WBN2Public Resource

From: Boyd, Desiree L [dlboyd@tva.gov]
Sent: Tuesday, March 26, 2013 2:38 PM
To: Hon, Andrew; Epperson, Dan; Quichocho, Jessie; Poole, Justin
Cc: Arent, Gordon; Hamill, Carol L; Boyd, Desiree L
Subject: TVA letter to NRC_03-26-13_2-PTI-002-02 & 2-PTI-084-01 transmittal to NRC
Attachments: 03-26-13_2-PTI-002-02 & 2-PTI-084-01 transmittal to NRC_Final.pdf

Please see attached TVA letter that was sent to the NRC today.

Thank You

~*~*~*~*~*~*~*~*~*~*~*~

Désireé L. Boyd

WBN Unit 2 Licensing

dlboyd@tva.gov

423-365-8764

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Recipients:
"Arent, Gordon" <garent@tva.gov>
Tracking Status: None
"Hamill, Carol L" <clhamill@tva.gov>
Tracking Status: None
"Boyd, Desiree L" <dlboyd@tva.gov>
Tracking Status: None
"Hon, Andrew" <Andrew.Hon@nrc.gov>
Tracking Status: None
"Epperson, Dan" <Dan.Epperson@nrc.gov>
Tracking Status: None
"Quichocho, Jessie" <Jessie.Quichocho@nrc.gov>
Tracking Status: None
"Poole, Justin" <Justin.Poole@nrc.gov>
Tracking Status: None

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

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

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

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

PTI NUMBER	Rev.	TITLE
2-PTI-002-02	0	Condenser Vacuum
2-PTI-084-01	0	Flood Mode Boration

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

Respectfully,

for

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

Enclosures

cc (Enclosures):

U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

bcc (Enclosures):

Jessie Quichocho
U.S. Nuclear Regulatory Commission
MS 08G9A
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Fred Brown, Deputy Regional Administrator for Construction
U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: Condenser Vacuum

Instruction No: 2-PTI-002-02

Revision No: 0000

PREPARED BY: Keith Jones Keith Jones DATE: 10-12-12
PRINT NAME / SIGNATURE

REVIEWED BY: Tom Padgett Tom Padgett DATE: 2-14-2013
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-003

JTG CHAIRMAN: Mark A Welch DATE: 3/7/2013

APPROVED BY : Mark A Welch DATE: 3/7/2013
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	3/11/13	ALL	Initial Issue. This procedure written using Unit 1 PTI-002-02 as a guide.

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Date _____

1.0 INTRODUCTION

1.1 Test Objectives

Demonstrate the proper operation of the Condenser Vacuum Pumps (CVPs) and their associated support equipment.

Demonstrate the integrity of the Main Condenser and Main Feed Pump Turbine (MFPT) Condensers.

1.2 Scope

A. Each CVP's Seal Water Tank level controls function properly.

B. Each CVP Seal Water Recirculating Pump operates correctly from its respective handswitches and starts automatically when its respective CVP starts.

C. Each CVP operates correctly from its respective handswitches in the Main Control Room and on local panels, and indicating lights indicate correct status.

D. Main Control Room alarms for low CVP seal water pressure, low Main Condenser vacuum, low MFPT Condenser vacuum, and CVP motor tripout function properly.

E. Each CVP suction and discharge valves function properly.

F. Each CVP starts automatically on low suction header vacuum.

G. Each CVP operates within design parameters throughout entire operating range.

H. The Condenser Vacuum Breaker and Condenser Vacuum Exhaust Bypass valves function properly.

I. This instruction does not:

1. Quantitatively verify instrument setpoints. Instrument setpoints are calibrated prior to performance of this instruction. This instruction only verifies qualitative operation of instrumentation.

2. Verify acceptable Main Condenser air in leakage at power operation. Main Condenser air in leakage at power operation is tested/verified during Power Ascension Testing.

Date _____

2.0 REFERENCES

2.1 Performance References

A. SMP-7.0, Control Of Cleanness, Layup And Flushing

B. SMP-9.0, Conduct of Test

C. TI-300, Electrical Arc Flash Personal Protective Equipment & Protection Boundary Matrices

D. GOI-7, Generic Equipment Operating Guidelines

E. 2-SOI-2&3.01, Condensate and Feedwater System

F. SOI-30.01, Turbine Building Ventilation System

G. 2-SOI-37.01, Gland Seal Water System

H. 2-SOI-47.01, Turbine Turning Gear Operation

I. 2-SOI-47.03, Main Turbine Steam Seal System

2.2 Developmental References

A. Final Safety Analysis Report, Amendment 109

1. Section 10.4.2, Main Condenser Evacuation System

2. Table 14.2-1, Sheet 68 & 69, Condensate and Condenser Vacuum System Test Summary

B. Drawings

1. Flow Diagrams

a. 2-47W801-1, Rev 11, MAIN & REHEAT STEAM

b. 2-47W801-2, Rev 16, STEAM GENERATOR BLOWDOWN SYSTEM

c. 2-47W802-1, Rev 10, EXTRACTION STEAM

d. 2-47W803-1, Rev 14, FEEDWATER

Date _____

2.2 Developmental References (continued)

e. 2-47W804-1, Rev 13, CONDENSATE
DRA 53307-030, Rev 0
DRA 53307-031, Rev 0
DRA 52340-092, Rev 0
DRA 52340-093, Rev 0

f. 2-47W804-2, Rev 14, CONDENSATE

g. 2-47W804-3, Rev 5, CONDENSATE

h. 2-47W805-1, Rev 15, HIGH PRESSURE HEATER DRAINS AND VENTS

i. 2-47W805-2, Rev 14, LOW PRESSURE HEATER DRAINS & VENTS

j. 2-47W805-3, Rev 7, HP & LP - HEATER DRAINS AND VENTS

k. 2-47W805-4, Rev 11, HP & LP - HEATER DRAINS AND VENTS

l. 2-47W805-5, Rev 12, HIGH PRESSURE HEATER DRAINS AND VENTS

m. 2-47W807-1, Rev 14, TURBINE DRAINS AND MISCELLANEOUS PIPING

n. 2-47W815-1, Rev 2, AUXILIARY BOILER SYSTEM

o. 2-47W838-1, Rev 8, CONDENSATE DEMINERALIZER SYSTEM

p. 2-47W841-1, Rev 7, GLAND SEAL WATER

q. 2-47W848-2, Rev 17, CONTROL AIR

r. 2-47W848-3, Rev 14, CONTROL AIR

2. Electrical

a. 2-45W760-2-2, Rev. 3, CONDENSATE SYSTEM SCHEMATIC DIAGRAMS

b. 2-45W760-2-4, Rev. 3, CONDENSATE SYSTEM SCHEMATIC DIAGRAMS

c. 2-45W600-2, Rev. 2, CONDENSATE SYSTEM SCHEMATIC DIAGRAMS

Date _____

2.2 Developmental References (continued)

d. 2-45W600-6-2, Rev. 2, HEATER DRAIN & VENTS SCHEMATIC DIAGRAMS

e. 2-45W760-55-1, Rev 3, ANNUNCIATOR SYSTEM SCHEMATIC DIAGRAMS

f. 2-45W600-57-20, Rev. 5, SEPERATION MISC AUX RELAYS SCHEMATIC DIAGRAMS

g. 2-45W600-57-21, Rev. 3, SEPERATION & MISC AUX RELAYS SCHEMATIC DIAGRAMS

h. 2-45W760-30-7, Rev 4, VENTILATING SYSTEM SCHEMATIC DIAGRAMS

i. 2-45W760-203-1, Rev. 0, 480V UNIT AUXILIARY POWER SCHEMATIC DIAGRAM

j. 2-45W747-1, Rev 4, 480V UNIT BOARD 2A SINGLE LINE

k. 2-45W747-2, Rev 4, 480V UNIT BOARD 2B SINGLE LINE

l. 2-45W753-1, Rev 5, 480V TURBINE MOV BD 2A SINGLE LINE

m. 2-45W753-5, Rev 4, 480V TURBINE MOV BD 2B SINGLE LINE

n. 1-45W708-2, Rev 36, MISC 120V AC DISTR PANELS CONNECTION DIAGRAMS

o. 1-45W2646-3, Rev 17, UNIT CONTROL BD 2-M-7 CONNECTION DIAGRAMS

p. 2-45W2747-4, Rev 1, 480V UNIT BOARDS CONNECTION DIAGRAMS

q. 6947D02, Rev H, LVME ‘DS’ SWGR 480V 3 PH 60 HZ SUBSTATION INTERNALS

r. 6948D26, Rev 905, LVME ‘DS’ SWGR 480V UNIT BD 2A 480V 3PH 60HZ SUBSTATION CONN DIAG UNIT 3
DRA 54155-042, Rev 1

Date _____

2.2 Developmental References (continued)

s. 6948D28, Rev 906, LVME 'DS' SWGR 480V UNIT BD 2A 480V 3PH 60HZ SUBSTATION CONN DIAG UNIT 5
DRA 58324-066, Rev 0
DRA 58324-068, Rev 0
DRA 58324-069, Rev 0

t. 6948D35, Rev 907, LVME 'DS' SWGR 480V UNIT BD 2B 480V 3PH 60HZ SUBSTATION CONN DIAG UNIT 4
DRA 54155-034, Rev 1

u. 6948D37, Rev 908, LVME 'DS' SWGR 480V UNIT BD 2B 480V 3PH 60HZ SUBSTATION CONN DIAG UNIT 6
DRA 58324-074, Rev 0
DRA 58324-076, Rev 0
DRA 58324-077, Rev 0

3. Logic/Control

a. 2-47W610-2-1, Rev. 9, CONTROL DIAGRAM CONDENSATE SYSTEM

b. 2-47W610-2-2, Rev. 9, CONTROL DIAGRAM CONDENSATE SYSTEM

c. 2-47W610-2-3, Rev. 6, CONTROL DIAGRAM CONDENSATE SYSTEM

d. 2-47W611-2-1, Rev 4, LOGIC DIAGRAM CONDENSATE

e. 2-47W610-6-5, Rev 4, CONTROL DIAGRAM HEATER DRAINS & VENT SYSTEM

Date _____

2.2 Developmental References (continued)

4. Other

   a. 2-45B655-E1B, Rev 0, ANNUNCIATOR WINDOW BOX XA-55-1B ENGRAVING

   b. 2-45B655-1B, Rev 1, ANNUNCIATOR INPUTS WINDOW BOX XA-55-1B

   c. 2-45B655-E3A, Rev 1, ANNUNCIATOR WINDOW BOX XA-55-3A ENGRAVING

   d. 2-45B655-3A, Rev 2, ANNUNCIATOR INPUTS WINDOW BOX XA-55-3A
   DRA 52378-214, Rev 0

   e. 2-45B655-E3B, Rev 1, ANNUNCIATOR WINDOW BOX XA-55-3B ENGRAVING

   f. 2-45B655-3B, Rev 2, ANNUNCIATOR INPUTS WINDOW BOX XA-55-3B

   g. 2-47A615-0, Rev 1, INTEGRATED COMPUTER SYSTEM TERMINATIONS AND I/O LIST (Pages 4, 13, 14, 22, & 30 of 30)

C. Documents

1. Vendor Manuals

   a. WBN-VTD-N010-0020; Rev. 7, Installation and Operation of Nash Condenser Exhaust System Model AT-2004E

   b. WBN-VTD-J057-0010, Rev 0, Jo-Bell General Mounting & Operating Instructions for Type R Explosion Proof

2. Other Documents

   a. 2-TSD-2-2, Rev 1, Condenser Vacuum System

   b. WBN2-2-4002, Rev 1, Condensate System

   c. 0-MI-57.002, Rev 1, Westinghouse DS Circuit Breaker Routine Maintenance, Inspection, and Testing

Date _____

2.2 Developmental References (continued)

3. Scaling & Setpoint Documents

   a. SSD-2-LS-2-169, Rev. 0, Condenser Vac Pump A Seal Water Level

   b. SSD-2-PDS-2-171, Rev.0, Condenser Vac Pump A Inlet Valve Control

   c. SSD-2-PS-2-171, Rev. 0, Condenser Vac Pump A Control

   d. SSD-2-PS-2-250, Rev. 0; Condenser Vac Pump A Back Pressure Control

   e. SSD-2-LS-2-174, Rev. 0, Condenser Vac Pump B Seal Water Level

   f. SSD-2-PDS-2-176, Rev.0, Condenser Vac Pump B Inlet Valve Control

   g. SSD-2-PS-2-176, Rev. 0, Condenser Vac Pump B Control

   h. SSD-2-PS-2-246, Rev. 0; Condenser Vac Pump B Back Pressure Control

   i. SSD-2-LS-2-179, Rev. 0, Condenser Vac Pump C Seal Water Level

   j. SSD-2-PDS-2-181, Rev.0, Condenser Vac Pump C Inlet Valve Control

   k. SSD-2-PS-2-181, Rev. 0, Condenser Vac Pump C Control

   l. SSD-2-PS-2-248, Rev. 0; Condenser Vac Pump C Back Pressure Control

   m. SSD-2-LPP-2-14, Rev 2, MFPT Condenser 2A Shell Vacuum Pressure

   n. SSD-2-LPP-2-15, Rev 1, MFPT Condenser 2B Shell Vacuum Pressure

   o. SSD-2-LPP-2-7, Rev 3, Condenser Zone B Hotwell Narrow Range Pressure

   p. SSD-2-LPP-2-10, Rev 2, Condenser Zone C Hotwell Narrow Range Pressure

Date _____

3.0 PRECAUTIONS AND LIMITATIONS

A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TI-300 and TVA Safety Manual Procedure 1021.

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

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

D. IF/THEN steps may be N/A'd if stated condition does not exist.

E. 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.

F. Condenser Vacuum Pump Switchgear has Overload Trip Switch (OTS) reset coils. Placing the Handswitch to STOP energizes the OTS Reset Coil and resets the OTS. The OTS Reset Coil should only be energized momentarily; the OTS contact in series with the Reset Coil should open to de-energize the coil. Do not hold the Handswitch in STOP if the coil does not de-energize to avoid overheating the coil.

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

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

I. Problems identified during the test shall be annotated on the 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.

J. Observe all Radiation Protection (RP) requirements when working in or near radiologically controlled areas.

Date _____

3.0 PRECAUTIONS AND LIMITATIONS (continued)

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

L. Test personnel will coordinate with Unit 1 operations when manipulating Unit 1 equipment if required.

M. System water chemistry is within system specifiable parameters especially for fluids supplied from external sources.

N. 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.

O. If the vibration is determined to be excessive the Test Engineer shall initiate a TDN.

P. This instruction uses both Absolute Pressure and Vacuum Pressure to quantify condenser pressure. Absolute Pressure (measured at inHgA) is zero-referenced against a perfect vacuum, so it is the true total pressure in the system. (Barometric Pressure is an example of an absolute pressure). Vacuum Pressure (measured at inHgVac) is zero-referenced against atmospheric pressure, so it is the difference between system pressure and atmospheric pressure. Decreasing vacuum pressure corresponds to increasing absolute pressure and vice versa.

Q. The terms Barometric Pressure and Atmospheric Pressure are used interchangeable in this instruction.

R. System air inleakage is not checked with exhaust unit Rotameter in this test.

S. Use caution when opening 2-PCV-6-330 and 2-DRV-2-713, -714, and -715. Ensure immediate area around these valves is free of debris that could be drawn into the Condenser or Condenser Vacuum Pumps during testing. Ensure dirt shield and screen are installed at 2-PCV-6-330 inlet.

T. Use caution when installing or removing test gauges; residual pressure or vacuum may be present.

U. Refer to GOI-7 for Condenser Vacuum Pump motor starting limitations.

Date _____

4.0 PREREQUISITE ACTIONS

NOTE

Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction section or subsection to which they apply.

4.1 Preliminary Actions

[1] **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. _____

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

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

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

[4] **VERIFY** current revisions and change paper for the referenced drawings have 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 data package. _____

[5] **EVALUATE** open items on Watts Bar Integrated Task Equipment List (WITEL), **AND**

ENSURE that they will NOT adversely affect the test performance. _____

Date _____

4.1 Preliminary Actions (continued)

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

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.6 _____

[7] **ENSURE** outstanding Design Change Notices (DCNs), Engineering Document Construction Releases (EDCRs) or Temporary Alterations (TAs) do NOT adversely impact testing, **AND**

ATTACH documentation of DCNs, EDCRs, and TAs that were reviewed to the data package. _____

[8] **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. _____

[9] **VERIFY** system cleanliness as required for the performance of this test has been completed in accordance with SMP-7.0.

A. Section 6.3 _____

B. Section 6.4 _____

C. Section 6.5 _____

D. Section 6.6 _____

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

Date _____

4.1 Preliminary Actions (continued)

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

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.6 _____

[12] **REVIEW** preventive maintenance records for equipment within the scope of this test, **AND**

VERIFY no conditions exist that will impact test performance.

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.6 _____

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

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.6 _____

Date _____

4.1 Preliminary Actions (continued)

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

A. Section 6.1 _____

B. Section 6.2 _____

C. Section 6.3 _____

D. Section 6.4 _____

E. Section 6.5 _____

F. Section 6.6 _____

Date _____

4.2 Special Tools, Measuring & Test Equipment, Parts & Supplies

[1] **OBTAIN** the following Measuring & Test Equipment (M&TE), or equivalent, **AND**

RECORD on the M&TE Log:

DESCRIPTION	MINIMUM RANGE	REQUIRED ACCURACY
Digital Stopwatch*	N/A	±0.1 sec/hr
Clamp-on Multi-meter	600V AC 200A	±2.4% of reading + 1 digit
Torque Screwdriver	0 - 35 in-lbs	±5% of scale
Barometer	27 - 31 inHg	±0.4% of range
Hotwire Anemometer	0-3000 FPM	±5% of reading
Vacuum Gauge A	0 - 30inHg	±0.5% of scale
Vacuum Gauge B	0 - 30inHg	±0.5% of scale
Vacuum Gauge C	0 - 30inHg	±0.5% of scale
Vacuum Gauge D	0 - 30inHg	±0.5% of scale
Pressure Gauge A	0 - 5 PSI	±1% of scale
Pressure Gauge B	0 - 5 PSI	±1% of scale
Pressure Gauge C	0 - 5 PSI	±1% of scale

* Digital stopwatches are calibrated one time only and do not require recalibration.

_____

[2] **ENSURE** the following are available:

A. One (1) handheld jumper for momentary use _____

B. Two (2) switched jumpers _____

C. Two (2) jumpers for use on secondary contacts in 480V switchgear _____

Date _____

4.3 Field Preparations

[1] **ENSURE** the following systems are in service or operable to the extent necessary to perform this test:

A. System 1, Main Steam* _____

B. System 2, Condensate* _____

C. System 3A, Main Feedwater* _____

D. System 5, Extraction Steam* _____

E. System 6, Heater Drains and Vents* _____

F. System 7, Turbine Extraction Traps and Drains* _____

G. System 12, Auxiliary Boiler*
(N/A if seal steam is to be supplied by Unit 1) _____

H. System 24, Raw Cooling Water _____

I. System 30O, Turbine Building Pump & Space Coolers _____

J. System 32, Control Air _____

K. System 37, Gland Seal Water _____

L. System 46A, Main Feedwater Controls* _____

M. System 47, Turbogenerator Controls* _____

N. System 261, Integrated Computer System _____

O. System 203, 480V Unit Power _____

P. System 209, Turbine MOV Power _____

* System included only because it is required to support condenser evacuation

Date _____

4.3 Field Preparations (continued)

NOTES

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

[2] **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-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT _____

B. 2-XA-55-3A-46C, CONDENSER VACUUM LO _____

C. 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO _____

D. 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO _____

E. 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO _____

F. 2-XA-55-3B-55D, MFPT CONDENSER VACUUM LO _____

Date _____

4.3 Field Preparations (continued)

[3] **ENSURE** the following ICS Points are in scan:

A. P2270A, MFPT A CONDENSER VACUUM PRESS _____

B. P2271A, MFPT B CONDENSER VACUUM PRESS _____

C. P2263A, COND ZONE A BACKPRESSURE _____

D. P2264A, COND ZONE B BACKPRESSURE _____

E. P2265A, COND ZONE C BACKPRESSURE _____

F. P1133A, COND ZONE C HOTWELL PRESS _____

G. Y9006C, CONDENSER VACUUM LOW _____

H. F2260A, COND VAC PMP AIR EXH FLOW 1 _____

I. F2700A, COND VAC PMP AIR EXHAUST FLOW 2 _____

J. T2467A, COND VAC HDR TEMP _____

K. Y8003A, RCW TEMP UNIT 2 _____

[4] **ENSURE** plant instruments required for test performance listed on Appendix C, Permanent Plant Instrumentation Log, have been placed in service and are within their calibration interval, **AND**

RECORD in Appendix C.

A. Section 6.3 _____

B. Section 6.5 _____

C. Section 6.6 _____

[5] **ENSURE** M&TE required for test performance has been (as required) filled, vented, placed in service and recorded on M&TE Log in SMP-9.0.

A. Section 6.5 _____

B. Section 6.6 _____

Date _____

4.3 Field Preparations (continued)

[6] **VERIFY** M&TE calibration due dates will support the completion of this test performance.

A. Section 6.5 _____

B. Section 6.6 _____

[7] **ENSURE** Gland Seal Water is established to the Condenser Vacuum Pumps per 2-SOI-37.01 or equivalent approved Temporary Operating Plan (TOP) for this purpose.

Instruction Used: ☐ 2-SOI-37.01 ☐ TOP: _____ _____

[8] **ENSURE** Raw Cooling Water is in service to the Condenser Vacuum Pump Seal Water coolers per 2-SOI-2&3.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-2&3.01 ☐ TOP: _____ _____

[9] **ENSURE** Raw Cooling Water is in service to the Condenser Vacuum Pump Area Cooler per SOI-30.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ SOI-30.01 ☐ TOP: _____ _____

[10] **PERFORM** switch lineup per Appendix D. _____

[11] **PERFORM** electrical breaker lineup per Appendix E. _____

[12] **PERFORM** valve lineup per Appendix F. _____

Date _____

4.3 Field Preparations (continued)

[13] **ENSURE** permanent screen and dirt shield is installed on suction of 2-PCV-6-330, CONDENSER VACUUM BREAKER, [T14G/720], and

ENSURE there is no debris in the area of suction around 2-PCV-6-330.

A. Section 6.2 _____

B. Section 6.6 _____

[14] **ENSURE** temporary test connections are installed in the following instrument sense lines:

A. Downstream (low side/pump side) sense line for 2-PDS-2-171, COND VAC PMP A INLET VLV CONT, [T14H/685]. _____

B. Downstream (low side/pump side) sense line for 2-PDS-2-176, COND VAC PMP B INLET VLV CONT, [T14G/685]. _____

C. Downstream (low side/pump side) sense line for 2-PDS-2-181, COND VAC PMP C INLET VLV CONT, [T14G/685]. _____

Date _____

4.3 Field Preparations (continued)

[15] **INSTALL** the following temporary 0-30 inHg vacuum Test Gauges at the following locations.

A. Vacuum Gauge A:
Downstream (low side/pump side) test connection of 2-PDS-2-171, COND VAC PMP A INLET VLV CONT [T14H/685].

_____ 1st

_____ CV

B. Vacuum Gauge B:
Downstream (low side/pump side) test connection of 2-PDS-2-176, COND VAC PMP B INLET VLV CONT [T14G/685].

_____ 1st

_____ CV

C. Vacuum Gauge C:
Downstream (low side/pump side) test connection of 2-PDS-2-181, COND VAC PMP C INLET VLV CONT [T14G/685].

_____ 1st

_____ CV

D. Vacuum Gauge D:
Upstream (high side) test connection of 2-PDI-2-175, CONDENSER VACUUM PMP 2B SUCTION STRN PRESS, at 2-ISIV-2-388B, [2-L-509, T15G/685].

_____ 1st

_____ CV

Date _____

4.3 Field Preparations (continued)

[16] **INSTALL** the following temporary 0-5 PSI pressure Test Gauges at the following locations:

A. Pressure Gauge A:
at the test connection downstream of 2-ISV-37-17, PRESSURE SWITCH ISOLATION VAC PUMP 2A, [T14H/685].

_____
1st

_____
CV

B. Pressure Gauge B:
at the test connection downstream of 2-ISV-37-18, PRESSURE SWITCH ISOLATION VAC PUMP 2B, [T14G/685].

_____
1st

_____
CV

C. Pressure Gauge C:
at the test connection downstream of 2-ISV-37-19, PRESSURE SWITCH ISOLATION VAC PUMP 2C, [T14G/685].

_____
1st

_____
CV

Date _____

4.4 Approvals and Notifications

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

Preoperational Startup Manager Signature	Date

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

U2 US/SRO/SM Signature	Date

Date _____

5.0 ACCEPTANCE CRITERIA

A. The Condenser Vacuum Pumps' Seal Water Tank level is maintained correctly

COMPONENT	Opens on decreasing Seal Water Tank Level.	Closes on increasing Seal Water Tank Level
2-LSV-2-169	6.3.1[4]	6.3.1[6]
2-LSV-2-174	6.3.2[4]	6.3.2[6]
2-LSV-2-179	6.3.3[4]	6.3.3[6]

B. The Condenser Vacuum Pumps' Seal Water Recirculation Pumps manual and automatic controls, interlocks, annunciations, alarms, and indications operate correctly.

COMPONENT	Controls and Indications	Alarms and Annunciations
2-PMP-2-171D	Subsection 6.4.1	Subsection 6.5.1
2-PMP-2-176D	Subsection 6.4.2	Subsection 6.5.2
2-PMP-2-181D	Subsection 6.4.3	Subsection 6.5.3

C. The Condenser Vacuum Pumps' Seal Water Recirculation Pumps automatically start when their respective Condenser Vacuum Pump starts.

COMPONENT	Auto-start on associated CVP start
2-PMP-2-171D	6.5.1[15]
2-PMP-2-176D	6.5.2[15]
2-PMP-2-181D	6.5.3[15]

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

D. The Condenser Vacuum Pumps' manual and automatic controls, interlocks, annunciations, alarms, and indications operate correctly.

COMPONENT	Controls and Indications
2-PMP-2-171	Subsection 6.5.1
2-PMP-2-176	Subsection 6.5.2
2-PMP-2-181	Subsection 6.5.3

E. The Condenser Vacuum Pumps automatically start on low pump suction vacuum.

COMPONENT	Auto-start on low vacuum
2-PMP-2-171	6.5.4[29]
2-PMP-2-176	6.5.4[23]
2-PMP-2-181	6.5.4[26]

F. The Condenser Vacuum Pumps respond appropriately to a Bus Undervoltage condition.

COMPONENT	Stops on Bus Undervoltage	Restarts after bus voltage is restored
2-PMP-2-171	6.5.1[27]	6.5.1[30]
2-PMP-2-176	6.5.2[27]	6.5.2[30]
2-PMP-2-181	6.5.3[27]	6.5.3[30]

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

G. The Condenser Vacuum Pumps' Suction Valves operate correctly.

COMPONENT	Opens on decreasing ΔP between associated CVP and Suction Header
2-FCV-2-171	6.5.4[17]
2-FCV-2-176	6.5.4[10]
2-FCV-2-181	6.5.4[13]

H. The Condenser Vacuum Pumps' Backpressure Relief Valves operate correctly.

COMPONENT	Opens on increasing pressure in associated CVP Seal Water Tank
2-FCV-2-250	6.5.1[51]
2-FCV-2-246	6.5.2[51]
2-FCV-2-248	6.5.3[51]

I. The Condenser Vacuum Pump Exhaust Bypass Valve operates correctly and indicating lights show correct valve position.

COMPONENT	Controls and Indications
2-FCV-2-255	Section 6.1

J. The Condenser Vacuum Breaker Valve operates correctly

COMPONENT	Controls and Indications
2-PCV-6-330	Section 6.2

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

K. The Condenser Vacuum Pumps operate within their design parameters.

Condenser Vacuum Pump 2A					
Suction Pressure	**Measured Suction Pressure**[4]		**Air Flow**[3]		**Motor Operates at ≤ 114.5 kVA**[5]
Atmospheric	N/A		N/A		6.6.1[11]
15 inHgA	**≤ 14.83 inHgA**	6.6.1[16]	**≥ 894 SCFM**[1]	6.6.1[16]	6.6.1[16]
5 inHgA	**≤ 4.83 inHgA**	6.6.1[20]	**≥ 276 SCFM**	6.6.1[20]	6.6.1[20]
3 inHgA	**≤ 2.83 inHgA**	6.6.1[23]	**≥ 160 SCFM**	6.6.1[23]	6.6.1[23]
2 inHgA	**≤ 1.83 inHgA**	6.6.1[26]	**≥ 95.5 SCFM**	6.6.1[26]	6.6.1[26]
1 inHgA	**≤ 0.83 inHgA**	6.6.1[30]	**≥ 32.5 SCFM**[2]	6.6.1[30]	6.6.1[30]

Condenser Vacuum Pump 2B					
Suction Pressure	**Measured Suction Pressure**[4]		**Air Flow**[3]		**Motor Operates at ≤ 114.5 kVA**[5]
Atmospheric	N/A		N/A		6.6.2[11]
15 inHgA	**≤ 14.83 inHgA**	6.6.2[16]	**≥ 849 SCFM**[1]	6.6.2[16]	6.6.2[16]
5 inHgA	**≤ 4.83 inHgA**	6.6.2[20]	**≥ 290 SCFM**	6.6.2[20]	6.6.2[20]
3 inHgA	**≤ 2.83 inHgA**	6.6.2[23]	**≥ 171 SCFM**	6.6.2[23]	6.6.2[23]
2 inHgA	**≤ 1.83 inHgA**	6.6.2[26]	**≥ 99 SCFM**	6.6.2[26]	6.6.2[26]
1 inHgA	**≤ 0.83 inHgA**	6.6.2[30]	**≥ 29 SCFM**[2]	6.6.2[30]	6.6.2[30]

1 Meeting this value will also verify acceptance criteria of ≥800 SCFM at 15 inHgA

2 Meeting this value will also verify acceptance criteria of ≥15 SCFM at 1 inHgA

3 Required air flow calculated using Nash Shop Test Curves (see Appendix H).

4 Required Pump Suction Pressure conservatively adjusted for instrument inaccuracies.

5 Verifies motor operates below overload conditions. (See Appendix H for calculation.)

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

Condenser Vacuum Pump 2C					
Suction Pressure	**Measured Suction Pressure**[4]		**Air Flow**[3]		**Motor Operates at ≤ 114.5 kVA**[5]
Atmospheric	N/A		N/A		6.6.3[11]
15 inHgA	**≤ 14.83 inHgA**	6.6.3[16]	**≥ 856 SCFM**[1]	6.6.3[16]	6.6.3[16]
5 inHgA	**≤ 4.83 inHgA**	6.6.3[20]	**≥ 267 SCFM**	6.6.3[20]	6.6.3[20]
3 inHgA	**≤ 2.83 inHgA**	6.6.3[23]	**≥ 154 SCFM**	6.6.3[23]	6.6.3[23]
2 inHgA	**≤ 1.83 inHgA**	6.6.3[26]	**≥ 92.5 SCFM**	6.6.3[26]	6.6.3[26]
1 inHgA	**≤ 0.83 inHgA**	6.6.3[30]	**≥ 33 SCFM**[2]	6.6.3[30]	6.6.3[30]

1 Meeting this value will also verify acceptance criteria of ≥800 SCFM at 15 inHgA

2 Meeting this value will also verify acceptance criteria of ≥15 SCFM at 1 inHgA

3 Required air flow calculated using Nash Shop Test Curves (see Appendix H).

4 Required Pump Suction Pressure conservatively adjusted for instrument inaccuracies.

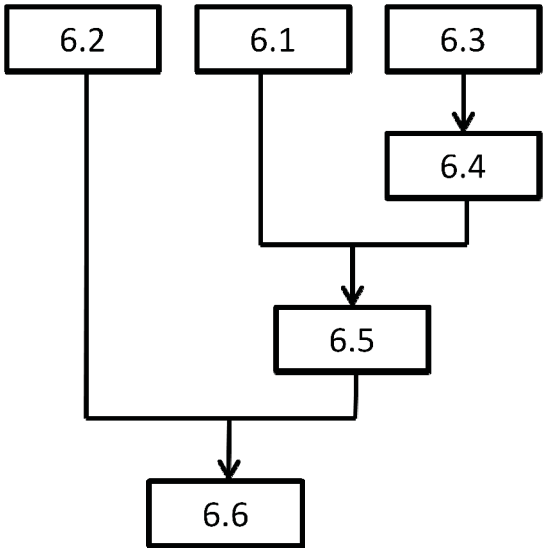
5 Verifies motor operates below overload conditions. (See Appendix H for calculation.)

Date _____

6.0 PERFORMANCE

NOTES

1) The Sections of this test shall be performed per the flow chart below.



2) Section 6.1 may be performed any time prior to Section 6.5; likewise, Section 6.2 may be performed any time prior to Section 6.6.

3) System piping and components should be visually monitored for vibration during steady state and transient operations.

4) This instruction does not quantitatively verify instrument setpoints. Unless otherwise noted, system parameters are recorded for information only.

5) Atmospheric conditions can change quickly. During performance of Section 6.6, record atmospheric pressure at least once per shift using Data Sheet 6 and at Test Director discretion during other Sections of this test. This is necessary to accurately determine the required vacuum pressure which corresponds to the required absolute pressure of the instruction.

6) This instruction uses both Absolute Pressure and Vacuum Pressure to quantify condenser pressure. Absolute Pressure (measured at inHgA) is zero-referenced against a perfect vacuum, so it is the true total pressure in the system. (Barometric Pressure is an example of an absolute pressure). Vacuum Pressure (measured at inHgVac) is zero-referenced against atmospheric pressure, so it is the difference between system pressure and atmospheric pressure. Decreasing vacuum pressure corresponds to increasing absolute pressure and vice versa.

Date _____

6.1 Condenser Vacuum Exhaust Bypass Valve Logic

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

[2] **PLACE** 2-HS-2-255, EXH BYPASS COND VAC PMPS, [2-M-3], to OPEN, **AND**

VERIFY the following:

A. At 2-HS-2-255:

- Red Light is ON _____
- Green Light is OFF _____

B. 2-FCV-2-255, COND VAC PUMP EXH HDR FILTER BYPASS, [T14G/708], is OPEN (locally). _____

[3] **PLACE** 2-HS-2-255, EXH BYPASS COND VAC PMPS, to CLOSE, **AND**

VERIFY the following:

A. At 2-HS-2-255:

- Red Light is OFF _____
- Green Light is ON _____

B. 2-FCV-2-255, COND VAC PUMP EXH HDR FILTER BYPASS, is CLOSED (locally). _____

[4] **PLACE** 2-HS-2-255, EXH BYPASS COND VAC PMPS, to OPEN, **AND**

VERIFY 2-FCV-2-255, COND VAC PUMP EXH HDR FILTER BYPASS, is OPEN (locally). _____

[5] **VERIFY** successful completion of this Section (6.1). **(Acc Crit)** _____

Date _____

6.2 Condenser Vacuum Breaker Valve Logic

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

CAUTION

Use caution when opening 2-PCV-6-330. Ensure immediate area around valve is free of debris that could enter the Condenser.

[2] **PLACE** 2-HS-6-330A, VACUUM BREAKER COND A, [2-M-3], to OPEN, **AND**

VERIFY the following:

A. At 2-HS-6-330A:

- Red Light is ON _____
- Green Light is OFF _____

B. **VERIFY** 2-PCV-6-330, CONDENSER VACUUM BREAKER, [T14G/720] is OPEN (locally). _____

[3] **PLACE** 2-HS-6-330A, VACUUM BREAKER COND A, to CLOSE, **AND**

VERIFY the following:

A. At 2-HS-6-330A:

- Red Light is OFF _____
- Green Light is ON _____

B. **VERIFY** 2-PCV-6-330, CONDENSER VACUUM BREAKER, is CLOSED (locally). _____

Date _____

6.2 Condenser Vacuum Breaker Valve Logic (continued)

[4] **PLACE** 2-HS-6-330B, CONDENSER VACUUM BREAKER, [2-JB-291-2053, T14G/729], to OPEN, **AND**

VERIFY 2-PCV-6-330, CONDENSER VACUUM BREAKER, is OPEN (locally). _____

[5] **PLACE** 2-HS-6-330B, CONDENSER VACUUM BREAKER, to CLOSE, **AND**

VERIFY 2-PCV-6-330, CONDENSER VACUUM BREAKER, is CLOSED (locally). _____

[6] **VERIFY** successful completion of this Section (6.2). **(Acc Crit)** _____

Date _____

6.3 Condenser Vacuum Pump Seal Water Makeup Valves Logic

NOTES

1) The CVP Seal Water Tank level controls use a fixed low tank level setpoint and a fixed high tank level reset point based on the tank level (elevation) at which the Seal Water Tank Level Switch is installed. The exterior of the Level Switch float chamber is marked "LOW LIQUID LEVEL" at the approximate setpoint level. The reset point is required to be below the tank overflow level and should be approximately 3/4" above the "LOW LIQUID LEVEL" mark.

2) The measurement marks on the Seal Water Tank Level Gauges are approximate and are used for reference only. The "LOW LIQUID LEVEL" mark on exterior of the Level Switch float chamber corresponds to approximately the 15" mark on the Level Guage, and the tank overflow level corresponds to approximately the 17" mark. Acceptance Criteria is qualitatively based on Level Switch actuation and its ability to maintain Tank level rather than on specific tank level values at which it actuates.

3) Seal Water Tank Level Makeup Valves are solenoid valves and do not have direct position indication. Valve position may be observed by several methods:

   - By hearing the solenoid click as it energizes and de-energizes.
   - By visually observing a step change in the Seal Water Tank level trend (e.g. observing a decreasing tank level begin increasing).
   - By using a ferrous object to determine when the solenoid is magnetized. The solenoid coil will be magnetized when it is energized.
   - By observing the solenoid change temperature. The solenoid will heat up when it is energized.

4) Subsections 6.3.1 through 6.3.3 may be performed in any order provided the steps within each Subsection are performed in the order written.

Date _____

6.3.1 CVP 2A Seal Water Makeup Valve Logic

NOTE

Condenser Vacuum Pump 2A Seal Water Tank level recorded in steps 6.3.1[4] and 6.3.1[6] is for information only.

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

[2] **ENSURE** Condenser Vacuum Pump 2A Seal Water Tank level is above approximately 15" on 2-LG-2-168, COND VAC PUMP A SEAL WATER LEVEL, [T14H/685]. _____

[3] **THROTTLE OPEN** 2-DRV-37-572, COND VAC PUMP 2A SEAL GSW DRAIN, [T14H/685], **AND**

SLOWLY DRAIN the Condenser Vacuum Pump 2A Seal Water Tank. _____

[4] **VERIFY** 2-LSV-2-169, COND VAC PMP A SEAL WATER MAKE UP, [T14H/685], OPENS at or below approximately 15" on 2-LG-2-168, COND VAC PUMP A SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-168): _____inches _____

[5] **CLOSE** 2-DRV-37-572, COND VAC PUMP 2A SEAL WATER TANK DRAIN. _____

[6] **VERIFY** 2-LSV-2-169, COND VAC PMP A SEAL WATER MAKE UP, CLOSES before the Seal Water Tank level reaches 17" on 2-LG-2-168, COND VAC PUMP A SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-168): _____inches _____

[7] **VERIFY** no water flows from the Condenser Vacuum Pump 2A Seal Water Tank overflow line. _____

Date _____

6.3.2 CVP 2B Seal Water Makeup Valve Logic

NOTE

Condenser Vacuum Pump 2B Seal Water Tank level recorded in steps 6.3.2[4] and 6.3.2[6] is for information only.

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

[2] **ENSURE** Condenser Vacuum Pump 2B Seal Water Tank level is above approximately 15" on 2-LG-2-173, COND VAC PUMP B SEAL WATER LEVEL, [T14G/685]. _____

[3] **THROTTLE OPEN** 2-DRV-37-571, COND VAC PUMP 2B SEAL GSW DRAIN, [T14G/685], **AND**

SLOWLY DRAIN the Condenser Vacuum Pump 2B Seal Water Tank. _____

[4] **VERIFY** 2-LSV-2-174, COND VAC PMP B SEAL WATER MAKE UP, [T14G/685], OPENS at or below approximately 15" on 2-LG-2-173, COND VAC PUMP B SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-173): _____inches _____

[5] **CLOSE** 2-DRV-37-571, COND VAC PUMP 2B SEAL WATER TANK DRAIN. _____

[6] **VERIFY** 2-LSV-2-174, COND VAC PMP B SEAL WATER MAKE UP, CLOSES before the Seal Water Tank level reaches 17" on 2-LG-2-173, COND VAC PUMP B SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-173): _____inches _____

[7] **VERIFY** no water flows from the Condenser Vacuum Pump 2B Seal Water Tank overflow line. _____

Date _____

6.3.3 CVP 2C Seal Water Makeup Valve Logic

NOTE

Condenser Vacuum Pump 2C Seal Water Tank level recorded in steps 6.3.3[4] and 6.3.3[6] is for information only.

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

[2] **ENSURE** Condenser Vacuum Pump 2C Seal Water Tank level is above approximately 15" on 2-LG-2-178, COND VAC PUMP C SEAL WATER LEVEL, [T14G/685]. _____

[3] **THROTTLE OPEN** 2-DRV-37-565, COND VAC PUMP 2C SEAL GSW DRAIN, [T14G/685], **AND**

SLOWLY DRAIN the Condenser Vacuum Pump 2C Seal Water Tank. _____

[4] **VERIFY** 2-LSV-2-179, COND VAC PMP C SEAL WATER MAKE UP, [T14G/685], OPENS at or below approximately 15" on 2-LG-2-178, COND VAC PUMP C SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-178): _____inches _____

[5] **CLOSE** 2-DRV-37-565, COND VAC PUMP 2C SEAL WATER TANK DRAIN. _____

[6] **VERIFY** 2-LSV-2-179 COND VAC PMP C SEAL WATER MAKE UP, CLOSES before the Seal Water Tank level reaches 17" on 2-LG-2-178, COND VAC PUMP C SEAL WATER LEVEL. **(Acc Crit)**

Tank Level (2-LG-2-178): _____inches _____

[7] **VERIFY** no water flows from the Condenser Vacuum Pump 2C Seal Water Tank overflow line. _____

Date _____

6.4 Condenser Vacuum Pump Recirculating Pumps Logic

NOTE

Subsections 6.4.1 through 6.4.3 may be performed in any order provided the steps within each Subsection are performed in the order written.

6.4.1 CVP 2A Seal Water Recirculating Pump Manual Logic

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

[2] **ENSURE** Section 6.3 has been completed. _____

[3] **ENSURE** Condenser Vacuum Pump 2A Seal Water Tank level is at or above level of 2-VTV-2-1045, COND VACUUM WATER PMP A VENT VALVE, [T14H/685]. _____

[4] **OPEN** 2-VTV-2-1045, COND VACUUM WATER PMP A VENT VALVE, to vent trapped air from 2-PMP-2-171D, **THEN**

CLOSE 2-VTV-2-1045 _____

[5] **ENSURE** 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, [2-JB-291-269, T14G/685] is RESET. _____

[6] **VERIFY** the following:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, [T14H/685], is OFF _____
- At 2-BKR-2-171D, COND VAC PMP 2A RECIRC PMP, [TURB MOV BD 2A, Compartment 3B], Red Light is OFF _____

Date _____

6.4.1 CVP 2A Seal Water Recirculating Pump Manual Logic (continued)

[7] **PRESS AND HOLD** TEST pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, STARTS _____
- At 2-BKR-2-171D, COND VAC PMP 2A RECIRC PMP, Red Light is ON. _____

[8] **RELEASE** TEST pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, STOPS. _____
- At 2-BKR-2-171D, COND VAC PMP 2A RECIRC PMP, Red Light is OFF. _____

[9] **PRESS** SAFE STOP pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP. _____

[10] **PRESS AND HOLD** TEST pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, is OFF _____
- At 2-BKR-2-171D, COND VAC PMP 2A RECIRC PMP, Red Light is OFF _____

[11] **RELEASE** TEST pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP. _____

[12] **VERIFY** successful completion of this Subsection (6.4.1). **(Acc Crit)** _____

Date _____

6.4.2 CVP 2B Seal Water Recirculating Pump Manual Logic

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

[2] **ENSURE** Section 6.3 has been completed. _____

[3] **ENSURE** Condenser Vacuum Pump 2B Seal Water Tank level is at or above level of 2-VTV-2-1046, COND VACUUM WATER PMP B VENT VALVE, [T14G/685]. _____

[4] **OPEN** 2-VTV-2-1046, COND VACUUM WATER PMP B VENT VALVE, to vent trapped air from 2-PMP-2-176D, **THEN**

CLOSE 2-VTV-2-1046 _____

[5] **ENSURE** 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, [2-JB-291-269, T14G/685] is RESET. _____

[6] **VERIFY** the following:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, [T14G/685], is OFF _____
- At 2-BKR-2-176D, COND VAC PMP 2B RECIRC PMP, [TURB MOV BD 2A, Compartment 5A], Red Light is OFF _____

Date _____

6.4.2 CVP 2B Seal Water Recirculating Pump Manual Logic (continued)

[7] **PRESS AND HOLD** TEST pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, STARTS _____
- At 2-BKR-2-176D, COND VAC PMP 2B RECIRC PMP, Red Light is ON. _____

[8] **RELEASE** TEST pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, STOPS. _____
- At 2-BKR-2-176D, COND VAC PMP 2B RECIRC PMP, Red Light is OFF. _____

[9] **PRESS** SAFE STOP pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP. _____

[10] **PRESS AND HOLD** TEST pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, is OFF _____
- At 2-BKR-2-176D, COND VAC PMP 2B RECIRC PMP, Red Light is OFF _____

[11] **RELEASE** TEST pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP. _____

[12] **VERIFY** successful completion of this Subsection (6.4.2). **(Acc Crit)** _____

Date _____

6.4.3 CVP 2C Seal Water Recirculating Pump Manual Logic

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

[2] **ENSURE** Section 6.3 has been completed. _____

[3] **ENSURE** Condenser Vacuum Pump 2C Seal Water Tank level is at or above level of 2-VTV-2-1047, COND VACUUM WATER PMP C VENT VALVE, [T14G/685]. _____

[4] **OPEN** 2-VTV-2-1047, COND VACUUM WATER PMP C VENT VALVE, to vent trapped air from 2-PMP-2-181D, **THEN**

CLOSE 2-VTV-2-1047 _____

[5] **ENSURE** 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, [2-JB-291-269, T14G/685] is RESET. _____

[6] **VERIFY** the following:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, [T14G/685], is OFF _____
- At 2-BKR-2-181D, COND VAC PMP 2C RECIRC PMP, [TURB MOV BD 2B, Compartment 10D], Red Light is OFF _____

Date _____

6.4.3 CVP 2C Seal Water Recirculating Pump Manual Logic (continued)

[7] **PRESS AND HOLD** TEST pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, STARTS _____
- At 2-BKR-2-181D, COND VAC PMP 2C RECIRC PMP, Red Light is ON. _____

[8] **RELEASE** TEST pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, STOPS. _____
- At 2-BKR-2-181D, COND VAC PMP 2C RECIRC PMP, Red Light is OFF. _____

[9] **PRESS** SAFE STOP pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP. _____

[10] **PRESS AND HOLD** TEST pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, is OFF _____
- At 2-BKR-2-181D, COND VAC PMP 2C RECIRC PMP, Red Light is OFF _____

[11] **RELEASE** TEST pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP. _____

[12] **VERIFY** successful completion of this Subsection (6.4.3). **(Acc Crit)** _____

Date _____

6.5 Condenser Vacuum Pumps Logic

NOTES

1) Section 6.5 operates the Condenser Vacuum Pumps with the Main Condenser and the Main Feed Pump Turbine Condensers isolated.
2) Low Seal Water Pressure Annunciator Windows 2-XA-55-3A-47C, -48C, and -49C contacts must be closed for approximately 8 seconds for window to actuate and open for approximately 8 seconds for window to clear.
3) Condenser Vacuum Pump Handswitches in the Main Control Room (2-HS-2-171A, -176A, -181A) spring return to P AUTO from both START and STOP positions.
4) Subsections 6.5.1 through 6.5.3 may be performed in any order provided the steps within each Subsection are performed in the order written. Subsection 6.5.4 is performed after Subsections 6.5.1 through 6.5.3 are complete.
5) Refer to GOI-7 for Condenser Vacuum Pump motor starting limitations.

Date _____

6.5.1 CVP 2A Logic

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

[2] **ENSURE** Sections 6.1 and 6.4 have been completed _____

[3] **RACK OUT** 2-BKR-2-171, CONDENSER VACUUM PMP 2A, [480V UNIT BD 2A, Compartment 3D]. _____

[4] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-171, CONDENSER VACUUM PMP 2A _____

NOTES

1) The following step will allow the CVP 2A control circuit to fully function while 2-BKR-2-171 is in TEST. Breaker will open and close in response to control signals, but CVP 2A itself will remain off.
2) See drawing 6947D02 for typical 480V Switchgear pin arrangement.

[5] **INSTALL** temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-171. (Drawing 6948D26)

A. Designated A-1:
Between Pin 3TP (wire 3DC) and Pin 13 (wire 3DC) _____ 1st _____ CV

B. Designated A-2:
Between Pin 6TP (wire 3DT) and Pin 9 (wire 3DT1) _____ 1st _____ CV

[6] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-171, CONDENSER VACUUM PMP 2A. _____ 1st _____ CV

[7] **RACK** 2-BKR-2-171, CONDENSER VACUUM PMP 2A, to the TEST position. _____

Date _____

6.5.1 CVP 2A Logic (continued)

[8] **VERIFY** 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is CLEAR. _____

[9] **VERIFY** Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is NORMAL (Green) _____

CAUTION

The following step involves work in an energized panel (250V DC Control Power).

NOTE

The following step will disable the Condenser Vacuum Pump 2A auto-start on low suction vacuum function.

[10] **LIFT** vendor wire 30 at TB30, Point 30 (opposite field wire 3DC5) in CVP 2A skid-mounted terminal box. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[11] **INSTALL** switched jumper (designated TS-171) between TB30 Point 30 and TB10 Point 6 in CVP 2A skid-mounted terminal box. (Drawing 2-45W2747-4), **AND**

ENSURE that the jumper test switch is OPEN (OFF).

_____ 1st

_____ CV

[12] **ENSURE** 2-ISV-32-2014, CNTL AIR ISOL VLV TO 2-FCV-2-250/2-FCV-2-171, [T14H/685] is CLOSED. _____

[13] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, [2-M-3], to P AUTO. _____

Date _____

6.5.1 CVP 2A Logic (continued)

[14] **PRESS** CONDENSER VACUUM PUMP 2A BKR TEST CLOSE pushbutton at 480V UNIT BD 2A, Compartment 3D, **AND**

VERIFY the following:

A. At 2-BKR-2-171, CONDENSER VACUUM PMP 2A:

- Red Light is ON _____
- Green Light is OFF _____
- Red Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, [T14H/685], is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], STARTS _____

C. Annunciation & Alarms:

- 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is in ALARM _____
- Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is in ALARM (Red) _____

[15] **PRESS** RESET pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, STARTS **(Acc Crit)** _____
- 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is NORMAL (Green) _____

Date _____

6.5.1 CVP 2A Logic (continued)

[16] **PRESS** CONDENSER VACUUM PUMP 2A BKR TEST TRIP pushbutton at 480V UNIT BD 2A, Compartment 3D, **AND**

VERIFY the following:

A. At 2-BKR-2-171, CONDENSER VACUUM PMP 2A:

- Red Light is OFF _____
- Green Light is ON _____
- Green Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-171D, COND VACUUM WATER PMP A, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____

C. Annunciation & Alarms:

- 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is NORMAL (Green) _____

[17] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], to OFF. _____

[18] **PRESS** SAFE STOP pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP, [2-JB-291-269, T14G/685]. _____

Date _____

6.5.1 CVP 2A Logic (continued)

NOTE

Annunciator Window 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, will continue to alarm and clear throughout the remainder of this section until step 6.5.1[50] as CVP 2A is simulated started and stopped.

[19] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, [2-M-3], to START, **AND**

VERIFY the following

A. At 2-HS-2-171A:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

B. At 2-BKR-2-171, CONDENSER VACUUM PMP 2A:

- Red Light is ON _____
- Green Light is OFF _____

[20] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, to STOP, **AND**

VERIFY the following:

A. At 2-HS-2-171A:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

B. At 2-BKR-2-171, CONDENSER VACUUM PMP 2A:

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.1 CVP 2A Logic (continued)

[21] **PRESS** TEST pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, [2-JB-291-269, T14G/685], **AND**

VERIFY at 2-HS-2-171A, COND VACUUM PMP A:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

[22] **PRESS** SAFE STOP pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY at 2-HS-2-171A, COND VACUUM PMP A:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[23] **PRESS** RESET pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY at 2-HS-2-171A, COND VACUUM PMP A:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[24] **PRESS** TEST pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY at 2-BKR-2-171, CONDENSER VACUUM PMP 2A:

- Red Light is ON _____
- Green Light is OFF _____

Date _____

6.5.1 CVP 2A Logic (continued)

CAUTION

Steps 6.5.1[25], 6.5.1[26], and 6.5.1[29] involve work in an energized panel (250V DC Control Power).

NOTE

The following two steps will setup and simulate a loss of bus voltage in 480V Unit Board 2A.

[25] **LIFT** wire (3DC2) from Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1, [480V UNIT BD 2A, Compartment 5A]. (Drawing 6948D28)

_____ 1st

_____ CV

[26] **MOMENTARILY PLACE** a handheld jumper between Terminal Point 2 (wire 3DTP) and Point 5 (wire 3DT1) on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1. (Drawing 6948D28)

_____ 1st

_____ CV

[27] **VERIFY** at 2-BKR-2-171, CONDENSER VACUUM PMP 2A: **(Acc Crit)**

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.1 CVP 2A Logic (continued)

NOTE

Steps 6.5.1[28] and 6.5.1[32] will temporarily restore and then disable CVP 2A auto-start on low vacuum in order to prove CVP 2A auto-start on restoration of bus voltage..

[28] **PLACE** Test Switch TS-171 to the CLOSED (ON) position. _____

NOTE

The following step will simulate a restoration of bus voltage in 480V Unit Board 2A.

[29] **LAND** wire (3DC2) on Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1. (Drawing 6948D28) _____ 1st _____ CV

[30] **VERIFY** at 2-BKR-2-171, CONDENSER VACUUM PMP 2A: **(Acc Crit)**

- Red Light is ON _____
- Green Light is OFF _____

[31] **PRESS** SAFE STOP pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A. _____

[32] **PLACE** Test Switch TS-171 to the OPEN (OFF) position. _____

[33] **RACK OUT** 2-BKR-2-171, CONDENSER VACUUM PMP 2A. _____

[34] **REMOVE** front cover of 2-BKR-2-171, CONDENSER VACUUM PMP 2A. _____

[35] **PLACE** 2-BKR-2-171, CONDENSER VACUUM PMP 2A, Overload Trip Switch (OTS) mechanical lock-in lever (DTA plunger) to the TRIP position. _____

[36] **INSTALL** front cover of 2-BKR-2-171, CONDENSER VACUUM PMP 2A. _____ 1st _____ CV

Date _____

6.5.1 CVP 2A Logic (continued)

[37] **PRESS** RESET pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A. _____

[38] **RACK** 2-BKR-2-171, CONDENSER VACUUM PMP 2A to the TEST position. _____

[39] **VERIFY** the following:

A. White Light at 2-HS-2-171A, COND VACUUM PMP A, is ON _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM _____

C. Motor Tripout Buzzer is ON _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM (Red). _____

NOTES

1) The following step will electrically reset the Overload Trip Switch (OTS) for 2-BKR-2-171. Do not hold the Handswitch in STOP if the coil does not de-energize to avoid overheating the OTS coil.
2) If the following step does not reset the OTS, then the OTS may be reset manually by pressing the OTS Reset button on the front of the Breaker, and a Test Deficiency Notice shall be initiated.

[40] **MOMENTARILY PLACE** 2-HS-2-171A, COND VACUUM PMP A, to STOP, **AND**

VERIFY the following:

A. White Light at 2-HS-2-171A is OFF _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is CLEAR _____

C. Motor Tripout Buzzer is OFF _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is NORMAL (Green). _____

Date _____

6.5.1 CVP 2A Logic (continued)

[41] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, to STOP PULL TO LOCK. _____

[42] **RACK OUT** 2-BKR-2-171, CONDENSER VACUUM PMP 2A. _____

[43] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-171, CONDENSER VACUUM PMP 2A, **AND**

REMOVE temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-171: (Drawing 6948D26) (Jumpers were installed in step 6.5.1[5])

A. Designated A-1:
Between Pin 3TP (wire 3DC) and Pin 13 (wire 3DC) _____ 1st _____ CV

B. Designated A-2:
Between Pin 6TP (wire 3DT) and Pin 9 (wire 3DT1) _____ 1st _____ CV

[44] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-171, CONDENSER VACUUM PMP 2A, **AND**

TORQUE between 25 and 35 in-lbs.

M&TE: _____ _____ 1st _____ CV

[45] **RACK** 2-BKR-2-171, CONDENSER VACUUM PMP 2A, to the CONNECTED position. _____

[46] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER to AUTO. _____

[47] **PRESS** RESET pushbutton 2-HS-2-171D, CONDENSER VACUUM PUMP 2A RECIRC PUMP. _____

[48] **OPEN** 2-ISV-32-2014, CNTL AIR ISOL VLV TO 2-FCV-2-250/2-FCV-2-171. _____

Date _____

6.5.1 CVP 2A Logic (continued)

[49] **ENSURE** Condenser Vacuum Pump 2A Seal Water Tank level is at or above approximately 15" on 2-LG-2-168, COND VAC PUMP A SEAL WATER LEVEL, [T14H/685]. _____

[50] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, to START, **AND**

VERIFY the following

- 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, [T14H/685], is ON. _____
- 2-PMP-2-171D, COND VACUUM WATER PMP A, is ON _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is ON _____
- 2-FCV-2-171, CONDENSER VACUUM PMP 2A SUCTION ISOL, [T14H/685], is OPEN. _____
- 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is NORMAL (Green) _____

NOTE

The following step will cause the pressure in the CVP 2A Seal Water Tank to rise. The pressure switch that controls 2-FCV-2-250 has a setpoint of 4 PSIG (±0.5PSI).

[51] **SLOWLY CLOSE** 2-CKV-2-710, CONDENSER VACUUM PMP 2A DISCHARGE CHECK, [T14H/685], **AND**

VERIFY 2-FCV-2-250, CONDENSER VACUUM PMP 2A VACUUM BREAKER, [T14H/685], begins to OPEN. **(Acc Crit)** _____

Date _____

6.5.1 CVP 2A Logic (continued)

[52] **RELEASE** handle of 2-CKV-2-710, CONDENSER VACUUM PMP 2A DISCHARGE CHECK, **AND**

VERIFY 2-FCV-2-250, CONDENSER VACUUM PMP 2A VACUUM BREAKER, CLOSES. _____

[53] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, to STOP PULL TO LOCK, **AND**

VERIFY the following

- 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, is OFF. _____
- 2-PMP-2-171D, COND VACUUM WATER PMP A, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____
- 2-FCV-2-171, CONDENSER VACUUM PMP 2A SUCTION ISOL, is CLOSED. _____
- 2-XA-55-3A-47C, VACUUM PMP A SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 47-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-251) is NORMAL (Green) _____

[54] **VERIFY** successful completion of this Subsection (6.5.1). **(Acc Crit)** _____

Date _____

6.5.2 CVP 2B Logic

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

[2] **ENSURE** Sections 6.1 and 6.4 have been completed _____

[3] **RACK OUT** 2-BKR-2-176, CONDENSER VACUUM PMP 2B, [480V UNIT BD 2B, Compartment 4C]. _____

[4] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____

NOTES

1) The following step will allow the CVP 2B control circuit to fully function while 2-BKR-2-176 is in TEST. Breaker will open and close in response to control signals, but CVP 2B itself will remain off.
2) See drawing 6947D02 for typical 480V Switchgear pin arrangement.

[5] **INSTALL** temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-176. (Drawing 6948D35)

A. Designated B-1:
Between Pin 3TP (wire 4CC) and Pin 13 (wire 4CC) _____ 1st _____ CV

B. Designated B-2:
Between Pin 6TP (wire 4CT) and Pin 9 (wire 4CT1) _____ 1st _____ CV

[6] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____ 1st _____ CV

[7] **RACK** 2-BKR-2-176, CONDENSER VACUUM PMP 2B, to the TEST position. _____

Date _____

6.5.2 CVP 2B Logic (continued)

[8] **VERIFY** 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is CLEAR. _____

[9] **VERIFY** Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is NORMAL (Green) _____

CAUTION

The following step involves work in an energized panel (250V DC Control Power).

NOTE

The following step will disable the Condenser Vacuum Pump 2B auto-start on low suction vacuum function.

[10] **LIFT** vendor wire 30 at TB30, Point 30 (opposite field wire 4CC5) in CVP 2B skid-mounted terminal box. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[11] **INSTALL** switched jumper (designated TS-176) between TB30 Point 30 and TB10 Point 6 in CVP 2B skid-mounted terminal box. (Drawing 2-45W2747-4), **AND**

ENSURE that the jumper test switch is OPEN (OFF).

_____ 1st

_____ CV

[12] **ENSURE** 2-ISV-32-2017, CONTROL AIR ISOLATION VALVE TO 2-FCV-2-176, [T14G/685] is CLOSED. _____

[13] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, [2-M-3], to P AUTO. _____

Date _____

6.5.2 CVP 2B Logic (continued)

[14] **PRESS** CONDENSER VACUUM PUMP 2B BKR TEST CLOSE pushbutton at 480V UNIT BD 2B, Compartment 4C, **AND**

VERIFY the following:

A. At 2-BKR-2-176, CONDENSER VACUUM PMP 2B:

- Red Light is ON _____
- Green Light is OFF _____
- Red Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, [T14G/685], is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], STARTS _____

C. Annunciation & Alarms:

- 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is in ALARM _____
- Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is in ALARM (Red) _____

[15] **PRESS** RESET pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, STARTS **(Acc Crit)** _____
- 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is NORMAL (Green) _____

Date _____

6.5.2 CVP 2B Logic (continued)

[16] **PRESS** CONDENSER VACUUM PUMP 2B BKR TEST TRIP pushbutton at 480V UNIT BD 2B, Compartment 4C, **AND**

VERIFY the following:

A. At 2-BKR-2-176, CONDENSER VACUUM PMP 2B:

- Red Light is OFF _____
- Green Light is ON _____
- Green Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-176D, COND VACUUM WATER PMP B, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____

C. Annunciation & Alarms:

- 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is NORMAL (Green) _____

[17] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], to OFF. _____

[18] **PRESS** SAFE STOP pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP, [2-JB-291-269, T14G/685]. _____

Date _____

6.5.2 CVP 2B Logic (continued)

NOTE

Annunciator Window 2-XA-55-3A-48C, VACUUM PMP A SEAL WATER PRESS LO, will continue to alarm and clear throughout the remainder of this section until step 6.5.2[50] as CVP 2B is simulated started and stopped.

[19] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, [2-M-3], to START, **AND**

VERIFY the following

A. At 2-HS-2-176A:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

B. At 2-BKR-2-176, CONDENSER VACUUM PMP 2B:

- Red Light is ON _____
- Green Light is OFF _____

[20] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, to STOP, **AND**

VERIFY the following:

A. At 2-HS-2-176A:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

B. At 2-BKR-2-176, CONDENSER VACUUM PMP 2B:

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.2 CVP 2B Logic (continued)

[21] **PRESS** TEST pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2A, [2-JB-291-269, T14G/685], **AND**

VERIFY at 2-HS-2-176A, COND VACUUM PMP B:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

[22] **PRESS** SAFE STOP pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B, **AND**

VERIFY at 2-HS-2-176A, COND VACUUM PMP B:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[23] **PRESS** RESET pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B, **AND**

VERIFY at 2-HS-2-176A, COND VACUUM PMP B:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[24] **PRESS** TEST pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B, **AND**

VERIFY at 2-BKR-2-176, CONDENSER VACUUM PMP 2B:

- Red Light is ON _____
- Green Light is OFF _____

Date _____

6.5.2 CVP 2B Logic (continued)

CAUTION

Steps 6.5.2[25], 6.5.2[26], and 6.5.2[29] involve work in an energized panel (250V DC Control Power).

NOTE

The following two steps will setup and simulate a loss of bus voltage in 480V Unit Board 2B.

[25] **LIFT** wire (4CC2) from Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1, [480V UNIT BD 2B, Compartment 6A]. (Drawing 6948D37)

_____ 1st

_____ CV

[26] **MOMENTARILY PLACE** a handheld jumper between Terminal Point 2 (wire 4CTP) and Point 5 (wire 4CT1) on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1. (Drawing 6948D37)

_____ 1st

_____ CV

[27] **VERIFY** at 2-BKR-2-176, CONDENSER VACUUM PMP 2B: **(Acc Crit)**

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.2 CVP 2B Logic (continued)

NOTE

Steps 6.5.2[28] and 6.5.2[32] will temporarily restore and then disable CVP 2B auto-start on low vacuum in order to prove CVP 2B auto-start on restoration of bus voltage..

[28] **PLACE** Test Switch TS-176 to the CLOSED (ON) position. _____

NOTE

The following step will simulate a restoration of bus voltage in 480V Unit Board 2A.

[29] **LAND** wire (4CC2) on Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX1. (Drawing 6948D37) _____ 1st _____ CV

[30] **VERIFY** at 2-BKR-2-176, CONDENSER VACUUM PMP 2B: **(Acc Crit)**

- Red Light is ON _____
- Green Light is OFF _____

[31] **PRESS** SAFE STOP pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B. _____

[32] **PLACE** Test Switch TS-176 to the OPEN (OFF) position. _____

[33] **RACK OUT** 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____

[34] **REMOVE** front cover of 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____

[35] **PLACE** 2-BKR-2-176, CONDENSER VACUUM PMP 2B, Overload Trip Switch (OTS) mechanical lock-in lever (DTA plunger) to the TRIP position. _____

[36] **INSTALL** front cover of 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____ 1st _____ CV

Date _____

6.5.2 CVP 2B Logic (continued)

[37] **PRESS** RESET pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B. _____

[38] **RACK** 2-BKR-2-176, CONDENSER VACUUM PMP 2B to the TEST position. _____

[39] **VERIFY** the following:

A. White Light at 2-HS-2-176A, COND VACUUM PMP B, is ON _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM _____

C. Motor Tripout Buzzer is ON _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM (Red). _____

NOTES

1) The following step will electrically reset the Overload Trip Switch (OTS) for 2-BKR-2-176. Do not hold the Handswitch in STOP if the coil does not de-energize to avoid overheating the OTS coil.
2) If the following step does not reset the OTS, then the OTS may be reset manually by pressing the OTS Reset button on the front of the Breaker, and a Test Deficiency Notice shall be initiated.

[40] **MOMENTARILY PLACE** 2-HS-2-176A, COND VACUUM PMP B, to STOP, **AND**

VERIFY the following:

A. White Light at 2-HS-2-176A is OFF _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is CLEAR _____

C. Motor Tripout Buzzer is OFF _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is NORMAL (Green). _____

Date _____

6.5.2 CVP 2B Logic (continued)

[41] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, to STOP PULL TO LOCK. _____

[42] **RACK OUT** 2-BKR-2-176, CONDENSER VACUUM PMP 2B. _____

[43] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-176, CONDENSER VACUUM PMP 2B, **AND**

REMOVE temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-176: (Drawing 6948D35) (Jumpers were installed in step 6.5.2[5])

A. Designated B-1:
Between Pin 3TP (wire 4CC) and Pin 13 (wire 4CC) _____ 1st _____ CV

B. Designated B-2:
Between Pin 6TP (wire 4CT) and Pin 9 (wire 4CT1) _____ 1st _____ CV

[44] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-176, CONDENSER VACUUM PMP 2B, **AND**

TORQUE between 25 and 35 in-lbs.

M&TE: _____ _____ 1st _____ CV

[45] **RACK** 2-BKR-2-176, CONDENSER VACUUM PMP 2B, to the CONNECTED position. _____

[46] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER to AUTO. _____

[47] **PRESS** RESET pushbutton 2-HS-2-176D, CONDENSER VACUUM PUMP 2B RECIRC PUMP. _____

[48] **OPEN** 2-ISV-32-2017, CONTROL AIR ISOLATION VALVE TO 2-FCV-2-176. _____

Date _____

6.5.2 CVP 2B Logic (continued)

[49] **ENSURE** Condenser Vacuum Pump 2B Seal Water Tank level is at or above approximately 15" on 2-LG-2-173, COND VAC PUMP B SEAL WATER LEVEL, [T14G/685]. _____

[50] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, to START, **AND**

VERIFY the following

- 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, [T14G/685], is ON. _____
- 2-PMP-2-176D, COND VACUUM WATER PMP B, is ON _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is ON _____
- 2-FCV-2-176, CONDENSER VACUUM PMP 2B SUCTION ISOL, [T14G/685], is OPEN. _____
- 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is NORMAL (Green) _____

NOTE

The following step will cause the pressure in the CVP 2B Seal Water Tank to rise. The pressure switch that controls 2-FCV-2-246 has a setpoint of 4 PSIG (±0.5PSI).

[51] **SLOWLY CLOSE** 2-CKV-2-711, CONDENSER VACUUM PMP 2B DISCHARGE CHECK, [T14G/685], **AND**

VERIFY 2-FCV-2-246, CONDENSER VACUUM PMP 2B VACUUM BREAKER, [T14G/685], begins to OPEN. **(Acc Crit)** _____

Date _____

6.5.2 CVP 2B Logic (continued)

[52] **RELEASE** handle of 2-CKV-2-711, CONDENSER VACUUM PMP 2B DISCHARGE CHECK, **AND**

VERIFY 2-FCV-2-246, CONDENSER VACUUM PMP 2B VACUUM BREAKER, CLOSES. _____

[53] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, to STOP PULL TO LOCK, **AND**

VERIFY the following

- 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, is OFF. _____
- 2-PMP-2-176D, COND VACUUM WATER PMP B, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____
- 2-FCV-2-176, CONDENSER VACUUM PMP 2B SUCTION ISOL, is CLOSED. _____
- 2-XA-55-3A-48C, VACUUM PMP B SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 48-C VACUUM PMP B SEAL WATER PRESS LO (PS-2-247) is NORMAL (Green) _____

[54] **VERIFY** successful completion of this Subsection (6.5.2). **(Acc Crit)** _____

Date _____

6.5.3 CVP 2C Logic

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

[2] **ENSURE** Sections 6.1 and 6.4 have been completed _____

[3] **RACK OUT** 2-BKR-2-181, CONDENSER VACUUM PMP 2C, [480V UNIT BD 2B, Compartment 4D]. _____

[4] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____

NOTES

1) The following step will allow the CVP 2C control circuit to fully function while 2-BKR-2-181 is in TEST. Breaker will open and close in response to control signals, but CVP 2C itself will remain off.
2) See drawing 6947D02 for typical 480V Switchgear pin arrangement.

[5] **INSTALL** temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-181. (Drawing 6948D35)

A. Designated C-1:
Between Pin 3TP (wire 4DC) and Pin 13 (wire 4DC) _____ 1st _____ CV

B. Designated C-2:
Between Pin 6TP (wire 4DT) and Pin 9 (wire 4DT1) _____ 1st _____ CV

[6] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____ 1st _____ CV

[7] **RACK** 2-BKR-2-181, CONDENSER VACUUM PMP 2C, to the TEST position. _____

Date _____

6.5.3 CVP 2C Logic (continued)

[8] **VERIFY** 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is CLEAR. _____

[9] **VERIFY** Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP C SEAL WATER PRESS LO (PS-2-249) is NORMAL (Green) _____

CAUTION

The following step involves work in an energized panel (250V DC Control Power).

NOTE

The following step will disable the Condenser Vacuum Pump 2C auto-start on low suction vacuum function.

[10] **LIFT** vendor wire 30 at TB30, Point 30 (opposite field wire 4DC5) in CVP 2C skid-mounted terminal box. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[11] **INSTALL** switched jumper (designated TS-181) between TB30 Point 30 and TB10 Point 6 in CVP 2C skid-mounted terminal box. (Drawing 2-45W2747-4), **AND**

ENSURE that the jumper test switch is OPEN (OFF).

_____ 1st

_____ CV

[12] **ENSURE** 2-ISV-32-2019, CNTL AIR ISOL VLV TO 2-FCV-2-248/2-FCV-2-181, [T14G/685] is CLOSED. _____

[13] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, [2-M-3], to P AUTO. _____

Date _____

6.5.3 CVP 2C Logic (continued)

[14] **PRESS** CONDENSER VACUUM PUMP 2C BKR TEST CLOSE pushbutton at 480V UNIT BD 2B, Compartment 4D, **AND**

VERIFY the following:

A. At 2-BKR-2-181, CONDENSER VACUUM PMP 2C:

- Red Light is ON _____
- Green Light is OFF _____
- Red Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, [T14G/685], is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], STARTS _____

C. Annunciation & Alarms:

- 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is in ALARM _____
- Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP C SEAL WATER PRESS LO (PS-2-249) is in ALARM (Red) _____

[15] **PRESS** RESET pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, **AND**

VERIFY the following:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, STARTS **(Acc Crit)** _____
- 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP C SEAL WATER PRESS LO (PS-2-249) is NORMAL (Green) _____

Date _____

6.5.3 CVP 2C Logic (continued)

[16] **PRESS** CONDENSER VACUUM PUMP 2C BKR TEST TRIP pushbutton at 480V UNIT BD 2B, Compartment 4D, **AND**

VERIFY the following:

A. At 2-BKR-2-181, CONDENSER VACUUM PMP 2C:

- Red Light is OFF _____
- Green Light is ON _____
- Green Flag at Breaker Panel _____

B. Locally:

- 2-PMP-2-181D, COND VACUUM WATER PMP C, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____

C. Annunciation & Alarms:

- 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP C SEAL WATER PRESS LO (PS-2-249) is NORMAL (Green) _____

[17] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER, [T14G/685], to OFF. _____

[18] **PRESS** SAFE STOP pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP, [2-JB-291-269, T14G/685]. _____

Date _____

6.5.3 CVP 2C Logic (continued)

NOTE

Annunciator Window 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, will continue to alarm and clear throughout the remainder of this section until step 6.5.3[50] as CVP 2C is simulated started and stopped.

[19] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, [2-M-3], to START, **AND**

VERIFY the following

A. At 2-HS-2-181A:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

B. At 2-BKR-2-181, CONDENSER VACUUM PMP 2C:

- Red Light is ON _____
- Green Light is OFF _____

[20] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, to STOP, **AND**

VERIFY the following:

A. At 2-HS-2-181A:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

B. At 2-BKR-2-181, CONDENSER VACUUM PMP 2C:

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.3 CVP 2C Logic (continued)

[21] **PRESS** TEST pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, [2-JB-291-269, T14G/685], **AND**

VERIFY at 2-HS-2-181A, COND VACUUM PMP C:

- Red Light is ON _____
- Green Light is OFF _____
- White Light is OFF _____

[22] **PRESS** SAFE STOP pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, **AND**

VERIFY at 2-HS-2-181A, COND VACUUM PMP C:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[23] **PRESS** RESET pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, **AND**

VERIFY at 2-HS-2-181A, COND VACUUM PMP C:

- Red Light is OFF _____
- Green Light is ON _____
- White Light is OFF _____

[24] **PRESS** TEST pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, **AND**

VERIFY at 2-BKR-2-181, CONDENSER VACUUM PMP 2C:

- Red Light is ON _____
- Green Light is OFF _____

Date _____

6.5.3 CVP 2C Logic (continued)

CAUTION

Steps 6.5.3[25], 6.5.3[26], and 6.5.3[29] involve work in an energized panel (250V DC Control Power).

NOTE

The following two steps will setup and simulate a loss of bus voltage in 480V Unit Board 2B.

[25] **LIFT** wire (4DC2) from Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX2, [480V UNIT BD 2B, Compartment 6A]. (Drawing 6948D37)

_____ 1st

_____ CV

[26] **MOMENTARILY PLACE** a handheld jumper between Terminal Point 2 (wire 4DTP) and Point 5 (wire 4DT1) on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX2. (Drawing 6948D37)

_____ 1st

_____ CV

[27] **VERIFY** at 2-BKR-2-181, CONDENSER VACUUM PMP 2C: **(Acc Crit)**

- Red Light is OFF _____
- Green Light is ON _____

Date _____

6.5.3 CVP 2C Logic (continued)

NOTE

Steps 6.5.3[28] and 6.5.3[32] will temporarily restore and then disable CVP 2C auto-start on low vacuum in order to prove CVP 2C auto-start on restoration of bus voltage..

[28] **PLACE** Test Switch TS-181 to the CLOSED (ON) position. _____

NOTE

The following step will simulate a restoration of bus voltage in 480V Unit Board 2B.

[29] **LAND** wire (4DC2) on Terminal Point 1 on 480-V BUS UNDERVOLTAGE AUX RELAY 27BX2. (Drawing 6948D37) _____ 1st _____ CV

[30] **VERIFY** at 2-BKR-2-181, CONDENSER VACUUM PMP 2C: **(Acc Crit)**

- Red Light is ON _____
- Green Light is OFF _____

[31] **PRESS** SAFE STOP pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C. _____

[32] **PLACE** Test Switch TS-181 to the OPEN (OFF) position. _____

[33] **RACK OUT** 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____

[34] **REMOVE** front cover of 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____

[35] **PLACE** 2-BKR-2-181, CONDENSER VACUUM PMP 2C, Overload Trip Switch (OTS) mechanical lock-in lever (DTA plunger) to the TRIP position. _____

[36] **INSTALL** front cover of 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____ 1st _____ CV

Date _____

6.5.3 CVP 2C Logic (continued)

[37] **PRESS** RESET pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C. _____

[38] **RACK** 2-BKR-2-181, CONDENSER VACUUM PMP 2C to the TEST position. _____

[39] **VERIFY** the following:

A. White Light at 2-HS-2-181A, COND VACUUM PMP C, is ON _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM _____

C. Motor Tripout Buzzer is ON _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is in ALARM (Red). _____

NOTES

1) The following step will electrically reset the Overload Trip Switch (OTS) for 2-BKR-2-181. Do not hold the Handswitch in STOP if the coil does not de-energize to avoid overheating the OTS coil.
2) If the following step does not reset the OTS, then the OTS may be reset manually by pressing the OTS Reset button on the front of the Breaker, and a Test Deficiency Notice shall be initiated.

[40] **MOMENTARILY PLACE** 2-HS-2-181A, COND VACUUM PMP C, to STOP, **AND**

VERIFY the following:

A. White Light at 2-HS-2-181A is OFF _____

B. 2-XA-55-1B-14E, M-1 THRU M-6 MOTOR TRIPOUT, is CLEAR _____

C. Motor Tripout Buzzer is OFF _____

D. Unit 2 Alarm Events Display Screen indicates 14-E M-1 THRU M-6 MOTOR TRIPOUT, is NORMAL (Green). _____

Date _____

6.5.3 CVP 2C Logic (continued)

[41] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, to STOP PULL TO LOCK. _____

[42] **RACK OUT** 2-BKR-2-181, CONDENSER VACUUM PMP 2C. _____

[43] **REMOVE** secondary contact cover on the top rear of 2-BKR-2-181, CONDENSER VACUUM PMP 2C, **AND**

REMOVE temporary jumpers between the following stationary secondary side contacts of 2-BKR-2-181: (Drawing 6948D35) (Jumpers were installed in step 6.5.3[5])

A. Designated C-1:
Between Pin 3TP (wire 4DC) and Pin 13 (wire 4DC) _____ 1st _____ CV

B. Designated C-2:
Between Pin 6TP (wire 4DT) and Pin 9 (wire 4DT1) _____ 1st _____ CV

[44] **REPLACE** secondary contact cover on the top rear of 2-BKR-2-181, CONDENSER VACUUM PMP 2A, **AND**

TORQUE between 25 and 35 in-lbs.

M&TE: _____ _____ 1st _____ CV

[45] **RACK** 2-BKR-2-181, CONDENSER VACUUM PMP 2C, to the CONNECTED position. _____

[46] **PLACE** 2-HS-30-883, CONDENSER VACUUM PUMP AREA COOLER to AUTO. _____

[47] **PRESS** RESET pushbutton 2-HS-2-181D, CONDENSER VACUUM PUMP 2C RECIRC PUMP. _____

[48] **OPEN** 2-ISV-32-2019, CNTL AIR ISOL VLV TO 2-FCV-2-248/2-FCV-2-181. _____

Date _____

6.5.3 CVP 2C Logic (continued)

[49] **ENSURE** Condenser Vacuum Pump 2C Seal Water Tank level is at or above approximately 15" on 2-LG-2-178, COND VAC PUMP C SEAL WATER LEVEL, [T14G/685]. _____

[50] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, to START, **AND**

VERIFY the following

- 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, [T14H/685], is ON. _____
- 2-PMP-2-181D, COND VACUUM WATER PMP C, is ON _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is ON _____
- 2-FCV-2-181, CONDENSER VACUUM PMP 2C SUCTION ISOL, [T14H/685], is OPEN. _____
- 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP A SEAL WATER PRESS LO (PS-2-249) is NORMAL (Green) _____

NOTE

The following step will cause the pressure in the CVP 2C Seal Water Tank to rise. The pressure switch that controls 2-FCV-2-248 has a setpoint of 4 PSIG (±0.5PSI).

[51] **SLOWLY CLOSE** 2-CKV-2-712, CONDENSER VACUUM PMP 2C DISCHARGE CHECK, [T14G/685], **AND**

VERIFY 2-FCV-2-248, CONDENSER VACUUM PMP 2C VACUUM BREAKER, [T14H/685], begins to OPEN. **(Acc Crit)** _____

Date _____

6.5.3 CVP 2C Logic (continued)

[52] **RELEASE** handle of 2-CKV-2-712, CONDENSER VACUUM PMP 2C DISCHARGE CHECK, **AND**

VERIFY 2-FCV-2-248, CONDENSER VACUUM PMP 2C VACUUM BREAKER, CLOSES. _____

[53] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, to STOP PULL TO LOCK, **AND**

VERIFY the following

- 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, is OFF. _____
- 2-PMP-2-181D, COND VACUUM WATER PMP C, is OFF _____
- 2-CLR-30-883, CONDENSER VACUUM PUMP AREA COOLER, is OFF _____
- 2-FCV-2-181, CONDENSER VACUUM PMP 2C SUCTION ISOL, is CLOSED. _____
- 2-XA-55-3A-49C, VACUUM PMP C SEAL WATER PRESS LO, is CLEAR _____
- Unit 2 Alarm Events Display Screen indicates 49-C VACUUM PMP C SEAL WATER PRESS LO (PS-2-249) is NORMAL (Green) _____

[54] **VERIFY** successful completion of this Subsection (6.5.3). **(Acc Crit)** _____

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum

[1] **ENSURE** Subsections 6.5.1, 6.5.2, and 6.5.3 have been completed. _____

CAUTION

Steps 6.5.4[2] through 6.5.4[5] involve work in energized panels (250V DC Control Power).

[2] **REMOVE** the switched jumpers from the following locations:

[2.1] Designated TS-171:
in CVP 2A skid-mounted terminal box between TB30 Point 30 and TB10 Point 6.
(Drawing 2-45W2747-4)

_____ 1st

_____ CV

[2.2] Designated TS-176:
in CVP 2B skid-mounted terminal box between TB30 Point 30 and TB10 Point 6.
(Drawing 2-45W2747-4)

_____ 1st

_____ CV

[2.3] Designated TS-181:
in CVP 2C skid-mounted terminal box between TB30 Point 30 and TB10 Point 6.
(Drawing 2-45W2747-4)

_____ 1st

_____ CV

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum (continued)

NOTE

The following three steps will restore and enable the Condenser Vacuum Pumps' auto-start on low vacuum function that was disabled in steps 6.5.1[10], 6.5.2[10], and 6.5.3[10].

[3] **LAND** vendor wire 30 at TB30, Point 30 (opposite field wire 3DC5) in CVP 2A skid-mounted terminal box, [T14H/685]. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[4] **LAND** vendor wire 30 at TB30, Point 30 (opposite field wire 4CC5) in CVP 2B skid-mounted terminal box, [T14G/685]. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[5] **LAND** vendor wire 30 at TB30, Point 30 (opposite field wire 4DC5) in CVP 2C skid-mounted terminal box, [T14G/685]. (Drawing 2-45W2747-4)

_____ 1st

_____ CV

[6] **PLACE** 2-HS-2-171A, COND VACUUM PMP A, [2-M-3], to P AUTO, **AND**

VERIFY 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, [T14H/685], STARTS. _____

[7] **ALLOW** Condenser Vacuum Pump suction header vacuum to stabilize on Vacuum Gauge D.

CVP Header Vacuum: _____ inHgVac _____

[8] **PLACE** 2-HS-2-176A, COND VACUUM PMP B, [2-M-3], to P AUTO, **AND**

VERIFY 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, [T14G/685], remains OFF. _____

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum (continued)

[9] **PRESS** TEST pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B, [2-JB-291-269, T14G/685], **AND**

VERIFY 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, STARTS. _____

NOTE

2-FCV-2-176 should not open until Condenser Vacuum Pump 2B draws enough vacuum within itself to approach the suction header vacuum. The differential pressure switch that controls 2-FCV-2-176 has a setpoint of 2.0 inHgDiff (±0.5 inHg).

[10] **VERIFY** 2-FCV-2-176, CONDENSER VACUUM PMP 2B SUCTION ISOL, [T14G/685], OPENS. **(Acc Crit)** _____

[11] **PLACE** 2-HS-2-181A, COND VACUUM PMP C, [2-M-3], to P AUTO, **AND**

VERIFY 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, [T14G/685], remains OFF. _____

[12] **PRESS** TEST pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, [2-JB-291-269], **AND**

VERIFY 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, STARTS. _____

NOTE

2-FCV-2-181 should not open until Condenser Vacuum Pump 2C draws enough vacuum within itself to approach the suction header vacuum. The differential pressure switch that controls 2-FCV-2-181 has a setpoint of 2.0 inHgDiff (±0.5 inHg).

[13] **VERIFY** 2-FCV-2-181, CONDENSER VACUUM PMP 2C SUCTION ISOL, [T14G/685], OPENS. **(Acc Crit)** _____

[14] **PRESS** SAFE STOP pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, STOPS. _____

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum (continued)

[15] **PRESS** RESET pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, remains OFF. _____

[16] **PRESS** TEST pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A, **AND**

VERIFY 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, STARTS. _____

NOTE

2-FCV-2-171 should not open until Condenser Vacuum Pump 2A draws enough vacuum within itself to approach the suction header vacuum. The differential pressure switch that controls 2-FCV-2-171 has a setpoint of 2.0 inHgDiff (±0.5 inHg).

[17] **VERIFY** 2-FCV-2-171, CONDENSER VACUUM PMP 2A SUCTION ISOL, [T14G/685], OPENS. **(Acc Crit)**

[18] **PRESS** SAFE STOP pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C. _____

[19] **PRESS** SAFE STOP pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B. _____

[20] **PRESS** SAFE STOP pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A. _____

[21] **PRESS** RESET pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B. _____

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum (continued)

NOTES

1) Valve 2-DRV-2-714 is throttled open in the following step and will remain open for the remainder of this section.
2) The pressure switches that control the auto-start feature of the Condenser Vacuum Pumps have a setpoint of 25.5 inHgVac (±0.3inHg).

[22] **THROTTLE OPEN** 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN, [T14G/685], until the Condenser Vacuum Pump suction header vacuum begins to gradually decrease as read on Vacuum Gauge D. _____

[23] **VERIFY** 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, STARTS. **(Acc Crit)** _____

[24] **PRESS** RESET pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C. _____

[25] **PRESS** SAFE STOP pushbutton 2-HS-2-176B, CONDENSER VACUUM PUMP 2B, **AND**

VERIFY 2-PMP-2-176, CONDENSER VACUUM PUMP 2B, STOPS. _____

[26] **VERIFY** 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, STARTS. **(Acc Crit)** _____

[27] **PRESS** RESET pushbutton 2-HS-2-171B, CONDENSER VACUUM PUMP 2A. _____

[28] **PRESS** SAFE STOP pushbutton 2-HS-2-181B, CONDENSER VACUUM PUMP 2C, **AND**

VERIFY 2-PMP-2-181, CONDENSER VACUUM PUMP 2C, STOPS. _____

[29] **VERIFY** 2-PMP-2-171, CONDENSER VACUUM PUMP 2A, STARTS. **(Acc Crit)** _____

Date _____

6.5.4 CVP Auto-Start on Low Condenser Vacuum (continued)

[30] **PLACE** the following Handswitches to STOP PULL TO LOCK:

- 2-HS-2-171A, COND VACUUM PMP A _____
- 2-HS-2-176A, COND VACUUM PMP B _____
- 2-HS-2-181A, COND VACUUM PMP C _____

[31] **PRESS** the RESET pushbutton on the following Handswitches:

- 2-HS-2-176B, CONDENSER VACUUM PUMP 2B _____
- 2-HS-2-181B, CONDENSER VACUUM PUMP 2C _____

[32] **CLOSE** 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN. _____

Date _____

6.6 Condenser Vacuum Pumps Performance

NOTES

1) Atmospheric conditions can change quickly. Atmospheric pressure should be recorded at least once per shift using Data Sheet 6 during performance of this Section.
2) Subsections 6.6.1 through 6.6.3 may be performed in any order provided the steps within each Subsection are performed in the order written.
3) Refer to GOI-7 for Condenser Vacuum Pump motor starting limitations.
4) All air flow traverses are taken in the condenser vacuum exhaust line at T14G/729.

6.6.1 Condenser Vacuum Pump 2A Individual Performance

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

[2] **ENSURE** Sections 6.2 and 6.5 have been completed _____

[3] **ENSURE** 2-FCV-2-255 is OPEN using 2-HS-2-255, EXH BYPASS COND VAC PMPS, [2-M-3]. _____

CAUTION

Use caution when opening 2-PCV-6-330. Ensure immediate area around valve is free of debris that could enter the Condenser.

[4] **ENSURE** 2-PCV-6-330 is OPEN using 2-HS-6-330A, VACUUM BREAKER COND A, [2-M-3]. _____

[5] **OPEN** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

[6] **OPEN** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[7] **BEGIN** recording Atmospheric Pressure on Data Sheet 6 (N/A if pressure recording has already begun) _____

[8] **VERIFY** Condenser Vacuum Pump Suction Header vacuum is at atmospheric pressure (0 inHgVac on Vacuum Gauge D). _____

[9] **START** 2-PMP-2-171 using 2-HS-2-171A, COND VACUUM PMP A, [2-M-3]. _____

[10] **RECORD** Condenser Vacuum Pump 2A operating data at Atmospheric Pressure on Data Sheets 1 and 4, **AND**

PERFORM calculations on Data Sheets 1 and 4. _____

[11] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA at Atmospheric Pressure from Data Sheet 1, **AND**

VERIFY motor kVA meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____

[12] **CLOSE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL. _____

[13] **CLOSE** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

NOTES

1) Throttle 2-ISV-2-1034 and -1035 in the following step first. If CVP 2A suction pressure of 15 inHgA cannot be obtained using 2-ISV-2-1034 and -1035, then 2-ISV-2-706 may be used in lieu of or in addition to them.
2) The intent of the following step is to increase the air flow rate of CVP 2A without increasing the suction pressure above 15 inHgA (to verify CVP 2A flow at 15 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[14] **THROTTLE** any or all of the following valves to obtain a pressure of 14.83 inHgA (or slightly less) on Vacuum Gauge A.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[15] **RECORD** Condenser Vacuum Pump 2A operating data at 15 inHgA on Data Sheets 1 and 4, **AND**

PERFORM calculations on Data Sheets 1 and 4. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[16] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 15 inHgA from Data Sheet 1, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 14.83 inHgA

_____ SCFM

Acc Crit: ≥ 894 SCFM

_____

[17] **ENSURE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL is CLOSED. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-713. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-ISV-2-1034 and/or -1035 in the following step first and then use 2-DRV-2-713 to fine-tune CVP 2A suction pressure if necessary.
2) The intent of the following step is to increase the air flow rate of CVP 2A without increasing the suction pressure above 5 inHgA (to verify CVP 2A flow at 5 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[18] **THROTTLE** any or all of the following valves to obtain a pressure of 4.83 inHgA (or slightly less) on Vacuum Gauge A.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-DRV-2-713, CONDENSER VACUUM PMP 2A SUCTION DRAIN, [T14H/685]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[19] **RECORD** Condenser Vacuum Pump 2A operating data at 5 inHgA on Data Sheets 1 and 4

PERFORM calculations on Data Sheets 1 and 4. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[20] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 5 inHgA from Data Sheet 1, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 4.83 inHgA

_____ SCFM

Acc Crit: ≥ 276 SCFM

_____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-713. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-713 in the following step first. If CVP 2A suction pressure of 3 inHgA cannot be obtained using 2-DRV-2-713, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2A without increasing the suction pressure above 3 inHgA (to verify CVP 2A flow at 3 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[21] **THROTTLE** any or all of the following valves to obtain a pressure of 2.83 inHgA (or slightly less) on Vacuum Gauge A.

- 2-DRV-2-713, CONDENSER VACUUM PMP 2A SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[22] **RECORD** Condenser Vacuum Pump 2A operating data at 3 inHgA on Data Sheets 1 and 4, **AND**

PERFORM calculations on Data Sheets 1 and 4. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[23] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 3 inHgA from Data Sheet 1, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 2.83 inHgA

_____ SCFM

Acc Crit: ≥ 160 SCFM

_____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-713. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-713 in the following step first. If CVP 2A suction pressure of 2 inHgA cannot be obtained using 2-DRV-2-713, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2A without increasing the suction pressure above 2 inHgA (to verify CVP 2A flow at 2 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[24] **THROTTLE** any or all of the following valves to obtain a pressure of 1.83 inHgA (or slightly less) on Vacuum Gauge A

- 2-DRV-2-713, CONDENSER VACUUM PMP 2A SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[25] **RECORD** Condenser Vacuum Pump 2A operating data at 2 inHgA on Data Sheets 1 and 4, **AND**

PERFORM calculations on Data Sheets 1 and 4. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[26] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 2 inHgA from Data Sheet 1, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 1.83 inHgA

_____ SCFM
Acc Crit: ≥ 95.5 SCFM

_____

[27] **ENSURE** the following valves are CLOSED.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL _____
- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL _____

CAUTION

Use caution when opening 2-DRV-2-713. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTE

The intent of the following step is to increase the air flow rate of CVP 2A without increasing the suction pressure above 1 inHgA (to verify CVP 2A flow at 1 inHgA). 2-DRV-2-713 should be throttled open slowly and the vacuum allowed to stabilize before recording air flow.

[28] **THROTTLE** 2-DRV-2-713, CONDENSER VACUUM PMP 2A SUCTION DRAIN, as open as possible while still maintaining suction pressure of 0.83 inHgA (or slightly less) on Vacuum Gauge A. _____

Date _____

6.6.1 Condenser Vacuum Pump 2A Individual Performance (continued)

[29] **RECORD** Condenser Vacuum Pump 2A operating data at 1 inHgA on Data Sheets 1 and 4, **AND**

PERFORM calculations on Data Sheets 1 and 4. _____

[30] **RECORD** Condenser Vacuum Pump 2A Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 1 inHgA from Data Sheet 1, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 0.83 inHgA

_____ SCFM
Acc Crit: ≥ 32.5 SCFM

_____

[31] **STOP** 2-PMP-2-171 by placing 2-HS-2-171A, COND VACUUM PMP A, to STOP PULL TO LOCK. _____

[32] **CLOSE** 2-DRV-2-713, CONDENSER VACUUM PMP 2A SUCTION DRAIN. _____

[33] **SUBMIT** a copy of the Condenser Vacuum Pump 2A performance data to Engineering for their review and evaluation, **AND**

RECORD name of engineer/department receiving data.

_____/_____ _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance

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

[2] **ENSURE** Sections 6.2 and 6.5 have been completed _____

[3] **ENSURE** 2-FCV-2-255 is OPEN using 2-HS-2-255, EXH BYPASS COND VAC PMPS, [2-M-3]. _____

CAUTION

Use caution when opening 2-PCV-6-330. Ensure immediate area around valve is free of debris that could enter the Condenser.

[4] **ENSURE** 2-PCV-6-330 is OPEN using 2-HS-6-330A, VACUUM BREAKER COND A, [2-M-3]. _____

[5] **OPEN** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

[6] **OPEN** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

[7] **BEGIN** recording Atmospheric Pressure on Data Sheet 6 (N/A if pressure recording has already begun) _____

[8] **VERIFY** Condenser Vacuum Pump Header vacuum is at atmospheric pressure (0 inHgVac on Vacuum Gauge D). _____

[9] **START** 2-PMP-2-176 using 2-HS-2-176A, COND VACUUM PMP B, [2-M-3]. _____

[10] **RECORD** Condenser Vacuum Pump 2B at Atmospheric Pressure operating data on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[11] **RECORD** the Motor Running kVA obtained from Condenser Vacuum Pump 2B at Atmospheric Pressure from Data Sheet 2, **AND**

VERIFY motor kVA meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____

[12] **CLOSE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL. _____

[13] **CLOSE** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL. _____

NOTES

1) Throttle 2-ISV-2-1034 and -1035 in the following step first. If CVP 2B suction pressure of 15 inHgA cannot be obtained using 2-ISV-2-1034 and -1035, then 2-ISV-2-706 may be used in lieu of or in addition to them.
2) The intent of the following step is to increase the air flow rate of CVP 2B without increasing the suction pressure above 15 inHgA (to verify CVP 2B flow at 15 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[14] **THROTTLE** any or all of the following valves to obtain a pressure of 14.83 inHgA (or slightly less) on Vacuum Gauge B.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[15] **RECORD** Condenser Vacuum Pump 2B operating data at 15 inHgA operating data on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

[16] **RECORD** Condenser Vacuum Pump 2B Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 15 inHgA from Data Sheet 2, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 14.83 inHgA

_____ SCFM
Acc Crit: ≥ 849 SCFM

_____

[17] **ENSURE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL is CLOSED. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-714. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-ISV-2-1034 and/or -1035 in the following step first and then use 2-DRV-2-714 to fine-tune CVP 2B suction pressure.
2) The intent of the following step is to increase the air flow rate of CVP 2B without increasing the suction pressure above 5 inHgA (to verify CVP 2B flow at 5 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[18] **THROTTLE** any or all of the following valves to obtain a pressure of 4.83 inHgA (or slightly less) on Vacuum Gauge B.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN, [T14G/685]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[19] **RECORD** Condenser Vacuum Pump 2B operating data at 5 inHgA on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[20] **RECORD** Condenser Vacuum Pump 2B Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 5 inHgA from Data Sheet 2, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 4.83 inHgA

_____ SCFM

Acc Crit: ≥ 290 SCFM

_____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-714. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-714 in the following step first. If CVP 2B suction pressure of 3 inHgA cannot be obtained using 2-DRV-2-714, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2B without increasing the suction pressure above 3 inHgA (to verify CVP 2B flow at 3 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[21] **THROTTLE** any or all of the following valves to obtain a pressure of 2.83 inHgA (or slightly less) on Vacuum Gauge B.

- 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[22] **RECORD** Condenser Vacuum Pump 2B operating data at 3 inHgA on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[23] **RECORD** Condenser Vacuum Pump 2B Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 3 inHgA from Data Sheet 2, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 2.83 inHgA

_____ SCFM

Acc Crit: ≥ 171 SCFM

_____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-714. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-714 in the following step first. If CVP 2B suction pressure of 2 inHgA cannot be obtained using 2-DRV-2-714, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2B without increasing the suction pressure above 2 inHgA (to verify CVP 2B flow at 2 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[24] **THROTTLE** any or all of the following valves to obtain a pressure of 1.83 inHgA (or slightly less) on Vacuum Gauge B

- 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[25] **RECORD** Condenser Vacuum Pump 2B operating data at 2 inHgA operating data on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[26] **RECORD** Condenser Vacuum Pump 2B Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 2 inHgA from Data Sheet 2, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 1.83 inHgA

_____ SCFM
Acc Crit: ≥ 99 SCFM

_____

[27] **ENSURE** the following valves are CLOSED

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL _____
- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL _____

CAUTION

Use caution when opening 2-DRV-2-714. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTE

The intent of the following step is to increase the air flow rate of CVP 2B without increasing the suction pressure above 1 inHgA (to verify CVP 2B flow at 1 inHgA). 2-DRV-2-714 should be throttled open slowly and the vacuum allowed to stabilize before recording air flow.

[28] **THROTTLE** 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN, as much as possible while still maintaining suction pressure of 0.83 inHgA (or slightly less) on Vacuum Gauge B. _____

Date _____

6.6.2 Condenser Vacuum Pump 2B Individual Performance (continued)

[29] **RECORD** Condenser Vacuum Pump 2B operating data at 1 inHgA on Data Sheets 2 and 4, **AND**

PERFORM calculations on Data Sheets 2 and 4. _____

[30] **RECORD** Condenser Vacuum Pump 2B Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 1 inHgA from Data Sheet 2, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 0.83 inHgA

_____ SCFM
Acc Crit: ≥ 29 SCFM

_____

[31] **STOP** 2-PMP-2-176 by placing 2-HS-2-176A, COND VACUUM PMP B, to STOP PULL TO LOCK. _____

[32] **CLOSE** 2-DRV-2-714, CONDENSER VACUUM PMP 2B SUCTION DRAIN. _____

[33] **SUBMIT** a copy of the Condenser Vacuum Pump 2B performance data to Engineering for their review and evaluation, **AND**

RECORD name of engineer/department receiving data.

_____/_____ _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance

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

[2] **ENSURE** Sections 6.2 and 6.5 have been completed _____

[3] **ENSURE** 2-FCV-2-255 is OPEN using 2-HS-2-255, EXH BYPASS COND VAC PMPS, [2-M-3]. _____

CAUTION

Use caution when opening 2-PCV-6-330. Ensure immediate area around valve is free of debris that could enter the Condenser.

[4] **ENSURE** 2-PCV-6-330 is OPEN using 2-HS-6-330A, VACUUM BREAKER COND A, [2-M-3]. _____

[5] **OPEN** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

[6] **OPEN** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL, [T14H/720]. _____

[7] **BEGIN** recording Atmospheric Pressure on Data Sheet 6 (N/A if pressure recording has already begun) _____

[8] **VERIFY** Condenser Vacuum Pump Header vacuum is at atmospheric pressure (0 inHgVac on Vacuum Gauge D). _____

[9] **START** 2-PMP-2-181 using 2-HS-2-181A, COND VACUUM PMP C, [2-M-3]. _____

[10] **RECORD** Condenser Vacuum Pump 2C at Atmospheric Pressure operating data on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

[11] **RECORD** the Motor Running kVA obtained from Condenser Vacuum Pump 2C at Atmospheric Pressure from Data Sheet 3, **AND**

VERIFY motor kVA meets acceptance criteria.

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____

[12] **CLOSE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL. _____

[13] **CLOSE** 2-ISV-2-716, MAIN CONDENSER VACUUM LINE ISOL. _____

NOTES

1) Throttle 2-ISV-2-1034 and -1035 in the following step first. If CVP 2C suction pressure of 15 inHgA cannot be obtained using 2-ISV-2-1034 and -1035, then 2-ISV-2-706 may be used in lieu of or in addition to them.
2) The intent of the following step is to increase the air flow rate of CVP 2C without increasing the suction pressure above 15 inHgA (to verify CVP 2C flow at 15 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[14] **THROTTLE** any or all of the following valves to obtain a pressure of 14.83 inHgA (or slightly less) on Vacuum Gauge C.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL, [T14H/720]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

[15] **RECORD** Condenser Vacuum Pump 2C operating data at 15 inHgA on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

[16] **RECORD** Condenser Vacuum Pump 2C Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 15 inHgA from Data Sheet 3, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 14.83 inHgA

_____ SCFM
Acc Crit: ≥ 856 SCFM

_____

[17] **ENSURE** 2-ISV-2-706, MAIN CONDENSER VACUUM LINE ISOL is CLOSED. _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-715. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-ISV-2-1034 and/or -1035 in the following step first and then use 2-DRV-2-715 to fine-tune CVP 2C suction pressure.
2) The intent of the following step is to increase the air flow rate of CVP 2C without increasing the suction pressure above 5 inHgA (to verify CVP 2C flow at 5 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[18] **THROTTLE** any or all of the following valves to obtain a pressure of 4.83 inHgA (or slightly less) on Vacuum Gauge C.

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-DRV-2-715, CONDENSER VACUUM PMP 2C SUCTION DRAIN, [T14G/685]

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[19] **RECORD** Condenser Vacuum Pump 2C operating data at 5 inHgA operating on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

[20] **RECORD** Condenser Vacuum Pump 2C Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 5 inHgA from Data Sheet 3, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 4.83 inHgA

_____ SCFM

Acc Crit: ≥ 267 SCFM

_____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-715. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-715 in the following step first. If CVP 2C suction pressure of 3 inHgA cannot be obtained using 2-DRV-2-715, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2C without increasing the suction pressure above 3 inHgA (to verify CVP 2C flow at 3 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[21] **THROTTLE** any or all of the following valves to obtain a pressure of 2.83 inHgA (or slightly less) on Vacuum Gauge C.

- 2-DRV-2-715, CONDENSER VACUUM PMP 2C SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[22] **RECORD** Condenser Vacuum Pump 2C operating data at 3 inHgA on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

[23] **RECORD** Condenser Vacuum Pump 2C Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 3 inHgA from Data Sheet 3, **AND**

VERIFY it meets acceptance criteria.

_____ kVA

Acc Crit: ≤ 114.5 kVA

_____ inHgA

Acc Crit: ≤ 2.83 inHgA

_____ SCFM

Acc Crit: ≥ 154 SCFM

_____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

CAUTION

Use caution when opening 2-DRV-2-715. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTES

1) Throttle 2-DRV-2-715 in the following step first. If CVP 2C suction pressure of 2 inHgA cannot be obtained using 2-DRV-2-715, then 2-ISV-2-1034 and/or -1035 may be used in lieu of or in addition to it.
2) The intent of the following step is to increase the air flow rate of CVP 2C without increasing the suction pressure above 2 inHgA (to verify CVP 2C flow at 2 inHgA). Valves should be throttled open slowly and the pressure allowed to stabilize before recording air flow.
3) Use check boxes to record the as-left valve positions.

[24] **THROTTLE** any or all of the following valves to obtain a pressure of 1.83 inHgA (or slightly less) on Vacuum Gauge C

- 2-DRV-2-715, CONDENSER VACUUM PMP 2C SUCTION DRAIN

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL

  ☐ CLOSED ☐ THROTTLED ☐ FULL OPEN _____

[25] **RECORD** Condenser Vacuum Pump 2C operating data at 2 inHgA on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

[26] **RECORD** Condenser Vacuum Pump 2C Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 2 inHgA from Data Sheet 3, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 1.83 inHgA

_____ SCFM
Acc Crit: ≥ 92.5 SCFM

_____

[27] **ENSURE** the following valves are CLOSED

- 2-ISV-2-1034, MFPT COND 2A SHELL VENT LINE ISOL _____
- 2-ISV-2-1035, MFPT COND 2B SHELL VENT LINE ISOL _____

CAUTION

Use caution when opening 2-DRV-2-715. Ensure immediate area around valve is free of debris that could enter the Condenser Vacuum Pump suction.

NOTE

The intent of the following step is to increase the air flow rate of CVP 2C without increasing the suction pressure above 1 inHgA (to verify CVP 2C flow at 1 inHgA). 2-DRV-2-715 should be throttled open slowly and the vacuum allowed to stabilize before recording air flow.

[28] **THROTTLE** 2-DRV-2-715, CONDENSER VACUUM PMP 2C SUCTION DRAIN, as much as possible while still maintaining suction pressure of 0.83 inHgA (or slightly less) on Vacuum Gauge C. _____

Date _____

6.6.3 Condenser Vacuum Pump 2C Individual Performance (continued)

[29] **RECORD** Condenser Vacuum Pump 2C operating data at 1 inHgA on Data Sheets 3 and 4, **AND**

PERFORM calculations on Data Sheets 3 and 4. _____

[30] **RECORD** Condenser Vacuum Pump 2C Motor Running kVA, Pump Suction Pressure, and Airflow Rate (use airflow traverse data) at 1 inHgA from Data Sheet 3, **AND**

VERIFY it meets acceptance criteria.

_____ kVA
Acc Crit: ≤ 114.5 kVA

_____ inHgA
Acc Crit: ≤ 0.83 inHgA

_____ SCFM
Acc Crit: ≥ 33 SCFM

_____

[31] **STOP** 2-PMP-2-181 by placing 2-HS-2-181A, COND VACUUM PMP B, to STOP PULL TO LOCK. _____

[32] **CLOSE** 2-DRV-2-715, CONDENSER VACUUM PMP 2C SUCTION DRAIN. _____

[33] **SUBMIT** a copy of the Condenser Vacuum Pump 2C performance data to Engineering for their review and evaluation, **AND**

RECORD name of engineer/department receiving data.

_____/_____ _____

Date _____

6.6.4 Condenser Evacuation

NOTES

1) If Main Condenser absolute pressure stabilizes at greater than 5 inHgA, the Condenser Vacuum Pumps may have to be stopped to repair excessive Condenser air inleakage. Re-perform this Subsection after Condenser inleakage is repaired.
2) Condenser Vacuum piping should be observed for excessive vibration or noise during the entire performance of this subsection. Performance of vibration walkdown is documented in step 6.6.4[22].

[1] **ENSURE** Subsections 6.6.1, 6.6.2, and 6.6.3 have been completed. _____

[2] **ENSURE** system valves are positioned in accordance with Appendix G, Valve Lineup for Condenser Evacuation. _____

[3] **ENSURE** all Main Condenser and MFPT Condenser manways and access hatches are securely closed. _____

[4] **ENSURE** 2-FCV-2-255 is OPEN using 2-HS-2-255, EXH BYPASS COND VAC PMPS. [2-M-3]. _____

[5] **ENSURE** 2-PCV-6-330 is CLOSED using 2-HS-6-330A, VACUUM BREAKER COND A, [2-M-3]. _____

[6] **ENSURE** Main Condenser and Main Feed Pump Turbine Condensers are at atmospheric pressure (0 inHgVac on Vacuum Gauge D). _____

[7] **ENSURE** Main Turbine is placed on Turning Gear per 2-SOI-47.01 or equivalent approved Temporary Operating Plan (TOP) for this purpose.

Instruction Used: ☐ 2-SOI-47.01 ☐ TOP: _____ _____

[8] **ENSURE** Main Turbine Steam Seals have been established per 2-SOI-47.03 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-47.03 ☐ TOP: _____ _____

Date _____

6.6.4 Condenser Evacuation (continued)

[9] **ENSURE** Gland Seal Water to Condenser Boot Seal and Condenser Vacuum Breaker has been established per 2-SOI-37.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-37.01 ☐ TOP: _____ _____

[10] **ENSURE** Main Feed Pump Turbines are placed on Turning Gear, **AND**

ENSURE Main Feed Pump Turbine Steam Seals have been established per 2-SOI-2&3.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-2&3.01 ☐ TOP: _____ _____

[11] **VERIFY** the following Annunciation and Alarms:

A. Annunciator Windows:

- 2-XA-55-3A-46C, CONDENSER VACUUM LO, is in ALARM _____
- 2-XA-55-3B-55D, MFPT CONDENSER VACUUM LO, is in ALARM _____

B. Unit 2 Alarm Events Display Screen:

- 46-C CONDENSER VACUUM LO (PS-2-7B/10) is in ALARM (Red) _____
- 46-C CONDENSER VACUUM LO/LO-LO (Y9006C) is in ALARM (Red) _____
- 55-D MFPT A CONDENSER VACUUM LO (PS-2-14) is in ALARM (Red) _____
- 55-D MFPT B CONDENSER VACUUM LO (PS-2-15) is in ALARM (Red) _____

Date _____

6.6.4 Condenser Evacuation (continued)

[12] **RECORD** the starting values of the following parameters.

(Zone A)	ICS Point P2263A	_____	inHgA
(Zone B)	ICS Point P2264A	_____	inHgA
(Zone C)	ICS Point P2265A	_____	inHgA
(MFPTC A)	ICS Point P2270A	_____	inHgA
(MFPTC B)	ICS Point P2271A	_____	inHgA
(Inleakage)	ICS Point F2700A	_____	SCFM
(Zone C)	2-P/TR-2-2	_____	inHgA
(M&TE)	Vacuum Gauge D	_____	inHgVac
(M&TE)	Atmospheric Pressure	_____	inHg

_____

NOTE

Start the stopwatch simultaneously with the first CVP started in the following step. (The CVP that is started first should have a recorded stopwatch time of 00:00:00)

[13] **START** all three Condenser Vacuum Pumps using their respective Control Room handswitch as follows, **AND**

RECORD stopwatch time (in hh:mm:ss) at each CVP start:

- 2-PMP-2-171 using 2-HS-2-171A, COND VACUUM PMP A, [2-M-3]

  _____ : : _____ _____

- 2-PMP-2-176 using 2-HS-2-176A, COND VACUUM PMP B, [2-M-3]

  _____ : : _____ _____

- 2-PMP-2-181 using 2-HS-2-181A, COND VACUUM PMP C, [2-M-3]

  _____ : : _____ _____

Date _____

6.6.4 Condenser Evacuation (continued)

NOTES

1) Step 6.6.4[14] is performed concurrently with steps 6.6.4[15] through 6.6.4[19].
2) Steps 6.6.4[15], 6.6.4[16], and 6.6.4[17] may be performed in parallel.

[14] **RECORD** system data on Data Sheet 5 at each of the listed Main Condenser absolute pressures as Main Condenser absolute pressure lowers.

A. Atmospheric Pressure _____

B. 25 inHgA _____

C. 20 inHgA _____

D. 15 inHgA _____

E. 10 inHgA _____

F. 5 inHgA _____

G. Final Pressure _____

[15] **RECORD** the MFPT Condenser pressures at which the following Alarms on the Unit 2 Alarm Events Display Screen change to NORMAL (Green).

A. 55-D MFPT A CONDENSER VACUUM LO (PS-2-14)

ICS Point P2270A _____ inHgA _____

B. 55-D MFPT B CONDENSER VACUUM LO (PS-2-15)

ICS Point P2271A _____ inHgA _____

Date _____

6.6.4 Condenser Evacuation (continued)

[16] **RECORD** the Main Condenser pressures at which the following Alarms on the Unit 2 Alarm Events Display Screen change to NORMAL (Green)

A. 46-C, CONDENSER VACUUM LO (PS-2-7B/10)

ICS Point P2265 _____ inHgA _____

B. 46-C, CONDENSER VACUUM LO/LO-LO (Y9006C)

ICS Point P2265 _____ inHgA _____

[17] **VERIFY** the following Annunciation and Alarms:

A. Annunciator Windows:

- 2-XA-55-3A-46C, CONDENSER VACUUM LO, is CLEAR _____
- 2-XA-55-3B-55D, MFPT CONDENSER VACUUM LO, is CLEAR _____

B. Unit 2 Alarm Events Display Screen:

- 46-C CONDENSER VACUUM LO (PS-2-7B/10) is NORMAL (Green) _____
- 46-C CONDENSER VACUUM LO/LO-LO (Y9006C) is NORMAL (Green) _____
- 55-D MFPT A CONDENSER VACUUM LO (PS-2-14) is NORMAL (Green) _____
- 55-D MFPT B CONDENSER VACUUM LO (PS-2-15) is NORMAL (Green) _____

[18] **WHEN** condenser pressure on 2-P/TR-2-2, COND TEMP & PRESS, [2-M-3], falls below 5 inHgA, **THEN**

CLOSE 2-FCV-2-255 using 2-HS-2-255, EXH BYPASS COND VAC PMPS. _____

Date _____

6.6.4 Condenser Evacuation (continued)

NOTE
Steps 6.6.4[19] and 6.6.4[21] may be performed in parallel.

[19] **WHEN** main condenser pressure on 2-P/TR-2-2, COND TEMP & PRESS, stabilizes, **THEN**

STOP the stopwatch, **AND**

RECORD the values below and on Data Sheet 5.

_____ : : _____
(hh:mm:ss)

(Zone A)	ICS Point P2263A	_____	inHgA
(Zone B)	ICS Point P2264A	_____	inHgA
(Zone C)	ICS Point P2265A	_____	inHgA
(MFPTC A)	ICS Point P2270A	_____	inHgA
(MFPTC B)	ICS Point P2271A	_____	inHgA
(Inleakage)	ICS Point F2700A	_____	SCFM
(Zone C)	2-P/TR-2-2	_____	inHgA
(M&TE)	Vacuum Gauge D	_____	inHgVac

_____

[20] **OPEN** 2-FCV-2-255 using 2-HS-2-255, EXH BYPASS COND VAC PMPS. _____

[21] **MEASURE** CVP discharge air flow traverse (Condenser air inleakage) using Data Sheet 4, **AND**

RECORD Condenser air inleakage from Data Sheet 4.

_____ SCFM _____

Date _____

6.6.4 Condenser Evacuation (continued)

[22] **ENSURE** Condenser Vacuum piping has been walked down to observe for excessive vibration or noise. _____

[23] **CLOSE** 2-ISV-2-627, MFPT COND 2A SHELL VENT LINE ISOL, [T15H/708]. _____

NOTE

The MFPT Condenser 2A Low Vacuum Alarm may take some time to come in. Normal system inleakage will cause MFPT Condenser 2A to slowly lose vacuum. MFPTC 2A Low Vacuum Alarm Setpoint is 17.5 inHgA.

[24] **VERIFY** 2-XA-55-3B-55D, MFPT CONDENSER VACUUM LO, is in ALARM. _____

[25] **VERIFY** Unit 2 Alarm Events Display Screen indicates 55-D MFPT A CONDENSER VACUUM LO (PS-2-14) is in ALARM (Red). _____

[26] **CLOSE** 2-ISV-2-626, MFPT COND 2B SHELL VENT LINE ISOL, [T15H/708]. _____

NOTE

The MFPT Condenser 2B Low Vacuum Alarm may take some time to come in. Normal system inleakage will cause MFPT Condenser 2B to slowly lose vacuum. MFPTC 2B Low Vacuum Alarm Setpoint is 17.5 inHgA.

[27] **VERIFY** 2-XA-55-3B-55D, MFPT CONDENSER VACUUM LO, REFLASHES. _____

[28] **VERIFY** Unit 2 Alarm Events Display Screen indicates 55-D MFPT B CONDENSER VACUUM LO (PS-2-15) is in ALARM (Red) _____

[29] **PLACE** the following handswitches in STOP PULL TO LOCK:

- 2-HS-2-171A, COND VACUUM PMP A _____
- 2-HS-2-176A, COND VACUUM PMP B _____
- 2-HS-2-181A, COND VACUUM PMP C _____

Date _____

6.6.4 Condenser Evacuation (continued)

NOTE

The Main Condenser Low Vacuum Alarm may take some time to come in. Normal system inleakage will cause the Main Condenser to slowly lose vacuum. Main Condenser Low Vacuum Alarm setpoint is 6.9 inHgA.

[30] **VERIFY** 2-XA-55-3A-46C, CONDENSER VACUUM LO is in ALARM. _____

[31] **VERIFY** Unit 2 Alarm Events Display Screen indicates 46-C CONDENSER VACUUM LO (PS-2-7B) is in ALARM (Red) _____

NOTE

The Main Condenser Lo-Lo Vacuum Alarm may take some time to come in. Normal system inleakage will cause the Main Condenser to slowly lose vacuum. Main Condenser Lo-Lo Vacuum Alarm setpoint is 10.0 inHgA.

[32] **VERIFY** 2-XA-55-3A-46C, CONDENSER VACUUM LO, REFLASHES. _____

[33] **VERIFY** Unit 2 Alarm Events Display Screen indicates 46-C CONDENSER VACUUM LO/LO-LO (Y9006C) is in ALARM (Red) _____

[34] **OPEN** the following Valves:

- 2-ISV-2-627, MFPT COND 2A SHELL VENT LINE ISOL. _____
- 2-ISV-2-626, MFPT COND 2B SHELL VENT LINE ISOL _____

Date _____

6.6.4 Condenser Evacuation (continued)

NOTE

Steps 6.6.4[35] through 6.6.4[41] may be N/A'd if system is to be left in its current configuration to facilitate other testing activities.

[35] **ENSURE** Main Turbine is removed from Turning Gear per 2-SOI-47.01 or equivalent approved TOP for this purpose.

[36] Instruction Used: ☐ 2-SOI-47.01 ☐ TOP: _____ _____

[37] **ENSURE** Main Turbine Steam Seals are secured per 2-SOI-47.03 or equivalent approved TOP for this purpose.

[38] Instruction Used: ☐ 2-SOI-47.03 ☐ TOP: _____ _____

[39] **ENSURE** Gland Seal Water to the Condenser Vacuum Pumps, Condenser Boot Seal and Condenser Vacuum Breaker is secured per 2-SOI-37.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-37.01 ☐ TOP: _____ _____

[40] **ENSURE** Main Feed Pump Turbines are removed from Turning Gear, **AND**

ENSURE Main Feed Pump Turbine Steam Seals are secured per 2-SOI-2&3.01 or equivalent approved TOP for this purpose.

Instruction Used: ☐ 2-SOI-2&3.01 ☐ TOP: _____ _____

[41] **STOP** recording Atmospheric Pressure on Data Sheet 6. _____

Date _____

6.6.4 Condenser Evacuation (continued)

[42] **OBTAIN** trend printouts of the following ICS points, as available (from ICS, PEDS, DatAWare, etc), for the duration of condenser evacuation, **AND**

ATTACH trend printouts to this data package:
(Unavailable points may be marked N/A.)

- P2263A, COND ZONE A BACKPRESSURE _____
- P2264A, COND ZONE B BACKPRESSURE _____
- P2265A, COND ZONE C BACKPRESSURE _____
- P1132A, COND ZONE A HOTWELL PRESS _____
- P1133A, COND ZONE C HOTWELL PRESS _____
- F2260A, COND VAC PMP AIR EXH FLOW 1 _____
- F2700A, COND VAC PMP AIR EXHAUST FLOW 2 _____
- P2270A, MFPT A CONDENSER VACUUM PRESS _____
- P2271A, MFPT B CONDENSER VACUUM PRESS _____
- T2467A, COND VAC HDR TEMP _____
- Y8003A, RCW TEMP UNIT 2 _____
- T2430A, COND CCW INLET-EAST SIDE TEMP _____
- T2431A, COND CCW INLET-WEST SIDE TEMP _____
- T2440A, COND CCW OUTLET-EAST SIDE TEMP _____
- T2441A, COND CCW OUTLET-WEST SIDE TEMP _____

[43] **SUBMIT** a copy of the Condenser Evacuation data to Engineering for their review and evaluation, **AND**

RECORD name of engineer/department receiving data.

_____/_____ _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES

NOTE

Post-performance steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the end of instruction performance.

[1] **VERIFY** Engineering has reviewed and evaluated test data to the extent necessary for acceptable system performance, **AND**

ATTACH copy of Engineering concurrence to the data package. _____

[2] **VERIFY** that post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

RECORD the results in the M&TE log. _____

[3] **VERIFY** no excessive vibration of piping system and components was observed during performance of Section 6.0. (If excessive vibration was observed, then verify engineering has evaluated the vibration and corrective actions have been initiated.) _____

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[4] **REMOVE** the following temporary 0-30 inHg vacuum Test Gauges at the following locations: (Installed in Step 4.3[15])

A. Vacuum Gauge A:
Downstream (low side) test connection of 2-PDS-2-171, COND VAC PMP A INLET VLV CONT, [T14H/685].

_____ 1st

_____ CV

B. Vacuum Gauge B:
Downstream (low side) test connection of 2-PDS-2-176, COND VAC PMP B INLET VLV CONT, [T14G/685].

_____ 1st

_____ CV

C. Vacuum Gauge C:
Downstream (low side) test connection of 2-PDS-2-181, COND VAC PMP C INLET VLV CONT, [T14G/685].

_____ 1st

_____ CV

D. Vacuum Gauge D:
Upstream (high side) test connection of 2-PDI-2-175, CONDENSER VACUUM PMP 2B SUCTION STRN PRESSS, at 2-ISIV-2-388B, [2-L-509, T15G/685].

_____ 1st

_____ CV

Date _____

7.0 POST-PERFORMANCE ACTIVITIES (continued)

[5] **REMOVE** the following temporary 0-5 PSI pressure Test Gauges at the following locations: (Installed in Step 4.3[16])

A. Pressure Gauge A:
at the test connection downstream of 2-ISV-37-17
PRESSURE SWITCH ISOLATION VAC PUMP 2A,
[T14H/685].

_____ 1st

_____ CV

B. Pressure Gauge B:
at the test connection downstream of 2-ISV-37-18
PRESSURE SWITCH ISOLATION VAC PUMP 2B,
[T14G/685].

_____ 1st

_____ CV

C. Pressure Gauge C:
at the test connection downstream of 2-ISV-37-19
PRESSURE SWITCH ISOLATION VAC PUMP 2C,
[T14G/685].

_____ 1st

_____ CV

[6] **NOTIFY** the Unit 2 US/SRO of the test completion and system alignment. _____

Date _____

8.0 RECORDS

A. QA Records

Completed Test Package

B. Non–QA Records

None

Appendix A
(Page 1 of 2)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

Date _____

NOTES

1) Additional copies of this table may be made as necessary.
2) Initial and date indicates review has been completed for impact.

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
2-TSD-2-2			
FSAR Section 10.4.2 Table 14.2-1 Sh 68 & 69			
WBN2-2-4002			
VTD-N010-0020			
VTD-J057-0010			
0-MI-57.002			
SSD-2-LS-2-169			
SSD-2-PDS-2-171			
SSD-2-PS-2-171			
SSD-2-PS-2-250			
SSD-2-LS-2-174			
SSD-2-PDS-2-176			
SSD-2-PS-2-176			
SSD-2-PS-2-246			
SSD-2-LS-2-179			

Appendix A
(Page 2 of 2)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

Date _____

PROCEDURE/ INSTRUCTION	REVISION/CHANGES	IMPACT Yes/No	INITIAL AND DATE. (N/A for no change)
SSD-2-PDS-2-181			
SSD-2-PS-2-181			
SSD-2-PS-2-248			
SSD-2-LPP-2-14			
SSD-2-LPP-2-15			
SSD-2-LPP-2-7			
SSD-2-LPP-2-10			

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

Date ________

NOTES
1) Additional copies of this table may be made as necessary.
2) These steps will be N/A'd if no temporary condition existed.

ITEM No.	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step No.	Performed By/Date CV By/Date	Step No.	Returned By/Date CV By/Date

Appendix C
(Page 1 of 4)

PERMANENT PLANT INSTRUMENTATION LOG

Date _____

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LG-2-168	N/A				NO	N/A	N/A
2-LS-2-169					NO	N/A	N/A
2-PDI-2-170[4]					NO	N/A	N/A
2-PDS-2-171					NO	N/A	N/A
2-PS-2-171					NO	N/A	N/A
2-PS-2-250					NO	N/A	N/A
2-PS-2-251					NO	N/A	N/A
2-TI-2-320[4]					NO	N/A	N/A
2-LG-2-173	N/A				NO	N/A	N/A
2-LS-2-174					NO	N/A	N/A
2-PDI-2-175[4]					NO	N/A	N/A
2-PDS-2-176					NO	N/A	N/A
2-PS-2-176					NO	N/A	N/A

Appendix C
(Page 2 of 4)

PERMANENT PLANT INSTRUMENTATION LOG

Date _____

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-PS-2-246					NO	N/A	N/A
2-PS-2-247					NO	N/A	N/A
2-TI-2-321[4]					NO	N/A	N/A
2-LG-2-178	N/A				NO	N/A	N/A
2-LS-2-179					NO	N/A	N/A
2-PDI-2-180[4]					NO	N/A	N/A
2-PDS-2-181					NO	N/A	N/A
2-PS-2-181					NO	N/A	N/A
2-PS-2-248					NO	N/A	N/A
2-PS-2-249					NO	N/A	N/A
2-TI-2-322[4]					NO	N/A	N/A

Appendix C
(Page 3 of 4)

PERMANENT PLANT INSTRUMENTATION LOG

Date _____

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-TE-2-183[4]					NO	N/A	N/A
2-LPF-2-256					NO	N/A	N/A
2-LPF-2-257					NO	N/A	N/A
2-LPP-2-1[4]					NO	N/A	N/A
2-LPP-2-2[3,4]					NO	N/A	N/A
2-LPP-2-7[4]					NO	N/A	N/A
2-LPP-2-10[4]					NO	N/A	N/A
2-LPP-2-336[3,4]					NO	N/A	N/A
2-LPP-2-14[4]					NO	N/A	N/A
2-LPP-2-15[4]					NO	N/A	N/A
2-LPT-24-24[4]					NO	N/A	N/A

Appendix C
(Page 4 of 4)
PERMANENT PLANT INSTRUMENTATION LOG

Date _____

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-LPT-27-58[3,4]					NO	N/A	N/A
2-LPT-27-68[3,4]					NO	N/A	N/A
2-LPT-27-74[3,4]					NO	N/A	N/A
2-LPT-27-84[3,4]					NO	N/A	N/A

[1] These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (N/A)

[2] May be identified as N/A if instrument was not used to verify/record quantitative acceptance criteria data.

[3] May be identified as N/A if instrument is not available.

[4] These instruments are only used in Subsection 6.6.4, Condenser Evacuation.

Appendix D
(Page 1 of 1)
SWITCH LINEUP

Date _____

SWITCH	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-HS-2-171A	2-M-3	COND VACUUM PMP A	STOP PULL TO LOCK	
2-HS-2-176A	2-M-3	COND VACUUM PMP B	STOP PULL TO LOCK	
2-HS-2-181A	2-M-3	COND VACUUM PMP C	STOP PULL TO LOCK	
2-HS-2-255	2-M-3	EXH BYPASS COND VAC PMPS	OPEN	
2-HS-6-330A	2-M-3	VACUUM BREAKER COND A	CLOSED	
2-HS-2-171B	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2A	SAFE STOP	
2-HS-2-176B	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2B	SAFE STOP	
2-HS-2-181B	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2C	SAFE STOP	
2-HS-2-171D	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2A RECIRC PUMP	SAFE STOP	
2-HS-2-176D	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2B RECIRC PUMP	SAFE STOP	
2-HS-3-181D	2-JB-291-269 [T14G/685]	CONDENSER VACUUM PUMP 2C RECIRC PUMP	SAFE STOP	
2-HS-6-330B	2-JB-291-2053 [T14G/729]	CONDENSER VACUUM BREAKER	CLOSED	
2-HS-30-883	T14G/685	CONDENSER VACUUM PUMP AREA COOLER	AUTO	

Appendix E
(Page 1 of 2)
ELECTRICAL LINEUP

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-BKR-2-171	480V UNIT BD 2A Compt 3D	CONDENSER VACUUM PMP 2A	DISCONNECTED	
2-FU-203-A3/31 2-FU-203-A3/32	480V UNIT BD 2A Compt 5A	COND VAC PMP 2A CLOSE/TRIP CONT	INSTALLED*	
2-BKR-2-176	480V UNIT BD 2B Compt 4C	CONDENSER VACUUM PMP 2B	DISCONNECTED	
2-BKR-2-181	480V UNIT BD 2B Compt 4D	CONDENSER VACUUM PMP 2C	DISCONNECTED	
2-FU-203-B4/21 2-FU-203-B4/22	480V UNIT BD 2B Compt 6A	COND VAC PMP 2B CLOSE/TRIP CONT	INSTALLED*	
2-FU-203-B4/31 2-FU-203-B4/32	480V UNIT BD 2B Compt 6A	COND VAC PMP 2C CLOSE/TRIP CONT	INSTALLED*	
2-BKR-2-171D	480V TURB MOV BD 2A, Compt 3B	COND VAC PMP 2A RECIRC PMP	ON	
2-FU-209-A3/11	480V TURB MOV BD 2A, Compt 3B	CVP 2A RECIRCULATING PUMP	INSTALLED*	
2-BKR-2-176D	480V TURB MOV BD 2A, Compt 5A	COND VAC PMP 2B RECIRC PMP	ON	
2-FU-209-A5/1	480V TURB MOV BD 2A, Compt 5A	CVP 2B RECIRCULATING PUMP	INSTALLED*	
2-BKR-2-181D	480V TURB MOV BD 2B, Compt 10D	COND VAC PMP 2C RECIRC PMP	ON	
2-FU-209-B10/31	480V TURB MOV BD 2B, Compt 10D	CVP 2C RECIRCULATING PUMP	INSTALLED*	
2-BKR-30-883	480V TURB MOV BD 2A, Compt 8B	CNDS VACUUM PUMP AREA CLR	ON	
2-FU-210-A8/11	480V TURB MOV BD 2A, Compt 8B	COND VACUUM PMP COOLER	INSTALLED*	

Appendix E
(Page 2 of 2)
ELECTRICAL LINEUP

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-BKR-278-M2C	120V AC INST PWR DISTR PNL 2B BKR 16	INST PWR DIST PNL B BKR16 TO 2-PNL-278-M2 CND VAC EXH	ON	
2-BKR-278-M2E	120V PANEL 2-M-7 INST PWR A RACK BKR 24	UNIT CNTL BD 2-M-7A BKR24 TO 2-PNL-278-M2	ON	
2-FU-275-R76/N1 2-FU-275-R76/N2	2-R-76 Row N, Fuse 1 & 2	MOTOR TRIPOUT BUZZER FOR PANELS M-1 THROUGH M-6 AND M-9	INSTALLED*	
2-FU-275-R76/N3 2-FU-275-R76/N4	2-R-76 Row N, Fuse 3 & 4	PANELS M-1 THROUGH M-6 MOTOR TRIPOUT ANNUNCIATION AUXILIARY RELAYS	INSTALLED*	

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

Appendix F
(Page 1 of 3)
INITIAL VALVE LINEUP

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-2-568	T14H/685	CONDENSER VACUUM PMP 2A SUCTION HDR ISOL	OPEN	
2-ISV-2-571	T14H/685	CONDENSER VACUUM PMP 2A DISCHARGE ISOL	OPEN	
2-RTV-2-386A	T14H/685	2-PDI-2-170 ROOT	OPEN	
2-RTV-2-387A	T14H/685	2-PDI-2-170 ROOT	OPEN	
2-DRV-2-713	T14H/685	CONDENSER VACUUM PMP 2A SUCTION DRAIN	CLOSED	
2-VTV-2-1045	T14H/685	COND VACUUM WATER PMP A VENT VALVE	CLOSED	
2-ISV-32-2014	T14H/685	CNTL AIR ISOL VLV TO 2-FCV-2-250/2-FCV-2-171	OPEN	
2-ISV-2-569	T14G/685	CONDENSER VACUUM PMP 2B SUCTION HDR ISOL	OPEN	
2-ISV-2-572	T14G/685	CONDENSER VACUUM PMP 2B DISCHARGE ISOL	OPEN	
2-RTV-2-388A	T14G/685	2-PDI-2-175 ROOT	OPEN	
2-RTV-2-389A	T14G/685	2-PDI-2-175 ROOT	OPEN	
2-DRV-2-714	T14G/685	CONDENSER VACUUM PMP 2B SUCTION DRAIN	CLOSED	
2-VTV-2-1046	T14G/685	COND VACUUM WATER PMP B VENT VALVE	CLOSED	
2-ISV-32-2017	T14G/685	CONTROL AIR ISOLATION VALVE TO 2-FCV-2-176	OPEN	
2-ISV-2-570	T14G/685	CONDENSER VACUUM PMP 2C SUCTION HDR ISOL	OPEN	
2-ISV-2-573	T14G/685	CONDENSER VACUUM PMP 2C DISCHARGE ISOL	OPEN	
2-RTV-2-390A	T14G/685	2-PDI-2-180 ROOT	OPEN	
2-RTV-2-391A	T14G/685	2-PDI-2-180 ROOT	OPEN	
2-DRV-2-715	T14G/685	CONDENSER VACUUM PMP 2C SUCTION DRAIN	CLOSED	

Appendix F
(Page 2 of 3)
INITIAL VALVE LINEUP

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-VTV-2-1047	T14G/685	COND VACUUM WATER PMP C VENT VALVE	CLOSED	
2-ISV-32-2019	T14G/685	CNTL AIR ISOL VLV TO 2-FCV-2-248/2-FCV-2-181	OPEN	
2-DRV-2-879	T14G/685	CONDENSER VACUUM PUMP DISCHARGE HDR DRAIN	CLOSED	
2-ISV-2-1032	T14H/708	MFPT COND 2A SHELL VENT LINE ISOL	OPEN	
2-ISV-2-1033	T14H/708	MFPT COND 2B SHELL VENT LINE ISOL	OPEN	
2-ISV-2-626	T15G/708	MFPT COND 2B SHELL VENT LINE ISOL	CLOSED	
2-ISV-2-627	T15H/708	MFPT COND 2A SHELL VENT LINE ISOL	CLOSED	
2-ISIV-90-119I	T14G/708	COND VACUUM PMP AIR EXH MON ISV	CLOSED	
2-ISIV-90-119J	T14G/708	COND VACUUM PMP AIR EXH MON ISV	CLOSED	
2-RTV-2-256/A1	T14G/708	2-FT-2-256 ROOT	OPEN	
2-RTV-2-256/A2	T14G/708	2-FT-2-256 ROOT	OPEN	
2-RTV-2-257A1	T14G/708	2-FT-2-257 ROOT	OPEN	
2-RTV-2-257A2	T14G/708	2-FT-2-257 ROOT	OPEN	
2-ISV-2-574	T14G/708	COND VAC PUMP EXH HDR INLET FILTER ISOL	OPEN	
2-ISV-2-575	T14G/708	COND VAC PUMP EXH HDR OUTLET FILTER ISOL	OPEN	

Appendix F
(Page 3 of 3)
INITIAL VALVE LINEUP

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-RTV-2-350A	T14G/708	2-PDIS-2-255 ROOT	CLOSED	
2-RTV-2-351A	T14G/708	2-PDIS-2-255 ROOT	CLOSED	
2-ISIV-90-129A	T14G/708	CNDS VAC PMP AIR EXH PART-IODINE SAMP ISV	CLOSED	
2-ISIV-90-129F	T14G/708	CNDS VAC PMP AIR EXH PART-IODINE SAMP ISV	CLOSED	
2-ISV-32-2060	T14G/708	CONTROL AIR ISOLATION VALVE TO 2-FCV-2-255	OPEN	
2-ISV-2-706	T14H/720	MAIN CONDENSER VACUUM LINE ISOL	CLOSED	
2-ISV-2-716	T14H/720	MAIN CONDENSER VACUUM LINE ISOL	CLOSED	
2-ISV-2-1034	T14H/720	MFPT COND 2A SHELL VENT LINE ISOL	CLOSED	
2-ISV-2-1035	T14H/720	MFPT COND 2B SHELL VENT LINE ISOL	CLOSED	
2-ISV-32-2625	T14G/720	CONTROL AIR ISOLATION VALVE TO 2-PCV-6-330	OPEN	

Appendix G
(Page 1 of 16)

VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-RTV-2-412A	T12E/680	MAIN CONDENSER LEVEL INSTR RACK SPARE	CLOSED	
2-RTV-2-414A	T12E/680	MAIN CONDENSER LEVEL INSTR RACK SPARE	CLOSED	
2-RTV-2-415A	T12E/680	MAIN CONDENSER LEVEL INSTR RACK SPARE	CLOSED	
2-RTV-2-416A	T12E/680	MAIN CONDENSER LEVEL INSTR RACK SPARE	CLOSED	
2-RTV-2-417A	T12E/680	MAIN CONDENSER LEVEL INSTR RACK SPARE	CLOSED	
2-RTV-2-418A	T12E/680	2-LS-2-12B ROOT	CLOSED	
2-RTV-2-419A	T12E/680	2-LS-2-12B ROOT	CLOSED	
2-RTV-2-420A	T12E/680	2-LS-2-12A ROOT	CLOSED	
2-RTV-2-421A	T12E/680	2-LS-2-12A ROOT	CLOSED	
2-DRV-2-920A	T12E/680	MAIN CONDENSER 2-LG-2-12 DRAIN	CLOSED	
2-VTV-2-882	T12E/680	MAIN CONDENSER 2-LG-2-12 VENT	CLOSED	
2-DRV-2-565	T13C/680	MAIN CONDENSER HOTWELL DRAIN	CLOSED	
2-RTV-2-1013A	T13H/680	HOTWELL A INSTR SPARE	CLOSED	
2-RTV-2-1015A	T13H/680	RT VLV TO LS-2-1009B	CLOSED	
2-RTV-2-1016A	T13H/680	RT VLV TO LS-2-1009B	CLOSED	
2-RTV-2-1017A	T13H/680	RT VLV TO LS-2-1009A	CLOSED	
2-RTV-2-1018A	T13H/680	RT VLV TO LS-2-1009A	CLOSED	
2-VTV-2-1019	T13H/680	HOTWELL A LEVEL CONDENSATE RSVR VENT	CLOSED	
2-DRV-2-1023	T13H/680	HOTWELL A LG-2-1009 DRAIN	CLOSED	
2-ISV-2-581	T14E/680	COND HOTWELL PUMP 2C SUCTION ISOL	CLOSED	
2-ISV-6-22	T14E/680	MFW HTR A2 COND BYP DNSTR ISOL	CLOSED	
2-ISV-6-23	T14E/680	MFW HTR B2 COND BYP DNSTR ISOL	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-2-579	T14F/680	COND HOTWELL PUMP 2A SUCTION ISOL	CLOSED	
2-ISV-2-580	T14F/680	COND HOTWELL PUMP 2B SUCTION ISOL	CLOSED	
2-RTV-2-300A	T14F/680	COND HOTWELL PUMP 2B SUCTION PRESS	CLOSED	
2-ISV-6-823	T14F/680	HOT WELL PUMP 2A VENT TO CONDENSER	CLOSED	
2-ISV-6-824	T14F/680	HOT WELL PUMP 2B VENT TO CONDENSER	CLOSED	
2-ISV-6-825	T14F/680	HOT WELL PUMP 2C VENT TO CONDENSER	CLOSED	
2-ISV-6-617	T14F/680	#3 HDT BYP 2-LCV-6-105B D/S ISOL	CLOSED	
2-ISV-6-619	T14F/680	#3 HDT BYP 2-LCV-6-105A D/S ISOL	CLOSED	
2-ISV-6-24	T14F/680	MFW HTR C2 COND BYP DNSTR ISOL	CLOSED	
2-ISV-6-793	T10E/685	#7 HDT PUMP 2A MIN FLOW ISOL	CLOSED	
2-ISV-6-794	T10E/685	#7 HDT PUMP 2B MIN FLOW ISOL	CLOSED	
2-ISV-6-1980	T10E/685	ISOL VLV TO NO. 7 HTR DRAIN TANK	CLOSED	
2-THV-6-195	T114H/685	NITROGEN INJECTION PORT THROTTLE VALVE	CLOSED	
2-DRV-12-514	T11F/685	CONDENSER SPARGING DRAIN	CLOSED	
2-ISV-6-2027	T11H/685	MFPT COND DR TK DR LINE ISOLATION VALVE	CLOSED	
2-LCV-6-209	T14G/685	MFPT COND DRAIN TANK BYPASS TO CONDENSER	CLOSED	
2-THV-6-203	T14H/685	NITROGEN INJECTION PORT THROTTLE VALVE	CLOSED	
2-ISV-6-2028	T14H/685	MFPT COND DR PUMP DISCH ISOLATION VALVE	CLOSED	
2-PFV-12-512	T8F/708	SPARGING NOZ SUP U2	CLOSED	
2-VTV-6-156	T9E/708	2-LG-6-190 VENT	CLOSED	
2-VTV-6-126	T9E/708	2-LG-6-190 DRAIN	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-6-764	T10E/708	CNDS HTR A6 SHELL SIDE 2-LCV-6-138 U/S ISOL	CLOSED	
2-ISV-6-767	T10E/708	CNDS HTR A6 SHELL SIDE 2-LCV-6-138 D/S ISOL	CLOSED	
2-ISV-6-765	T10E/708	CNDS HTR B6 SHELL SIDE 2-LCV-6-158 U/S ISOL	CLOSED	
2-ISV-6-768	T10E/708	CNDS HTR B6 SHELL SIDE 2-LCV-6-158 D/S ISOL	CLOSED	
2-ISV-6-766	T10E/708	CNDS HTR C6 SHELL SIDE 2-LCV-6-177 U/S ISOL	CLOSED	
2-ISV-6-769	T10E/708	CNDS HTR C6 SHELL SIDE 2-LCV-6-177 D/S ISOL	CLOSED	
2-DRV-6-953	T10E/708	#7 HEATER DRAIN TANK LEVEL COLUMN DRAIN	CLOSED	
2-ISV-12-650	T10F/708	BLDG HTG SYS CNDS ISOL	CLOSED	
2-ISV-12-644	T10F/708	AUX STM CNDS RETURN 2-LCV-12-698 D/S ISOL	CLOSED	
2-ISV-1-992	T10G/708	MAIN STEAM HEADER MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-1-1002	T10G/708	MAIN STEAM HEADER MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-1-982	T10H/708	MAIN STEAM HEADER MSTR TRAP DRAIN ISOL	CLOSED	
2-FCV-14-114	T11E/708	CNDS POLISHER RINSE HDR TO HOTWELL ISOL	CLOSED	
2-DRV-6-894	T11E/708	CNDS HEATER C5 SHELL SIDE DRAIN	CLOSED	
2-RTV-6-413A	T11E/708	2-PI-6-174 ROOT	CLOSED	
2-ISV-6-776	T11E/708	#7 HEATER DRAIN TANK 2-LCV-6-190B U/S ISOL	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-6-777	T11E/708	#7 HEATER DRAIN TANK 2-LCV-6-190B D/S ISOL	CLOSED	
2-RTV-6-419A	T11F/708	2-PI-6-179 ROOT	CLOSED	
2-VTV-15-852	T11H/708	SG BLOWDOWN PUMP SUCT HDR VENT	CLOSED	
2-ISV-1-972	T11J/708	MAIN STEAM HEADER MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-15-919	T11J/708	SG BLOWDOWN RAD MON RETURN ISOL	CLOSED	
2-ISV-1-962	T12J/708	MAIN STEAM HEADER MSTR TRAP DRAIN ISOL	CLOSED	
2-RTV-15-113A	T12J/708	2-RE-90-120/2-RE-90-121 ROOT	CLOSED	
2-RTV-15-100A	T12J/708	2-PI-15-30 ROOT	CLOSED	
2-FCV-3-195	T13J/708	MFW DEAERATION LINE CONTROL	CLOSED	
2-PCV-3-40	T13J/708	MFW DEAERATION LINE BACK PRESSURE CONTROL	CLOSED	
2-ISV-5-622	T14E/708	#3 EXTR STM HDR COND ISOL	CLOSED	
2-VTV-6-679	T14G/708	MFW HTR C1 SHELL SIDE OPERATING VENT	CLOSED	
2-ISV-5-623	T14H/708	#3 EXTR STM HDR DRAIN ISOL	CLOSED	
2-ISV-2-626	T15G/708	MFPT COND 2B SHELL VENT LINE ISOL	OPEN	
2-VTV-6-677	T15G/708	MFW HTR A1 SHELL SIDE OPERATING VENT	CLOSED	
2-VTV-6-678	T15G/708	MFW HTR B1 SHELL SIDE OPERATING VENT	CLOSED	
2-ISV-6-798	T15G/708	MFPT CONDENSER 2B OUT ISOL	CLOSED	
2-VTV-6-800	T15G/708	MFPT CONDENSER 2B VENT	CLOSED	
2-VTV-6-995	T15G/708	MFPT CONDENSER 2B IN VENT	CLOSED	
2-VTV-6-996	T15G/708	MFPT CONDENSER 2B OUT VENT	CLOSED	
2-ISV-2-627	T15H/708	MFPT COND 2A SHELL VENT LINE ISOL	OPEN	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-6-797	T15H/708	MFPT CONDENSER 2A OUT ISOL	CLOSED	
2-VTV-6-799	T15H/708	MFPT CONDENSER 2A VENT	CLOSED	
2-VTV-6-993	T15H/708	MFPT CONDENSER 2A IN VENT	CLOSED	
2-VTV-6-994	T15H/708	MFPT CONDENSER 2A OUT VENT	CLOSED	
2-ISV-1-952	T15M/708	MAIN STEAM LOOP 4 MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-1-932	T15M/708	MAIN STEAM LOOP 2 MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-1-922	T15M/708	MAIN STEAM LOOP 1 MSTR TRAP DRAIN ISOL	CLOSED	
2-ISV-1-942	T15M/708	MAIN STEAM LOOP 3 MSTR TRAP DRAIN ISOL	CLOSED	
2-RTV-2-308A	T16H/708	2-PS-2-252B/2-PS-2-252E ROOT	OPEN	
2-RTV-2-307A	T16J/708	2-PS-2-252A/2-PS-2-252D ROOT	OPEN	
2-ISV-6-602	T14G/720	MFW HTR A1 SHELL SIDE BYP LCV-6-15B D/S ISOL	CLOSED	
2-ISV-6-603	T14G/720	MFW HTR B1 SHELL SIDE BYP LCV-6-35B D/S ISOL	CLOSED	
2-ISV-6-604	T14G/720	MFW HTR C1 SHELL SIDE BYP LCV-6-58B D/S ISOL	CLOSED	
2-ISV-2-706	T14H/720	MAIN CONDENSER VACUUM LINE ISOL	OPEN	
2-ISV-2-716	T14H/720	MAIN CONDENSER VACUUM LINE ISOL	OPEN	
2-IBV-1-637	T10F/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-113	T10F/724	CONDENSER B MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-638	T10F/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-114	T10F/724	CONDENSER C MAIN STEAM DUMP VLV	CLOSED	
2-DRV-6-893	T10F/724	CNDS HEATER B5 SHELL SIDE DRAIN	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-DRV-6-908	T10F/724	CNDS HEATER B6 SHELL SIDE DRAIN	CLOSED	
2-FCV-1-112	T10G/724	CONDENSER B MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-631	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-107	T10G/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-632	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-108	T10G/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-633	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-109	T10G/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-634	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-110	T10G/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-635	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-111	T10G/724	CONDENSER B MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-636	T10G/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-DRV-6-920	T10G/724	CNDS HEATER B7 SHELL SIDE DRAIN	CLOSED	
2-IBV-1-627	T10H/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-103	T10H/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-628	T10H/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-104	T10H/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-629	T10H/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-105	T10H/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-IBV-1-630	T10H/724	MAIN STEAM DUMP MANUAL ISOL	CLOSED	
2-FCV-1-106	T10H/724	CONDENSER A MAIN STEAM DUMP VLV	CLOSED	
2-RTV-6-418A	T11E/724	2-PI-6-160 ROOT	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-DRV-6-909	T11E/724	CNDS HEATER C6 SHELL SIDE DRAIN	CLOSED	
2-RTV-6-425A	T11E/724	2-PI-6-183 ROOT	CLOSED	
2-DRV-6-951	T11E/724	CNDS HTR C6 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	
2-DRV-6-1138	T11E/724	2-LIC-6-177 DRAIN	CLOSED	
2-VTV-6-1148	T11E/724	2-LIC-6-177 VENT	CLOSED	
2-VTV-6-1836B	T11E/724	2-LG-6-177 VENT	CLOSED	
2-DRV-6-1837B	T11E/724	DRAIN VALVE FOR 2-LG-6-177	CLOSED	
2-RTV-47-215CA	T11F/724	2-FCV-47-215C SENSING LINE ROOT	CLOSED	
2-ISV-2-861	T11F/724	SGBD 1ST STAGE HX TO MN CONDENSER ISOL	CLOSED	
2-RTV-6-421A	T11F/724	2-PI-6-145 ROOT	CLOSED	
2-RTV-6-412A	T11F/724	2-PI-6-155 ROOT	CLOSED	
2-RTV-6-423A	T11F/724	2-PI-6-165 ROOT	CLOSED	
2-ISV-6-754	T11F/724	CNDS HTR C5 SHELL SIDE 2-LCV-6-172 U/S ISOL	CLOSED	
2-ISV-6-757	T11F/724	CNDS HTR C5 SHELL SIDE 2-LCV-6-172 D/S ISOL	CLOSED	
2-DRV-6-921	T11F/724	CNDS HEATER C7 SHELL SIDE DRAIN	CLOSED	
2-ISV-5-624	T11F/724	MSR A2/B2/C2 EXTR STM COND DRN ISOL	CLOSED	
2-DRV-6-947	T11F/724	CNDS HTR B5 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	
2-DRV-6-1122	T11F/724	2-LIC-6-153 DRAIN	CLOSED	
2-VTV-6-1132	T11F/724	2-LIC-6-153 VENT	CLOSED	
2-VTV-6-1796B	T11F/724	2-LG-6-153 VENT	CLOSED	
2-DRV-6-1797B	T11F/724	DRAIN VALVE FOR 2-LG-6-153	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-47-427-	T11G/724	LP TURB B EXHAUST HOOD SPRAY FCV D/S ISOL	CLOSED	
2-BYV-47-432	T11G/724	LP TURB B EXHAUST HOOD SPRAY FCV BYPASS	CLOSED	
2-RTV-47-215BA	T11G/724	2-FCV-47-215B SENSING LINE ROOT	CLOSED	
2-ISV-47-429	T11G/724	LP TURB C EXHAUST HOOD SPRAY FCV D/S ISOL	CLOSED	
2-BYV-47-433	T11G/724	LP TURB C EXHAUST HOOD SPRAY FCV BYPASS	CLOSED	
2-DRV-6-892	T11G/724	CNDS HEATER A5 SHELL SIDE DRAIN	CLOSED	
2-RTV-6-411A	T11G/724	2-PI-6-134 ROOT	CLOSED	
2-ISV-6-752	T11G/724	CNDS HTR A5 SHELL SIDE 2-LCV-6-133 U/S ISOL	CLOSED	
2-ISV-6-755	T11G/724	CNDS HTR A5 SHELL SIDE 2-LCV-6-133 D/S ISOL	CLOSED	
2-RTV-6-414A	T11G/724	2-PI-6-136 ROOT	CLOSED	
2-DRV-6-907	T11G/724	CNDS HEATER A6 SHELL SIDE DRAIN	CLOSED	
2-RTV-6-417A	T11G/724	2-PI-6-140 ROOT	CLOSED	
2-RTV-6-408A	T11G/724	2-PI-6-132 ROOT	CLOSED	
2-ISV-6-753	T11G/724	CNDS HTR B5 SHELL SIDE 2-LCV-6-153 U/S ISOL	CLOSED	
2-ISV-6-756	T11G/724	CNDS HTR B5 SHELL SIDE 2-LCV-6-153 D/S ISOL	CLOSED	
2-RTV-6-415A	T11G/724	2-PI-6-157 ROOT	CLOSED	
2-RTV-6-409A	T11G/724	2-PI-6-152 ROOT	CLOSED	
2-DRV-6-946	T11G/724	CNDS HTR A5 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-DRV-6-1118	T11G/724	2-LIC-6-133 DRAIN VALVE	CLOSED	
2-VTV-6-1128	T11G/724	2-LIC-6-133 VENT	CLOSED	
2-VTV-6-1786B	T11G/724	2-LG-6-133 VENT	CLOSED	
2-DRV-6-1787B	T11G/724	DRAIN VALVE FOR 2-LG-6-133	CLOSED	
2-DRV-6-948	T11G/724	CNDS HTR C5 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	
2-DRV-6-1126	T11G/724	2-LIC-6-172 DRAIN	CLOSED	
2-VTV-6-1136	T11G/724	2-LIC-6-172 VENT	CLOSED	
2-VTV-6-1806B	T11G/724	2-LG-6-172 VENT	CLOSED	
2-DRV-6-1807B	T11G/724	DRAIN VALVE FOR 2-LG-6-172	CLOSED	
2-DRV-6-950	T11G/724	CNDS HTR B6 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	
2-DRV-6-1134	T11G/724	2-LIC-6-158 DRAIN	CLOSED	
2-VTV-6-1144	T11G/724	2-LIC-6-158 VENT	CLOSED	
2-VTV-6-1826B	T11G/724	2-LG-6-158 VENT	CLOSED	
2-DRV-6-1827B	T11G/724	DRAIN VALVE FOR 2-LG-6-158	CLOSED	
2-ISV-47-426	T11H/724	LP TURB A EXHAUST HOOD SPRAY FCV U/S ISOL	CLOSED	
2-BYV-47-431	T11H/724	LP TURB A EXHAUST HOOD SPRAY FCV BYPASS	CLOSED	
2-RTV-47-215AA	T11H/724	2-FCV-47-215A SENSING LINE ROOT	CLOSED	
2-VTV-6-916	T11H/724	HTR A7 CHANNEL DRAIN	CLOSED	
2-ISV-5-621	T11H/724	MSR A1/B1/V1 EXTR STM COND DRN ISOL	CLOSED	
2-DRV-6-949	T11H/724	CNDS HTR A6 SHELL SIDE LEVEL COLUMN DRAIN	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-DRV-6-1130	T11H/724	2-LIC-6-138 DRAIN	CLOSED	
2-VTV-6-1140	T11H/724	2-LIC-6-138 VENT	CLOSED	
2-VTV-6-1816B	T11H/724	2-LG-6-138 VENT	CLOSED	
2-DRV-6-1817B	T11H/724	DRAIN VALVE FOR 2-LG-6-138	CLOSED	
2-RTV-6-416A	T12E/724	2-PI-6-176 ROOT	CLOSED	
2-RTV-6-410A	T12E/724	2-PI-6-171 ROOT	CLOSED	
2-ISV-6-875	T11E/729	MSR B-1 LP DRN TNK BYP 2-LCV-6-28B D/S ISOL	CLOSED	
2-ISV-6-876	T11E/729	MSR C-1 LP DRN TNK BYP 2-LCV-6-50B D/S ISOL	CLOSED	
2-ISV-6-874	T11F/729	MSR A-1 LP DRN TNK BYP 2-LCV-6-4B D/S ISOL	CLOSED	
2-ISV-6-830	T11G/729	MSR A-2 HP DRN TNK BYP 2-LCV-6-76B D/S ISOL	CLOSED	
2-ISV-6-831	T11G/729	MSR B-2 HP DRN TNK BYP 2-LCV-6-85B D/S ISOL	CLOSED	
2-ISV-6-832	T11G/729	MSR C-2 HP DRN TNK BYP 2-LCV-6-94B D/S ISOL	CLOSED	
2-ISV-6-833	T11G/729	MSR A-1 HP DRN TNK BYP 2-LCV-6-13B D/S ISOL	CLOSED	
2-ISV-6-842	T11G/729	MSR B-1 HP DRN TNK BYP 2-LCV-6-33B D/S ISOL	CLOSED	
2-ISV-6-843	T11G/729	MSR C-1 HP DRN TNK BYP 2-LCV-6-56B D/S ISOL	CLOSED	
2-VTV-15-922	T11H/729	SG BLOWDOWN FLASH TANK DISCH VENT	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-FCV-7-1	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-2	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-3	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-4	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-5	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-6	T12H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-7	T13H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-8	T13H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-9	T13H/729	TURBINE EXTRACTION DRAIN	CLOSED	
2-FCV-7-10	T13H/729	MN TURBINE VENTILATING STEAM DUMP	CLOSED	
2-FCV-7-11	T13H/729	MN TURBINE VENTILATING STEAM DUMP	CLOSED	
2-ISV-6-850	T14D/729	MSR A-2 BELLY DRN TNK BYP LCV-6-74B D/S ISOL	CLOSED	
2-ISV-6-851	T14D/729	MSR B-2 BELLY DRN TNK BYP LCV-6-83B D/S ISOL	CLOSED	
2-ISV-6-852	T14D/729	MSR C-2 BELLY DRN TNK BYP LCV-6-92B D/S ISOL	CLOSED	
2-ISV-6-859	T14D/729	MSR A-1 BELLY DRN TNK BYP LCV-6-9B D/S ISOL	CLOSED	
2-ISV-6-860	T14D/729	MSR B-1 BELLY DRN TNK BYP LCV-6-31B D/S ISOL	CLOSED	
2-ISV-6-861	T14D/729	MSR C-1 BELLY DRN TNK BYP LCV-6-52B D/S ISOL	CLOSED	
2-VTV-5-573	T14E/729	CNDS HTR C4 EXTR STM INLET VENT	CLOSED	
2-ISV-6-867	T14E/729	MSR B-2 LP DRN TNK BYP 2-LCV-6-81B D/S ISOL	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-ISV-6-1988	T14E/729	HTR A3/B3/C3 OPER VENT COND ISOL	CLOSED	
2-ISV-6-1989	T14E/729	HTR A2/B2/C2 OPER VENT COND ISOL	CLOSED	
2-IBV-5-502	T14F/729	CNDS HTR C4 EXTR STM INLET 2-FCV-5-70 BYP	CLOSED	
2-FCV-5-70	T14F/729	CNDS HTR C4 EXTR STM INLET FLOW CNTL	CLOSED	
2-VTV-5-572	T14F/729	CNDS HTR B4 EXTR STM INLET VENT	CLOSED	
2-RTV-5-228A	T14F/729	2-PI-5-68/2-PT-5-68 ROOT	CLOSED	
2-RTV-5-232A	T14F/729	2-PI-5-83/2-PT-5-83 ROOT	CLOSED	
2-RTV-5-235A	T14F/729	2-PI-5-86/2-PT-5-86 ROOT	CLOSED	
2-RTV-5-240A	T14F/729	2-PI-5-91B/2-PT-5-91 ROOT	CLOSED	
2-RTV-5-241A	T14F/729	2-PI-5-92 ROOT	CLOSED	
2-TV-5-551	T14F/729	CNDS HTR C4 EXTR STM TEST CONN	CLOSED	
2-TV-5-552	T14F/729	CNDS HTR C5 EXTR STM TEST CONN	CLOSED	
2-TV-5-553	T14F/729	CNDS HTR C6 EXTR STM TEST CONN	CLOSED	
2-TV-5-554	T14F/729	CNDS HTR C7 EXTR STM TEST CONN	CLOSED	
2-TV-5-555	T14F/729	CNDS HTR C7 EXTR STM TEST CONN	CLOSED	
2-ISV-6-738	T14F/729	CNDS HTR B4 SHELL SIDE 2-LCV-6-147A D/S ISOL	CLOSED	
2-ISV-6-841	T14F/729	MSR A-2 LP DRN TNK BYP 2-LCV-6-72B D/S ISOL	CLOSED	
2-ISV-6-739	T14F/729	CNDS HTR C4 SHELL SIDE 2-LCV-6-166A D/S ISOL	CLOSED	
2-IBV-6-748	T14F/729	CNDS HTR C4 SHELL SIDE BYP LCV-6-166B D/S ISOL	CLOSED	
2-ISV-6-868	T14F/729	DRN TNK BYP 2-LCV-6-90B D/S ISOL	CLOSED	
2-VTV-5-571	T14G/729	CNDS HTR A4 EXTR STM INLET VENT	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-RTV-5-226A	T14G/729	2-PI-5-60/2-PT-5-60 ROOT	CLOSED	
2-RTV-5-231A	T14G/729	2-PI-80/2-PT-5-80 ROOT	CLOSED	
2-RTV-5-234A	T14G/729	2-PI-5-85/2-PT-5-85 ROOT	CLOSED	
2-RTV-5-238A	T14G/729	2-PI-5-89B/2-PT-5-89 ROOT	CLOSED	
2-RTV-5-239A	T14G/729	2-PI-5-90 ROOT	CLOSED	
2-TV-5-546	T14G/729	CNDS HTR B4 EXTR STM TEST CONN	CLOSED	
2-TV-5-547	T14G/729	CNDS HTR B5 EXTR STM TEST CONN	CLOSED	
2-TV-5-548	T14G/729	CNDS HTR B6 EXTR STM TEST CONN	CLOSED	
2-TV-5-549	T14G/729	CNDS HTR B7 EXTR STM TEST CONN	CLOSED	
2-TV-5-550	T14G/729	CNDS HTR B7 EXTR STM TEST CONN	CLOSED	
2-RTV-2-369A	T14G/729	SPARE ROOT	CLOSED	
2-RTV-2-994A	T14G/729	SPARE ROOT	CLOSED	
2-TV-2-1000	T14G/729	SPARE TEST	CLOSED	
2-RTV-2-927A	T14G/729	2-PT-2-1, 2-PT-2-2 ROOT	OPEN	
2-RTV-2-370A	T14G/729	SPARE ROOT	CLOSED	
2-RTV-2-995A	T14G/729	SPARE ROOT	CLOSED	
2-RTV-2-1001	T14G/729	SPARE TEST	CLOSED	
2-RTV-2-925A	T14G/729	2-PT-2-7 ROOT	OPEN	
2-RTV-2-380A	T14G/729	SPARE ROOT	CLOSED	
2-RTV-2-996A	T14G/729	SPARE ROOT	CLOSED	
2-RTV-2-1002	T14G/729	SPARE TEST	CLOSED	
2-RTV-2-926A	T14G/729	2-PT-2-10, 2-PT-2-336 ROOT	OPEN	
2-ISV-6-737	T14G/729	CNDS HTR A4 SHELL SIDE 2-LCV-6-127 D/S ISOL	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-IBV-6-746	T14G/729	CNDS HTR A4 SHELL SIDE BYP LCV-6-127B D/S ISOL	CLOSED	
2-IBV-6-747	T14G/729	CNDS HTR B4 SHELL SIDE BYP LCV-6-147B D/S ISOL	CLOSED	
2-RTV-5-224A	T14H/729	2-PI-5-52B/2-PT-5-52 ROOT	CLOSED	
2-RTV-5-230A	T14H/729	2-PI-5-77B/2-PT-5-77 ROOT	CLOSED	
2-RTV-5-233A	T14H/729	2-PI-5-84B/2-PT-5-84 ROOT	CLOSED	
2-RTV-5-236A	T14H/729	2-PI-5-87B/2-PT-5-87 ROOT	CLOSED	
2-RTV-5-237A	T14H/729	2-PI-5-88 ROOT	CLOSED	
2-TV-5-541	T14H/729	CNDS HTR A4 EXTR STM TEST CONN	CLOSED	
2-TV-5-542	T14H/729	CNDS HTR A5 EXTR STM TEST CONN	CLOSED	
2-TV-5-543	T14H/729	CNDS HTR A6 EXTR STM TEST CONN	CLOSED	
2-TV-5-544	T14H/729	CNDS HTR A7 EXTR STM TEST CONN	CLOSED	
2-TV-5-545	T14H/729	CNDS HTR A7 EXTR STM TEST CONN	CLOSED	
2-ISV-5-629	T14H/729	MSR A2/B2/C2 EXTR STM DRN COND ISO	CLOSED	
2-IBV-5-501	T15F/729	CNDS HTR B4 EXTR STM INLET 2-FCV-5-62 BYP	CLOSED	
2-FCV-5-62	T15F/729	CNDS HTR B4 EXTR STM INLET FLOW CNTL	CLOSED	
2-FCV-1-45	T15H/729	MFPT 2B LP STEAM CONTROL VLV	CLOSED	
2-FCV-1-46	T15H/729	MFPT 2B LP STEAM STOP VLV	CLOSED	
2-ISV-3-580	T15H/729	MAIN FEEDWATER PUMP A RECIRC ISOL	CLOSED	
2-ISV-3-581	T15H/729	MAIN FEEDWATER PUMP B RECIRC ISOL	CLOSED	
2-FCV-1-38	T15J/729	MFPT 2A LP STEAM CONTROL VLV	CLOSED	
2-FCV-1-39	T15J/729	MFPT 2A LP STEAM STOP VLV	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-FCV-3-208	T15J/729	STANDBY MAIN FEEDWATER PUMP MIN FLOW	CLOSED	
2-IBV-5-500	T16F/729	CNDS HTR A4 EXTR STM INLET 2-FCV-5-54 BYP	CLOSED	
2-FCV-5-54	T16F/729	CNDS HTR A4 EXTR STM INLET FLOW CNTL	CLOSED	
2-FCV-1-43	T16H/729	MFPT 2B HP STEAM STOP VLV	CLOSED	
2-FCV-1-44	T16H/729	MFPT 2B HP STEAM CONTROL VLV	CLOSED	
2-FCV-1-36	T16J/729	MFPT 2A HP STEAM STOP VLV	CLOSED	
2-FCV-1-37	T16J/729	MFPT 2A HP STEAM CONTROL VLV	CLOSED	
2-HCV-3-208	T16J/729	STANDBY MAIN FEEDWATER PUMP RECIRC WARMING	CLOSED	
2-PCV-6-47	T10F/755	MSR C-1 LOW PRESSURE START UP VENT	CLOSED	
2-ISV-6-2042	T10G/755	ISOLATION VALVE FOR MSR 2C-1 START UP VENT	CLOSED	
2-PCV-6-25	T12E/755	MSR B-1 LOW PRESSURE START UP VENT	CLOSED	
2-FCV-1-101	T12F/755	MSR C-1 TO LP TURB C STOP VLV	CLOSED	
2-FCV-1-102	T12F/755	MSR C-1 TO LP TURB C INTERCEPT VLV	CLOSED	
2-ISV-6-2041	T12F/755	ISOLATION VALVE FOR MSR 2B-1 START UP VENT	CLOSED	
2-FCV-1-94	T12G/755	MSR B-1 TO LP TURB B STOP VLV	CLOSED	
2-FCV-1-95	T12G/755	MSR B-1 TO LP TURB B INTERCEPT VLV	CLOSED	
2-ISV-2-2040	T12G/755	ISOLATION VALVE FOR MSR 2A-1 START UP VENT	CLOSED	
2-FCV-1-87	T12H/755	MSR A-1 TO LP TURB A STOP VLV	CLOSED	
2-FCV-1-88	T12H/755	MSR A-1 TO LP TURB A INTERCEPT VLV	CLOSED	
2-PCV-6-1	T12J/755	MSR A-1 LOW PRESSURE START UP VENT	CLOSED	

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VALVE LINEUP FOR CONDENSER EVACUATION

Date _____

COMPONENT	LOCATION	NOMENCLATURE	POSITION	VERIFIED BY INITIAL
2-FCV-1-133	T13F/755	MSR C-2 TO LP TURB C STOP VLV	CLOSED	
2-FCV-1-134	T13F/755	MSR C-2 TO LP TURB C INTERCEPT VLV	CLOSED	
2-FCV-1-128	T13G/755	MSR B-2 TO LP TURB B STOP VLV	CLOSED	
2-FCV-1-129	T13G/755	MSR B-2 TO LP TURB B INTERCEPT VLV	CLOSED	
2-FCV-1-123	T13H/755	MSR A-2 TO LP TURB A STOP VLV	CLOSED	
2-FCV-1-124	T13H/755	MSR A-2 TO LP TURB A INTERCEPT VLV	CLOSED	
2-LOV-47-727	T13J/755	HP TURBINE STEAM SEAL LEAKOFF	CLOSED	
2-LOV-47-728	T13J/755	HP TURBINE STEAM SEAL LEAKOFF	CLOSED	
2-LOV-47-729	T13J/755	HP TURBINE STEAM SEAL LEAKOFF	CLOSED	
2-LOV-47-730	T13J/755	HP TURBINE STEAM SEAL LEAKOFF	CLOSED	
2-PCV-6-78	T14E/755	MSR B-2 LOW PRESSURE START UP VENT	CLOSED	
2-ISV-6-2044	T14F/755	ISOLATION VALVE FOR MSR 2B-2 START UP VENT	CLOSED	
2-RTV-7-200A	T14G/755	2-PS-7-1 ROOT	CLOSED	
2-ISV-2-2043	T14G/755	ISOLATION VALVE FOR MSR 2A-2 START UP VENT	CLOSED	
2-PCV-6-69	T14J/755	MSR A-2 LOW PRESSURE START UP VENT	CLOSED	
2-PCV-6-87	T15F/755	MSR C-2 LOW PRESSURE START UP VENT	CLOSED	
2-ISV-6-2045	T15G/755	ISOLATION VALVE FOR MSR 2C-2 START UP VENT	CLOSED	

* If condensate is run in long path recirculation then these valves will be positioned as required by applicable operating guidelines.

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BACKGROUND CALCULATIONS

Date _____

1.0 CVP Motor Running Overload

CVP Motors are required to operate below overload conditions.
CVP Motors have the following nameplate information:

Amps: 151 Volts: 460

Assuming each measured current and voltage value is within ±2.4% of reading, then the instrument uncertainty associated with the motor current and voltage measurements can be calculated.

$$I_{AVG} = \frac{\sum I}{3} = \frac{I_A + I_B + I_C}{3}$$

$$I_A = I_{AM} \pm 0.024 I_{AM} = I_{AM}(1 \pm 0.024) \qquad I_B = I_{BM} \pm 0.024 I_{BM} = I_{BM}(1 \pm 0.024)$$

$$I_C = I_{CM} \pm 0.024 I_{CM} = I_{CM}(1 \pm 0.024)$$

Where I_{AM}, I_{BM}, and I_{CM} are measured currents in A, B, and C phases, respectively.

$$I_{AVG} = \frac{I_{AM}(1 \pm 0.024) + I_{BM}(1 \pm 0.024) + I_{CM}(1 \pm 0.024)}{3} = \frac{(1 \pm 0.024) \cdot (I_{AM} + I_{BM} + I_{CM})}{3}$$

Applying that same logic to measured Voltage:

$$\frac{(I_{AM} + I_{BM} + I_{CM})}{3} = \frac{I_{AVG}}{(1 \pm 0.024)} \qquad \text{and} \qquad \frac{(V_{ABM} + V_{BCM} + V_{ACM})}{3} = \frac{V_{AVG}}{(1 \pm 0.024)}$$

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BACKGROUND CALCULATIONS

Date _____

1.0 CVP Motor Running Overload (continued)

Using these values as inputs to motor running kVA

$$\text{Actual kVA} = \frac{\sqrt{3} \times \text{Actual Volts} \times \text{Actual Amps}}{1000}$$

$$\text{Actual kVA} = \frac{\sqrt{3} \times \frac{I_{AVG}}{(1 \pm 0.024)} \times \frac{V_{AVG}}{(1 \pm 0.024)}}{1000} = \frac{\sqrt{3} \times \frac{I_{AVG} \times V_{AVG}}{(1 \pm 0.024)^2}}{1000}$$

$$= \frac{\sqrt{3} \times I_{AVG} \times V_{AVG}}{1000} \times \frac{1}{1.0486} \quad \text{or} \quad = \frac{\sqrt{3} \times I_{AVG} \times V_{AVG}}{1000} \times \frac{1}{0.9526}$$

Maximum CVP motor kVA is 120.3 based on the following calculation:

$$\text{Namelate kVA} = \frac{\sqrt{3} \times \text{NP Volts} \times \text{NP Amps}}{1000} = \frac{\sqrt{3} \times 460 \times 151}{1000} = 120.3 \text{ kVA}$$

Therefore, since actual kVA cannot exceed Nameplate kVA:

$$= 120.3 \times \frac{1}{1.0486} = 114.7 \quad \text{or} \quad = 120.3 \times \frac{1}{0.9526} = 126.3$$

The Acceptance Criteria to ensure no CVP Motor overload is that the CVP Motors operate at **no greater than 114.5 kVA** to conservatively account for instrument inaccuracies.

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows

A. SCOPE

The required air flows required to meet the acceptance criteria of equaling or exceeding pump shop test curve for suction pressure and capacity were extracted from the Nash Shop Test Curves for the respective CVPs. These curves are Attachments 1, 2, and 3 of this instruction.

The Nash Shop Test curves are measured in Actual Cubic Feet per Minute (ACFM) at the pump suction pressure at a pump speed of 590 RPM. This presents three challenges.

1. The CVPs in this test are configured to operate at 500 RPM.
2. Plant configuration does not facilitate measuring airflow at the CVP suction; CVP flows are measured at the common discharge line.
3. The instrumentation that will be used to measure air flow measured in Standard Cubic Feet per Minute (SCFM)

Therefore, the required pump flows must be converted to SCFM values at 500 RPM.

Calculating the required CVP flows is a four-step process.

1. Pump flow values are adjusted to 500 RPM pump speed.
2. Linear interpolation is used to determine the required flow value in ACFM
3. The interpolated flow value is then converted to SCFM
4. Instrument inaccuracies are applied.

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

B. EQUATIONS USED

1. Using Pump laws, if the pump wheel diameter is constant a change in pump speed is linearly proportional to pump flow rate.

$$\frac{q_1}{q_2} = \frac{n_1}{n_2} \qquad \text{which becomes:} \qquad q_2 = \frac{n_2}{n_1} \times q_1$$

Where:
q = flow rate
n = pump speed

2. The generic formula for linear interpolation is:

$$Y = \frac{(X - X_1)(Y_2 - Y_1)}{(X_2 - X_1)} + Y_1$$

Where:
X_1, Y_1 = First coordinates
X_2, Y_2 = Second coordinates
X = Target X coordinate
Y = Interpolated Y coordinate

3. The formula for relating ACFM to SCFM (standard conditions are Barometric Pressure = 29.92inHg and Air Temp = 70°F) is:

$$q_{SCFM} = q_{ACFM} \times \frac{P_{Barometric} + P_{Static}}{P_{STD}} \times \frac{T_{STD} + 460}{T_A + 460}$$

Where:
q = flow rate
P = Air Pressure (inHg)
T = Temperature (°F)

Assuming standard conditions, this relationship becomes:

P_{STD} = 29.92 inHg
T_{STD}= 70°F
P_A = Air Stream Absolute Pressure (inHgA)
T_A = Air Stream Temperature (°F)

$$q_{SCFM} = q_{ACFM} \times \frac{P_A}{29.92} \times \frac{530}{T_A + 460} = 17.714 \times q_{ACFM} \times \frac{P_A}{T_A + 460}$$

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

4. Assuming each measured air velocity value is within ±5% of reading, then the instrument uncertainty associated with the air flow measurements can be calculated.

$$V_{Measured} = V_{Actual} \pm 0.05 V_{Actual} = V_{Actual}(1 \pm 0.05)$$

Where:
q = flow rate
A = Area
V = Air Velocity
n = number of Traverse Points

$$V_{AVG} = \frac{\sum V_{Actual}}{n} = \frac{V_{Measured(1)}(1 \pm 0.05) + V_{Measured(2)}(1 \pm 0.05) + ... + V_{Measured(n)}(1 \pm 0.05)}{n}$$

$$= \frac{(1 \pm 0.05)(V_{Measured(1)} + V_{Measured(2)} + ... + V_{Measured(n)})}{n} = (1 \pm 0.05)\frac{\sum V_{Measuredl}}{n} = (1 \pm 0.05)V_{AVG(Measuredl)}$$

$$q = A \times V_{AVG}$$

$$q = A \times (1 \pm 0.05)V_{AVG(Measured)}$$

Therefore, since Area is a constant and has no associated uncertainties:

$$\frac{q}{(1 \pm 0.05)} = A \times V_{AVG(Measured)} = q_{Measured}$$

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

C. CALCULATIONS

This Appendix will step through the complete process with one point on the curve for CVP 2A and show the other curve point calculations in a table.

Determine the Air Flow at 15 inHgA for CVP 2A based on the data from Nash Shop Test Curve 78U4265 (Attachment 1):

Point 1 = 1968.6 CFM at 15.54 inHgA and
Point 2 = 1848.3 CFM at 7.82 inHgA
Temperature = 60°F

1. Adjusting pump flow values to 500 RPM pump speed:

$$q_2 = \frac{n_2}{n_1} \times q_1$$

Where:
q = flow rate
n = pump speed

$$q_2 = \frac{500}{590} \times 1968.6 = 1668.3$$

$$q_2 = \frac{500}{590} \times 1848.3 = 1566.4$$

So the pump flows adjusted to a pump speed of 500 RPM are:
Point 1 = 1668.3 CFM at 15.54 inHgA and
Point 2 = 1566.4 CFM at 7.82 inHgA

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

2. Interpolating to determine the required flow value in ACFM:

$$Y = \frac{(X - X_1)(Y_2 - Y_1)}{(X_2 - X_1)} + Y_1$$

Where:
X_1, Y_1 = First coordinates
X_2, Y_2 = Second coordinates
X = Target X coordinate
Y = Interpolated Y coordinate

Point coordinates are (15.54, 1668.3) and (7.82, 1566.4) and the value to be interpolated is Air Flow (Y) at target pressure of 15 inHgA (X):

$$Y = \frac{(15 - 15.54)(1566.4 - 1668.3)}{(7.82 - 15.54)} + 1668.3 = 1661.2$$

So, pump flow is 1661.2 CFM at 15 inHgA

3. Converting the interpolated flow value to SCFM:

$$q_{SCFM} = 17.714 \times q_{ACFM} \times \frac{P}{T + 460}$$

Where:
q = flow rate
P = Air Stream Absolute Pressure (inHgA)
T = Air Stream Temperature (°F)

$$q_{SCFM} = 17.714 \times 1661.2 \times \frac{15}{60 + 460} = 848.8$$

So, pump flow at 15 inHgA is 848.8 SCFM

4. Applying instrument inaccuracies:

$$\frac{q}{(1 \pm 0.05)} = q_{Measured}$$

$$\frac{848.8}{1.05} = 808.4 \qquad \frac{848.8}{0.95} = 893.5$$

Since 848.8 SCFM is the minimum required flow, the Acceptance Criteria value will be adjusted to **894 SCFM** to account for instrument inaccuracies.

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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

5. Calculation Tables

These tables use the same four-step process shown in 2.0C.1 through 2.0C.4 to determine the acceptance criteria values for the CVP flow rates.

Condenser Vacuum Pump 2A

Temperature: 60°F							
Pressure (inHgA)		22.86	15.54	7.82	4.25	2.30	1.50
Flow (CFM)	@ 590 RPM	2084.9	1968.6	1848.3	1805.8	1715.2	1311.3
	@ 500 RPM	*1766.9*	*1668.3*	*1566.4*	*1530.3*	*1453.6*	*1111.3*

Interpolation	Pressure (inHgA)	15	5	3	2	1
	Flow (CFM)	*1661.2*	*1537.9*	*1481.1*	*1325.2*	*897.3*
Convert to SCFM		*848.8*	*261.9*	*151.4*	*90.3*	*30.6*
Apply instrument inaccuracies (SCFM)		*893.5*	*275.7*	*159.4*	*95.1*	*32.2*
Acceptance Criteria (SCFM)		**894**	**276**	**160**	**95.5**	**32.5**

Condenser Vacuum Pump 2B

Temperature: 60°F							
Pressure (inHgA)		22.94	16.32	8.00	4.16	2.33	1.56
Flow (CFM)	@ 590 RPM	2086.8	1866.2	1838.0	1922.4	1845.6	1321.7
	@ 500 RPM	*1768.5*	*1581.5*	*1557.6*	*1629.2*	*1564.1*	*1120.1*

Interpolation	Pressure (inHgA)	15	5	3	2	1
	Flow (CFM)	*1577.7*	*1613.5*	*1587.9*	*1373.8*	*797.2*
Convert to SCFM		*806.2*	*274.8*	*162.3*	*93.6*	*27.2*
Apply instrument inaccuracies (SCFM)		*848.6*	*289.3*	*170.8*	*98.5*	*28.5*
Acceptance Criteria (SCFM)		**849**	**290**	**171**	**99**	**29**

Appendix H
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BACKGROUND CALCULATIONS

Date _____

2.0 CVP Air Flows (continued)

Condenser Vacuum Pump 2C

Temperature: 60°F							
Pressure (inHgA)		22.86	15.93	7.96	4.34	2.32	1.47
Flow (CFM)	@ 590 RPM	2058.2	1887.4	1792.6	1741.4	1654.6	1285.2
	@ 500 RPM	*1744.2*	*1599.5*	*1519.2*	*1475.8*	*1402.2*	*1089.2*

Interpolation	Pressure (inHgA)	15	5	3	2	1
	Flow (CFM)	*1590.1*	*1483.7*	*1427.0*	*1284.3*	*916.1*
Convert to SCFM		*812.5*	*252.7*	*145.8*	*87.5*	*31.2*
Apply instrument inaccuracies (SCFM)		*855.3*	*266.0*	*153.5*	*92.1*	*32.8*
Acceptance Criteria (SCFM)		**856**	**267**	**154**	**92.5**	**33**

Appendix H
(Page 10 of 10)

BACKGROUND CALCULATIONS

Date _____

3.0 CVP Suction Pressure

Assuming the Barometric Pressure reading is within ±0.4% of range:

Range: 27-31 inHg $0.004 \times (31 - 27) = 0.016 \text{ inHg}$

Assuming that the Vacuum Gauge readings are within 0.5% of scale

Scale: 0-30 inHg $0.005 \times (30 - 0) = 0.15 \text{ inHg}$

Since the barometric pressure and the vacuum pressure are used together to determine the CVP suction absolute pressure, the maximum error in CVP suction pressure will be the sum of each reading's maximum error.

$0.016 + 0.15 = 0.166 \text{ inHg}$

Therefore, the acceptance criteria for each CVP suction value will be adjusted to be **0.17 inHg less** than its required value.

Required Value	15	5	3	2	1
Acceptance Criteria	**14.83**	**4.83**	**2.83**	**1.83**	**0.83**

Data Sheet 1
(Page 1 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[10]	**CVP 2A at Atmospheric Pressure**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\quad) \times (\quad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 1
(Page 2 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[15]	**CVP 2A at 15 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 14.83 inHgA = BP - 14.83= _____ inHgVac

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\quad) \times (\quad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 1
(Page 3 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[19]	**CVP 2A at 5 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 4.83 inHgA = BP - 4.83= _____ inHgVac

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 1
(Page 4 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[22]	**CVP 2A at 3 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 2.83 inHgA = BP - 2.83= _____ inHgVac

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 1
(Page 5 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[25]	**CVP 2A at 2 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 1.83 inHgA = BP - 1.83= _____ inHgVac

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 1
(Page 6 of 6)

Condenser Vacuum Pump 2A Performance

Date _____

Step 6.6.1[29]	**CVP 2A at 1 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 0.83 inHgA = BP - 0.83= _____ inHgVac

CVP 2A Suction Pressure (Vacuum Gauge A) _____ inHgVac = _____ inHgA

CVP 2A Discharge Pressure (Pressure Gauge A) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge A M&TE: _____

Multimeter M&TE: _____ Pressure Gauge A M&TE: _____

Data Sheet 2
(Page 1 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[10]	**CVP 2B at Atmospheric Pressure**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\quad) \times (\quad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 2
(Page 2 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[15]	**CVP 2B at 15 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 14.83 inHgA = BP - 14.83= _____ inHgVac

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 2
(Page 3 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[19]	**CVP 2B at 5 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 4.83 inHgA = BP - 4.83= _____ inHgVac

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 2
(Page 4 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[22]	**CVP 2B at 3 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 2.83 inHgA = BP - 2.83= _____ inHgVac

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 2
(Page 5 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[25]	**CVP 2B at 2 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 1.83 inHgA = BP - 1.83= _____ inHgVac

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 2
(Page 6 of 6)

Condenser Vacuum Pump 2B Performance

Date _____

Step 6.6.2[29]	**CVP 2B at 1 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 0.83 inHgA = BP - 0.83= _____ inHgVac

CVP 2B Suction Pressure (Vacuum Gauge B) _____ inHgVac = _____ inHgA

CVP 2B Discharge Pressure (Pressure Gauge B) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge B M&TE: _____

Multimeter M&TE: _____ Pressure Gauge B M&TE: _____

Data Sheet 3
(Page 1 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[10]	**CVP 2C at Atmospheric Pressure**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\quad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\quad) \times (\quad)}{1000} = \_\_\_\_\_ \text{ kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 3
(Page 2 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[15]	**CVP 2C at 15 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 14.83 inHgA = BP - 14.83= _____ inHgVac

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 3
(Page 3 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[19]	**CVP 2C at 5 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 4.83 inHgA = BP - 4.83= _____ inHgVac

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 3
(Page 4 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[22]	**CVP 2C at 3 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 2.83 inHgA = BP - 2.83= _____ inHgVac

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 3
(Page 5 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[25]	**CVP 2C at 2 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 1.83 inHgA = BP - 1.83= _____ inHgVac

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 3
(Page 6 of 6)

Condenser Vacuum Pump 2C Performance

Date _____

Step 6.6.3[29]	**CVP 2C at 1 inHgA**

Absolute Pressure (inHgA) = Barometric Pressure(inHg) - Vacuum Pressure (inHgVac)

Barometric Pressure (BP): _____ inHg

Req'd Vac = 0.83 inHgA = BP - 0.83= _____ inHgVac

CVP 2C Suction Pressure (Vacuum Gauge C) _____ inHgVac = _____ inHgA

CVP 2C Discharge Pressure (Pressure Gauge C) _____ PSI

Airflow Traverse (Use Data Sheet 4) _____ SCFM

ICS Point F2260A _____ SCFM

Phase	Current (Amps)
A	
B	
C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

Phase	Voltage (Volts)
A - B	
A - C	
B - C	
$\frac{\text{TOTAL}}{3} = \text{AVERAGE}$	$\frac{\qquad}{3} =$

$$\text{Motor kVA} = \frac{\sqrt{3} \times (\text{Average Volts}) \times (\text{Average Amps})}{1000} = \frac{\sqrt{3} \times (\qquad) \times (\qquad)}{1000} = \_\_\_\_\_ \text{kVA}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Barometer M&TE: _____ Vacuum Gauge C M&TE: _____

Multimeter M&TE: _____ Pressure Gauge C M&TE: _____

Data Sheet 4
(Page 1 of 1)

Condenser Vacuum Pump Air Flow Traverse

Date _____

NOTE

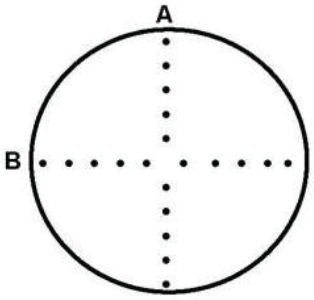
Additional Copies of this Data Sheet will be required and may be made as necessary

Step: _____ **CVP:** _____ **Suction Pressure:** _____ **inHgA**

Anemometer M&TE ID: _____

Inside Pipe Diameter = 12.00 in.

Duct Area (A) = 0.785 ft^2



1 - 1/4 in.
2 - 1 in.
3 - 1 3/4 in.
4 - 2 3/4 in.
5 - 4 1/8 in.

6 - 7 7/8 in.
7 - 9 1/4 in.
8 - 10 1/4 in.
9 - 11 in.
10 - 11 3/4 in

Dimensions are from inside wall.

Traverse Point	Velocity (FPM)
A1	
A2	
A3	
A4	
A5	
A6	
A7	
A8	
A9	
A10	

Traverse Point	Velocity (FPM)
B1	
B2	
B3	
B4	
B5	
B6	
B7	
B8	
B9	
B10	

Test port caps/plugs reinstalled: _____ 2nd Party Verified: _____

$$V_{AVG} = \left(\sum \text{Velocities}\right) \div 20 = \frac{\qquad}{20} = \_\_\_\_\_ \text{FPM}$$

$$\text{Airflow} = A \times V_{AVG} = 0.785 \times \_\_\_\_\_ = \_\_\_\_\_ \text{SCFM}$$

Data Taken By: _____

Calculations Performed By: _____ Date: _____

Calculations Verified By: _____ Date: _____

Data Sheet 5
(Page 1 of 2)

Condenser Evacuation Performance Data

Date _____

Step 6.6.4[14]		6.6.4[14]A	6.6.4[14]B	6.6.4[14]C	6.6.4[14]D	6.6.4[14]E	6.6.4[14]F	6.6.4[14]G
Condenser Pressure (inHgA)	**2-P/TR-2-2**	_____ **(Atm)**	**25**	**20**	**15**	**10**	**5**	_____ **(Final)**
Time (hh:mm:ss)	Stopwatch M&TE:_____							
Condenser Exhaust Flow (SCFM)	ICS Pt. F2700A							
	ICS Pt. F2260A							
RCW Inlet Temp (°F)	ICS Pt. Y8003A							
CVP Seal Wtr HTX Outlet Temp (°F)	2-TI-2-320							
	2-TI-2-321							
	2-TI-2-322							
CVP Suction Strainer ΔP (inH2O)	2-PDI-2-170							
	2-PDI-2-175							
	2-PDI-2-180							

Data Sheet 5
(Page 2 of 2)

Condenser Evacuation Performance Data

Date _____

Step 6.6.4[14]		6.6.4[14]A	6.6.4[14]B	6.6.4[14]C	6.6.4[14]D	6.6.4[14]E	6.6.4[14]F	6.6.4[14]G
Condenser Pressure (inHgA)	**2-P/TR-2-2**	_____ **(Atm)**	**25**	**20**	**15**	**10**	**5**	_____ **(Final)**
CVP Discharge Pressure (PSI)	Pressure Gauge A M&TE:_____							
	Pressure Gauge B M&TE:_____							
	Pressure Gauge C M&TE:_____							
MFPT Condenser 2A Pressure (inHgA)	ICS Pt. P2270A							
MFPT Condenser 2B Pressure (inHgA)	ICS Pt. P2271A							

Data Sheet 6
(Page 1 of 1)

Barometric Pressure

Date _____

NOTES

1) Additional copies of this Data Sheet may be made as necessary

2) Atmospheric conditions can change quickly. Record atmospheric pressure at least once per shift during performance of Section 6.6.

Time	Date	Barometric Pressure	Barometer M&TE	Initials
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		
		inHg		

Attachment 1
(Page 1 of 1)

Condenser Vacuum Pump 2A Curve

Date _____

THE NASH ENGINEERING CO
TRUMBULL CT USA 06611

CERTIFIED PRODUCTION TEST
PRODTEST VERSION 3.81

PRODUCT CODE 4670200440000 REV- D NAME- AT2004 TEST NO- 78U4265

PUMP SPEED- 590 RPM ORDER NO- 1773686 TESTED- 07/22/2010

CUSTOMER ORDER NUMBER TVA

********** TEST DATA ********** ********** CORRECTED DATA **********

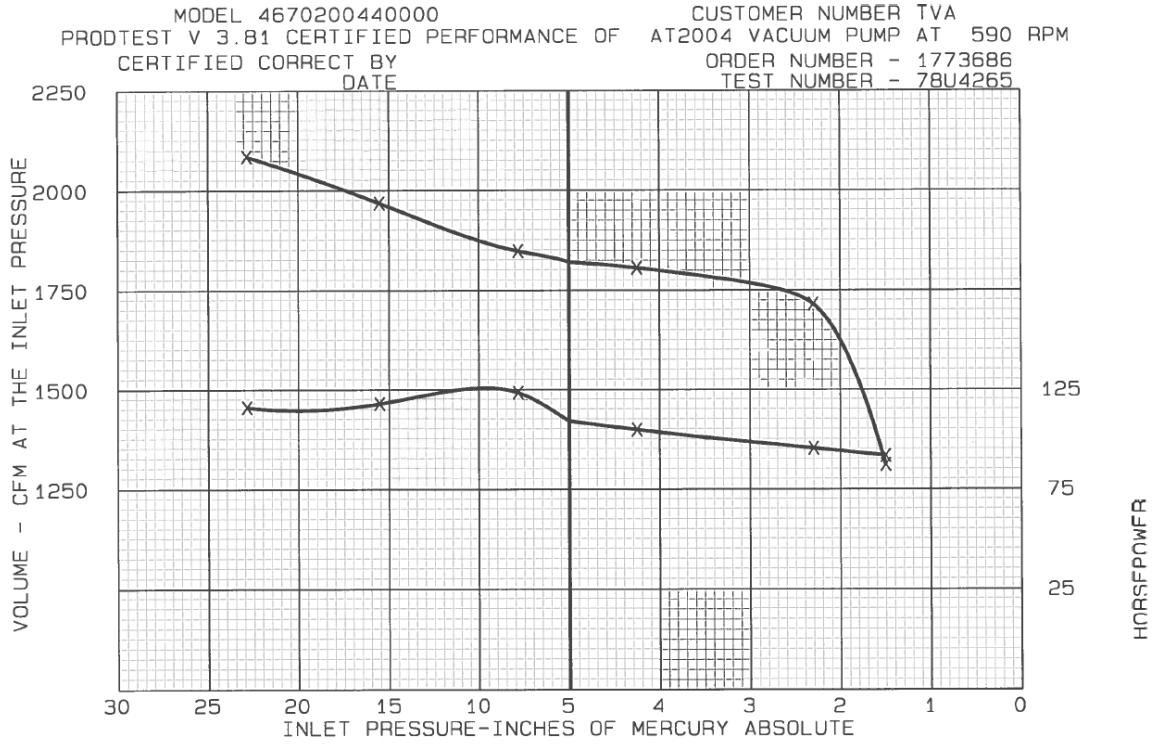
BAR: 29.27 INHG TEMP 79.0 DEG F BAR: 29.92 INHG TEMP: 60.0 DEG F

HEADER ABS IN HG	SEAL WATER TEMP DEG F	PRESS PSIG	RATE GPM	ABS IN HG	CFM	HP
22.36	86.0	0.0	40.0	22.86	2084.9	116.1
15.20	86.0	0.0	40.0	15.54	1968.6	118.0
7.65	86.5	0.0	40.0	7.82	1848.3	123.6
4.16	87.5	0.0	40.0	4.25	1805.8	104.8
2.30	87.5	0.0	40.0	2.30	1715.2	95.5
1.50	88.0	0.0	40.0	1.50	1311.3	91.7

LEAKS : NONE BEARING TEMP : NORMAL NOISE AND VIBRATION : OK

CERTIFIED CORRECT BY ENGINEERING DIVISION FOR FEATURE 1009

_____ DATE _____



Attachment 2
(Page 1 of 1)

Condenser Vacuum Pump 2B Curve

THE NASH ENGINEERING CO
TRUMBULL CT USA 06611

CERTIFIED PRODUCTION TEST
PRODTEST VERSION 3.81

PRODUCT CODE 4670200440000 REV- D NAME- AT2004 TEST NO- 78U4261

PUMP SPEED- 590 RPM ORDER NO- 1773681 TESTED- 07/22/2010

CUSTOMER ORDER NUMBER TVA

********** TEST DATA ********** ********** CORRECTED DATA **********

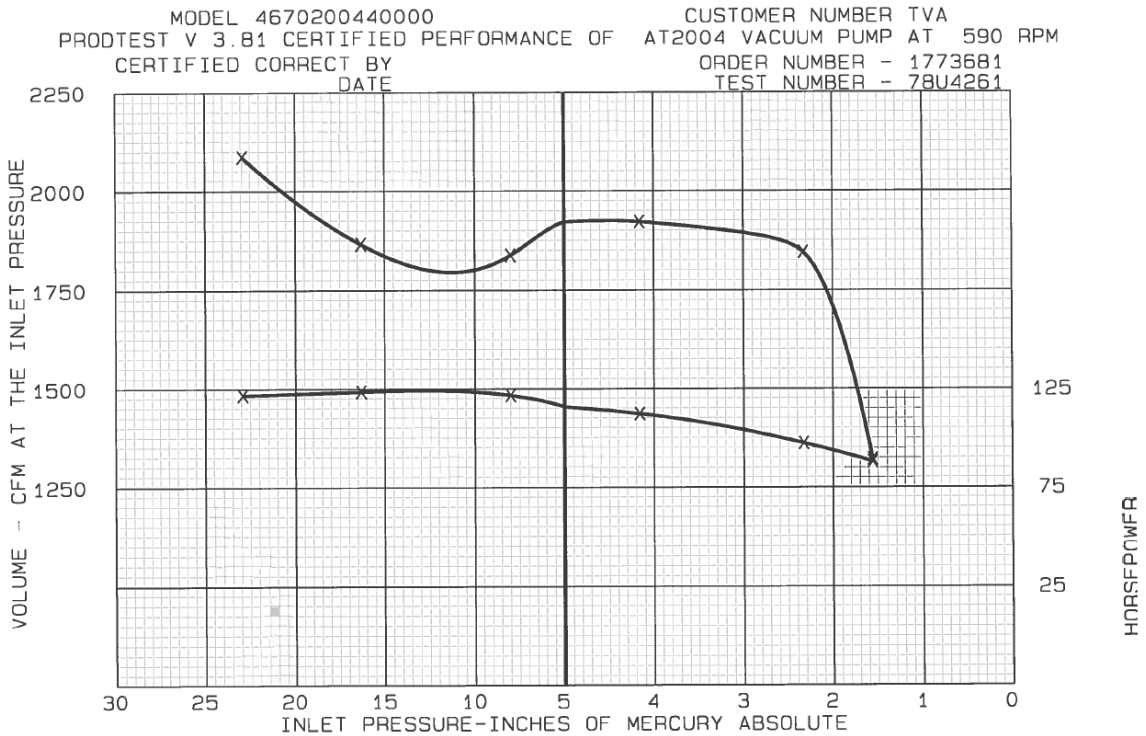
BAR: 29.27 INHG TEMP 95.0 DEG F BAR: 29.92 INHG TEMP: 60.0 DEG F

HEADER ABS IN HG	SEAL WATER TEMP DEG F	SEAL WATER PRESS PSIG	SEAL WATER RATE GPM	ABS IN HG	CFM	HP
22.44	94.0	0.0	40.0	22.94	2086.8	121.7
15.97	91.7	0.0	40.0	16.32	1866.2	123.6
7.83	92.0	0.0	40.0	8.00	1838.0	121.7
4.07	92.0	0.0	40.0	4.16	1922.4	112.3
2.33	92.0	0.0	40.0	2.33	1845.6	97.4
1.56	90.0	0.0	40.0	1.56	1321.7	88.0

LEAKS : NONE BEARING TEMP : NORMAL NOISE AND VIBRATION : OK

CERTIFIED CORRECT BY ENGINEERING DIVISION FOR FEATURE 1009

_____ DATE _____



Attachment 3
(Page 1 of 1)

Condenser Vacuum Pump 2C Curve

Date _____

THE NASH ENGINEERING CO
TRUMBULL CT USA 06611

CERTIFIED PRODUCTION TEST
PRODTEST VERSION 3.81

PRODUCT CODE 4670200440000 REV- D NAME- AT2004 TEST NO- 78U4263

PUMP SPEED- 590 RPM ORDER NO- 1773685 TESTED- 07/22/2010

CUSTOMER ORDER NUMBER TVA

********** TEST DATA ********** ********** CORRECTED DATA **********

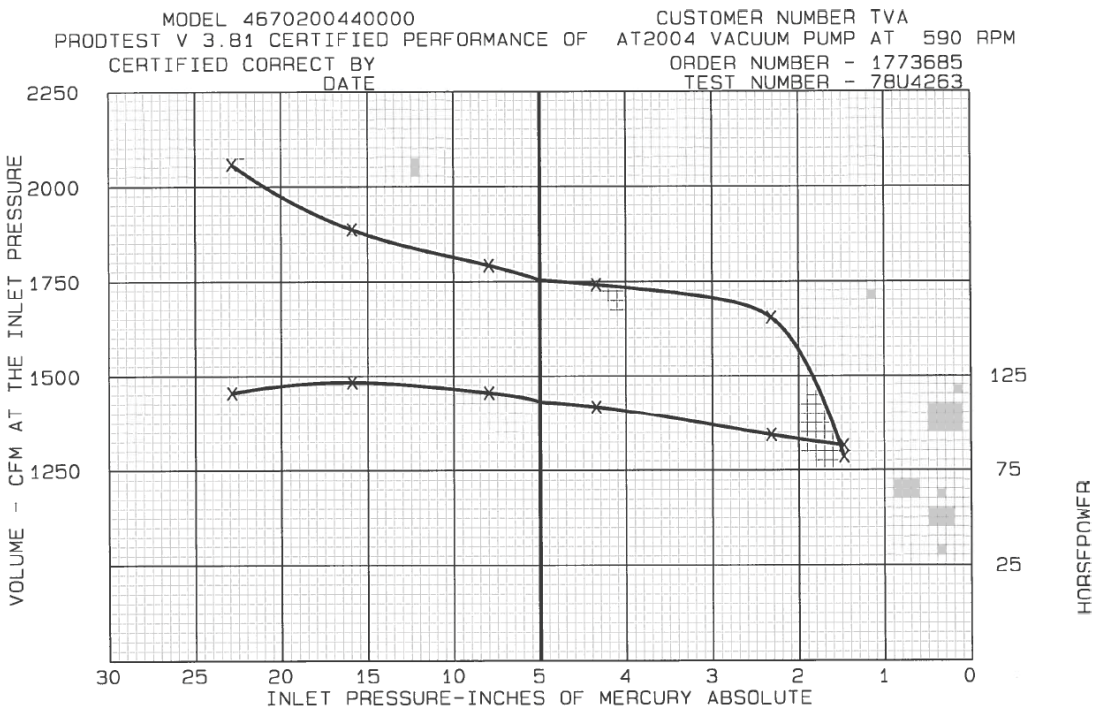
BAR: 29.27 INHG TEMP 81.0 DEG F BAR: 29.92 INHG TEMP: 60.0 DEG F

HEADER ABS IN HG	SEAL WATER TEMP DEG F	SEAL WATER PRESS PSIG	SEAL WATER RATE GPM	ABS IN HG	CFM	HP
22.36	86.0	0.0	40.0	22.86	2058.2	116.1
15.58	87.0	0.0	40.0	15.93	1887.4	121.7
7.79	87.0	0.0	40.0	7.96	1792.6	116.1
4.25	87.0	0.0	40.0	4.34	1741.4	108.6
2.32	87.0	0.0	40.0	2.32	1654.6	93.6
1.47	87.0	0.0	40.0	1.47	1285.2	88.0

LEAKS : NONE BEARING TEMP : NORMAL NOISE AND VIBRATION : OK

CERTIFIED CORRECT BY ENGINEERING DIVISION FOR FEATURE 1009

_____ DATE _____



WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST

TITLE: FLOOD MODE BORATION

Instruction No: 2-PTI-084-01

Revision No: 0000

PREPARED BY: T. E. Tuckier T E Tuckier DATE: 3/5/2013
PRINT NAME / SIGNATURE

REVIEWED BY: Whiting S. Delk Whiting S. Delk DATE: 3/6/2013
PRINT NAME / SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING No: 2-13-003

JTG CHAIRMAN: Nick A Welch DATE: 3/7/2013

APPROVED BY : Nick A Welch DATE: 3/7/2013
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	3/11/13	ALL	Initial Issue. This procedure was developed from Rev. 0 of Unit 1 PTI-084-01, 2-TSD-84-1, Rev 0001, 2-TI-50.048 and 2-TI-50.049 Rev 0001.

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1.0 INTRODUCTION

1.1 Test Objectives

The objective of this test is to verify the operability and performance of the Unit 2 Auxiliary Charging Pumps and other components of the Auxiliary Charging System (ACS) and to demonstrate the operability of the system as a whole under conditions as close to design as possible. This test will also verify the connection and proper mating of applicable spool pieces.

This test shall verify flow through the Unit 2 ACS pumps only. Flow through the Auxiliary Charging Booster Pumps, non-regenerative demineralizer tank and filters are Unit 0 and have previously been tested.

This test shall also verify the connection and proper mating of affected spool pieces to include make up flow from the U-2 Reactor Coolant Drain Tank (RCDT) and to the Reactor Coolant System (RCS) via the Chemical and Volume Control System (CVCS).

1.2 Scope

Performance of this test will demonstrate that:

A. The Unit 2 ACS pumps can provide makeup water to the U-2 Reactor Coolant System (RCS).

B. The spool pieces required for flood mode operation can be installed and mate properly.

C. The intertie piping between Chemical & Volume Control System (CVCS) and Reactor Coolant System (RCS) is unobstructed.

D. Testing observations are made of the vibration of system pumps, piping and other components during normal steady state and transient operations. Based on engineering judgment by test personnel, measurements shall be taken on areas and components exhibiting excessive vibration. Transient operations include pump starts, trips, valve openings and closures, and all components which are considered an integral part of the transient.

2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, Conduct of Test

B. TI-31.02, Plant Equipment Vibration Monitoring & Vibration Diagnostics Program

C. MI-17.003, Flood Mode Preparation Storage Locations and Periodic Inventory

D. 2-TI-50.048, Flood Mode Auxiliary Charging Pump 2A Performance Test

E. 2-TI-50.049, Flood Mode Auxiliary Charging Pump 2B Performance Test

F. 2-MI-17.019, Flood Preparation - Auxiliary Charging System Spool Piece

G. 2-MI-17.018, Flood Preparation High Pressure Fire Protection System Spool Pieces

H. 2-MI-17.020, Flood Preparation - Sample Heat Exchanger Spool Pieces

I. 0-MI-17.021, Installation of Spool Pieces between ERCW and Component Cooling System

J. 2-MI-17.022, Flood Preparation- Installation of Spool Pieces between SFPC and RHR Systems

K. 2-MI-17.023, Flood Preparation - Reactor Coolant Drain Tank Spool Pieces

L. 2-CP-062-02, Cleanness Plan, Rev. 0000

M. 2-CP-077-01, Cleanness Plant, Rev. 0000

2.2 Developmental References

A. Final Safety Analysis Report

1. FSAR-(Amendment 109)

a. Section 9.3.6, Auxiliary Charging System

b. Table 14.2-1, Sheet 20 of 89, Flood Mode Boration System Test Summary

B. Drawings

1. Flow Diagrams

a. 2-47W809-7,Rev 5 (CC) Flow Diagram Flood Mode Boration Makeup System

b. 2-47W809-1 Rev 12 (CC), Flow Diagram Chemical and Volume Control System

c. 2-47W830-1 Rev 6 (CC), Mechanical Flow Diagram Waste Disposal System

d. 1-47W850-2 Rev 35 (CC), Flow Diagram Fire Protection Raw Service Water

e. 2-47W845-2 Rev 7 (CC), Mechanical Flow Diagram Essential Raw Cooling Water System

2. Electrical

a. 2-45W760-84-1, Rev 1 (CC), Wiring Diagram Flood Mode Boration Makeup Sys Schematic Diagrams

b. 2-45W756-2 Rev 1 (CC), 480V Cont and Aux Bldg VT Bd 2A1-A Single Line - Sh-2

c. 2-45W756-6 Rev 0 (CC), 480V Cont and Aux Bldg VT Bd 2B1-B Single Line - Sh-2

3. Logic/Control

a. 2-47W610-41-1 Rev 2 (CC), Electrical Control Diagram Flood Mode Boration Makeup Sys Layup Wtr Treatment System

2.2 Developmental References (continued)

C. Documents

1. WBN2-84-4001, Flood Mode Boration Makeup System (Rev. 01)
2. 2-TSD-84-1, Flood Mode Boration System, (Rev. 0001)
3. NPG-SPP-18.4.6, Control of Fire Protection Impairments (Rev 0001)

3.0 PRECAUTIONS AND LIMITATIONS

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

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

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

D. The hinged cover of the Auxiliary Boration Mixing Tank (ABMT) must be open during flood mode operation so the tank's associated instrumentation will not be damaged. Use CAUTION to ensure tank/system is not overpressurized.

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

F. RCS pressure must be less than 350 psig before installation and removal of temporary spool pieces.

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.

K. Problems identified during the test shall be annotated on the 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.

3.0 PRECAUTIONS AND LIMITATIONS (continued)

L. Notification/Coordination of activities with Unit 1 is required, since Mixing Tank falls under the control of the operating unit.

M. Transients include pump starts and stops, water hammers or other fluid transients. Check valves should be observed for abnormal slam during startup or shutdown of pumps.

N. If the vibration is determined to be excessive the Test Engineer shall initiate a Test Deficiency Notice (TDN) and notify Preventive and Diagnostic Maintenance (PDM). Submit the findings to Nuclear Engineering (NE).

O. Unit 1, 2, and common components operated in this test are in close proximity. Use caution to ensure correct component is selected and operated.

4.0 PREREQUISITE ACTIONS

NOTE

Prerequisite steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the start of the instruction subsection to which they apply.

4.1 Preliminary Actions

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

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

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

ATTACH to this PTI for use during the performance of this test. _____

[3] **ENSURE** changes to the references listed in Appendix A, Test Procedure/Instruction Reference Review, have been reviewed, recorded, and determined **NOT** to adversely affect the test performance. _____

[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. (Unit 1 SM/US must approve performance on or affecting Unit 0 or Unit 1 components.) _____

[5] **ENSURE** special environmental conditions are available for testing if required. _____

[6] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Releases (EDCR's) or Temporary Alterations (TAs) do not adversely impact testing, and

Attach documentation of DCNs, EDCRs, and TA's that were reviewed to the data package. _____

4.1 Preliminary Actions (continued)

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

[8] **ENSURE** 2-TI-50.048, 2-TI-50.049, 0-MI-17.021, 2-MI-17.018, 2-MI-17.019, 2-MI-17.020, 2-MI-17.022, and 2-MI-17.023 have been reviewed for concurrence by JTG.

JTG Meeting: _____. _____

[9] **VERIFY** the system cleanliness, as required for the performance of this test has been completed in accordance with SMP-7.0, Control of Cleanness, Layup and Flushing. _____

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

[11] **CONDUCT** a pretest briefing with Test and Operations personnel in accordance with SMP-9.0, Conduct of Test. _____

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

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

[14] **ENSURE** components contained within the boundaries of this test are under the jurisdictional control of Preoperational Startup Engineering (PSE) in accordance with SMP-4.0, System Completion and Turnover. _____

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

[16] **VERIFY** supports required for System 84 testing are in place or an equivalent engineering approved temporary support is installed.

_____
STE

4.1 Preliminary Actions (continued)

[17] **VERIFY** spring cans identified for Systems 84 are installed, unpinned, and on scale with no visual indication of damage, loose parts or interferences.

_____
STE

[18] **VERIFY** snubbers identified for Systems 84 are installed with no visual indication of damage, loose parts or interferences.

_____
STE

[19] **VERIFY** Boundary Drawings are up to date or necessary changes accomplished prior to the start of testing and that any change to the Boundary Drawings do not impact the validity of the test. _____

[20] **CONDUCT** a pretest briefing with test and operations personnel in accordance with SMP-9.0. _____

[21] **ESTABLISH** communications in areas where testing is to be conducted. _____

[22] **PREPARE** Work Order to install & restore spool piece 2-SPPC-84-112, Aux Chg Sys in accordance with 2-MI-17.019

WO# _____. _____

[23] **PREPARE** Work Order to install & restore spool piece 2-SPPC-84-111, RCDT in accordance with 2-MI-17.023

WO# _____. _____

[24] **PREPARE** Work Order to install & restore spool pieces 2-SPPC-084-0687 and 0-SPPC-067-559A & 559B, Sample Htx in accordance with 2-MI-17.020

WO# _____. _____

4.1 Preliminary Actions (continued)

[25] **PREPARE** Work Order to install & restore spool pieces 0-SPPC-067-0529, 0557, 0558A and 0558B,ERCW/CCS Sys in accordance with 2-MI-17.021

WO# _____. _____

[26] **PREPARE** Work Order to install & restore spool pieces 2-SPPC-078-0625 and 0-SPPC-078-0625, SFPC/RHR Sys in accordance with 2-MI-17.022

WO# _____. _____

[27] **PREPARE** Work Order to install & restore spool piece 2-SPPC-003-6384 and 6385, HPFP/AFW Sys in accordance with 2-MI-17.018

WO# _____. _____

[28] **PREPARE** Work Order to install & restore fire hose connected at 2-ISV-3-6385, AFW/FP XCONN SPOOL BRANCH ISOLATION VALVE routed to Aux Boration Makeup Tank (0-TANK-084-110) and placed in hinged access at top of tank

WO# _____. _____

[29] **PREPARE** Work Order to install & restore fire hose (without nozzle) from 2-ISV-26-670 EL 757/A12U to Aux Boration Makeup tank and place in hinged access at top of tank.

WO# _____. _____

4.2 Special Tools, M&TE, Parts, and Supplies

NOTE

Steps 4.2[1] through 4.2[4] will be performed by Maintenance.

[1] **OBTAIN** a 1-inch hose or tubing (approximately 20 ft) with an attached 1-inch globe valve, and a 3-inch by 1-inch reducer rated at a minimum of 200 psig for connection to the Flood Mode Boration Non-Regenerative Demineralizer resin fill plug. _____

[2] **OBTAIN** a strainer assembly and flush cloth for filtering pump discharge to prevent resin from entering the drainage system. _____

NOTE

Temporary valve and flange for the following step must be rated for ≥ 600 psig. Hose must be located downstream of the temporary valve and must be rated for 200 psig.

[3] **OBTAIN** a 1-inch hose or tubing (approximately 20 ft) with a 1-inch pipe flange attached on one end and a valve suitable to throttle flow (ball valve is not permitted), for connection at spool piece 2-SPPC-084-0112 to provide a pump discharge flow path. _____

[4] **OBTAIN** container and tubing approximately 1/4 inch diameter for insertion into ear of each pump cylinder or a plastic bag to collect venting fluid. _____

[5] **ENSURE** a stethoscope is available for check valve testing. _____

NOTE

Steps 4.2[6] and 4.2[7] will be performed by Plant Services. The drums should have removable lids or tops.

[6] **OBTAIN** four 55-gallon drums for receiving water discharged during this test. _____

4.2 Special Tools, M&TE, Parts, and Supplies (continued)

[7] **MARK** the four drums to identify the contents (one drum marked similar to "TI Test Quantity", one drum marked similar to "TI CKV Test" and the other two drums similar to "TI Water Collection", and

INDICATE all to contain potentially contaminated DI water. _____

[8] **OBTAIN** either a 3-foot scale or a tape measure with a minimum of 1/16-inch graduations for use as a dip-stick. _____

NOTE

PDM/Operations will supply vibration meter with identification and calibration due date.

[9] **OBTAIN** a stopwatch with an accuracy of ± 1.5 sec/hr, and

RECORD the following M&TE information:

M&TE _____ _____

NOTE

Step 4.2[10] will be performed by IM.

[10] **ENSURE** a liquid catch container is available. _____

[11] **ENSURE** the following M&TE is available:

DESCRIPTION	MIN RANGE / MAX RANGE	ACTUAL RANGE	ACCURACY
Discharge Press Gauge	0 - 600 psig / 0 - 600 psig		± 1% of full scale
Suction Press Gauge	0 - 100 psig / 0 - 100 psig		± 1% of full scale
Suction Press Gauge	0 - 30 psig / 0 - 30 psig		± 1% of full scale
Suction Press Gauge	0 - 15 psig / 0 - 15 psig		± 1% of full scale

_____

4.3 Field Preparations

NOTE

Unit 1 permission is required prior to installing equipment or operating any portion of the Aux Boration Makeup Tank.

[1] **OBTAIN** Unit 1 SM/US authorization prior to installing equipment or operating any portion of the Aux Boration Makeup Tank or System. _____

[2] **ENSURE** mixed bed demineralizer resin is in Flood Mode Boration Non-Regenerative Demineralizer. _____

[3] **ENSURE** filter cartridge is in Flood Mode Boration Makeup System Filter, 0-FLTR-84-1. _____

[4] **ENSURE** filter cartridge is in Flood Mode Boration Makeup System Filter, 0-FLTR-84-512. _____

4.4 Approvals and Notifications

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

_____ _____
Preoperational Startup Manager Signature Date

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

_____ _____
US/SRO/SM Signature Date

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

_____ _____
US/SRO/SM Signature Date

[4] **OBTAIN** Fire Protection Impairment Permit (FPIP) for affected hose station in accordance with NPG-SPP-18.4.6. _____

5.0 ACCEPTANCE CRITERIA

[1] The Hydraulic performance of the auxiliary charging pumps and booster pumps meets or exceeds design requirements.

A. Auxiliary Charging Pump flow rates are greater than or equal to 100 gph, at 350 psig or greater discharge pressure. (2-TI-50.048, 2-TI-50.049 Steps 6.2[12], 6.2[34]), Section 6.1, and 6.2

B. Each Auxiliary Charging Pump can be operated from a local control station and indicating lights operate correctly. (2-TI-50.048, 2-TI-50.049 Step 6.2[27], 6.2[28]), Section 6.1, and 6.2

[2] Equipment required for Flood Mode Boration Operation can be properly installed.

A. Auxiliary Charging Spool Piece, 2-SPPC-084-0112, can be properly installed. (Step 6.3[5])

B. Reactor Coolant Drain Tank Spool Piece, 2-SPPC-084-0111, can be properly installed. (Step 6.4[6])

C. Sample HTX Spool Pieces 2-SPPC-067-687 and 0-SPPC-067-559A & 559B, can be properly installed. (Step 6.5[5])

D. ERCW/CCS Spool Pieces 0-SPPC-067-067-0529, 0557, 0558A, and 0558B can be properly installed. (Step 6.6[5])

E. Spend Fuel Pool Cooling/Residual Heat Removal Spool Piece 2-SPPC-078-0625 and 0-SPPC-078-0625 can be properly installed. (Step 6.7[5])

F. High Pressure Fire Protection (HPFP) hose can be routed to the Flood Mode Aux Boration Makeup Tank. (Step 6.8[4], 6.9[6])

G. High Pressure Fire Protection System to Auxiliary Feedwater System spool pieces can be properly installed. (Step 6.9[10])

[3] The interconnected piping between CVCS and RCS is unobstructed (Step 6.2[5])

[4] Piping and components do not exhibit indications of excessive vibration in various operating modes (Steps 6.1[1] and 6.2[1])

6.0 PERFORMANCE

NOTES

1) Subsections 6.1 and 6.2 are to be performed in sequence, although certain steps may be performed concurrently.
2) Subsections 6.3 through 6.9 may be performed in any order or concurrently.
3) Sign off steps may be delayed until completion of both test sections when duplicate actions would result.

6.1 Performance Test of Flood Mode Aux Charging Pump 2A

NOTES

1) Auxiliary Charging System equipment is located in the Auxiliary Building EL 757/A5U, unless otherwise noted.
2) During the performance of this subsection visual observation of transient and steady-state vibration is required.

[1] **PERFORM** observations to ensure piping and components do not exhibit indications of excessive vibration while testing in accordance with Step 6.1[2] and

DOCUMENT in Chronological Test Log (CTL) **(Acc Crit 5.0[4])** _____

[2] **PERFORM** 2-TI-50.048, Flood Mode Auxiliary Charging Pump 2A Performance Test. _____

[3] **VERIFY** Completed test 2-TI-50.048, Flood Mode Auxiliary Charging Pump 2A Performance Test met acceptance criteria as specified in Section 5.0. **(Acc Crit 5.0[1]A, 5.0[1]B)** _____

_____
Reviewer

[4] **ATTACH** the completed 2-TI-50.048 performance test to this instruction. **(Acc Crit 5.0[1]A, 5.0[1]B)** _____

6.2 Performance Test of Flood Mode Aux Charging Pump 2B

NOTES

1) Auxiliary Charging System equipment is located in the Auxiliary Building EL 757/A5U, unless otherwise noted.
2) During the performance of this subsection visual observation of transient and steady-state vibrations is required.

[1] **PERFORM** observations to ensure piping and components do not exhibit indications of excessive vibration while testing in accordance with Step 6.2[2] and

DOCUMENT in Chronological Test Log (CTL) **(Acc Crit 5.0[4])** _____

[2] **PERFORM** 2-TI-50.049, Flood Mode Auxiliary Charging Pump 2B Performance Test. _____

[3] **VERIFY** Completed test 2-TI-50.049, Flood Mode Auxiliary Charging Pump 2B Performance Test met acceptance criteria as specified in Section 5.0. **(Acc Crit 5.0[1]A, 5.0[1]B)** _____

_____
Reviewer

[4] **ATTACH** the completed 2-TI-50.049 performance test to this instruction.**(Acc Crit 5.0[1]A, 5.0[1]B)** _____

[5] **VERIFY** completed performance of 2-CP-062-02 Cleanness Plan and 2-CP-077-01, Cleanness Plan demonstrate flow paths from Flood Mode Auxiliary Charging Pump(s) discharge spool piece to the CVCS charging line and discharge line from the Reactor Coolant Drain Tank to the makeup spool piece to the Auxiliary Boron Mixing tank, are unobstructed. **(Acc Crit 5.0[3]).** _____

_____
Reviewer

6.2 Performance Test of Flood Mode Aux Charging Pump 2B (continued)

[6] **ATTACH** copies of appropriate pages of 2-CP-062-02 and 2-CP-077-01 to document discharge of Auxiliary Charging Pump piping spool piece connection to CVCS, and discharge of RCDT pumps to Aux Boration Mixing Tank piping spool piece are unobstructed, for inclusion with this test **(Acc Crit 5.0[3]**). _____

6.3 Install Flood Prep Aux Chg Sys Spool Piece (2-SPPC-84-112)

NOTE

Auxiliary Charging System equipment is located in the Auxiliary Building EL 757/A5U, unless otherwise noted.

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

NOTE

Step 6.3[2] is to be performed immediately prior to performance of Step 6.2[3] to ensure accuracy of required installation time.

[2] **RECORD** date and time (prior to start of Step 6.2[3]).

Date _____ Time _____ _____

[3] **PERFORM** 2-MI-17.019, Flood Preparation Auxiliary Charging System Spool Piece to install 2-SPPC-84-112. _____

[4] **RECORD** date and time at completion of Step 6.2[3].

Date _____ Time _____ _____

[5] **VERIFY** Auxiliary Charging System Spool Piece (2-SPPC-84-112) with all gaskets, studs, and nuts, has been properly installed. (**Acc Crit 5.0[2]A)** _____

[6] **DETERMINE** the actual installation Time.

Step 6.3[4] _____ (-) Step 6.3[2] _____ = _____ hr. _____

[7] **VERIFY** the installation time recorded in Step 6.3[6] is less than or equal to 1 hour.

_____

6.3 Install Flood Prep Aux Chg Sys Spool Piece (2-SPPC-84-112) (continued)

[8] **REMOVE** Auxiliary Charging System Spool Piece, 2-SPPC-84-112, and

RESTORE both Blind Flanges at each spool piece location. _____

_____
IV

[9] **RETURN** 2-SPPC-84-112, Auxiliary charging System Spool Piece, to storage location and replace required gaskets, tools, rigging etc. as needed to ensure readiness for future installation in accordance with MI-17.003. _____

_____
IV

6.4 Install Flood Prep RCDT Spool Piece (2-SPPC-84-111)

NOTE

Auxiliary Charging System equipment is located in the Auxiliary Building EL 757/A5U unless otherwise noted.

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

[2] **OBTAIN** U-2 US authorization to install and remove RCDT spool piece 2- SPPC-84-111. _____

NOTE

Step 6.4[3] is to be performed immediately prior to performance of Step 6.4[4] to ensure accuracy of required installation time.

[3] **RECORD** date and time (prior to start of Step 6.4[4]).

Date _____ Time _____ _____

[4] **PERFORM** 2-MI-17.023, Flood Preparation Reactor Coolant Drain Tank Spool Pieces to install 2-SPPC-84-111. _____

[5] **RECORD** date and time at completion of Step 6.4[4].

Date _____ Time _____ _____

[6] **VERIFY** Reactor Coolant Drain Tank Spool Piece (2-SPPC-84-111) with all gaskets, studs, and nuts, has been properly installed. (**Acc Crit 5.0[2]B**) _____

[7] **DETERMINE** the actual installation Time.

6.4[5] _____ (-) Step 6.4[3] _____ = _____ hr. _____

[8] **VERIFY** the installation time recorded in Step 6.4[7] is less than or equal to 1 hour.

_____

6.4 Install Flood Prep RCDT Spool Piece (2-SPPC-84-111) (continued)

[9] **REMOVE** Reactor Coolant Drain Tank Spool Piece, 2-SPPC-84-111, and

RESTORE both Blind Flanges at spool piece location. _____

_____
IV

[10] **RETURN** 2-SPPC-84-111, Reactor Coolant Drain Tank Spool Piece, to storage location and replace required gaskets, tools, rigging, etc. as needed to ensure readiness for future installation in accordance with MI-17.003. _____

_____
IV

[11] **NOTIFY** U-2 US that 2-SPPC-84-111 has been removed and stored in accordance with 2-MI-17.003. _____

6.5 Install Flood Prep Sample Htx Spool Pieces

[1] **OBTAIN** authorization from Unit 1 Shift Manager/Unit Supervisor (SM/US) and Unit 2 US to install/remove spool pieces. _____

NOTE

Step 6.5[2] is to be performed immediately prior to performance of Step 6.5[3] to ensure accuracy of required installation time.

[2] **RECORD** date and time (prior to start of Step 6.5[3]).

Date _____ Time _____ _____

[3] **PERFORM** 2-MI-17.020, Sample HTX Spool Pieces 2-SPPC-67-687 and 0-SPPC-67-559A and 559B . _____

[4] **RECORD** date and time at completion of Step 6.5[3]

Date _____ Time _____ _____

[5] **VERIFY** Sample HTX Spool Pieces (2-SPPC-067-687 and 0-SPPC-067-559A and 559B) with all gaskets, studs, and nuts, have been properly installed. (**Acc Crit 5.0[2]C**) _____

[6] **DETERMINE** the actual installation Time.

Step 6.5[4] _____ (-) Step 6.5[2] _____ = _____ hr. _____

[7] **VERIFY** the installation time recorded in Step 6.5[6] is less than or equal to 1 hour.

_____

[8] **REMOVE** Sample HTX Spool Pieces, 2-SPPC-067-687 and 0-SPPC-067-559A & 559B, and

RESTORE both Blind Flanges at spool piece location. _____

_____

IV

6.5 Install Flood Prep Sample Htx Spool Pieces (continued)

[9] **RETURN** 2-SPPC-067-687 and 0-SPPC-067-559A & 559B, Sample HTX Spool Pieces, to storage location and replace required gaskets, tools, rigging, etc. as needed to ensure readiness for future installation in accordance with MI-17.003 . _____

_____
IV

[10] **NOTIFY** Unit 1 SM/US and Unit 2 US that 2-MI-17.020 is complete. _____

6.6 Install Flood Prep Spool Pieces - ERCW/CCS

[1] **OBTAIN** authorization from Unit 1 SM/US and Unit 2 US to install/remove spool piece (0-SPPC-67-529, 557, 558A, and 558B). _____

NOTE

Step 6.6[2] is to be performed immediately prior to performance of Step 6.6[3] to ensure accuracy of required installation time.

[2] **RECORD** date and time (prior to start of Step 6.6[3]).

Date _____ Time _____ _____

[3] **PERFORM** 2-MI-17.021, ERCW/CCS Spool Piece to install 0-SPPC-67-529, 557, 558A and 558B, per WO# _____. _____

[4] **RECORD** date and time at completion of Step 6.6[3].

Date _____ Time _____ _____

[5] **VERIFY** ERCW/CCS Spool Pieces (0-SPPC-67-529, 557, 558A, and 558B) with all gaskets, studs, and nuts, have been properly installed. (**Acc Crit 5.0[2]D**) _____

[6] **DETERMINE** the actual installation Time.

Step 6.6[4] _____ (-) Step 6.6[2] _____ = _____ hr. _____

[7] **VERIFY** the installation time recorded in Step 6.6[6] is less than or equal to 1 hour. _____

[8] **REMOVE** ERCW/CCS Spool Pieces, (0-SPPC-67-529, 557, 558A, and 558B), and

RESTORE both Blind Flanges at spool piece location. _____

_____

6.6 Install Flood Prep Spool Pieces - ERCW/CCS (continued)

[9] **RETURN** 0-SPPC-67-529, 557, 558A, and 558B, ERCW/CCS Spool Pieces, to storage location and replace required gaskets, tools, etc. as needed to ensure readiness for future installation in accordance with MI-17.003. _____

_____
IV

[10] **NOTIFY** Unit 1 SM/US and Unit 2 US, 2-MI-17.021 is complete. _____

6.7 Install Flood Prep Spool Piece - SFPC/RHR

[1] **OBTAIN** authorization from Unit 1 SM/US and Unit 2 US to install/remove spool piece. _____

NOTE

Step 6.7[2] is to be performed immediately prior to performance of Step 6.7[3] to ensure accuracy of required installation time.

[2] **RECORD** date and time (prior to start of Step 6.7[3]).

Date _____ Time _____ _____

[3] **PERFORM** 2-MI-17.022, to install SFPC/RHR Spool Piece 2-SPPC-78-625 and 0-SPPC-78-625. _____

[4] **RECORD** date and time at completion of Step 6.7[3].

Date _____ Time _____ _____

[5] **VERIFY** SFPC/RHR Spool Pieces (0-SPPC-078-625 and 2-SPPC-78-625) with all gaskets, studs, and nuts, have been properly installed. (**Acc Crit 5.0[2]E**) _____

[6] **DETERMINE** the actual installation Time.

Step 6.7[4] _____ (-) Step 6.7[2] _____ = _____ hr. _____

[7] **VERIFY** the installation time recorded in Step 6.7[6] is less than or equal to 1 hour.

_____

[8] **REMOVE** SFPC/RHR Spool Pieces (0-SPPC-78-625 and 2-SPPC-78-625) and

RESTORE both Blind Flanges at spool piece location. _____

_____
IV

6.7 Install Flood Prep Spool Piece - SFPC/RHR (continued)

[9] **RETURN** 0-SPPC-78-625 and 2-SPPC-78-625, SFPC/RHR Spool Pieces, to storage location and replace required gaskets, tools, rigging, etc. as needed to ensure readiness for future installation in accordance with MI-17.003. _____

_____
IV

[10] **NOTIFY** Unit 1 SM/US and Unit 2 US, 2-MI-17.022 is complete. _____

6.8 HPFP Supply Capability to Flood Mode Aux Boration M/U Tank

NOTE

Auxiliary Charging System equipment is located in the Auxiliary Building EL 757/A5U, unless otherwise noted.

[1] **ENSURE** FPIP for deployment of fire hose (at 2-ISV-26-670) without nozzle, as a makeup source to Auxiliary Boration Makeup Tank is on hand. _____

CAUTION

NO fire header water is to be introduced into the Auxiliary Boration Makeup Tank.

[2] **VERIFY** Manual Valve 2-ISV-26-670, AUXILIARY BLDG HPFP HOSE STA ISOL, located at EL 757/A12U in Rm 757.0-A10, is CLOSED. _____

[3] **REMOVE** nozzle from fire hose connected at Manual Valve 2-ISV-26-670, AUXILIARY BLDG HPFP HOSE STA ISOL. _____

[4] **ROUTE** fire hose connected at 2-ISV-26-670, AUXILIARY BLDG HPFP HOSE STA ISOL, to 0-TANK-84-110, FLOOD MODE AUXILIARY BORATION MAKEUP TANK, and

PLACE fire hose in hinged access at top of tank. (**Acc Crit 5.0[2]F**) _____

[5] **REMOVE** fire hose from 0-TANK-84-110, FLOOD MODE AUXILIARY BORATION MAKEUP TANK, and

RESTORE fire hose station to normal configuration and

CLOSE Fire Protection Impairment Permit (FPIP). _____

[6] **VERIFY** hose station (2-ISV-26-670) is restored and FPIP appropriately closed in accordance with NPG-SPP-18.4.6.. _____

_____

6.9 ALT HPFP Capability to Flood Mode Aux Boration M/U Tank

[1] **OBTAIN** U-1 SRO/Fire Ops authorization to install AFW/HPFP spool pieces in accordance with 2-MI-17.018. _____

[2] **OBTAIN** U-2 SM/US authorization to install AFW/HPFP spool pieces in accordance with 2-MI-17.018. _____

NOTE

Step 6.9[3] is to be performed immediately prior to performance of Step 6.9[4] to ensure accuracy of required installation time.

[3] **RECORD** date and time (prior to start of Step 6.9[4]).

Date _____ Time _____ _____

[4] **PERFORM** 2-MI-17.018 Flood Preparation High Pressure Fire Protection System Spool Pieces to install 2-SPPC-3-6384 and 2-SPPC-3-6385. _____

[5] **CONNECT** fire hose to hose connection at valve 2-ISV-3-6385, AFW/FP XCONN SPOOL BRANCH ISOLATION VALVE. _____

[6] **ROUTE** fire hose to 0-TANK-84-110, FLOOD MODE AUXILIARY BORATION MAKEUP TANK, and

PLACE fire hose in hinged access at top of tank. (**Acc Crit** 5.0[2]F) _____

[7] **RECORD** date and time at completion of Step 6.9[6].

Date _____ Time _____ _____

[8] **DETERMINE** the actual installation Time.

Step 6.9[7] _____ (-) Step 6.9[3] _____ = _____ hr.

[9] **VERIFY** the installation time recorded in Step 6.9[8] is less than or equal to 2 hours. _____

6.9 ALT HPFP Capability to Flood Mode Aux Boration M/U Tank (continued)

[10] **VERIFY** High Pressure Fire Protection System to Auxiliary Feedwater System spool pieces with all gaskets, studs, and nuts, have been properly installed. (**Acc Crit 5.0[2]G**) _____

[11] **REMOVE** fire hose from 0-TANK-84-110, FLOOD MODE AUXILIARY BORATION MAKEUP TANK. _____

[12] **REMOVE** the High Pressure Fire Protection System to Auxiliary Feedwater System spool pieces, and

RESTORE the blind flanges at each spool piece location. _____

_____
IV

[13] **RETURN** High Pressure Fire Protection System to Auxiliary Feedwater System spool pieces and fire hose to their storage location and replace required gaskets, tools, rigging, etc. for future installation in accordance with MI-17.003. _____

_____
IV

[14] **NOTIFY** U-1 US/Fire Ops of section completion for Fire Operating Requirement evaluation. _____

[15] **NOTIFY** U-2 SM/US of section completion for Fire Operating Requirement evaluation. _____

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 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] **ENSURE** M&TE and temporary test equipment installed, has been removed and system returned to original (normal) configuration.

_____
IM

_____
IV

[4] **NOTIFY** the Unit 1 SM/US and Unit 2 US of the test completion and System alignment. _____

8.0 RECORDS

8.1 QA Records

Complete Test Package

8.2 Non-QA Records

None

Appendix A
(Page 1 of 1)

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)
FSAR Section 9.3.6, Figure 9.3-18 Table 14.2-1 Sht 20 of 89	Amendment 109	
2-TSD-84-1	001	
WBN2-84-4001	draft	

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION 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

Appendix C
(Page 1 of 1)

PERMANENT PLANT INSTRUMENTATION LOG

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED[1]	PLACED IN SERVICE[1]	USED FOR QUANTITATIVE Acc Crit		POST-TEST CAL DATE[2]	POST-TEST CALIBRATION ACCEPTABLE[2] INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
0-PI-84-5							
0-PI-84-7							
0-PI-84-10							
0-PI-84-12							
0-LI-84-1							
2-PI-84-15							
2-PI-84-17							
2-PI-84-20							
2-PI-84-22							

[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.