] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[15] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[16] **PLACE** 2-HS-62-53A in OPEN. _____

6.9.1 2-FIS-62-12, RCP #1 Seal Bypass Flow (continued)

[17] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" is in ALARM. **(Acc Crit)** _____

[18] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" ALARM. _____

[19] **ENSURE** pressure source is set to 10 inWC. _____

[20] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[21] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[22] **REMOVE** pressure source (min range 0-20 inWC) at 2-L-271 on 2-FIS-62-12. _____

[23] **OPEN** 2-ISIV-62-433C, ISOL VLV TO 2-FIS-62-12. _____

[24] **OPEN** 2-ISIV-62-433C, ISOL VLV TO 2-FIS-62-12. _____

[25] **ENSURE** 2-FCV-62-53 is CLOSED _____

6.9.2 2-FIS-62-25, RCP #2 Seal Bypass Flow

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. _____

[2] **ENSURE** Seal Injection is out of service. _____

[3] **ENSURE** 2-FCV-62-53 is OPEN. _____

[4] **CLOSE** 2-ISIV-62-427B, ISOL VLV TO 2-FIS-62-25. _____

[5] **CLOSE** 2-ISIV-62-426B, ISOL VLV TO 2-FIS-62-25. _____

[6] **INSTALL** a pressure source (min range 0-20 inWC) at 2-L-264 on 2-FIS-62-25 to simulate Low Seal Bypass Flow. _____

[7] **ENSURE** pressure source is set to 10 inWC. _____

[8] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

6.9.2 2-FIS-62-25, RCP #2 Seal Bypass Flow (continued)

[9] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[10] **ENSURE** pressure source is set to 0 inWC. _____

[11] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" is in ALARM. **(Acc Crit)** _____

[12] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" ALARM. _____

[13] **ENSURE** pressure source is set to 10 inWC. _____]

[14] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[15] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[16] **REMOVE** pressure source (min range 0-20 inWC) at 2-L-264 on 2-FIS-62-25 to simulate Low Seal Bypass Flow. _____

[17] **OPEN** 2-ISIV-62-427B, ISOL VLV TO 2-FIS-62-25. _____

[18] **OPEN** 2-ISIV-62-427B, ISOL VLV TO 2-FIS-62-25. _____

[19] **ENSURE** 2-FCV-62-53 is CLOSED _____

6.9.3 **2-FIS-62-38, RCP #3 Seal Bypass Flow**

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. _____

[2] **ENSURE** Seal Injection is out of service. _____

[3] **ENSURE** 2-FCV-62-53 is OPEN. _____

[4] **CLOSE** 2-ISIV-62-421B, ISOL VLV TO 2-FIS-62-38. _____

[5] **CLOSE** 2-ISIV-62-420B, ISOL VLV TO 2-FIS-62-38. _____

[6] **INSTALL** a pressure source (min range 0-20 inWC) at 2-L-264 on 2-FIS-62-38 to simulate Low Seal Bypass Flow. _____

[7] **ENSURE** pressure source is set to 10 inWC. _____

6.9.3 2-FIS-62-38, RCP #3 Seal Bypass Flow (continued)

[8] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[10] **ENSURE** pressure source is set to 0 inWC. _____

[11] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" is in ALARM. **(Acc Crit)** _____

[12] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" ALARM. _____

[13] **ENSURE** pressure source is set to 10 inWC. _____]

[14] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[15] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[16] **REMOVE** pressure source (min range 0-20 inWC) at 2-L-264 on 2-FIS-62-38 to simulate Low Seal Bypass Flow. _____

[17] **OPEN** 2-ISIV-62-421B, ISOL VLV TO 2-FIS-62-38. _____

[18] **OPEN** 2-ISIV-62-421B, ISOL VLV TO 2-FIS-62-38. _____

[19] **ENSURE** 2-FCV-62-53 is CLOSED. _____

6.9.4 2-FIS-62-51, RCP #4 Seal Bypass Flow

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.9 have been completed. _____

[2] **ENSURE** Seal Injection is out of service. _____

[3] **ENSURE** 2-FCV-62-53 is OPEN. _____

[4] **CLOSE** 2-ISIV-62-439C, ISOL VLV TO 2-FIS-62-51. _____

[5] **CLOSE** 2-ISIV-62-438C, ISOL VLV TO 2-FIS-62-51. _____

6.9.4 2-FIS-62-51, RCP #4 Seal Bypass Flow (continued)

[6] **INSTALL** a pressure source (min range 0-20 inWC) at 2-L-263 on 2-FIS-62-51 to simulate Low Seal Bypass Flow. _____

[7] **ENSURE** pressure source is set to 10 inWC. _____

[8] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[9] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[10] **ENSURE** pressure source is set to 0 inWC. _____

[11] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" is in ALARM. **(Acc Crit)** _____

[12] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" ALARM. _____

[13] **ENSURE** pressure source is set to 10 inWC. _____]

[14] **VERIFY** 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO" CLEAR. _____

[15] **VERIFY** Unit 2 Ronan Annunciator System “99-E RCP SEAL BYPASS FLOW LO" is CLEAR. _____

[16] **REMOVE** pressure source (min range 0-20 inWC) at 2-L-263 on 2-FIS-62-12 to simulate Low Seal Bypass Flow. _____

[17] **OPEN** 2-ISIV-62-439C, ISOL VLV TO 2-FIS-62-51. _____

[18] **OPEN** 2-ISIV-62-438C, ISOL VLV TO 2-FIS-62-51. _____

[19] **ENSURE** 2-FCV-62-53 is CLOSED. _____

6.10 Seal Bypass Functional Test

NOTE

This section should be performed in conjunction with 2-SOI-68.02 for filling and venting the Reactor Coolant Pumps.

[1] **VERIFY** #1 Seal ΔP greater than 200 psid using 2-PDI-62-8A, -21A, -34A, or -47A for associated RCP [2-M-5]. _____

[2] **VERIFY** 8 to 13 gpm RCP Seal Supply Flow to associated RCP seal using 2-FI-62-1A, -14A, -27A, or -40A [2-M-5]. _____

[3] **ENSURE** VCT pressure at least 15 psig using 2-PI-62-122, VCT PRESS [2-M-6]. _____

[4] **VERIFY** #1 Seal Leakoff greater than 0.2 gpm, using 2-FR-62-23, -24, -49, or -50 for associated RCP or within Normal Operating Range for existing #1 Seal ΔP _____

[5] **ENSURE** RCS pressure is greater than 325 psig but less than 1000 psig. _____

[6] **OPEN** 2-FCV-62-53, #1 SEAL BYPASS using 2-HS-62-53A [2-M-5] to VENT RCP. _____

[7] **RECORD** the status of 2-XA-55-5B/99E (2-M-5) "RCP SEAL BYPASS FLOW LO"

Annunciator: ALARM CLEAR (circle one) _____

[8] **RECORD** seal bypass flow on the following instrumentation:

2-FIS-62-12	_____	GPM	_____
2-FIS-62-25	_____	GPM	_____
2-FIS-62-38	_____	GPM	_____
2-FIS-62-51	_____	GPM	_____

[9] **CLOSE** 2-FCV-62-53, #1 SEAL BYPASS using 2-HS-62-53A _____

6.11 Charging and Letdown Flow and Pressure Control Tests

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.11 have been completed. _____

NOTE

During the performance of this Subsection, piping vibration data will be collected. The TE is responsible for performance of piping vibration activities in accordance with 2-PTI-999-01 and shall make an entry in the Chronological Test Log.

[2] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-72 operating mode will be available. _____

NOTES

1) After any significant change in letdown and charging flow, the RCP seal injection flows should be checked and adjusted as required.
2) Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, may be placed in Manual and pressure increased or decreased when letdown flow is decreased or increased respectively. The letdown orifices Acceptance Criteria values are 45 gpm and 75 gpm. Adjustment to Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, setpoint should be made to provide these letdown flow values prior to returning the Controller to AUTO. Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, should be placed in AUTO after pressure has stabilized.
3) 2-HIC-62-89A, CHARGING HDR RCP SEALS FLOW CONTROL and 2-HIC-62-93A, CVCS CHARGING HEADER FLOW CTLR, may be adjusted as necessary to maintain Seal Injection flow and Charging and Letdown balance.

[3] **VERIFY/PLACE** Handswitch 2-HS-62-79A, LETDOWN FLOW HI TEMP DIVERSION CONT, to the VCTK position at 2-M-6 to divert letdown flow to the Volume Control Tank. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

NOTE

The following steps establish flow through 2-OR-62-72, LETDOWN ORIFICE, limiting letdown flow to approximately 45 gpm and causing a corresponding reduction in charging flow. Test steps in this alignment should be completed without delay in order to minimize the time during which reduced charging flows are passed through the Regenerative Heat Exchanger.

[4] **ENSURE** Letdown and Charging is Established via 45 GPM Orifice, through Valve 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[5] **VERIFY** the following valve positions by light indication at 2-M-6:

A. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, OPEN _____

B. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, CLOSED _____

C. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, CLOSED _____

D. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, CLOSED _____

[6] **ENSURE** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, at 2-M-6 is in the AUTO position. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

NOTE

The recording of letdown flow readings from 2-FE-62-82 in the remainder of this section requires letdown temperature to be maintained 120-130°F. Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, will be adjusted to maintain this temperature range.

[7] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, at 2-M-6 to ESTABLISH a Letdown Heat Exchanger outlet temperature less than 127°F as observed on 2-TI-62-78, LTDN HT EXCH OUT, at 2-M-6. _____

[8] **RECORD** Letdown Heat Exchanger outlet temperature as read on 2-TI-62-78 (2-M-6), LTDN HT EXCH OUT:

2-TI-62-78 _____°F (< 127°F) _____

[9] **RECORD** letdown flow from Computer Point F0134A
Computer Point F0134A _____ gpm _____

NOTE

The accuracy of Computer point F0134A from 2-LPF-62-82 is ±0.6625% of full scale (200 gpm) plus 2% uncertainty from the Flow Element. This is equal to ±5.325 gpm which is rounded up to ±5.33 gpm and applied to the acceptance criteria values from section 5.0.

[10] **VERIFY** Corrected Flow Rate through 2-OR-62-72, LETDOWN ORIFICE, provides ≥ 50.33: **(Acc Crit)** _____

[11] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-72.

_____ _____
Vibration Engineer Signature Date

[12] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-73 operating mode will be available. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[13] **ENSURE** Letdown and Charging is Established via 75 GPM Orifice through Valve 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[14] **VERIFY** the following valve positions by light indication:

A. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, OPEN _____

B. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, CLOSED _____

C. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, CLOSED _____

D. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, CLOSED _____

[15] **VERIFY** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, is in the AUTO position. _____

NOTE

Step 6.11[16] through 6.11[23] will verify that 2-TCV-70-192 is modulating to control discharge temperature of Letdown Heat Exchanger by observing the output indicator on 2-HIC-62-78A.

[16] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, at 2-M-6 to ESTABLISH a Letdown Heat Exchanger outlet temperature 120-130°F as observed on 2-TI-62-78, LTDN HT EXCH OUT, at 2-M-6. _____

[17] **ENSURE** 2-HIC-62-78A in AUTO. _____

[18] **RECORD** Letdown Heat Exchanger outlet temperature as read on 2-TI-62-78, LTDN HT EXCH OUT:

2-TI-62-78 _____°F (120-130°F) _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[19] **PLACE** 2-HIC-62-78A in Manual _____

[20] **DECREASE** Letdown temperature approximately 20°F using 2-HIC-62-78A. _____

[21] **RECORD** Letdown Heat Exchanger outlet temperature as read on 2-TI-62-78, LTDN HT EXCH OUT:

2-TI-62-78 _____°F _____

[22] **PLACE** 2-HIC-62-78A in Auto. _____

[23] **VERIFY** Output Indication on 2-HIC-62-78A changes as 2-TCV-70-192 modulates to restore Letdown Heat Exchanger outlet temperature to setpoint. **(Acc Crit)** _____

[24] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, to ESTABLISH a Letdown Heat Exchanger outlet temperature of 127°F (120-130°F) as observed on 2-TI-62-78, LTDN HT EXCH OUT. _____

[25] **RECORD** letdown flow from Computer Point F0134A
Computer Point F0134A _____ gpm _____

NOTE

The accuracy of Computer point F0134A from 2-LPF-62-82 is ±0.6625% of full scale (200 gpm) plus 2% uncertainty from the Flow Element. This is equal to ±5.325 gpm which is rounded up to ±5.33 gpm and applied to the acceptance criteria values from section 5.0.

[26] **VERIFY** Corrected Flow Rate through 2-OR-62-73, LETDOWN ORIFICE, provides ≥ 80.33 gpm with the tolerance calculated: **(Acc Crit)** _____

[27] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-73.

_____ _____
Vibration Engineer Signature Date

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[28] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-73 and 2-OR-62-76 operating mode will be available. _____

[29] **PLACE** Handswitch 2-HS-62-76, REGEN HT EXCH LETDOWN ISOL VALVE, to the OPEN position **AND**

VERIFY the following valve positions by light indication:

A. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, OPEN _____

B. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, OPEN _____

C. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, CLOSED _____

D. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, CLOSED _____

[30] **RECORD** letdown flow from Computer Point F0134A
Computer Point F0134A _____ gpm _____

NOTE

Due to the relatively large uncertainty involved with the following calculation compared to the expected result of approximately 3gpm, the results will require engineering approval. Because of this no uncertainty will be factored into the following calculation.

[31] **CALCULATE** the difference in recorded flowrates between Steps 6.11[30] and 6.11[21] to determine 2-OR-62-76, 5 GPM ORIFICE, flowrate:

(Step 6.11[30] _____ gpm) - (Step 6.11[21] _____ gpm)
= _____ gpm _____

_____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[32] **VERIFY** Corrected Flow Rate through 2-OR-62-76, 5 GPM ORIFICE, provides ≥ 3 gpm with the tolerance calculated: **(Acc Crit)** _____

[33] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-73 and 2-HS-62-76.

_____ _____
Vibration Engineer Signature Date

[34] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-74 operating mode will be available. _____

[35] **PLACE** Handswitch 2-HS-62-76, REGEN HT EXCH LETDOWN ISOL VALVE to the CLOSE position. _____

[36] **ESTABLISH** ≥75 gpm letdown flow via 2-OR-62-74, LETDOWN ORIFICE, through Valve 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[37] **VERIFY** the following valve positions by light indication at 2-M-6:

A. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, CLOSED _____

B. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, CLOSED _____

C. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, OPEN _____

D. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, CLOSED _____

[38] **VERIFY** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, is in the AUTO position. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[39] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, to ESTABLISH a Letdown Heat Exchanger outlet temperature of 127°F (120-130°F) as observed on 2-TI-62-78, LTDN HT EXCH OUT. _____

[40] **RECORD** Letdown Heat Exchanger outlet temperature as read on 2-TI-62-78, LTDN HT EXCH OUT:

2-TI-62-78_____°F (120-130°F) _____

[41] **RECORD** letdown flow from Computer Point F0134A
Computer Point F0134A _____ gpm _____

NOTE

The accuracy of Computer point F0134A from 2-LPF-62-82 is ±0.6625% of full scale (200 gpm) plus 2% uncertainty from the Flow Element. This is equal to ±5.325 gpm which is rounded up to ±5.33 gpm and applied to the acceptance criteria values from section 5.0.

[42] **VERIFY** Corrected Flow Rate through 2-OR-62-74, LETDOWN ORIFICE, provides ≥ 80.33 gpm with the tolerance calculated: **(Acc Crit)** _____

[43] **RECORD** Regenerative Heat Exchanger baseline data on Appendix D. _____

[44] **PERFORM** calculation in Appendix E Section **1.0** _____

[45] **RECORD** Regenerative Heat Exchanger Tube Side Mass Flow Rate ($\dot{m}_{Regen\_tube}$) from calculation in Appendix E Section **1.0**

_____ lb/hr ≥27,148 lb/hr _____

[46] **VERIFY** $\dot{m}_{Regen\_tube}$ from Appendix E Section **1.0** is ≥27,148 lb/hr. **(Acc Crit)** _____

[47] **PERFORM** calculation in Appendix E Section **3.0** _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[48] **RECORD** Regenerative Heat Exchanger Shell Side Mass Flow Rate ($\dot{m}_{Regen\_shell}$) from calculation in Appendix E Section **3.0**

_____ lb/hr ≥37,020 lb/hr _____

[49] **VERIFY** $\dot{m}_{Regen\_shell}$ from Appendix E Section **3.0** is ≥37,020 lb/hr. **(Acc Crit)** _____

[50] **RECORD** Temperature Drop across Regenerative Heat Exchanger Shell Side ΔT_{Regen_Shell} from calculation in Appendix E Section **3.0**

_____ °F ≥267.3°F _____

[51] **VERIFY** ΔT_{Regen_Shell} from Appendix E Section **3.0** is ≥267.3°F. **(Acc Crit)** _____

[52] **RECORD** Letdown Heat Exchanger baseline data on Appendix D. _____

[53] **PERFORM** calculation in Appendix E Section **2.0** _____

[54] **RECORD** Letdown Heat Exchanger Tube Side Mass Flow Rate ($\dot{m}_{Ltdn}$) from calculation in Appendix E Section **2.0**

_____ lb/hr ≥37,050 lb/hr _____

[55] **VERIFY** $\dot{m}_{Ltdn}$ from Appendix E Section **2.0** is ≥37,050 lb/hr. **(Acc Crit)** _____

[56] **RECORD** Temperature Drop across Letdown Heat Exchanger (ΔT_{Ltdn}) from calculation in Appendix E Section **2.0**

_____ °F ≥163°F _____

[57] **VERIFY** ΔT_{Ltdn} from Appendix E Section **2.0** is ≥163°F. **(Acc Crit)** _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[58] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-74.

_____ _____
Vibration Engineer Signature Date

[59] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-72 and 2-OR-62-74 operating mode will be available. _____

[60] **ENSURE** Letdown and Charging is ESTABLISHED via 2-OR-62-72, LETDOWN ORIFICE, and 2-OR-62-74, LETDOWN ORIFICE, through Valves 2-FCV-62-72, and 2-FCV-62-74, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[61] **VERIFY** the following valve positions by light indication:

A. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, OPEN _____

B. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, OPEN _____

C. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, CLOSED _____

D. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, CLOSED _____

[62] **VERIFY** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, is in the AUTO position. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[63] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, to ESTABLISH a Letdown Heat Exchanger outlet temperature of 127°F (120-130°F) as observed on 2-TI-62-78, LTDN HT EXCH OUT. _____

[64] **RECORD** letdown flow from Computer Point F0134A

Computer Point F0134A _____ gpm _____

[65] **VERIFY** Flow Rate through 2-OR-62-72 and 2-OR-62-74 provides less than 120 gpm: _____

[66] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-72 and 2-HS-62-74.

_____ _____
Vibration Engineer Signature Date

[67] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and that the Normal Letdown through 2-OR-62-72 and 2-OR-62-73 operating mode will be available. _____

[68] **ESTABLISH** 120 gpm letdown flow via 2-OR-62-72, LETDOWN ORIFICE and 2-OR-62-73, LETDOWN ORIFICE through Valve 2-FCV-62-72 and Valve 2-FCV-62-73, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[69] **VERIFY** the following valve positions by light indication:

A. 2-FCV-62-73, CVCS LETDOWN ORIFICE B ISOLATION, OPEN _____

B. 2-FCV-62-72, CVCS LETDOWN ORIFICE A ISOLATION, OPEN _____

C. 2-FCV-62-74, CVCS LETDOWN ORIFICE C ISOLATION, CLOSED _____

D. 2-FCV-62-76, CVCS LETDOWN ORIFICE ISOLATION, CLOSED _____

[70] **VERIFY** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, is in the AUTO position. _____

[71] **ADJUST** Controller 2-HIC-62-78A, LETDOWN HT EXCH OUTLET TEMP, to ESTABLISH a Letdown Heat Exchanger outlet temperature of 127°F (120-130°F) as observed on 2-TI-62-78, LTDN HT EXCH OUT. _____

[72] **RECORD** Letdown Heat Exchanger outlet temperature as read on 2-TI-62-78, LTDN HT EXCH OUT:

2-TI-62-78_____°F (120-130°F) _____

[73] **IF** Computer Point F0134A does **NOT** read approximately 120 GPM, **THEN**

ADJUST Controller 2-HIC-62-81 to ESTABLISH a Letdown flowrate of less than 120 gpm. _____

[74] **RECORD** letdown flow from Computer Point F0134A

Computer Point F0134A _____ gpm _____

[75] **VERIFY** flow through 2-OR-62-72 and 2-OR-62-73 provides Less Than 120 gpm: _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[76] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Letdown flowpath through 2-OR-62-72 and 2-HS-62-73.

_____ _____
Vibration Engineer Signature Date

[77] **IF** Computer Point F0134A does **NOT** read between 120-150 GPM, **THEN**

ADJUST Controller 2-HIC-62-81 to ESTABLISH a Letdown flowrate 120-150 gpm. _____

[78] **RECORD** letdown flow from Computer Point F0134A

Computer Point F0134A _____ gpm _____

[79] **RECORD** Filter 2-FLTR-62-117, REACTOR COOLANT FILTER, inlet and outlet pressure indications from the following pressure indicators:

A. 2-PI-62-116 _____psig _____

B. 2-PI-62-117 _____psig _____

[80] **RECORD** Reactor Coolant Filter, differential pressure between 2-PI-62-116 and 2-PI-62-117 on DPG-1.

_____ psi _____

[81] **PERFORM** steps in Data Sheet 1 to determine the uncertainty in DPG-1, **AND**

RECORD results from Data Sheet 1.

_____ ± _____ psig _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[82] **IF** differential pressure is > 5 psi with the tolerance calculated in the previous step, **THEN**

INITIATE a TDN **AND**

PERFORM the following steps to change out a dirty RCS Filter: _____

A. **BYPASS** Reactor Coolant Filter _____

B. **INITIATE** and/ or **RECORD** WO# to replace filter in 2-FLTR-62-117, REACTOR COOLANT FILTER:
WO# _____ _____

C. **WHEN** filter replacement WO is COMPLETE, **THEN**

RESTORE Reactor Coolant Filter to Normal _____

D. **RECORD** Reactor Coolant Filter, differential pressure between 2-PI-62-116 and 2-PI-62-117 on DPG-1.

_____ psi _____

E. **PERFORM** steps Data Sheet 1 to determine the uncertainty in DPG-1, **AND**

RECORD results from Data Sheet 1.

_____ ± _____ psig _____

F. **RECORD** implementing procedure.

Procedure Number _____ _____

[83] **VERIFY** Filter 2-FLTR-62-117, REACTOR COOLANT FILTER, differential pressure is ≤ 5 with the tolerance calculated: **(Acc Crit)** _____

[84] **ATTACH** 0-500 psi Pressure Gauge to Test Connection downstream of double isolation valve 2-TV-62-605 (Aux 729, A12W), CVCS LETDOWN HEADER TEST. _____

[85] **SLOWLY OPEN** 2-TV-62-707, CVCS LETDOWN HEADER TEST. _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[86] **SLOWLY OPEN** 2-TV-62-605. _____

[87] **RECORD** Pressure downstream of Letdown Orifices.

_____ psig _____

[88] **PERFORM** steps Data Sheet 1 to determine the uncertainty in the Pressure Gauge, **AND**

Record results from Data Sheet 1.

_____ ± _____ psig _____

[89] **VERIFY** Pressure downstream of Letdown Orifices is ≥200 psig with the tolerance calculated in the previous step. **(Acc Crit)** _____

[90] **CLOSE** 2-TV-62-707. _____

[91] **CLOSE** 2-TV-62-605. _____

[92] **REMOVE** 0-500 psi Pressure Gauge to Test Connection downstream of 2-TV-62-605. _____

[93] **RECORD** RCS and CVCS controller parameter setpoints at the following indicators:

A. 2-LIC-68-339 _____% _____

B. 2-HIC-62-93A _____% _____

C. 2-HIC-62-78A _____% _____

D. 2-HIC-62-81A _____% _____

6.11 Charging and Letdown Flow and Pressure Control Tests (continued)

[94] **RECORD** the following charging and letdown parameters from the following indicators:

A. Computer Point F0134A _____ gpm _____

B. 2-FI-62-93A _____ gpm _____

C. 2-TI-62-78 _____°F _____

D. 2-PI-62-81 _____ psig _____

[95] **ENSURE** Ultrasonic Flowmeter (0-250 gpm range) downstream of Valve 2-CKV-62-543 (RXB 716, AC4), NOR CHRG CHECK is removed. _____

_____
CV

[96] **OBTAIN** engineering approval for results of calculation from step 6.11[32] (**ACC CRIT**) _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests

NOTES

1) Quantitative Acceptance criteria Recorded from permanent plant equipment in this subsection have been modified to account for instrument inaccuracy. Methodology is shown in Appendix F.
2) If the valves are adjusted step 6.12[3] shall be Re-Performed per SMP-9.0 and a TDN initiated.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.12 have been completed. _____

A. **VERIFY/ESTABLISH** Seal Injection flow through Filter 2-FLTR-62-96, CVCS SEAL WTR INJECTION FILTER B

B. **RECORD** implementing procedure.

Procedure Number _____ _____

[2] **RECORD** Temperature indication at 2-TI-62-131, VCT OUTLET TEMP, at 2-M-6:

2-TI-62-131_____°F _____

[3] **RECORD** RCP Seal Water Injection Flow from the following flow indications on 2-M-5:

2-FI-62-1A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-14A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-27A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-40A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[4] **CALCULATE** the sum of the four Seal Injection flows recorded from Flow Indicators in Step 6.12[3]:

RCP1 = 2-FI-62-1A = _____ gpm

RCP2 = 2-FI-62-14A = _____ gpm

RCP3 = 2-FI-62-27A = _____ gpm

RCP4 = 2-FI-62-40A = _____ gpm

$$Q_{Total\_Seal\_Flow} = \frac{\quad}{RCP1} + \frac{\quad}{RCP2} + \frac{\quad}{RCP3} + \frac{\quad}{RCP4}$$ = _____ gpm _____

_____
IV

[5] **VERIFY** the sum of Seal Injection flowrates calculated in Step 6.12[4] is ≤38.8 gpm. **(Acc Crit)** _____

[6] **RECORD** Filter 2-FLTR-62-96, CVCS SEAL WTR INJECTION FILTER B, differential pressure from 2-PDIS-62-96 (Aux 713, A11 T), CVCS SEAL WTR INJECTION FILTER B DIFF PRESS.

2-PDIS-62-96 _____ psid (≤6.25 psid) _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[7] **IF** differential pressure is > 6.25 psid **THEN**

INITIATE a TDN **AND**

PERFORM the following steps to REPLACE the filter in Seal Injection Filter 2B:

A. **PLACE** Seal Injection Filter 2A IN SERVICE **THEN REMOVE** Seal Injection Filter 2B FROM SERVICE _____

B. **INITIATE and/ or RECORD WO#** to replace filter in 2-FLTR-62-96, CVCS SEAL WTR INJECTION FILTER B: WO# _____ _____

C. **WHEN** filter replacement WO is COMPLETE, **THEN**

PLACE Seal Injection Filter 2B IN SERVICE and **REMOVE** Seal Injection Filter 2A FROM SERVICE. _____

D. **RECORD** Filter 2-FLTR-62-96, CVCS SEAL WTR INJECTION FILTER B, differential pressure from 2-PDIS-62-96 (Aux 713, A11 T), CVCS SEAL WTR INJECTION FILTER B DIFF PRESS.

2-PDIS-62-96 _____ psid (≤6.25 psid) _____

E. **RECORD** implementing procedure.

Procedure Number _____ _____

NOTE

Quantitative Acceptance criterion in the following step has been modified to account for instrument inaccuracy. Methodology is shown in Appendix F 6.25psid guarantees a differential pressure of ≤ 7 psid read on 2-PDIS-62-96.

[8] **VERIFY** differential pressure on 2-PDIS-62-96 is ≤ 6.25 psid with a total Seal Injection Flow of 16 to 32 gpm. **(Acc Crit)** _____

[9] **VERIFY** Acceptance Criteria for steps 6.12[3] and 6.12[8] have been met. _____

[10] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ΔP HI, at 2-M-5 is CLEAR. _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[11] **CLOSE** 2-ISIV-62-96B/H, ISOL VLV TO 2-PDIS-62-96, 2-L-153. _____

[12] **CLOSE** 2-ISIV-62-96B/L, ISOL VLV TO 2-PDIS-62-96, 2-L-153. _____

[13] **OPEN** 2-EQIV-62-96D, EQUALIZING VLV TO 2-PDIS-62-96, 2-L-153. _____

[14] **CLOSE** 2-EQIV-62-96D, EQUALIZING VLV TO 2-PDIS-62-96, 2-L-153. _____

[15] **INSTALL** pressure source to high side calibration fitting on 2-PDIS-62-96, 2-L-153. _____

[16] **INCREASE** test pressure until 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ΔP HI, ALARMS, **AND**

RECORD Differential pressure on 2-PDIS-62-96, 2-L-153.

_____ psid _____

[17] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ΔP HI, ALARMS. **(Acc Crit)** _____

[18] **VERIFY** Unit 2 Ronan Annunciator System indicates 101-D RCP SEAL INJ FILTER B DP HI (PDIS-62-96), is in ALARM. _____

[19] **DECREASE** test pressure until 2-PDIS-62-96 reads 0 PSID. _____

[20] **VERIFY** Unit 2 Ronan Annunciator System indicates 101-D RCP SEAL INJ FILTER B DP HI (PDIS-62-96) is NORMAL. _____

[21] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ΔP HI, is CLEAR. _____

[22] **REMOVE** pressure source from high side calibration fitting on 2-PDIS-62-96. _____

[23] **OPEN** 2-ISIV-62-96B/L, ISOL VLV TO 2-PDIS-62-96. _____

[24] **OPEN** 2-ISIV-62-96B/H, ISOL VLV TO 2-PDIS-62-96. _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[25] **ESTABLISH** flow through Filter 2-FLTR-62-97, SEAL WATER INJECTION FILTER A, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[26] **RECORD** temperature indication at 2-TI-62-131, VCT OUTLET TEMP:

2-TI-62-131_____°F _____

[27] **RECORD** RCP Seal Water Injection Flow from the following flow indications:

2-FI-62-1A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-14A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-27A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

2-FI-62-40A = _____ gpm (6.6-12.4 gpm) **(Acc Crit)** _____

[28] **IF** RCP Seal Water Injection Flow rates in step 6.12[27] failed to meet acceptance criteria **AND**/ **OR** adjustments to Seal Water Injection throttle valves are made **THEN** **REPEAT** Steps 6.12[1]A through6.12[5] **AND** 6.12[25] through 6.12[30]. _____

[29] **CALCULATE** the sum of the four Seal Injection flows recorded from Flow Indicators in Step 6.12[27]:

RCP1 = 2-FI-62-1A = _____ gpm

RCP2 = 2-FI-62-14A = _____ gpm

RCP3 = 2-FI-62-27A = _____ gpm

RCP4 = 2-FI-62-40A = _____ gpm

$Q_{Total\_Seal\_Flow} = \frac{\_\_\_\_\_}{RCP1} + \frac{\_\_\_\_\_}{RCP2} + \frac{\_\_\_\_\_}{RCP3} + \frac{\_\_\_\_\_}{RCP4}$ = _____ gpm _____

_____

IV

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[30] **VERIFY** the sum of Seal Injection flowrates calculated in Step 6.12[29] is ≤38.8 gpm. **(Acc Crit)** _____

[31] **RECORD** Filter 2-FLTR-62-97, SEAL WATER INJECTION FILTER A, differential pressure from 2-PDIS-62-97 (Aux 713, A11T), CVCS SEAL WTR INJECTION FILTER A DIFF PRESS.

2-PDIS-62-97 _____ psid (≤6.25 psid) _____

NOTE

Quantitative Acceptance criterion in the following step has been modified to account for instrument inaccuracy. Methodology is shown in Appendix F 6.25psid guarantees a differential pressure of ≤ 7 psid read on 2-PDIS-62-97.

[32] **IF** differential pressure is >6.25 psid **THEN**

INITIATE a TDN **AND**

PERFORM the following steps to REPLACE the filter in Seal Injection Filter 2A:

A. **PLACE** Seal Injection Filter 2B IN SERVICE**, THEN REMOVE** Seal Injection Filter 2A FROM SERVICE _____

B. **INITIATE and/ or RECORD WO#** to replace filter in 2-FLTR-62-97, CVCS SEAL WTR INJECTION FILTER A: WO# _____ _____

C. **PLACE** Seal Injection Filter 2A IN SERVICE, **THEN REMOVE** Seal Injection Filter 2B FROM SERVICE _____

D. **RECORD** Filter 2-FLTR-62-97, SEAL WATER INJECTION FILTER A, differential pressure from 2-PDIS-62-97 (Aux 713, A11T), CVCS SEAL WTR INJECTION FILTER A DIFF PRESS.

2-PDIS-62-97 _____ psid (≤6.25 psid) _____

E. **RECORD** implementing procedure.

Procedure Number _____ _____

[33] **VERIFY** differential pressure on 2-PDIS-62-97 is ≤6.25 psid with a total Seal Injection Flow of 16 to 32 gpm. **(Acc Crit)** _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[34] **VERIFY** Acceptance Criteria for steps 6.12[3] through 6.12[33] have been met. _____

[35] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ∆P HI, at 2-M-5 is CLEAR. _____

[36] **CLOSE** 2-ISIV-62-97B/H, ISOL VLV TO 2-PDIS-62-97, 2-L-153. _____

[37] **CLOSE** 2-ISIV-62-97B/L, ISOL VLV TO 2-PDIS-62-97, 2-L-153. _____

[38] **OPEN** 2-EQIV-62-97D, EQUALIZING VLV TO 2-PDIS-62-97, 2-L-153. _____

[39] **CLOSE** 2-EQIV-62-97D, EQUALIZING VLV TO 2-PDIS-62-97, 2-L-153. _____

[40] **INSTALL** pressure source to high side calibration fitting on 2-PDIS-62-97, 2-L-153. _____

[41] **INCREASE** test pressure UNTIL 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ∆P HI, ALARMS, **AND**

RECORD Differential pressure on 2-PDIS-62-97

_____ psid _____

[42] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ∆P HI, ALARMS. **(Acc Crit)** _____

[43] **VERIFY** Unit 2 Ronan Annunciator System indicates 101-D RCP SEAL INJ FILTER A DP HI (PDIS-62-97) is in ALARM. _____

[44] **DECREASE** test pressure UNTIL 2-PDIS-62-97 reads 0 PSID. _____

[45] **VERIFY** Unit 2 Ronan Annunciator System indicates 101-D RCP SEAL INJ FILTER A DP HI (PDIS-62-97) is NORMAL. _____

[46] **VERIFY** 2-XA-55-5B/101D, RCP SEAL INJ FILTER A/B ∆P HI, is CLEAR. _____

[47] **REMOVE** pressure source from high side calibration fitting on 2-PDIS-62-97. _____

[48] **OPEN** 2-ISIV-62-97B/L, ISOL VLV TO 2-PDIS-62-97. _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[49] **OPEN** 2-ISIV-62-97B/H, ISOL VLV TO 2-PDIS-62-97. _____

[50] **RECORD** RCP Seal Water Leakoff Flow:

A. RCP 1 HIGH RANGE RETURN FLOW
Computer Point F1018A _____ gpm _____

B. RCP 2 HIGH RANGE RETURN FLOW
Computer Point F1020A _____ gpm _____

C. RCP 3 HIGH RANGE RETURN FLOW
Computer Point F1022A _____ gpm _____

D. RCP 3 HIGH RANGE RETURN FLOW
Computer Point F1024A _____ gpm _____

[51] **CALCULATE** the sum of RCP High Range Seal Water Leakoff flows, recorded in Step 6.12[50]:

F1018A RCP 1 _____ gpm + F1020A RCP 2 _____ gpm

+ F1022A RCP 3 + _____ gpm + F1024A RCP 4 _____ gpm

= Total Leakoff Flow = _____ gpm _____

_____
IV

[52] **RECORD** output on 2-HIC-62-93A, CVCS CHARGING HEADER FLOW CTLR.

_____ % _____

[53] **RECORD** output on 2-HIC-62-89A, CHARGING HDR RCP SEALS FLOW CONTROL.

_____ % _____

[54] **PLACE** 2-HIC-62-93A in MANUAL _____

[55] **REDUCE** Output on 2-HIC-62-93A to 0% _____

[56] **REDUCE** Output on 2-HIC-62-89A to 0% _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[57] **RECORD** Seal Injection flow on Ultrasonic Flowmeter downstream of Valve 2-FCV-62-93, CVCS CHARGING HEADER FLOW / PZR LEVEL CONTROL.

_____ GPM _____

[58] **PERFORM** steps Data Sheet 1 to determine the uncertainty in Seal Injection flow, **AND**

RECORD results from Data Sheet 1.

_____ ± _____ psig _____

[59] **VERIFY** Seal Injection flow with the tolerance calculated in 6.12[58] is 32- 35 GPM. **(Acc Crit)** _____

[60] **RESTORE** Output on 2-HIC-62-89A to output recorded in step 6.12[53]. _____

[61] **RESTORE** Output on 2-HIC-62-93A to output recorded in step 6.12[52]. _____

[62] **PLACE** 2-HIC-62-93A in AUTO. _____

[63] **PLACE** 2-HIC-62-93B (2-L-112) selector switch in MANUAL. _____

[64] **LOWER** 2-HIC-62-93B (2-L-112) until output indicator reads approximately 0. _____

[65] **VERIFY** 2-XI-62-93(2-M-5) illuminates. (**Acc Crit**) _____

[66] **PLACE** 2-HIC-62-93B (2-L-112) selector switch in AUTO. _____

[67] **RECORD** Filter 2-FLTR-62-65, SEAL WATER FILTER, flow from ultrasonic flowmeter downstream of Valve 2-ISV-62-642:

Ultrasonic Flowmeter _____ gpm _____

[68] **ENSURE** flowrate recorded in previous step is 25-35 gpm. _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

[69] **RECORD** Filter 2-FLTR-62-65, SEAL WATER FILTER, inlet and outlet pressure indications from the following indicators on 2-L-46:

A. 2-PI-62-64, CVCS SEAL WATER RETURN FLTR INLET PRESSURE _____psig _____

B. 2-PI-62-65, CVCS SEAL WATER RETURN FLTR OUTLET PRESSURE _____psig _____

[70] **RECORD** Filter 2-FLTR-62-65, SEAL WATER FILTER, differential pressure between 2-PI-62-64 and 2-PI-62-65 on DPG-2.

_____ psig _____

[71] **IF** differential pressure is >4 psid, **THEN**

INITIATE a TDN **AND**

PERFORM the following steps to REPLACE the filter in the Seal Return Filter:

A. **OPEN** 2-BYV-62-643 (Aux 713, A10U), CVCS SEAL WTR RETURN FILTER BYPASS _____

B. **CLOSE** 2-ISV-62-642 (Aux 713, A10T), CVCS SEAL WTR RETURN FILTER INLET ISOL _____

C. **CLOSE** 2-ISV-62-644 (Aux 713, A10U), CVCS SEAL WTR RETURN FILTER OUT ISOL _____

D. **INITIATE and/ or RECORD WO#** to replace filter in 2-FLTR-62-65, SEAL WATER FILTER:
WO# _____ _____

E. **WHEN** filter replacement WO is COMPLETE, **THEN**

OPEN 2-ISV-62-642, CVCS SEAL WTR RETURN FILTER INLET ISOL _____

F. **OPEN** 2-ISV-62-644, CVCS SEAL WTR RETURN FILTER OUT ISOL _____

6.12 RCP Seal Flow and Filter Differential Pressure Tests (continued)

G. **CLOSE** 2-BYV-62-643, CVCS SEAL WTR RETURN FILTER BYPASS _____

H. **RECORD** Filter 2-FLTR-62-65, SEAL WATER FILTER, differential pressure between 2-PI-62-64 and 2-PI-62-65 on DPG-2.

_____ psi _____

NOTE

Quantitative Acceptance criterion in the following step has been modified to account for instrument inaccuracy. Methodology is shown in Appendix F 4 psid guarantees a differential pressure of ≤ 5 psid read on 2-PI-62-64 and 2-PI-62-65.

[72] **VERIFY** Filter 2-FLTR-62-65, SEAL WATER FILTER, differential pressure is ≤4 psid.**(Acc Crit)** _____

[73] **ENSURE** Ultrasonic Flowmeter (0-100 gpm range) downstream of Valve 2-FCV-62-93, CVCS CHARGING HEADER FLOW / PZR LEVEL CONTROL, is removed. _____

_____
CV

[74] **ENSURE** Ultrasonic Flowmeter (0-100 gpm range) downstream of Valve 2-ISV-62-642, CVCS SEAL WTR RETURN FILTER INLET ISOL, is removed. _____

_____
CV

6.13 Excess Letdown Heat Exchanger Flow Test

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.13 have been completed. _____

NOTE

During the performance of this Subsection, piping vibration data will be collected. The TE is responsible for performance of piping vibration activities in accordance with 2-PTI-999-01 and shall make an entry in the Chronological Test Log.

[2] **ENSURE** the Piping Vibration Test Engineer has been NOTIFIED of the performance of this test and that the Excess Letdown operating mode will be AVAILABLE. _____

CAUTION

High flowrates through Excess Letdown Flow Control Valve 2-FCV-62-56 may result in lower RCP No. 1 Seal Leakoff flows. Limit flow through 2-FCV-62-56 to ensure No. 1 Seal leakoffs remain above 1 gpm.

NOTE

While Excess Letdown is in service the VCT level could increase, causing Valve 2-LCV-62-118, DIVERSION FLOW TO HOLDUP TANKS, to divert letdown to the Recycle Holdup Tank.

[3] **PLACE** the Excess Letdown in service with flow directed to the Seal Return Line (Normal) flowpath, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **ADJUST** Throttle Valve 2-THV-70-702 (Aux 713, Pipe Chase), EXCESS LETDOWN HX CCS SUPPLY THROTTLE, to ESTABLISH a flowrate of 210-220 gpm as indicated on Flow Indicator 2-FI-70-84, EXC LTDN HX FLOW, at 0-M-27B. _____

[5] **RECORD** indication of 2-FI-70-84, EXC LTDN HX FLOW

_____ gpm (210-220 gpm) _____

6.13 Excess Letdown Heat Exchanger Flow Test (continued)

[6] **VERIFY/PLACE** Handswitch 2-HS-62-59A, EXCESS LTDN DIVERT, to the NORMAL position by light indication at 2-M-5. _____

[7] **PLACE** Computer Points T0446A, RCS LOOP 3 COLD LEG TEMP and T0122A, EXCESS LETDOWN HX OUT TEMP in trend. _____

[8] **ADJUST** Controller 2-HIC-62-56A, EXCESS LTDN FLOW CONTROL, at 2-M-5 to ESTABLISH a ΔT of $\geq$365°F between Computer Points T0446A and T0122A. _____

[9] **RECORD** Controller 2-TI-62-58 Output indication at 2-M-5:

2-TI-62-58, EXCESS LTDN TEMP _____°F _____

[10] **RECORD** Controller 2-HIC-62-56A, EXCESS LTDN FLOW CONTROL, output indication at 2-M-5:

2-HIC-62-56A, EXCESS LTDN FLOW CONTROL_____% _____

[11] **RECORD** Excess Letdown Heat Exchanger baseline data on Appendix D. _____

[12] **PERFORM** calculations in Appendix E Section **4.0**. _____

[13] **RECORD** $\dot{m}_{Ex\_Ltdn}$ from calculation in Appendix E Section **4.0**

$\geq$12,340 lb/hr _____

[14] **VERIFY** Excess Letdown Heat Exchanger Side Mass Flow Rate ($\dot{m}_{Ex\_Ltdn}$) from Appendix E Section **4.0** is $\geq$12,340 lb/hr. **(Acc Crit)** _____

[15] **VERIFY** Temperature Drop across Excess Letdown Heat Exchanger from Appendix E Section **4.0** is $\geq$362.3°F. **(Acc Crit)** _____

[16] **RECORD** Seal Water Heat Exchanger baseline data on Appendix D. _____

[17] **PERFORM** calculations in Appendix E Section **5.0**. _____

6.13 Excess Letdown Heat Exchanger Flow Test (continued)

[18] **RECORD** $\dot{m}_{Seal}$ from calculation in Appendix E Section **5.0**

_____ ≥47,879 lb/hr _____

[19] **VERIFY** Seal Water Heat Exchanger Mass Flow Rate ($\dot{m}_{Seal}$) from Appendix E Section **5.0** is ≥47,879 lb/hr. **(Acc Crit)** _____

[20] **VERIFY** Temperature Drop across Seal Water Heat Exchanger from Appendix E Section **5.0** is ≥30.4°F. **(Acc Crit)** _____

[21] **ENSURE** Excess Letdown flow through valve 2-FCV-62-56, EXCESS LETDOWN FLOW CONT, has been in operation for ≥1hour. _____

[22] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Excess Letdown flowpath to the RCP Seal Return header.

_____ _____
Vibration Engineer Signature Date

[23] **REMOVE** the Excess Letdown Heat Exchanger from service, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[24] **REMOVE** Computer Points T0446A and T0122A from trend status. _____

[25] **ENSURE** Ultrasonic Flowmeter (0-250 gpm range) downstream of Valve 2-ISV-62-650 (Aux 713, Pipe Chase), CVCS SEAL WATER HX OUTLET ISOL, is removed. _____

_____
CV

6.14 CVCS Mixed Bed Demineralizer Temperature, Flow, and Differential Pressure Tests

NOTES

1) Quantitative Acceptance criteria Recorded from permanent plant equipment in this subsection have been modified to account for instrument inaccuracy. Methodology is shown in Appendix F.
2) When establishing flow greater than 120 GPM all three orifices may be opened.

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.14 have been completed. _____

[2] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test and the following system operating modes will be available:

A. Normal Letdown. _____

B. Mixed Bed Demineralizers _____

[3] **VERIFY/ESTABLISH** 120 gpm Letdown Flow, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **ENSURE** Demineralizer 2-DEMIN-62-1/1A, CVCS MIXED BED DEMINERALIZER 2A, is in service with a full load of Resin, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[5] **ENSURE** 2-HS-62-79A, LETDOWN FLOW HI TEMP DIVERSION CONT, is in the DEMIN position at 2-M-6. _____

[6] **RECORD** Letdown Flow from Computer Point F0134A:

Computer Point F0134A_____ gpm _____

6.14 CVCS Mixed Bed Demineralizer Temperature, Flow, and Differential Pressure Tests (continued)

[7] **IF** Computer Point F0134A does **NOT** read 120-150 gpm **THEN**

ADJUST Controller 2-HIC-62-81 to ESTABLISH a Letdown Flowrate of 120-150 gpm. _____

[8] **RECORD** Mixed Bed Demineralizer inlet and outlet pressure indications from the following locations:

A. 2-PI-62-112 (Aux 713, A12T), CVCS MIXED BED DEMIN INLET HEADER PRESSURE
_____psig _____

B. 2-PI-62-116 (Aux 713, A11T), REACTOR COOLANT FILTER INLET PRESSURE
_____psig _____

[9] **CALCULATE** the differential pressure across the 2A Mixed Bed Demineralizer:

2-PI-62-112_____ - 2-PI-62-116 _____ - 0.9 psig (Gauge Elevation Correction) = Demineralizer D/P_____ psid (≤20) _____

_____
IV

[10] **VERIFY** the differential pressure across the 2A Mixed Bed Demineralizer is ≤ 20 psid. **(Acc Crit)** _____

[11] **ENSURE** Demineralizer 2-DEMIN-62-1/1A, CVCS MIXED BED DEMINERALIZER 2A, is OUT OF SERVICE, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

6.14 CVCS Mixed Bed Demineralizer Temperature, Flow, and Differential Pressure Tests (continued)

[12] **ENSURE** Demineralizer 2-DEMIN-62-1/1B, CVCS MIXED BED DEMINERALIZER 2B, is IN SERVICE with a full load of Resin, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[13] **ENSURE** 2-HS-62-79A, LETDOWN FLOW HI TEMP DIVERSION CONT, is in the DEMIN position at 2-M-6. _____

[14] **IF** Computer Point F0134A does **NOT** read 120-150 gpm, **THEN**

ADJUST Controller 2-HIC-62-81 to ESTABLISH a Letdown Flowrate of 120-150 gpm. _____

[15] **RECORD** Letdown Flow from Computer Point F0134A:

Computer Point F0134A_____ gpm _____

[16] **RECORD** Mixed Bed Demineralizer inlet and outlet pressure indications from the following locations:

A. 2-PI-62-112, CVCS MIXED BED DEMIN INLET HEADER PRESSURE _____psig _____

B. 2-PI-62-116, REACTOR COOLANT FILTER INLET PRESSURE _____psig _____

[17] **CALCULATE** the differential pressure across the 2B Mixed Bed Demineralizer:

2-PI-62-112_____ - 2-PI-62-116 _____ - 0.9 psig (Gauge

Elevation Correction) = Demineralizer D/P_____ psid (≤20) _____

_____
IV

[18] **VERIFY** the differential pressure across the 2B Mixed Bed Demineralizer is ≤ 20 psid. **(Acc Crit)** _____

6.14 CVCS Mixed Bed Demineralizer Temperature, Flow, and Differential Pressure Tests (continued)

[19] **ESTABLISH** Normal (75 gpm) Letdown Flow and Charging, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[20] **ENSURE** Demineralizer WBN-2-DEMN-062-0113, CVCS CATION BED DEMINERALIZER, is IN SERVICE with a full load of Resin, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[21] **ENSURE** 2-HS-62-79A, LETDOWN FLOW HI TEMP DIVERSION CONT, is in the DEMIN position at 2-M-6. _____

[22] **IF** Computer Point F0134A does **NOT** read >75 gpm **THEN**

ADJUST Controller 2-HIC-62-81 to ESTABLISH a Letdown Flowrate of >75 gpm. _____

[23] **RECORD** Letdown Flow from Computer Point F0134A:

Computer Point F0134A_____ gpm _____

[24] **RECORD** Mixed Bed Demineralizer inlet and outlet pressure indications from the following locations:

A. 2-PI-62-112, CVCS MIXED BED DEMIN INLET HEADER PRESSURE _____psig _____

B. 2-PI-62-116, REACTOR COOLANT FILTER INLET PRESSURE _____psig _____

[25] **RECORD** 2B Mixed Bed Demineralizer differential pressure from step 6.14[17] 2B D/P = _____ psid _____

6.14 CVCS Mixed Bed Demineralizer Temperature, Flow, and Differential Pressure Tests (continued)

[26] **CALCULATE** the differential pressure across the Cation Bed Demineralizer:

2-PI-62-112_____ - 2-PI-62-116 _____ - 0.9 psig (Gauge Elevation Correction) - 2BD/P _____ psid = Demineralizer D/P_____ psid (≤12.8) _____

_____
IV

[27] **VERIFY** the differential pressure across the Cation Bed Demineralizer is ≤ 12.8 psid **(Acc Crit)** _____

[28] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the flowpath through Mixed Bed Demineralizer.

_____ _____
Vibration Engineer Signature Date

[29] **ESTABLISH** 75 to 120 gpm Letdown Flow, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[30] **RECORD** Letdown Flow from Computer Point F0134A:

Computer Point F0134A _____ gpm _____

6.15 Charging Pump Capability to Deliver Seal Water Tests

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.15 have been completed. _____

NOTES

1) After any significant change in letdown and charging flow, the RCP seal injection flows should be checked and adjusted, as required.
2) Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, may be placed in Manual and pressure increased or decreased when letdown flow is decreased or increased respectively. Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, should be placed in Auto after pressure has stabilized. Letdown header pressure is normally maintained at approximately 335 psig. The header high pressure alarm will occur at 440 psig and the header relief valve will lift at 660 psig.
3) During the performance of this Subsection, piping vibration data will be collected. The TE is responsible for performance of piping vibration activities in accordance with 2-PTI-999-01 and shall make an entry in the Chronological Test Log.

[2] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test. The following system operating modes will be available:

A. Normal Charging (CCP 2A-A in Service) - Steady state ☐

B. Seal Water Injection - Steady state ☐

_____ _____
Vibration Engineer Signature Date

[3] **VERIFY/ESTABLISH** Normal (75 gpm) Letdown Flow and Charging using 2-PMP-62-108, CENTRIFUGAL CHARGING PUMP 2A-A, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **ENSURE** Seal Injection is established, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[5] **VERIFY/PLACE** Handswitch 2-HS-62-85A, CHARGING FLOW CL LOOP 1, in the OPEN position **AND**

VERIFY Valve 2-FCV-62-85, CHARGING FLOW RCS CL LOOP 1, is OPEN by light indication at 2-M-6. _____

[6] **VERIFY/PLACE** Handswitch 2-HS-62-86A, CHARGING FLOW RCS CL LOOP 4, in the CLOSE position **AND**

VERIFY Valve 2-FCV-62-86, CHARGING FLOW RCS CL LOOP 4, is CLOSED by light indication at 2-M-6. _____

[7] **VERIFY/PLACE** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, at 2-M-6 is in the AUTO position. _____

[8] **VERIFY** Controller 2-LIC-68-339, RCS PRZR LEVEL, at 2-M-4 is in AUTO. _____

[9] **PLACE** the following Computer Points in trend **AND**

RECORD initial data:

A. Computer Point F0128A CHARG PMP DISCH HDR FLOW

_____ gpm _____

B. Computer Point F0131A RCP1 SEAL WTR FLOW

_____ gpm _____

C. Computer Point F0129A RCP2 SEAL WTR FLOW

_____ gpm _____

D. Computer Point F0127A RCP3 SEAL WTR FLOW

_____ gpm _____

E. Computer Point F0125A RCP4 SEAL WTR FLOW

_____ gpm _____

F. Computer Point P0142A CHARG PMP DISCH HDR PRESSURE

_____psig _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[10] **PERFORM** 2-SI-68-33, MEASUREMENT OF CONTROLLED LEAKAGE OF THE REACTOR COOLANT PUMP SEALS. _____

[11] **REVIEW** completed Surveillance Instruction 2-SI-68-33 **AND EXTRACT** the following data/information:

A. Valve 2-FCV-62-93 was fully opened by completion of Surveillance. _____

B. Final Charging Header Pressure value recorded in 2-SI-68-33.

_____ psig _____

C. Final Total Seal Injection flowrate value calculated in 2-SI-68-33.

_____ GPM _____

D. Reactor Coolant pressure recorded in 2-SI-68-33.

_____ psig _____

[12] **CALCULATE** the differential /pressure between the Charging Header pressure recorded in Section 6.15[11]B and Reactor Coolant pressure recorded in 6.15[11]D.

(Step 6.15[11]B) minus (Step 6.15[11]D)= psid

_____psig -_____psig =_____ psid .

_____

_____
IV

[13] **VERIFY** the Following:

A. RCP Seal Injection flow is ≤40 gpm with Charging Pump header pressure ≥2440psig. _____

B. Pressurizer level control valve 2-FCV-62-93 FULL OPEN. _____

[14] **ATTACH** copy of completed Surveillance Instruction 2-SI-68-33 to test instruction as an attachment. _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[15] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Charging (CCP 2A-A in Service) and Seal Water Injection.

_____ _____
Vibration Engineer Signature Date

[16] **VERIFY/ESTABLISH** Maximum of 120 gpm Letdown Flow, **AND**
RECORD CVCS Letdown Flowrate from Computer Point F0134A:

Computer Point F0134A _____ gpm _____

[17] **VERIFY** Valve 2-TCV-62-79, LETDOWN FLOW TEMP DIVERSION CONT VLV, is in the DEMIN position by light indication on Handswitch 2-HS-62-79A, LETDOWN FLOW HI TEMP DIVERSION CONT, at 2-M-6. _____

[18] **NOTIFY** TE responsible for 2-PTI-999-01 that conditions have been established for transient event for:

A. 2-PMP-62-108, Centrifugal Charging Pump 2A-A in STOP _____

B. 2-PMP-62-104, Centrifugal Charging Pump 2B-B in START _____

[19] **ESTABLISH** Charging Flow and Seal Injection using 2-PMP-62-104, CENTRIFUGAL CHARGING PUMP 2B-B, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[20] **ENSURE** 2-PMP-62-108, CENTRIFUGAL CHARGING PUMP 2A-A, is STOPPED. _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[21] **RECORD** the following parameters:

A. 2-FI-62-1A (2-M-5), RCP 1 SEAL SUP FLOW _____ gpm _____

B. 2-FI-62-14A (2-M-5) RCP 2 SEAL SUP FLOW _____ gpm _____

C. 2-FI-62-27A (2-M-5) RCP 3 SEAL SUP FLOW _____ gpm _____

D. 2-FI-62-40A (2-M-5) RCP 4 SEAL SUP FLOW _____ gpm _____

E. 2-PI-62-92A CHARGING HDR PRESS _____ psig (2400-2500psig) _____

F. 2-FI-62-93A CHARGING FLOW _____ gpm _____

G. Computer Point P0142A _____psig _____

H. Computer Point F0128A _____ gpm _____

I. Computer Point F0131A _____ gpm _____

J. Computer Point F0129A _____ gpm _____

K. Computer Point F0127A _____ gpm _____

L. Computer Point F0125A _____ gpm _____

[22] **NOTIFY** TE responsible for 2-PTI-999-01 that conditions have been established for steady state vibration for:

A. Normal Charging (CCP 2B-B in Service) - Steady state _____

B. Alternate Charging - Steady state _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

NOTE

The following steps will place CVCS Charging Flow, Pressure and Seal Water Injection Flow in a state to validate that the system may be MAINTAINED AUTOMATICALLY.

[23] **PLACE** Handswitch 2-HS-62-86A, CHARGING FLOW RCS CL LOOP 4, in the OPEN position **AND**

VERIFY Valve 2-FCV-62-86, CHARGING FLOW RCS CL LOOP 4, is OPEN by light indication at 2-M-6 _____

[24] **PLACE** Handswitch 2-HS-62-85A, CHARGING FLOW RCS CL LOOP 1, in the CLOSE position **AND** _____

VERIFY Valve 2-FCV-62-85, CHARGING FLOW RCS CL LOOP 1, is CLOSED by light indication at 2-M-6. _____

[25] **VERIFY/ESTABLISH** 120 gpm Letdown Flowrate, **AND**

RECORD Letdown Flowrate from Computer Point F0134A:

Computer Point F0134A _____ gpm _____

[26] **VERIFY/PLACE** Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, is in the AUTO position. _____

[27] **VERIFY** Controller 2-LIC-68-339, RCS PRZR LEVEL, is in AUTO. _____

[28] **RECORD** the following parameters:

A. 2-FI-62-1A (2-M-5), RCP 1 SEAL SUP FLOW _____ gpm _____

B. 2-FI-62-14A (2-M-5) RCP 2 SEAL SUP FLOW _____ gpm _____

C. 2-FI-62-27A (2-M-5) RCP 3 SEAL SUP FLOW _____ gpm _____

D. 2-FI-62-40A (2-M-5) RCP 4 SEAL SUP FLOW _____ gpm _____

E. 2-PI-62-92A CHARGING HDR PRESS _____psig _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

F. 2-FI-62-93A CHARGING FLOW _____ gpm _____

G. Computer Point P0142A _____psig _____

H. Computer Point F0128A _____ gpm _____

I. Computer Point F0131A _____ gpm _____

J. Computer Point F0129A _____ gpm _____

K. Computer Point F0127A _____ gpm _____

L. Computer Point F0125A _____ gpm _____

[29] **VERIFY** the CVCS Charging Flow, Pressure and Seal Water Injection Flow can be MAINTAINED AUTOMATICALLY. _____

[30] **CALCULATE** the Alternate charging header flowrate through Valve 2-FCV-62-86, CHARGING FLOW RCS CL LOOP 4, using data recorded in Step 6.15[28]:

A. F0131A _____ + F0129A _____ + F0127A _____ +

F0125A_____ = Total RCP Seal Injection Flow = _____ gpm

Calculation Performed By: _____

Calculation Verified By: _____

B. Subtract total RCP Seal Injection flow from Computer Point F0128A (Charging Header Flow) to DETERMINE actual flow to the Alternate charging header:

Step 6.15[28]H _____ - Step 6.15[28]A _____ =

Alternate Charging flow = _____ gpm

Calculation Performed By: _____

Calculation Verified By: _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[31] **VERIFY** Alternate Charging header flow calculated in Step 6.15[30]B is 89-103 gpm with approximately 120 gpm Letdown Flowrate:

Alt. Charging Hdr. flow_____ gpm _____

[32] **ENSURE** Alternate Charging flow through valve 2-FCV-62-86, CHARGING FLOW RCS CL LOOP 4, has been in operation for ≥1hour. _____

[33] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Normal Charging (CCP 2B-B in Service) and Alternate Charging.

_____ _____
Vibration Engineer Signature Date

[34] **NOTIFY** TE responsible for 2-PTI-999-01 that conditions have been established for transient event for:

A. 2-PMP-62-108, Centrifugal Charging Pump 2A-A in Start _____

B. 2-PMP-62-104, Centrifugal Charging Pump 2B-B in Stop _____

[35] **ESTABLISH** Charging Flow and Seal Injection using 2-PMP-62-108, CENTRIFUGAL CHARGING PUMP 2A-A, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[36] **ENSURE** 2-PMP-62-104, CENTRIFUGAL CHARGING PUMP 2B-B, is STOPPED. _____

[37] **REDUCE** letdown flow to 75 gpm, **AND**

RECORD Letdown Flowrate from Computer Point F0134A:

Computer Point F0134A_____ gpm _____

6.15 Charging Pump Capability to Deliver Seal Water Tests (continued)

[38] **REMOVE** the following Computer Points from a trending condition:

Computer Point F0128A _____

Computer Point F0131A _____

Computer Point F0129A _____

Computer Point F0127A _____

Computer Point F0125A _____

Computer Point P0142A _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.16 have been completed. _____

NOTES

1) After any significant change in letdown and charging flow, the RCP seal injection flows should be checked and adjusted, as required.
2) Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT, may be placed in MANUAL and pressure increased or decreased when letdown flow is decreased or increased respectively. Controller 2-HIC-62-81A, LETDOWN HT EXCH PRESS CONT should be placed in AUTO after pressure has stabilized.
3) Quantitative Acceptance criteria Recorded from permanent plant equipment in this subsection have been modified to account for instrument inaccuracy. Methodology is shown in Appendix F.

[2] **ENSURE** the Piping Vibration Test Engineer has been notified of the performance of this test. The following system operating modes will be available:

Boric Acid Transfer Pump 2A-A operation _____

Boric Acid Transfer Pump 2B-B operation _____

[3] **VERIFY/ESTABLISH** maximum 120 gpm Letdown Flow, **AND RECORD** implementing procedure.

Procedure Number _____ _____

[4] **VERIFY/PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, at 2-M-6 to the CLOSE position. _____

[5] **PLACE** Handswitch 2-HS-62-140A, VCT MAKEUP CONTROL, at 2-M-6 to the STOP position. _____

[6] **PLACE** Handswitch 2-HS-62-140B, VCT MAKEUP MODE, at 2-M-6 to the STOP position. _____

[7] **VERIFY/PLACE** Handswitch 2-HS-62-230D, BA PMP A SPEED, at 2-M-6, to the FAST position. _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[8] **VERIFY/PLACE** Handswitch 2-HS-62-230A, BA PMP A, to the START position at 2-M-6. _____

[9] **ADJUST** Handswitch 2-HS-62-138A, EMERG BORATE, at 2-M-5 as required, to ESTABLISH 45-50 gpm flow rate on 2-FI-62-137A, EMERG BORATE FLOW, at 2-M-5. _____

[10] **RECORD** flow from 2-FI-62-137A, EMERG BORATE FLOW:

2-FI-62-137A_____ gpm _____

NOTE

Quantitative Acceptance criterion in the following step has been modified to account for instrument inaccuracy. Methodology is shown in Appendix F. 45gpm guarantees a flow of > 35gpm through the flow path and is easily read on 2-FI-62-137A.

[11] **VERIFY** Flow Rate through 2-FI-62-137A provides >45gpm: **(Acc Crit)** _____

[12] **VERIFY/PLACE** Handswitch 2-HS-62-230D, BA PMP A SPEED, at 2-M-6 to the SLOW position. _____

[13] **PLACE** Handswitch 2-HS-62-138A, EMERG BORATE, to the CLOSE position. _____

[14] **OPEN** Valve 2-ISV-62-929 (Aux 713, A13T), CVCS ALTERNATE BORATION. _____

[15] **PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, to the P AUTO position. _____

[16] **PLACE** Handswitch 2-HS-62-144, VCT MAKEUP OUTLET VLV CONTROL, to the CLOSE position. _____

[17] **PLACE** Handswitch 2-HS-62-140B, VCT MAKEUP MODE, at 2-M-6 to the BORATE position. _____

[18] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[19] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIALS
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 36 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =100	

[20] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. _____

[21] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIALS
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[22] **VERIFY** makeup flow rate indicated by Computer Pt F0110D, BORIC ACID TO BLENDER, reads approximately 36 GPM. _____

[23] **RECORD** makeup flow rate from Computer Pt F0110D, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = _____ gpm _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[24] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in STOP. _____

[25] **PERFORM** the following calculations to determine the Corrected Flow Rate for the previous reading.

$$U_F = F \cdot \frac{U_{Alt\_Bor}}{100}$$

$$CFR = F - U_F$$

Where: F = Flowrate (gpm) from Computer Pt F0110D

U_{Alt_Bor} = 0.36% (tolerance of from Computer Pt F0110D)

CFR = Corrected Flow Rate (gpm)

$$U_F = \frac{\_\_\_\_\_}{F\,(gpm)} \cdot \frac{1}{100} = \_\_\_\_\_ \text{ gpm}$$

$$CFR = \frac{\_\_\_\_\_}{F\,(gpm)} - \frac{\_\_\_\_\_}{U_F\,(gpm)} = \_\_\_\_\_ \text{ gpm}$$ _____

_____
IV

[26] **VERIFY** Corrected Flow Rate through 2-ISV-62-929 provides >35gpm: **(Acc Crit)** _____

[27] **PLACE** Handswitch 2-HS-62-138A, EMERG BORATE, to the OPEN position. _____

[28] **CLOSE** Valve 2-ISV-62-929, CVCS ALTERNATE BORATION. _____

[29] **PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, to the CLOSE position. _____

[30] **PLACE** Handswitch 2-HS-62-230A, BA PMP A, to the STOP position. _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[31] **PLACE** Handswitch 2-HS-62-232A, BA PMP B, to the START position. _____

[32] **VERIFY/PLACE** Handswitch 2-HS-62-232D, BA PMP B SPEED, at 2-M-6 to the FAST position. _____

[33] **ADJUST** Handswitch 2-HS-62-138A, EMERG BORATE, as required, to ESTABLISH a 45 gpm flow rate on 2-FI-62-137A, EMERG BORATE FLOW, at 2-M-5. _____

[34] **RECORD** flow from 2-FI-62-137A, EMERG BORATE FLOW:

2-FI-62-137A_____ gpm _____

NOTE

Quantitative Acceptance criterion in the following step has been modified to account for instrument inaccuracy. Methodology is shown in Appendix F. 45gpm guarantees a flow of > 35gpm through the flow path and is easily read on 2-FI-62-137A.

[35] **VERIFY** Flow Rate through 2-FI-62-137A provides >45gpm: **(Acc Crit)** _____

[36] **VERIFY/PLACE** Handswitch 2-HS-62-232D, BA PMP B SPEED, at 2-M-6 to the SLOW position. _____

[37] **PLACE** Handswitch 2-HS-62-138A, EMERG BORATE, to the CLOSE position. _____

[38] **OPEN** Valve 2-ISV-62-929, CVCS ALTERNATE BORATION. _____

[39] **PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, to the P AUTO position. _____

[40] **MOMENTARILY DEPRESS** the RESET pushbutton on 2-FQ-62-139 (2-M-6) _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[41] **ADJUST** to the following settings:

UNID	DESCRIPTION	SETTING	INITIALS
2-FC-62-139	BORIC ACID FLOW TO BLENDER CONTROL (2-M-6)	SETP = 36 GPM	
2-FQ-62-139	BORIC ACID FLOW BATCH COUNTER (2-M-6)	TARGET GALLONS =100	

[42] **MOMENTARILY PLACE** 2-HS-62-140A (2-M-6) in START. _____

[43] **VERIFY** the following:

UNID	LOCATION	STATUS	INITIALS
2-HS-62-140D	(2-M-6)	Red - ON	
		Green - ON	
2-HS-62-144	(2-M-6)	Red - OFF	
		Green - ON	

[44] **VERIFY** makeup flow rate indicated by Computer Pt F0110D, BORIC ACID TO BLENDER, reads approximately 36 GPM. _____

[45] **RECORD** makeup flow rate from Computer Pt F0110D, BORIC ACID TO BLENDER, 2-M-6.

Flowrate = _____ gpm _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[46] **PERFORM** the following calculations to determine the Corrected Flow Rate for the previous reading.

$$U_F = F \cdot \frac{U_{E\_Bor}}{100}$$

$$CFR = F - U_F$$

Where: F = Flowrate (gpm) from Computer Pt F0110D

U_{Alt_Bor} = 0.36% (tolerance of from Computer Pt F0110D)

CFR = Corrected Flow Rate (gpm)

$$U_F = \frac{\text{\_\_\_\_\_}}{F\,(gpm)} \cdot \frac{1}{100} = \text{\_\_\_\_\_ gpm}$$

$$CFR = \frac{\text{\_\_\_\_\_}}{F\,(gpm)} - \frac{\text{\_\_\_\_\_}}{U_F\,(gpm)} = \text{\_\_\_\_\_ gpm}$$ _____

_____
IV

[47] **VERIFY** Corrected Flow Rate through 2-ISV-62-929 provides >35gpm: **(Acc Crit)** _____

NOTE

Pressurizer and VCT level will increase during the following Boric Acid Filter full flow test.

[48] **PLACE** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, at 2-M-4 in MANUAL. _____

[49] **ADJUST** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, setpoint to RAISE Charging Flow to 150 gpm on 2-FI-62-93A, CHARG HDR FLOW CONT, at 2-M-5. _____

[50] **PLACE** Handswitch 2-HS-62-230A, BA PMP A, to the START position. _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[51] **VERIFY** Ultrasonic Flowmeter (0-250 gpm range) downstream of Valve 2-ISV-62-1061 (Aux 713, A13Q), BORIC ACID FILTER B OUTLET, reads > 150 GPM. _____

[52] **RECORD** the following:

A. Ultrasonic Flowmeter, _____ gpm _____

B. 2-PI-62-234 (Aux 713, A14Q), BORIC ACID FILTER A INLET PRESSURE _____psig _____

C. 2-PI-62-235 (Aux 713, A13Q), BORIC ACID FILTER A OUTLET PRESSURE _____psig _____

[53] **RECORD** Boric Acid Filter B Outlet, differential pressure between 2-PI-62-234 and 2-PI-62-235 on DPG-3.

_____ psig _____

[54] **PERFORM** steps Data Sheet 1 to determine the uncertainty in DPG-3, **AND**

RECORD results from Data Sheet 1.

_____ ± _____ psig _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[55] **IF** differential pressure is > 5 psid with the tolerance calculated in 6.16[54] **THEN**

INITIATE a TDN **AND**

PERFORM the following steps to REPLACE the filter in Boric Acid Filter B:

A. **BYPASS** Boric Acid Filter B per SOI-62.05 _____

B. **INITIATE and/ or RECORD WO#** to replace filter in 2-FLTR-62-1B, BORIC ACID FILTER B:
WO# _____ _____

C. **WHEN** filter replacement WO is COMPLETE, **THEN**

RESTORE Boric Acid Filter B to service per SOI-62.05 _____

D. **VERIFY** Ultrasonic Flowmeter (0-250 gpm range) downstream of Valve 2-ISV-62-1061 (Aux 713, A13Q), BORIC ACID FILTER B OUTLET, reads > 150 GPM. _____

E. **RECORD** the following:

- Ultrasonic Flowmeter, _____ gpm _____
- 2-PI-62-234 (Aux 713, A14Q), BORIC ACID FILTER A INLET PRESSURE _____psig _____
- 2-PI-62-235 (Aux 713, A13Q), BORIC ACID FILTER A OUTLET PRESSURE _____psig _____

F. **RECORD** Boric Acid Filter B Outlet, differential pressure between 2-PI-62-234 and 2-PI-62-235 on DPG-3.

_____ psig _____

G. **PERFORM** steps Data Sheet 1 to determine the uncertainty in DPG-3, **AND**

RECORD results from Data Sheet 1.

_____ ± _____ psig _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[56] **VERIFY** Filter 2-FLTR-62-1B differential pressure with the tolerance calculated is ≤ 5 psid : **(Acc Crit)** _____

[57] **CLOSE** Valve 2-ISV-62-929, CVCS ALTERNATE BORATION. _____

[58] **PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, to the CLOSE position. _____

[59] **VERIFY/PLACE** Handswitch 2-HS-62-230D, BA PMP A SPEED, at 2-M-6 to the FAST position. _____

[60] **VERIFY/PLACE** Handswitch 2-HS-62-232D, BA PMP B SPEED, at 2-M-6 to the FAST position. _____

[61] **ADJUST** Handswitch 2-HS-62-138A, EMERG BORATE, as required, to provide a 75 gpm (75-77 gpm), flow rate on 2-FI-62-137A, EMERG BORATE FLOW. _____

[62] **VERIFY** TE responsible for 2-PTI-999-01 has recorded vibration data for steady state vibration for the Boric Acid Transfer Pumps.

_____ _____
Vibration Engineer Signature Date

[63] **VERIFY/PLACE** Handswitch 2-HS-62-230D, BA PMP A SPEED, at 2-M-6 to the SLOW position. _____

[64] **VERIFY/PLACE** Handswitch 2-HS-62-232D, BA PMP B SPEED, at 2-M-6 to the SLOW position. _____

[65] **PLACE** Handswitch 2-HS-62-230A, BA PMP A, to the STOP PULL-TO-LOCK position. _____

[66] **PLACE** Handswitch 2-HS-62-232A, BA PMP B, to the STOP PULL-TO-LOCK position. _____

[67] **PLACE** Handswitch 2-HS-62-138A, EMERG BORATE, to the CLOSE position. _____

[68] **ADJUST** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, setpoint to LOWER Charging Flow to 80 gpm on 2-FI-62-93A, CHARG HDR FLOW CONT. _____

6.16 Boric Acid Emergency Boration, Manual Boration, and Filter Flow Tests (continued)

[69] **PLACE** Handswitch 2-HS-62-140D, BA TO BLENDER, to the P-AUTO position. _____

[70] **PLACE** Handswitch 2-HS-62-140B, VCT MAKEUP MODE, to the AUTO position. _____

[71] **ADJUST** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, as required to RESTORE Pressurizer program level. _____

[72] **VERIFY** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, Deviation signal is 0 (zero). _____

[73] **PLACE** Level Controller 2-LIC-68-339, RCS PRZR LEVEL, to AUTO. _____

[74] **VERIFY/ESTABLISH** Normal (75 gpm) Letdown Flow, **AND RECORD** implementing procedure.

Procedure Number _____ _____

[75] **ENSURE** Ultrasonic Flowmeter (0-250 gpm range) downstream of Valve 2-ISV-62-1061, BORIC ACID FILTER B OUTLET, is removed. _____

_____
CV

6.17 CVCS Chemical Addition Capability Test

NOTE

Control of Reactor Coolant System Oxygen levels will be established by Hydrazine addition as specified by the Chemistry Department. This test section provides verification that the CVCS Chemical Mixing Tank, valves and piping function as designed to provide this capability. Coordination between Chemistry and the TE is required to complete this section

[1] **VERIFY** prerequisites listed in Section 4.0 for Subsection 6.17 have been completed. _____

[2] **OBTAIN** Reactor Coolant System sample sheets which reflect Oxygen concentrations prior to Hydrazine addition **AND**

ATTACH sample sheets to the Data Package. _____

[3] **ADD** Hydrazine volume as determined by Chemistry, **AND**

RECORD implementing procedure.

Procedure Number _____ _____

[4] **OBTAIN** Reactor Coolant System sample sheets which reflect Oxygen concentrations following Hydrazine addition **AND**

ATTACH sample sheets to the Data Package. _____

[5] **REVIEW** Reactor Coolant chemistry parameters monitored during HFT. _____

[6] **VERIFY** that the in-service Mixed Bed Demineralizer maintains monitored Reactor Coolant chemistry parameters within the applicable specification limits of Chemistry Manual Chapter 3 **AND**

ATTACH supporting documentation to the Data Package. _____

7.0 POST-PERFORMANCE ACTIVITIES

[1] **VERIFY** that post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed and the results RECORDED on Measuring and Test Equipment (M&TE) Log, Appendix E in 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 2 US/SRO of the test completion and system alignment. _____

[4] **VERIFY** that Nuclear Engineering review of the CVCS system heat exchanger performance data is complete and Nuclear Engineering concurs that system heat exchangers operate in accordance with design requirements and that supporting documentation is attached to this test package. _____

[5] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543, NOR CHRG CHECK [RXB, 716, AC4]. from Subsection 6.11 is removed. _____

_____
CV

[6] **ENSURE** Differential Pressure Gauge to read differential pressure between 2-PI-62-116 and 2-PI-62-117, from Subsection 6.11 is removed per SMP-19.0. _____

_____
CV

[7] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-FCV-62-93, CVCS CHARGING HEADER FLOW / PZR LEVEL CONTROL [Aux,692,A12U]. from Subsection 6.12 is removed. _____

_____
CV

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[8] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-ISV-62-642, CVCS SEAL WTR RETURN FILTER INLET ISOL [Aux,713, A10T]. from Subsection 6.12 is removed. _____

_____
CV

[9] **ENSURE** Differential Pressure Gauge to read differential pressure between 2-PI-62-64 and 2-PI-62-65, from Subsection 6.12 is removed per SMP-19.0 per SMP-19.0. _____

_____
CV

[10] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56, CVCS EXCESS LETDOWN FLOW CONTROL [RXB, 716, Az 114]. from Subsection 6.13 is removed. _____

_____
CV

[11] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650, CVCS SEAL WATER HX OUTLET ISOL [Aux, 713, A10U]. from Subsection 6.13 is removed. _____

_____
CV

[12] **ENSURE** Ultrasonic Flowmeter downstream of Valve 2-ISV-62-1061, BORIC ACID FILTER B OUTLET, [Aux, 713, A13Q] near Filter 2-FLTR-62-1B, BORIC ACID FILTER B from Subsection 6.16 is removed. _____

_____
CV

[13] **ENSURE** Differential Pressure Gauge to read differential pressure between 2-PI-62-234 and 2-PI-62-235, from Subsection 6.16 is removed. _____

_____
CV

8.0 RECORDS

A. QA Records

Completed 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)
Unit 2 FSAR - Amendment 112 Section 9.3, Table 9.3-4, 5 Table 14.2-1 Sheets 18-19		
2-TSD-62-01, CVCS Charging and Letdown (HFT)		
2-TSD-62-02, Boric Acid System Logic Test		
2-TSD-62-03, Chemical And Volume Control System-Charging and Letdown (Hot Functional Testing)		
2-ARI-109-115, Rev 004U2, CVCS & RHR -RPS & ESF		
ARI-102-108, Rev 003U2, HVAC & CVCS		
2-PTI-068-01, Rev 0000, Preoperational Test - HFT Heatup and Cooldown		
2-T-68-60, Rev 0, Setpoint and Scaling Document RCS WR Cold Leg Temperature.		
SSD-2-LPF-62-1, Rev 1, RCP 1 Seal Water Flow.		
SSD-2-LPF-62-14, Rev 1, RCP 2 SEAL WATER FLOW.		
SSD-2-LPF-62-27, Rev 1, RCP 3 Seal Water Flow.		

Appendix A
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TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	INITIAL AND DATE. (N/A for no change)
SSD-2-LPF-62-40, Rev 1, RCP 4 Seal Water Flow.		
SSD-2-LPP-62-8, Rev 0, RCP 1 DP Across No 1 Seal.		
SSD-2-LPP-62-21, Rev 0, RCP 2 DP Across No 1 Seal.		
SSD-2-LPP-62-34, Rev 2, RCP 3 DP Across No 1 Seal.		
SSD-2-LPP-62-47, Rev 0, RCP 3 DP Across No 1 Seal.		
SSD-2-LPT-62-78, Rev 0, Letdown HTX Outlet Temp.		
SSD-2-LPF-62-56, Rev 2, Excess Letdown Flow Control.		
SSD-2-LPP-62-81, Rev 1, Letdown Heat Exchanger Pressure Control		
SSD-2-LPF-62-82-S Rev 0, Letdown Heat Exch Flow		
SSD-2-LPF-62-93A, Rev 3, Charging Header Flow		
SSD-2-LPL-68-339A, Rev 3, Pressurizer Level Control		

Appendix B
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TEMPORARY CONDITIONS LOG

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

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-LPF-62-37				X			
2-LPF-62-50				X			
2-LPT-62-4					X		
2-LPT-62-17					X		
2-LPT-62-30					X		
2-LPT-62-43					X		
2-LPT-62-16					X		
2-LPT-62-29					X		
2-LPT-62-42					X		
2-PDIS-62-96				X			
2-PDIS-62-97				X			
2-FIS-62-25					X		
2-FIS-62-38					X		

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-FIS-62-51					X		
2-LPP-62-8					X		
2-LPP-62-21					X		
2-LPP-62-34					X		
2-LPP-62-47					X		
2-LPF-62-10					X		
2-LPF-62-23					X		
2-LPF-62-36					X		
2-LPF-62-49					X		
2-LPF-62-11				X			
2-LPF-62-24				X			

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-LS-62-6A					X		
2-LS-62-6B					X		
2-LS-62-19A					X		
2-LS-62-19B					X		
2-LS-62-32A					X		
2-LS-62-32B					X		
2-LS-62-45A					X		
2-LS-62-45B					X		
2-LPF-62-1				X			
2-LPF-62-14				X			
2-LPF-62-27				X			
2-LPF-62-40				X			

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-FIS-62-12					X		
2-LPT-62-131					X		
2-LPT-62-3					X		
2-LPP-62-81					X		
2-LPF-62-82				X			
2-LPT-62-78				X			
2-PI-62-116				X			
2-PI-62-117				X			
2-LPL-68-339A					X		
2-LPT-62-71				X			
2-LPF-70-84					X		
2-LPT-68-60				X			

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-LPT-70-86					X		
1-LPT-70-161					X		
0-LPT-70-162					X		
2-LPT-70-161					X		
2-LPF-62-56					X		
2-PI-62-64				X			
2-PI-62-65				X			
2-LPT-62-58				X			
2-LPT-62-80C					X		
2-LPP-62-92A					X		
2-LPF-62-137				X			

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-LPF-62-139/140					X		
2-PI-62-112				X			
2-LPT-62-87					X		
2-LPT-70-191					X		
2-LPF-70-190					X		
2-TI-62-62				X			
2-TI-62-66				X			
2-LPT-70-175					X		
2-LPF-70-176					X		
2-P-68-323					X		

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-P-68-334					X		
0-TIC-62-228					X		
2-LPL-62-130A					X		
2-LPL-62-129A					X		
2-LPP-62-119					X		
2-LPP-62-120					X		
2-LPP-62-122				X			
2-LPF-62-93A					X		
2-LPF-62-89					X		
2-LPP-62-57					X		
2-LPL-68-339A					X		
2-PI-62-234				X			

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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]
		INIT/DATE	INIT/DATE	YES	NO		INITIAL/DATE
2-PI-62-235				X			
2-LPP-62-110					X		
2-PI-62-110					X		
2-PS-62-247					X		
2-LPP-62-106					X		
2-PI-62-106					X		
2-PS-62-244					X		
2-LPF-62-83					X		

[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.

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HEAT EXCHANGER BASELINE DATA

REGENERATIVE HEAT EXCHANGER BASELINE DATA

Regenerative Heat Exchanger - 2-HTX-62-120	
Description	**Initial/Date**
Tube Side Inlet Temperature: Computer Point T0140A _____ °F	_____/_____
Tube Side Outlet Temperature: Computer Point T0126A _____ °F	_____/_____
Tube Side (Charging) Flowrate: Ultrasonic Flowmeter Downstream of 2-CKV-62-543 _____ gpm	_____/_____
Shell Side Inlet Temperature: Computer Point T0446A _____ °F	_____/_____
Shell Side Outlet Temperature: Computer Point T0127A _____ °F	_____/_____
Shell Side Flowrate Computer Point F0134A _____ gpm	_____/_____

Appendix D
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HEAT EXCHANGER BASELINE DATA

LETDOWN HEAT EXCHANGER BASELINE DATA

Letdown Heat Exchanger - 2-HTX-62-124	
Description	**Initial/Date**
Tube Side Inlet Temperature: Computer Point T0127A _____ °F	_____/_____
Tube Side Outlet Temperature: Computer Point T0145A _____ °F	_____/_____
Tube Side Flowrate Computer Point F0134A _____ gpm	_____/_____
Shell Side (CCS) Inlet Temperature: (Record only in service HX, others are N/A) 1-TI-70-161, CCS HTX A OUTLET (0-M-27B) _____ °F 0-TI-70-162, CCS HTX C OUTLET (0-M-27B) _____ °F 2-TI-70-161, CCS HTX B OUTLET (0-M-27B) _____ °F	_____/_____
Shell Side (CCS) Outlet Temperature: 2-TI-70-191, LETDN HTX OUTLET (0-M-27B)_____ °F	_____/_____
Shell Side (CCS) Flowrate: 2-FI-70-190, LETDN HTX OUTLET (0-M-27B)_____ gpm	_____/_____

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HEAT EXCHANGER BASELINE DATA

SEAL WATER HEAT EXCHANGER BASELINE DATA

CVCS Seal Water Heat Exchanger - 2-HTX-62-66	
Description	**Initial/Date**
Tube Side Inlet Temperature: 2-TI-62-62, CVCS SEAL WATER RETURN HEADER TEMP _____ °F	_____/_____
Tube Side Outlet Temperature: 2-TI-62-66, CVCS SEAL WATER HX OUTLET TEMP _____ °F(≤127°F)	_____/_____
Tube Side Flowrate: Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650 Tube Side Flowrate _____ gpm	_____/_____
Shell Side (CCS) Inlet Temperature: (Record only in service HX, others are N/A) 1-TI-70-161, CCS HTX A OUTLET (0-M-27B)_____ °F 0-TI-70-162, CCS HTX C OUTLET (0-M-27B)_____ °F 2-TI-70-161, CCS HTX B OUTLET (0-M-27B)_____ °F	_____/_____
Shell Side (CCS) Outlet Temperature: 2-TI-70-175, SEAL WTR HTX A OUT (0-M-27B)_____ °F	_____/_____
Shell Side (CCS) Flowrate: 2-FI-70-176, SEAL WTR HTX A OUT (0-M-27B)_____ gpm	_____/_____

Appendix D
(Page 4 of 4)

HEAT EXCHANGER BASELINE DATA

EXCESS LETDOWN HEAT EXCHANGER BASELINE DATA

Excess Letdown Heat Exchanger - 2-HTX-62-121	
Description	**Initial/Date**
Tube Side Inlet Temperature: Computer Point T0446A _____ °F	_____/_____
Tube Side Outlet Temperature: Computer Point T0122A _____ °F	_____/_____
Tube Side Flowrate: Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56	_____/_____
Shell Side (CCS) Inlet Temperature (Only CCS flow supplying 2-HTX-62-121 must be recorded. Others may be marked N/A.) : 1-TI-70-161, CCS HTX A OUTLET (0-M-27B)_____ °F 0-TI-70-162, CCS HTX C OUTLET (0-M-27B)_____ °F 2-TI-70-161, CCS HTX B OUTLET (0-M-27B)_____ °F	_____/_____
Shell Side Outlet Temperature: 2-TI-70-86 _____ °F	_____/_____
Shell Side Flowrate 2-FI-70-84 _____ gpm	_____/_____

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Heat Exchanger Calculations

1.0 REGENERATIVE HEAT EXCHANGER TUBE SIDE

$$\dot{m} = Q \cdot \rho$$

Where:

$\dot{m}$ = Regenerative Heat Exchanger Tube Side Mass Flowrate (lbm/hr)

Q = Tube Side (Charging) Flowrate measured on Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543 (gpm)

T_{T0140A} = Tube Side (Charging) Inlet Temperature measured on Computer Point T0140A (°F)

ρ = Density (lbm/ft^3)

$U_{\%Q}$ = Uncertainty in Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543

U_Q = Uncertainty in Regenerative Heat Exchanger Tube Side Flowrate

$U_{\dot{m}}$ = Uncertainty in Regenerative Heat Exchanger Tube Side Mass Flowrate

[1] Record the following Data from Appendix D Regenerative Heat Exchanger Baseline Data :

Q = _____ GPM

T_{T0140A} (Inlet) = _____°F _____

[2] **RECORD** the uncertainty in Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543, **AND**

INDICATE if the uncertainty is of Full Scale or of Reading.

$U_{\%Q}$ = ±_____ % _____ _____

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Heat Exchanger Calculations

[3] **IF** Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543 uncertainty is of Full Scale **THEN** perform the following to calculate U_Q. (NA if of Reading)

$U_Q = U_{\%Q}$ x Full Scale Flow Rate =

_____ % x _____ GPM = ±_____ GPM _____

_____
IV

[4] **IF** Ultrasonic Flowmeter downstream of Valve 2-CKV-62-543 uncertainty is of Reading **THEN** perform the following to calculate U_Q. (NA if of Full Scale)

$U_Q = U_{\%Q}$ x Q =

_____ %+2%) x _____ GPM = ±_____ GPM _____

_____
IV

[5] **DETERMINE** the density of water at Tube Side Inlet temperature recorded in Appendix D Regenerative Heat Exchanger Baseline Data using Properties of Saturated Water.

ρ = _____ $\frac{lbm}{ft^3}$ _____

Appendix E
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Heat Exchanger Calculations

[6] **PERFORM** the following Calculation using data recorded from Appendix D Regenerative Heat Exchanger Baseline Data:

$$\dot{m} = \frac{\quad}{\text{gpm}} \cdot \frac{\quad}{\text{lbm/ft}^3} \cdot \frac{.1336\text{ft}^3}{\text{gal}} \cdot \frac{60\,\text{min}}{\text{hr}} = \frac{\quad}{\text{lbm/hr}}$$

$$\dot{U}_m = \sqrt{\left(\frac{U_Q}{Q}\right)^2} \cdot \dot{m} = \sqrt{\left(\frac{\quad}{\text{gpm}} \Big/ \frac{\quad}{\text{gpm}}\right)^2} \cdot \frac{\quad}{\text{lbm/hr}} = \pm\_\_\_\_\_ \text{ lbm/hr}$$

$$\dot{m}_{Regen\_tube} = \frac{\quad}{\dot{m}} - \frac{\quad}{\dot{U}_m} = \_\_\_\_\_ \text{ lbm/hr } (\geq 27{,}148 \text{ lbm/hr})$$

_____

_____
IV

Appendix E
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Heat Exchanger Calculations

2.0 LETDOWN HEAT EXCHANGER

$$\dot{m} = Q \cdot \rho$$

$$\Delta T = T_{inlet} - T_{outlet}$$

Where:

$\dot{m}$	=	Mass Flowrate (lbm/hr)
Q	=	Letdown Heat Exchanger Tube Side Flowrate from Computer Point F0134A (gpm)
ρ	=	Density (lbm/ft^3)
ΔT	=	Temperature Drop across Letdown Heat Exchanger
T_{T0127A}	=	Inlet temperature of Letdown Heat Exchanger Computer Point T0127A (°F)
T_{T0145A}	=	Outlet temperature of Letdown Heat Exchanger Computer Point T0145A (°F)
U_Q	=	Uncertainty in Letdown Heat Exchanger Flowrate Computer Point F0134A = $\pm$ 3.33 gpm (Includes $\pm$2% uncertainty from Flow Element)
U_{T0127A}	=	Uncertainty in Inlet temperature of Letdown Heat Exchanger Computer Point T0127A = $\pm$ 4.8 °F
U_{T0145A}	=	Uncertainty in Outlet temperature of Letdown Heat Exchanger Computer Point T0145A = $\pm$ 3.6 °F
$U_{\dot{m}}$	=	Uncertainty in Letdown Heat Exchanger Mass Flowrate
U_{FE}	=	Uncertainty associated with Flow Element (2%)

Appendix E
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Heat Exchanger Calculations

[1] Record the following Data from Appendix D Letdown Heat Exchanger Baseline Data Perform the following Calculation:

Q = _____ GPM

$T_{T0127\ A}$ (Inlet) = _____°F

$T_{T0145\ A}$ (Outlet) = _____°F _____

[2] Using Properties of Saturated Water table determine the density of water at Tube Side Outlet temperature recorded in Appendix D Letdown Heat Exchanger Baseline Data

ρ = _____ $\frac{lbm}{ft^3}$ _____

[3] Using data recorded from Appendix D Letdown Heat Exchanger Baseline Data Perform the following Calculation:

$$\dot{m} = \frac{\quad}{gpm} \cdot \frac{\quad}{lbm/ft^3} \cdot \frac{.1336 ft^3}{gal} \cdot \frac{60\,min}{hr} = \frac{\quad}{lbm/hr}$$

$$U_{\dot{m}} = \sqrt{\left(\frac{U_Q}{Q}\right)^2} \cdot \dot{m} = \sqrt{\left(1.33 \Big/ \frac{\quad}{gpm}\right)^2} \cdot \frac{\quad}{lbm/hr} = \pm \_\_\_\_\_ \text{ lbm/hr}$$

$$\dot{m}_{Ltdn} = \frac{\quad}{\dot{m}} - \frac{\quad}{U_{\dot{m}}} = \_\_\_\_\_ \text{ gpm } (\geq 27{,}148 \text{ lbm/hr})$$

$$\Delta T = \frac{\quad}{T_{T0127A}} - \frac{\quad}{T_{T0145A}} = \_\_\_\_\_ °F$$

$$U_{\Delta T} = \sqrt{(U_{T0127A})^2 + (U_{T0145A})^2} = \sqrt{(4.8)^2 + (3.6)^2} = \pm 6\ °F$$

$$\Delta T_{Ltdn} = \Delta T - U_{\Delta T} = \frac{\quad}{\Delta T} - 6 = \_\_\_\_\_ °F\ (\geq 163°F)$$

_____

_____

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Heat Exchanger Calculations

3.0 REGENERATIVE HEAT EXCHANGER SHELL SIDE

$$\dot{m} = Q \cdot \rho$$

$$\Delta T = T_{inlet} - T_{outlet}$$

Where:

$\dot{m}$ = Mass Flowrate (lbm/hr)

Q = Regenerative Heat Exchanger Shell Side Flowrate from Computer Point F0134A

ρ = Density (lbm/ft^3)

ΔT = Temperature Drop across Regenerative Heat Exchanger Shell Side (°F)

T_{T0446A} = Inlet temperature of Regenerative Heat Exchanger Shell Side Computer Point T0446A (°F)

T_{T0127A} = Outlet temperature of Regenerative Heat Exchanger Shell Side Computer Point T0127A (°F)

U_Q = Uncertainty in of Regenerative Heat Exchanger Shell Side Flowrate Computer Point F0134A = ± 3.33 GPM (Includes ±2% uncertainty from Flow Element)

U_{T0446A} = Uncertainty in Inlet temperature of Regenerative Heat Exchanger Shell Side = ± 4.23 °F

U_{T0127A} = Uncertainty in Inlet temperature of Letdown Heat Exchanger Computer Point T0127A = ± 4.8 °F

$U_{\dot{m}}$ = Uncertainty in Regenerative Heat Exchanger Tube Side Mass Flowrate (lbm/hr)

[1] Record the following Data from Appendix D Regenerative Heat Exchanger Shell Side Baseline Data:

Q = _____ GPM

T_{T0446A} (Inlet) = _____°F

T_{T0127A} (Outlet) = _____°F _____

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Heat Exchanger Calculations

[2] Using the Properties of Saturated Water table determine the density of water at Shell Side Outlet temperature recorded in Appendix D Regenerative Heat Exchanger Shell Side Baseline Data

ρ = _____ $\frac{lbm}{ft^3}$ _____

[3] Using data recorded from Appendix D Regenerative Heat Exchanger Shell Side Baseline Data Perform the following Calculation:

$$\dot{m} = \frac{\quad}{gpm} \cdot \frac{\quad}{lbm/ft^3} \cdot \frac{.1336 ft^3}{gal} \cdot \frac{60 min}{hr} = \frac{\quad}{lbm/hr}$$

$$U_{\dot{m}} = \sqrt{\left(\frac{U_Q}{Q}\right)^2} \cdot \dot{m} = \sqrt{\left(1.33 \Big/ \frac{\quad}{gpm}\right)^2} \cdot \frac{\quad}{lbm/hr} = \pm$$ _____lbm/hr

$$\dot{m}_{Regen\_Shell} = \frac{\quad}{\dot{m}} - \frac{\quad}{U_{\dot{m}}} =$$ _____ lbm/hr (≥37,020 lbm/hr)

$$\Delta T = \frac{\quad}{T_{T0446A}} - \frac{\quad}{T_{T0127A}} =$$ _____°F

$$U_{\Delta T} = \sqrt{(U_{T0127A})^2 + (U_{T0446A})^2} = \sqrt{(4.8)^2 + (4.23)^2} = \pm 6.4\ °F$$

$$\Delta T_{Regen\_Shell} = \frac{\quad}{\Delta T} - \frac{\quad}{U_{\Delta T}} =$$ _____°F (≥267.3°F)

_____

_____
IV

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Heat Exchanger Calculations

4.0 EXCESS LETDOWN HEAT EXCHANGER

$$\dot{m} = Q \cdot \rho$$

$$\Delta T = T_{inlet} - T_{outlet}$$

Where:

$\dot{m}$ = Mass Flowrate (lbm/hr)

Q = Excess Letdown Heat Exchanger Tube Side Flowrate from Ultra Sonic Flowmeter downstream of 2-FCV-62-56

ρ = Density (lbm/ft^3)

ΔT = Temperature Drop across Excess Letdown Heat Exchanger

T_{T0446A} = Inlet temperature of Excess Letdown Heat Exchanger Computer Point T0446A (°F)

T_{T0122A} = Outlet temperature of Excess Letdown Heat Exchanger Computer Point T0122A (°F)

$U_{\%Q}$ = Uncertainty in Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56

U_Q = Uncertainty in Excess Letdown Heat Exchanger Flowrate

U_{T0446A} = Uncertainty in Inlet temperature of Excess Letdown Heat Exchanger Side = $\pm$ 4.23 °F

U_{T0122A} = Uncertainty in Outlet temperature of Excess Letdown Heat Exchanger Computer Point T0122A = $\pm$ 2.24 °F

$U_{\dot{m}}$ = Uncertainty in Excess Letdown Heat Exchanger Mass Flowrate

Appendix E
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Heat Exchanger Calculations

[1] Record the following Data from Appendix D Excess Letdown Heat Exchanger Baseline Data Perform the following Calculation:

Q = _____ GPM

$T_{T\,0446\,A}$ (Inlet) = _____°F

$T_{T\,0122\,A}$ (Outlet) = _____°F _____

[2] **RECORD** the uncertainty in Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56, **AND**

INDICATE if the uncertainty is of Full Scale or of Reading.

$U_{\%Q}$ = ±_____ % _____ _____

[3] **IF** Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56 uncertainty is of Full Scale **THEN** perform the following to calculate U_Q. (NA if of Reading)

$U_Q = U_{\%Q}$ x Full Scale Flow Rate =

_____ % x _____ GPM = ±_____ GPM _____

_____
IV

[4] **IF** Ultrasonic Flowmeter downstream of Valve 2-FCV-62-56 uncertainty is of Reading **THEN** perform the following to calculate U_Q. (NA if of Full Scale)

$U_Q = U_{\%Q}$ x Q =

_____ % x _____ GPM = ±_____ GPM _____

_____
IV

Appendix E
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Heat Exchanger Calculations

[5] Using the Properties of Saturated Water table determine the density of water at Tube Side Outlet temperature recorded in Appendix D Excess Letdown Heat Exchanger Baseline Data

ρ = _____ $\frac{lbm}{ft^3}$ _____

[6] **PERFORM** the following calculation using data recorded from Appendix D Excess Letdown Heat Exchanger Baseline Data:

$U_Q = \frac{\quad}{Q} \cdot .01 =$ ± _____ gpm

$\dot{m} = \frac{\quad}{gpm} \cdot \frac{\quad}{lbm/ft^3} \cdot \frac{.1336 ft^3}{gal} \cdot \frac{60 min}{hr} = \frac{\quad}{lbm/hr}$

$U_{\dot{m}} = \sqrt{\left(\frac{U_Q}{Q}\right)^2} \cdot \dot{m} = \sqrt{\left(\frac{\quad}{gpm} / \frac{\quad}{gpm}\right)^2} \cdot \frac{\quad}{lbm/hr}$ = ± _____ lbm/hr

$\dot{m}_{Ex\_Ltdn} = \frac{\quad}{\dot{m}} - \frac{\quad}{U_{\dot{m}}}$ = _____ lbm/hr (≥12,340 lbm/hr)

T_{T0446A} = _____ °F

$\Delta T = \frac{\quad}{T_{T0446A}} - \frac{\quad}{T_{T0122A}}$ = _____ °F

$U_{\Delta T} = \sqrt{(U_{T0122A})^2 + (U_{T0446A})^2} = \sqrt{(2.24)^2 + (4.23)^2}$ = ± 4.79 °F

$\Delta T_{Ex\_Ltdn} = \frac{\quad}{\Delta T} - \frac{\quad}{U_{\Delta T}}$ = _____ °F (≥362.3°F)

_____

_____
IV

Appendix E
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Heat Exchanger Calculations

5.0 SEAL WATER HEAT EXCHANGER

$$\dot{m} = Q \cdot \rho$$

$$\Delta T = T_{inlet} - T_{outlet}$$

Where:

$\dot{m}$ = Mass Flowrate (lbm/hr)

Q = Seal Water Heat Exchanger Tube Side Flowrate from Ultra Sonic Flowmeter downstream of 2-FCV-62-56 (gpm)

ρ = Density $\left(lbm/ft^3\right)$

ΔT = Temperature Drop across Seal Water Heat Exchanger (°F)

T_{Inlet} = Inlet temperature of Seal Water Heat Exchanger 2-TI-62-62 (°F)

T_{Outlet} = Outlet temperature of Seal Water Heat Exchanger Computer Point 2-TI-62-66 (°F)

$U_{\%Q}$ = Uncertainty in Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650

U_Q = Uncertainty in Seal Water Heat Exchanger flow rate.

U_{T_Inlet} = Uncertainty in Inlet temperature of Seal Water Heat Exchanger Side = $\pm$ 4°F

U_{T_Outlet} = Uncertainty in Outlet temperature of Seal Water Heat Exchanger = $\pm$ 4°F

$U_{\dot{m}}$ = Uncertainty in Seal Water Heat Exchanger Mass Flowrate

Appendix E
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Heat Exchanger Calculations

[1] **RECORD** the following Data from Appendix D Seal Water Heat Exchanger Baseline Data:

Q = _____ GPM

T_{Inlet} = _____°F

T_{Outlet} = _____°F _____

[2] **RECORD** the uncertainty in Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650, **AND**

INDICATE if the uncertainty is of Full Scale or of Reading.

$U_{\%Q}$ = ±_____ % _____ _____

[3] **IF** Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650 uncertainty is of Full Scale **THEN** perform the following to calculate U_Q. (NA if of Reading)

U_Q = $U_{\%Q}$ x Full Scale Flow Rate =

_____ % x _____ GPM = ±_____ GPM _____

_____
IV

[4] **IF** Ultrasonic Flowmeter downstream of Valve 2-ISV-62-650 uncertainty is of Reading **THEN** perform the following to calculate U_Q. (NA if of Full Scale)

U_Q = $U_{\%Q}$ x Q =

_____ % x _____ GPM = ±_____ GPM _____

_____
IV

[5] Using the Properties of Saturated Water table determine the density of water at Tube Side Outlet temperature recorded in Appendix D Seal Water Heat Exchanger Baseline Data

ρ = _____ $\frac{lbm}{ft^3}$ _____

Appendix E
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Heat Exchanger Calculations

[6] Using data recorded from Appendix D Seal Water Heat Exchanger Baseline Data Perform the following Calculation:

$$\dot{m} = \frac{\quad}{\text{gpm}} \cdot \frac{\quad}{\text{lbm/ft}^3} \cdot \frac{.1336\text{ft}^3}{\text{gal}} \cdot \frac{60\,\text{min}}{\text{hr}} = \frac{\quad}{\text{lbm/hr}}$$

$$U_{\dot{m}} = \sqrt{\left(\frac{U_Q}{Q}\right)^2} \cdot \dot{m} = \sqrt{\left(\frac{\quad}{\text{gpm}} \Big/ \frac{\quad}{\text{gpm}}\right)^2} \cdot \frac{\quad}{\text{lbm/hr}} = \pm \underline{\quad\quad} \text{lbm/hr}$$

$$\dot{m}_{Seal} = \frac{\quad}{\dot{m}} - \frac{\quad}{U_{\dot{m}}} = \underline{\quad\quad\quad} \text{ lbm/hr (≥47,879 lbm/hr)}$$

$$T_{Inlet} = \underline{\quad\quad\quad}\,°F$$

$$\Delta T = \frac{\quad}{T_{Inlet}} - \frac{\quad}{T_{Outlet}} = \underline{\quad\quad\quad}\,°F$$

$$U_{\Delta T} = \sqrt{2 \cdot (4)^2} = \pm 5.66\ °F$$

$$\Delta T_{Seal} = \frac{\quad}{\Delta T} - \frac{\quad}{U_{\Delta T}} = \underline{\quad\quad\quad}\,°F\ (\geq 30.4°F)$$

Appendix E
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Heat Exchanger Calculations

PROPERTIES OF SATURATED WATER - From Steam Tables

Temperature (°F)	Density (lbm/ft^3)	Temperature (°F)	Density (lbm/ft^3)
32	62.42	260	58.51
40	62.42	280	57.94
50	62.38	300	57.31
60	62.34	350	55.59
70	62.27	400	53.65
80	62.17	450	51.55
90	62.11	500	49.02
100	61.99	550	45.92
110	61.84	600	42.37
120	61.73	220	59.63
130	61.54	240	59.1
140	61.39	260	58.51
150	61.2	280	57.94
160	61.01	300	57.31
170	60.79	350	55.59
180	60.57	400	53.65
190	60.35	450	51.55
200	60.13	500	49.02
220	59.63	550	45.92
240	59.1	600	42.37

The following equation may be performed to interpolate the correct density based on water temperature:

$$\rho = \rho_1 + (\rho_2 - \rho_1)\frac{T - T_1}{T_2 - T_1}$$

Appendix F
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Methodology for Modified Acceptance Criteria

- 2-OR-62-76 Flowrate

  Computer Point F0134A

  Accuracy = ±5.33 gpm (Includes ±2% uncertainty from Flow Element)

  To calculate the uncertainty in total *CVCS Letdown flow for Orifice B* the sum of the squares for the uncertainties is performed

  $U_{Letdown\_Flow} = \sqrt{2 \cdot (5.33)^2}$ = ±7.54 gpm

- Seal Injection Flow Calculations

  Calculating the uncertainty of the sum of the readings from 2-FI-62-1A, 2-FI-62-14A, 2-FI-62-27A, and 2-FI-62-40A. Uses the following methodology.

  Accuracy = ±0.472 gpm

  Readability = ±0.1 gpm

  Overall Tolerance = ±0.572 gpm

  To calculate the uncertainty in total seal flow the sum of the squares of for the uncertainties is performed

  $U_{Total\_Seal\_Flow} = \sqrt{4 \cdot (0.572)^2}$ = ±1.144 gpm

  Tolerance is rounded to the nearest readable digit when adding or subtracting from the acceptance criteria.

- Seal Injection Filters

  2-PDIS-62-96 & 2-PDIS-62-97

  Accuracy = ±0.5 psid

  Readability = ±0.25 psid

  Overall Tolerance = ±0.75 psid

  Tolerance is rounded to the nearest readable digit when adding or subtracting from the acceptance criteria.

Appendix F
(Page 2 of 2)

Methodology for Modified Acceptance Criteria

- Mixed Bed A & B and Cation DPs

  2-PI-62-112 & 2-PI-62-116

  Accuracy = ±2 psig

  Readability = ±1 psig

  Overall Tolerance = ±3 psig

  To calculate the uncertainty in Mixed Bed A & B and Cation DPs the sum of the squares of for the uncertainties is performed

  $U_{Demin} = \sqrt{2 \cdot (3)^2}$ = ±4.24 psig

- Emergency Boration

  For measurements used as Acceptance Criteria from 2-FI-62-137A, Excel was used to determine the point at which the measured reading with the error of ±2.3% of full scale IN WC, would meet the Acceptance Criteria.

IN WC		Actual Flow		Low Limit		Hi Limit	
		150*sqrt((INWC/400)		150*sqrt((INWC-9.2)/400)		150*sqrt((INWC+9.2)/400)	
29	in	40.39	gpm	33.37	gpm	46.35	gpm
30	in	41.08	gpm	34.21	gpm	46.96	gpm
31	in	41.76	gpm	35.02	gpm	47.55	gpm
32	in	42.43	gpm	35.81	gpm	48.14	gpm

Data Sheet 1
(Page 1 of 2)

Determining Uncertainty in M&TE

$U_R = R \times U_{M\&TE}$

$R_C = R \pm U_R$

Where:

R	=	Reading from M&TE
U_R	=	Uncertainty in M&TE Reading
R_C	=	Reading from M&TE corrected for uncertainty
$U_{M\&TE}$	=	Uncertainty of M&TE

[1] **RECORD** the section and step for which this Data Sheet is being performed.

_____ _____

[2] **RECORD** Reading from M&TE **AND**

INDICATE the units of the reading.

R = _____ _____

[3] **RECORD** the M&TE Identification Number and Calibration Due Date:

M&TE _____ Cal Due Date _____ _____

[4] **RECORD** the value and units of the M&TE uncertainty, and

INDICATE if the uncertainty is of Full Scale or of Reading.

$U_{M\&TE}$ = ± _____ of _____ _____

Data Sheet 1
(Page 2 of 2)

Determining Uncertainty in M&TE

[5] **IF** the M&TE uncertainty is of Full Scale **THEN**

PERFORM the following to calculate uncertainty of the M&TE Reading **AND RECORD** the units. (NA if uncertainty is of Reading)

U_R = Full Scale rating of M&TE x $U_{M\&TE}$ =

_____ x _____ = ±_____ _____

_____
IV

[6] **IF** the M&TE uncertainty is of Reading **THEN**

PERFORM the following to calculate uncertainty of the M&TE Reading **AND RECORD** the units. (NA if uncertainty is of Full Scale)

U_R = R x $U_{M\&TE}$ =

_____ x _____ = ±_____ _____

_____
IV

[7] **RECORD** the following and indicate the units:

$R_C = R \pm U_R$ = _____ ± _____ _____

[8] **TRANSFER** the value for R_C to the Subsection and Step recorded in Step [1] of Data Sheet 1 _____

[9] **ATTACH** this Data Sheet to the Data Package for 2-PTI-062-03. _____