WBN2Public Resource

From: Boyd, Desiree L [dlboyd@tva.gov]
Sent: Friday, October 29, 2010 8:43 AM
To: Wiebe, Joel; Poole, Justin; Raghavan, Rags; Milano, Patrick; Campbell, Stephen
Cc: Crouch, William D; Hamill, Carol L; Boyd, Desiree L
Subject: TVA letter to NRC_10-28-10_2-PTI-268-01 transmittal to NRC
Attachments: 10-28-10_2-PTI-268-01 transmittal to NRC_Final.pdf

Please see attached letter that was sent to NRC today.

Thank You,

~*~*~*~*~*~*~*~*~*~*~*~*~*~*~*~
Désireé L. Boyd
WBN 2 Licensing Support
Sun Technical Services
dlboyd@tva.gov
423-365-8764
~*~*~*~*~*~*~*~*~*~*~*~*~*~*~*~

Hearing Identifier: Watts_Bar_2_Operating_LA_Public
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From: Boyd, Desiree L

Created By: dlboyd@tva.gov

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October 28, 2010

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 Instruction**

The following approved WBN Unit 2 Pre-op Test Instruction (PTI) is enclosed:

PTI NUMBER	Rev.	TITLE
2-PTI-268-01	0	Permanent Hydrogen Mitigation System

If you have any questions, please contact Pete Olson at (423) 365-3294.

Sincerely,

M. Bajestani

Masoud Bajestani
Watts Bar Unit 2 Vice President

cc (Enclosure):

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 (Enclosure):

Stephen Campbell
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U. S. Nuclear Regulatory Commission
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WATTS BAR NUCLEAR PLANT

UNIT 2 STARTUP

TITLE: Permanent Hydrogen Mitigation System

Instruction No: 2-PTI-268-01

Revision No: 0000

PREPARED BY: Regina Ballard Regina Ballard DATE 8/12/10

PRINT NAME/ SIGNATURE

REVIEWED BY: A. Blake Lowe A. Blake Lowe DATE 8/12/10

PRINT NAME/ SIGNATURE

INSTRUCTION APPROVAL

JTG MEETING NO: 2-10-010

JTG CHAIRMAN: _____ DATE 10/12/10

APPROVED BY: _____ DATE 10/12/10

PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING NO: _____

JTG CHAIRMAN: _____ DATE _____

APPROVED BY: _____ DATE _____

PREOPERATIONAL STARTUP MANAGER

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	10/19/10	ALL	INITIAL ISSUE

Table of Contents

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1.0 INTRODUCTION

1.1 Test Objectives

The purpose of this test instruction is to verify that the Hydrogen Igniters will provide ignition sources of a specified minimum surface temperature without exceeding a designated maximum input power requirement by energizing each igniter circuit and verifying the voltage, current, and igniter surface temperature.

1.2 Scope

A. This test demonstrates the functionality of the Permanent Hydrogen Mitigation system by ensuring the igniters reach a minimum surface temperature of 1700°F and the power requirement for each Hydrogen Igniter circuit does not exceed 663 watts.

B. The 68 igniters are equally divided into 2 redundant groups, each with independent and separate controls, power supplies and locations.

1. 38 Train A and Train B igniters located in the lower compartment of containment.

2. 30 Train A and Train B igniters located throughout the upper compartment of containment and the upper plenum of the ice condenser.

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2.0 REFERENCES

2.1 Performance References

A. SMP-9.0, Conduct of Test

B. SPP-10.11, Control of Ignition Sources (Hot Work)

2.2 Developmental References

A. Final Safety Analysis Report (FSAR)

1. FSAR–Amendment 100

a. FSAR Table 14.2-1, Sheet 40 of 89, Combustible Gas Control Systems Test Summary

b. FSAR Chapter 6, Section 6.2.5A, Hydrogen Mitigation System

B. Drawings

1. Flow Diagrams

None

2. Electrical Drawings

a. 45W2770-7, Rev 4, Wiring Diagrams 480V Cont & Aux Bldg Vent Bd 2A1-A Connection Diagrams, AD
DRA 52348-031, Rev 0
DRA 52348-032, Rev 0

b. 45B2770-9E, Rev 5, Wiring Diagrams 480V C & A Bldg Vt Bd 2A1-A, Conn Diag - Compt 9E, AD
DRA 53290-010, Rev 0

c. 45W2772-7, Rev 4, Wiring Diagrams 480V Cont & Aux Bldg Vent Bd 2B1-B Connection Diagrams, AD
DRA 52348-033, Rev 0
DRA 52348-034, Rev 0

d. 45B2772-12C, Rev 4, Wiring Diagrams 480V C & A Bldg Vt Bd 2B1-B, Conn Diag.- Compt 12C, AD
DRA 53290-037, Rev 0

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2.2 Developmental References (continued)

e. 45W2649-2, Rev 10, Wiring Diagrams Unit Control Board, Panel 2-M-10 Connection Diagrams, Sheet 2, AD

f. 2-45W2656-4, Rev 0, Wiring Diagrams Unit Control Board, Panel 2-M-21 Connection Diagrams, Sheet 4, CC
DRA 52315-077, Rev 0

g. 2-45W756-2, Rev 0, Wiring Diagrams 480V Cont & Aux Bldg Vt Bd 2A1-A Single Line, Sheet 2, CC

h. 2-45W756-6 , Rev 0, Wiring Diagrams 480V Cont & Aux Bldg Vt Bd 2B1-B Single Line, Sheet 2, CC

i. 2-45W760-268-1, Rev 0, Wiring Diagram Permanent Hydrogen Mitigation Sys Schematic Diagrams, CC
DRA 52348-028, Rev 0
DRA 52348-029, Rev 0
DRA 52348-030, Rev 0
DRA 53290-050, Rev 0
DRA 53290-069, Rev 0

j. 2-45B655-5C, Rev 0, Main Control Room Annunciator Inputs Window Box, XA-55-5C, CC

k. 2-45B655-E5C, Rev 0, Electrical Annunciator Window Box XA-55-5C Engraving (Contract Number 75554B), CC

3. Mechanical

None

4. Logic/Control

None

5. Other

a. 45W872-2, Rev 23, Conduit & Grounding Floor El. 716.0 Ceiling Plan, AD
DRA 52348-002, Rev 0

b. 45W872-8, Rev 27, Conduit & Grounding El. 716.0 Details, Sheet 6, AD
DRA 52348-003

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2.2 Developmental References (continued)

c. 45W872-9, Rev 33, Conduit & Grounding Floor El. 716.0 Details, Sheet 7, AD
DRA 52348-004

d. 45W872-10, Rev 36, Conduit & Grounding Floor El. 716.0 Details, Sheet 8, AD
DRA 52348-005

e. 45W872-11, Rev 28, Conduit & Grounding Floor El. 716.0 Details, Sheet 9, AD
DRA 52348-006

f. 45W872-16, Rev 17, Conduit & Grounding Floor El. 716.0 Details, Sheet 14, AD
DRA 52348-007

g. 45W872-18, Rev 25, Conduit & Grounding Floor El. 716.0 Details, Sheet 16, AD
DRA 52348-008

h. 45W872-19, Rev 23, Conduit & Grounding Floor El. 716.0 Details, Sheet 17, AD
DRA 52348-009

i. 45W874-2, Rev 22, Conduit & Grounding Floor El. 744.5 Ceiling Plan, AD
DRA 52348-010

j. 45W874-9, Rev 9, Conduit & Grounding Floor El. 744.5 Details, Sheet 7, AD
DRA 52348-011

k. 45W876-2, Rev 23, Conduit & Grounding El. 756.63 Ceiling Plan, AD
DRA 52348-012

l. 45W876-4, Rev 18, Conduit & Grounding El. 756.63 Details, Sheet 2, AD
DRA 52348-013

m. 45W876-7, Rev 19, Conduit & Grounding El. 756.63 Details, Sheet 5
DRA 52348-014

n. 45W876-8, Rev 13, Conduit & Grounding El. 756.63 Details, Sheet 6, AD
DRA 52348-015

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2.2 Developmental References (continued)

o. 45W876-9, Rev 6, Conduit & Grounding El. 756.63 Details, AD DRA 52348-016

p. 45W876-10, Rev 7, Conduit & Grounding El. 756.63 Details, AD DRA 52348-017

q. 45W876-11, Rev 4, Conduit & Grounding El. 756.63 Details, AD DRA 52348-018

r. 45W876-12, Rev 7, Conduit & Grounding El. 756.63 Details, AD DRA 52348-019

s. 45W878-2, Rev 8, Conduit & Grounding Dome Plan, AD DRA 52348-020

6. Vendor Drawings

a. 193-3442-4, Rev D, Igniter Assembly, Tayco Engineering Inc., Contract 829810

b. F9275200001S, Rev 4, 3 Phase Line Regulator 3RTF-480/120-208-30, Power Conversion Products Inc, Contract 830802.

c. 7003-51051-53, Rev B, Electrical Schematic 120V Distribution Cabinet, Nutherm International Inc, Contract 830137.

C. Vendor Manuals

1. WBN-VTM-N431-0090, Rev 5, Vendor Technical Manual for Nuthern International Power Distribution Panels, Contract Number 81-827910

2. WBN-VTM-P319-0010, Rev 0, Vendor Technical Manual for Power Conversion Products, Inc. Three-Phase Regulating Transformers, Contract Number 82K05-00830802

D. Documents

1. 2-TSD-268-01, Rev 0, Permanent Hydrogen Mitigation System Test Scoping Document

2. WBN2-83-4001, Rev 0, System Description for Combustible Gas Control System

3. L44850214800, Letter to NRC from TVA concerning surveillance requirements for demonstrating the functionality of hydrogen igniters

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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. Component tags and labels may differ slightly (abbreviations, punctuation, letter case, etc.) from the description given in this test. If this situation occurs, it shall NOT be considered a test deficiency or procedure deviation. It shall be documented in the CTL and reconciled by way of a plant labeling request or drawing discrepancy or single-line date typo change in the procedure as appropriate.

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

E. All terminal points and connection are to be considered energized. Instrumentation must be used to determine if the circuits are de-energized.

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

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

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

I. Figures 1 through 5 provide locations of the 68 hydrogen igniters in the containment. The figures may be marked up during test conduct, as required. For example, as each igniter is located and the required temperature measurement is completed, place a check mark at the igniter location symbol.

J. Ensure no adverse impact to the operation of Unit 1 structures, systems or components.

Data Package: Page ____ of ____ **Date _____**

4.0 PREREQUISITE ACTIONS

NOTE
Preliminary action steps may be performed in any order with Test Directors approval.

4.1 Preliminary Actions

[1] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision and as needed, each test person assisting in this test has the current revision. _____

[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 "Test Procedure and Instruction Reference Review", Appendix A, have been reviewed, and determined NOT to adversely affect the test performance. _____

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

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

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

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

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

[7] **ENSURE** outstanding Design Change Notices (DCN's), Engineering Document Construction Release (EDCR's) or Temporary Alterations (TA's) do NOT adversely impact testing. _____

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4.1 Preliminary Actions (continued)

[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** Measuring and Test Equipment (M&TE) required for test performance has been (as required) filled, vented, place in service and recorded on Measuring and Test Equipment Log in SMP-9.0.

A. Subsection 6.1 _____

B. Subsection 6.2 _____

C. Subsection 6.3 _____

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

A. Subsection 6.1 _____

B. Subsection 6.2 _____

C. Subsection 6.3 _____

[11] **VERIFY** the following system is operational and have been placed in service to the extent necessary to perform this test:

A. System 214, 480V Control & Aux (C&A) Bldg Vent Boards 2-MCC-214-A1-A (Board 2A1-A), 2-BKR-214-B1/9E-B _____

B. System 214, 480V Control & Aux (C&A) Bldg Vent Boards 2-MCC-214-B1-B (Board 2B1-B), 2-BKR-214-B1/12C-B _____

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

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4.1 Preliminary Actions (continued)

[13] **VERIFY** System 55, Annunciator and Sequential Events Recording System, TBK switches and the Master switch associated with the following annunciator window inputs are in the ON position, **AND**

VERIFY the annunciator window, 2-XA-55-5C/102-C, software inputs are ENABLED. _____

NOTE

Inspect for combustibles within two feet of igniters during pretest walk down. Line of sight view of each igniter (profile or oblique) should be noted as required to facilitate thermography measurements as well as requirements for ladders and/or scaffolding.

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

A. Subsection 6.1 _____

B. Subsection 6.2 _____

C. Subsection 6.3 _____

[15] **ENSURE** a Hot Work Permit which allows energization of the Hydrogen Igniters in the Containment has been obtained. (See Control of Ignition Sources (Hot Work), SPP 10.11) _____

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

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

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4.2 Special Tools, Measuring and Test Equipment (M&TE), Parts, and Supplies

[1] **ENSURE** the following are available: _____

- 2 Jumpers

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

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

- Voltmeter, Minimum Range 0 to 150 Vac, Required Accuracy ±0.5 Volts.
- Optical/Infrared Pyrometer, Mikron Model - M90V or Equivalent, Minimum Range 1500° to 2000°F, Required Accuracy ±34°F.
- Optical/Infrared Pyrometer, Minimum Range 1420° to 2500°F, Required Accuracy ±34°F.
- Clamp-on Ammeter, Minimum Range 0 to 10 amperes, Required Accuracy ±0.25 amperes.

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4.3 Field Preparations

[1] **ENSURE** the following Handswitches at MCR Panel 2-M-10 are in the OFF position:

A. Handswitch 2-HS-268-73, H2 IGNITERS GROUP A. _____

B. Handswitch 2-HS-268-74, H2 IGNITERS GROUP B. _____

[2] **VERIFY** that required ladders and/or scaffolding are installed (if required) to facilitate thermography measurements.

A. Subsection 6.2 _____

B. Subsection 6.3 _____

[3] **VERIFY** that each Hydrogen Igniters has been energized continuously for a period of at least 24 hours and allowed to cool to ambient temperature following installation to ensure that any protective factory coating has been burned off the igniters, **AND**

RECORD method of this verification in the Chronological Test Log. (Subsections 6.2 & 6.3) _____

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4.4 Approvals and Notifications

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

_____ _____
Preoperational Startup Manager Signature — Date

[2] **OBTAIN** Shift Manager's (SM) authorization.

_____ _____
SM Signature — Date

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5.0 ACCEPTANCE CRITERIA

NOTE

Acceptance criteria values of 1325 Watts and 1700°F as listed in the Permanent Hydrogen Mitigation System Test Scoping Document, 2-TSD-268-01, are adjusted to account for M&TE tolerances.

[1] Each igniter maintains a minimum surface temperature of 1734°F while not exceeding 1275 Watts, the maximum power requirement for two igniters.

A. Train A Igniters: Steps 6.2[64] and 6.2[65]

B. Train B Igniters: Steps 6.3[64] and 6.3[65]

[2] Record the voltage and current for each circuit at the Distribution Panels:

A. Train A Distribution Panel, 2-DPL-268-1-A: Step 6.2[29]

B. Train B Distribution Panel, 2-DPL-268-2-B: Step 6.3[29]

[3] Each train can be energized from the Main Control Room.

A. Train A Igniters 6.1[165.2]

B. Train B Igniters 6.1[169.2]

[4] Indicating lights indicate the correct status of each igniter train in the Main Control Room.

A. Train A Igniters Steps 6.1[164] and 6.1[165.1]

B. Train B Igniters Steps 6.1[168] and 6.1[169.1]

[5] Annunciator "PHMS PWR DIST. PNL. A/B UV/BKR TRIP" alarms on:

[5.1] Handswitch in "ON" and undervoltage.

A. Train A: Steps 6.1[46.1] and 6.1[46.2]

B. Train B: Steps 6.1[48.1] and 6.1[48.2]

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5.0 ACCEPTANCE CRITERIA (continued)

[5.2] Distribution Panel supply circuit breaker open.

A. Train A - Distribution panel, 2-DPL-268-1-A, supply breaker, 2-BRK-268-1/M1-A: Step 6.1[122]

B. Train B - Distribution panel 2-DPL-268-2-B, supply breaker, 2-BKR-268-2/M1-B: Step 6.1[124]

[5.3] Distribution Panel output circuit breaker 1 through 18 trip.

[5.3.1] Train A - Distribution panel, 2-DPL-268-1-A, output breakers:

A. 2-BKR-268-1/1-A: Step 6.1[50]

B. 2-BKR-268-1/2-A: Step 6.1[52]

C. 2-BKR-268-1/3-A: Step 6.1[54]

D. 2-BKR-268-1/4-A: Step 6.1[56]

E. 2-BKR-268-1/5-A: Step 6.1[58]

F. 2-BKR-268-1/6-A: Step 6.1[60]

G. 2-BKR-268-1/7-A: Step 6.1[62]

H. 2-BKR-268-1/8-A: Step 6.1[64]

I. 2-BKR-268-1/9-A: Step 6.1[66]

J. 2-BKR-268-1/10-A: Step 6.1[68]

K. 2-BKR-268-1/11-A: Step 6.1[70]

L. 2-BKR-268-1/12-A: Step 6.1[72]

M. 2-BKR-268-1/13-A: Step 6.1[74]

N. 2-BKR-268-1/14-A: Step 6.1[76]

O. 2-BKR-268-1/15-A: Step 6.1[78]

P. 2-BKR-268-1/16-A: Step 6.1[80]

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5.0 ACCEPTANCE CRITERIA (continued)

Q. 2-BKR-268-1/17-A: Step 6.1[82]

R. 2-BKR-268-1/18-A: Step 6.1[84]

[5.3.2] Train B - Distribution panel, 2-DPL-268-2-B, output breakers:

A. 2-BKR-268-2/1-B: Step 6.1[86]

B. 2-BKR-268-2/2-B: 6.1[88]

C. 2-BKR-268-2/3-B: 6.1[90]

D. 2-BKR-268-2/4-B: 6.1[92]

E. 2-BKR-268-2/5-B: 6.1[94]

F. 2-BKR-268-2/6-B: 6.1[96]

G. 2-BKR-268-2/7-B: 6.1[98]

H. 2-BKR-268-2/8-B: 6.1[100]

I. 2-BKR-268-2/9-B: 6.1[102]

J. 2-BKR-268-2/10-B: 6.1[104]

K. 2-BKR-268-2/11-B: 6.1[106]

L. 2-BKR-268-2/12-B: 6.1[108]

M. 2-BKR-268-2/13-B: 6.1[110]

N. 2-BKR-268-2/14-B: 6.1[112]

O. 2-BKR-268-2/15-B: 6.1[114]

P. 2-BKR-268-2/16-B: 6.1[116]

Q. 2-BKR-268-2/17-B: 6.1[118]

R. 2-BKR-268-2/18-B: 6.1[120]

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6.0 PERFORMANCE

6.1 PHMS Control and Alarm Function Tests

[1] **ENSURE** precautions and limitations in Section 3.0 have been reviewed. _____

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

[3] **ENSURE** the following PHMS Supply Breaker, Breaker 2-BKR-268-1-A, PERMANENT HYDROGEN MITIGATION SYSTEMS 2-DXF-268-1-A, at Compt 9E of Board 2A1-A, is in the OFF position. _____

_____
CV

[4] **ENSURE** the following PHMS Supply Breaker, Breaker 2-BKR-268-2-B, PERMANENT HYDROGEN MITIGATION SYSTEM 2-DXF-268-2-B, at Compt 12C of Board 2B-B, is in the OFF position. _____

_____
CV

NOTE

Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A is located at COL A12V, EL 782'.

[5] **ENSURE** Breaker 2-BKR-268-1/1-A, Breaker 1 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[6] **ENSURE** Breaker 2-BKR-268-1/2-A, Breaker 2 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[7] **ENSURE** Breaker 2-BKR-268-1/3-A, Breaker 3 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[8] **ENSURE** Breaker 2-BKR-268-1/4-A, Breaker 4 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[9] **ENSURE** Breaker 2-BKR-268-1/5-A, Breaker 5 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[10] **ENSURE** Breaker 2-BKR-268-1/6-A, Breaker 6 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[11] **ENSURE** Breaker 2-BKR-268-1/7-A, Breaker 7 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[12] **ENSURE** Breaker 2-BKR-268-1/8-A, Breaker 8 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[13] **ENSURE** Breaker 2-BKR-268-1/9-A, Breaker 9 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[14] **ENSURE** Breaker 2-BKR-268-1/10-A, Breaker 10 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[15] **ENSURE** Breaker 2-BKR-268-1/11-A, Breaker 11 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[16] **ENSURE** Breaker 2-BKR-268-1/12-A, Breaker 12 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[17] **ENSURE** Breaker 2-BKR-268-1/13-A, Breaker 13 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[18] **ENSURE** Breaker 2-BKR-268-1/14-A, Breaker 14 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

[19] **ENSURE** Breaker 2-BKR-268-1/15-A, Breaker 15 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

[20] **ENSURE** Breaker 2-BKR-268-1/16-A, Breaker 16 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

[21] **ENSURE** Breaker 2-BKR-268-1/17-A, Breaker 17 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

[22] **ENSURE** Breaker 2-BKR-268-1/18-A, Breaker 18 at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, is in the ON position. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

NOTE
Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B is located at COL A12V, EL 782'.

[23] **ENSURE** Breaker 2-BKR-268-2/1-B, Breaker 1 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[24] **ENSURE** Breaker 2-BKR-268-2/2-B, Breaker 2 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[25] **ENSURE** Breaker 2-BKR-268-2/3-B, Breaker 3 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[26] **ENSURE** Breaker 2-BKR-268-2/4-B, Breaker 4 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[27] **ENSURE** Breaker 2-BKR-268-2/5-B, Breaker 5 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[28] **ENSURE** Breaker 2-BKR-268-2/6-B, Breaker 6 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[29] **ENSURE** Breaker 2-BKR-268-2/7-B, Breaker 7 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[30] **ENSURE** Breaker 2-BKR-268-2/8-B, Breaker 8 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[31] **ENSURE** Breaker 2-BKR-268-2/9-B, Breaker 9 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[32] **ENSURE** Breaker 2-BKR-268-2/10-B, Breaker 10 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[33] **ENSURE** Breaker 2-BKR-268-2/11-B, Breaker 11 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[34] **ENSURE** Breaker 2-BKR-268-2/12-B, Breaker 12 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[35] **ENSURE** Breaker 2-BKR-268-2/13-B, Breaker 13 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[36] **ENSURE** Breaker 2-BKR-268-2/14-B, Breaker 14 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[37] **ENSURE** Breaker 2-BKR-268-2/15-B, Breaker 15 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[38] **ENSURE** Breaker 2-BKR-268-2/16-B, Breaker 16 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[39] **ENSURE** Breaker 2-BKR-268-2/17-B, Breaker 17 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[40] **ENSURE** Breaker 2-BKR-268-2/18-B, Breaker 18 at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

[41] **ENSURE** AC POWER Breaker CB1, 2-BKR-268-1A-A, AC CIRCUIT BREAKER PHMS GROUP A, at Panel 2-DXF-268-1-A, is in the ON position. _____

_____ CV

[42] **ENSURE** AC POWER Breaker CB1, 2-BKR-268-2A-B, AC CIRCUIT BREAKER PHMS GROUP B, at Panel 2-DXF-268-2-B, is in the ON position. _____

_____ CV

[43] **ENSURE** Hydrogen Mitigation Distribution Panel MAIN Breaker, 2-BKR-268-1/M1-A, GROUP A PHMS ISOL BKR, at Panel 2-DPL-268-1-A, is in the ON position. _____

_____ CV

[44] **ENSURE** Hydrogen Mitigation Distribution Panel MAIN Breaker, 2-BKR-268-2/M1-B, GROUP B PHMS ISOL BKR, at Panel 2-DPL-268-2-B, is in the ON position. _____

_____ CV

NOTE

Annunciator Window, 2-XA-55-5C/102-C, PHMS PNL A/B UV/BKR TRIP is located in the Main Control Room on panel 2-M-5.

[45] **VERIFY** 2-XA-55-5C/102–C, PHMS PWR DIST PNL A/B UV/BKR TRIP, is CLEAR. _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[46] **PLACE** and **HOLD** handheld jumper across points 6 and 7 of the auxiliary contact at 480V C&A Bldg Vent Bd 2A1-A, Compt 9E. _____

_____ CV

[46.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. (**Acc Crit**) _____

[46.2] **VERIFY** Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). (**Acc Crit**) _____

[47] **REMOVE** handheld jumper across points 6 and 7 of the auxiliary contact at 480V C&A Bldg Vent Bd 2A1-A, Compt 9E. _____

_____ CV

[47.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

[47.2] **VERIFY** Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is NORMAL (Blue). _____

[48] **PLACE** and **HOLD** handheld jumper across points 6 and 7 of the auxiliary contact at 480V C&A Bldg Vent Bd 2B1-B, Compt 12C. _____

_____ CV

[48.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. (**Acc Crit**) _____

[48.2] **VERIFY** Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). (**Acc Crit**) _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[49] **REMOVE** handheld jumper across points 6 and 7 of the auxiliary contact at 480V C&A Bldg Vent Bd 2B1-B, Compt 12C, Breaker 2-BKR-268-2-B. _____

_____
CV

[49.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B W/BKR TRIP, CLEARS. _____

[49.2] **VERIFY** Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

NOTES

1) Section 6.1[50] to 6.1[85] verifies the breakers at Panel 2-DPL-268-1-A TRIP and RESET.
2) Each of the following breakers is equipped with a Red TRIP Button which trips the breaker when turned clockwise.

[50] **TRIP** Breaker 2-BKR-268-1/1-A, (Breaker 1), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[50.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[51] **RESET** Breaker 2-BKR-268-1/1-A, (Breaker 1), at Panel 2-DPL-268-1-A. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[51.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[52] **TRIP** Breaker 2-BKR-268-1/2-A, (Breaker 2), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[52.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[53] **RESET** Breaker 2-BKR-268-1/2-A, (Breaker 2), at Panel 2-DPL-268-1-A. _____

_____
CV

[53.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[54] **TRIP** Breaker 2-BKR-268-1/3-A, (Breaker 3), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[54.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[55] **RESET** Breaker 2-BKR-268-1/3-A, (Breaker 3), at Panel 2-DPL-268-1-A. _____

_____
CV

[55.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[56] **TRIP** Breaker 2-BKR-268-1/4-A, (Breaker 4), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[56.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[57] **RESET** Breaker 2-BKR-268-1/4-A, (Breaker 4), at Panel 2-DPL-268-1-A. _____

_____
CV

[57.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[58] **TRIP** Breaker 2-BKR-268-1/5-A, (Breaker 5), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[58.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[59] **RESET** Breaker 2-BKR-268-1/5-A, (Breaker 5), at Panel 2-DPL-268-1-A. _____

_____
CV

[59.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[60] **TRIP** Breaker 2-BKR-268-1/6-A, (Breaker 6), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[60.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[61] **RESET** Breaker 2-BKR-268-1/6-A, (Breaker 6), at Panel 2-DPL-268-1-A. _____

_____
CV

[61.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[62] **TRIP** Breaker 2-BKR-268-1/7-A, (Breaker 7), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[62.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[63] **RESET** Breaker 2-BKR-268-1/7-A, (Breaker 7), at Panel 2-DPL-268-1-A. _____

_____
CV

[63.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[64] **TRIP** Breaker 2-BKR-268-1/8-A, (Breaker 8), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[64.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[65] **RESET** Breaker 2-BKR-268-1/8-A, (Breaker 8), at Panel 2-DPL-268-1-A. _____

_____
CV

[65.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[66] **TRIP** Breaker 2-BKR-268-1/9-A, (Breaker 9), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[66.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[67] **RESET** Breaker 2-BKR-268-1/9-A, (Breaker 9), at Panel 2-DPL-268-1-A. _____

_____
CV

[67.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[68] **TRIP** Breaker 2-BKR-268-1/10-A, (Breaker 10), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[68.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[69] **RESET** Breaker 2-BKR-268-1/10-A, (Breaker 10), at Panel 2-DPL-268-1-A. _____

_____
CV

[69.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[70] **TRIP** Breaker 2-BKR-268-1/11-A, (Breaker 11), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[70.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[71] **RESET** Breaker 2-BKR-268-1/11-A, (Breaker 11), at Panel 2-DPL-268-1-A. _____

_____
CV

[71.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[72] **TRIP** Breaker 2-BKR-268-1/12-A, (Breaker 12), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[72.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[73] **RESET** Breaker 2-BKR-268-1/12-A, (Breaker 12), at Panel 2-DPL-268-1-A. _____

_____
CV

[73.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[74] **TRIP** Breaker 2-BKR-268-1/13-A, (Breaker 13), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[74.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[75] **RESET** Breaker 2-BKR-268-1/13-A, (Breaker 13), at Panel 2-DPL-268-1-A. _____

_____
CV

[75.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[76] **TRIP** Breaker 2-BKR-268-1/14-A, (Breaker 14), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[76.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[77] **RESET** Breaker 2-BKR-268-1/14-A, (Breaker 14), at Panel 2-DPL-268-1-A. _____

_____
CV

[77.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[78] **TRIP** Breaker 2-BKR-268-1/15-A, (Breaker 15), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[78.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[79] **RESET** Breaker 2-BKR-268-1/15-A, (Breaker 15), at Panel 2-DPL-268-1-A. _____

_____
CV

[79.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[80] **TRIP** Breaker 2-BKR-268-1/16-A, (Breaker 16), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[80.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[81] **RESET** Breaker 2-BKR-268-1/16-A, (Breaker 16), at Panel 2-DPL-268-1-A. _____

_____
CV

[81.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

[82] **TRIP** Breaker 2-BKR-268-1/17-A, (Breaker 17), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. **(Acc Crit)** _____

_____
CV

[82.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[83] **RESET** Breaker 2-BKR-268-1/17-A, (Breaker 17), at Panel 2-DPL-268-1-A. _____

_____
CV

[83.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[84] **TRIP** Breaker 2-BKR-268-1/18-A, (Breaker 18), at Panel 2-DPL-268-1-A, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[84.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is in ALARM (Red). _____

[85] **RESET** 2-BKR-268-1/18-A, (Breaker 18), at Panel 2-DPL-268-1-A. _____

_____
CV

[85.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL A UV/BKR TRIPPED is NORMAL (Blue). _____

NOTES

1) Section 6.1[86] to 6.1[121] verifies the breakers at Panel 2-DPL-268-2-B TRIP and RESET.
2) Each of the following breakers is equipped with a Red TRIP Button which trips the breaker when turned clockwise.

[86] **TRIP** Breaker 2-BKR-268-2/1-B, (Breaker 1), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[86.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[87] **RESET** 2-BKR-268-2/1-B, (Breaker 1), at Panel 2-DPL-268-2-B. _____

_____
CV

[87.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[88] **TRIP** Breaker 2-BKR-268-2/2-B, (Breaker 2), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[88.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[89] **RESET** 2-BKR-268-2/2-B, (Breaker 2), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[89.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[90] **TRIP** Breaker at 2-BKR-268-2/3-B, (Breaker 3), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[90.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[91] **RESET** 2-BKR-268-2/3-B, (Breaker 3), at Panel 2-DPL-268-2-B. _____

_____
CV

[91.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[92] **TRIP** Breaker 2-BKR-268-2/4-B, (Breaker 4), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[92.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[93] **RESET** 2-BKR-268-2/4-B, (Breaker 4), at Panel 2-DPL-268-2-B. _____

_____
CV

[93.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[94] **TRIP** Breaker 2-BKR-268-2/5-B, (Breaker 5), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[94.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[95] **RESET** 2-BKR-268-2/5-B, (Breaker 5), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[95.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[96] **TRIP** Breaker at 2-BKR-268-2/6-B, (Breaker 6), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[96.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[97] **RESET** 2-BKR-268-2/6-B, (Breaker 6), at Panel 2-DPL-268-2-B. _____

_____
CV

[97.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[98] **TRIP** Breaker 2-BKR-268-2/7-B, (Breaker 7), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[98.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[99] **RESET** 2-BKR-268-2/7-B, (Breaker 7), at Panel 2-DPL-268-2-B. _____

_____
CV

[99.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[100] **TRIP** Breaker 2-BKR-268-2/8-B, (Breaker 8), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[100.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[101] **RESET** 2-BKR-268-2/8-B, (Breaker 8), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[101.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[102] **TRIP** Breaker 2-BKR-268-2/9-B, (Breaker 9), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[102.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[103] **RESET** 2-BKR-268-2/9-B, (Breaker 9), at Panel 2-DPL-268-2-B. _____

_____
CV

[103.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[104] **TRIP** Breaker 2-BKR-268-2/10-B, (Breaker 10), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[104.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[105] **RESET** 2-BKR-268-2/10-B, (Breaker 10), at Panel 2-DPL-268-2-B. _____

_____
CV

[105.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[106] **TRIP** Breaker 2-BKR-268-2/11-B, (Breaker 11), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[106.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[107] **RESET** 2-BKR-268-2/11-B, (Breaker 11), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[107.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[108] **TRIP** Breaker 2-BKR-268-2/12-B, (Breaker 12), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[108.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[109] **RESET** 2-BKR-268-2/12-B, (Breaker 12), at Panel 2-DPL-268-2-B. _____

_____
CV

[109.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[110] **TRIP** Breaker 2-BKR-268-2/13-B, (Breaker 13), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[110.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[111] **RESET** 2-BKR-268-2/13-B, (Breaker 13), at Panel 2-DPL-268-2-B. _____

_____
CV

[111.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[112] **TRIP** Breaker 2-BKR-268-2/14-B, (Breaker 14), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[112.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[113] **RESET** 2-BKR-268-2/14-B, (Breaker 14), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[113.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[114] **TRIP** Breaker 2-BKR-268-2/15-B, (Breaker 15), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[114.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[115] **RESET** 2-BKR-268-2/15-B, (Breaker 15), at Panel 2-DPL-268-2-B. _____

_____
CV

[115.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[116] **TRIP** Breaker 2-BKR-268-2/16-B, (Breaker 16), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[116.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[117] **RESET** 2-BKR-268-2/16-B, (Breaker 16), at Panel 2-DPL-268-2-B. _____

_____
CV

[117.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[118] **TRIP** Breaker 2-BKR-268-2/17-B, (Breaker 17), at Panel 2-DPL-268-2-B, by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[118.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[119] **RESET** 2-BKR-268-2/17-B, (Breaker 17), at Panel 2-DPL-268-2-B. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[119.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

[120] **TRIP** Breaker 2-BKR-268-2/18-B, (Breaker 18), at Panel 2-DPL-268-2-B; by way of Red TRIP Button. (**Acc Crit**) _____

_____
CV

[120.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is in ALARM (Red). _____

[121] **RESET** 2-BKR-268-2/18-B, (Breaker 18), at Panel 2-DPL-268-2-B. _____

_____
CV

[121.1] **VERIFY** the following:

A. 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

B. Unit 2 Event Display Monitor indicates 102-C PHMS POWER DIST PNL B UV/BKR TRIPPED is NORMAL (Blue). _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[122] **PLACE** MAIN Breaker 2-BKR-268-1/M1-A at Panel 2-DPL-268-1-A in the OFF position. (**Acc Crit**) _____

_____
CV

[122.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

[123] **PLACE** MAIN Breaker 2-BKR-268-1/M1-A at Panel 2-DPL-268-1-A in the ON position. _____

_____
CV

[123.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, is CLEAR. _____

[124] **PLACE** MAIN Breaker 2-BKR-268-2/M1-B at Panel 2-DPL-268-2-B in the OFF position. (**Acc Crit**) _____

_____
CV

[124.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

[125] **PLACE** MAIN Breaker 2-BKR-268-2/M1-B at Panel 2-DPL-268-2-B in the ON position. _____

_____
CV

[125.1] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, is CLEAR. _____

[126] **PLACE** Breaker 2-BKR-268-1/1-A, Breaker 1, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[127] **PLACE** Breaker 2-BKR-268-1/2-A, Breaker 2, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[128] **PLACE** Breaker 2-BKR-268-1/3-A, Breaker 3, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[129] **PLACE** Breaker 2-BKR-268-1/4-A, Breaker 4, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[130] **PLACE** Breaker 2-BKR-268-1/5-A, Breaker 5, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[131] **PLACE** Breaker 2-BKR-268-1/6-A, Breaker 6, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[132] **PLACE** Breaker 2-BKR-268-1/7-A, Breaker 7, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[133] **PLACE** Breaker 2-BKR-268-1/8-A, Breaker 8, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[134] **PLACE** Breaker 2-BKR-268-1/9-A, Breaker 9, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[135] **PLACE** Breaker 2-BKR-268-1/10-A, Breaker 10, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[136] **PLACE** Breaker 2-BKR-268-1/11-A, Breaker 11, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[137] **PLACE** Breaker 2-BKR-268-1/12-A, Breaker 12, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[138] **PLACE** Breaker 2-BKR-268-1/13-A, Breaker 13, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[139] **PLACE** Breaker 2-BKR-268-1/14-A, Breaker 14, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[140] **PLACE** Breaker 2-BKR-268-1/15-A, Breaker 15, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[141] **PLACE** Breaker 2-BKR-268-1/16-A, Breaker 16, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[142] **PLACE** Breaker 2-BKR-268-1/17-A, Breaker 17, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[143] **PLACE** Breaker 2-BKR-268-1/18-A, Breaker 18, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the OFF position. _____

_____ CV

[144] **PLACE** Breaker 2-BKR-268-2/1-B, Breaker 1, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[145] **PLACE** Breaker 2-BKR-268-2/2-B, Breaker 2, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[146] **PLACE** Breaker 2-BKR-268-2/3-B, Breaker 3, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[147] **PLACE** Breaker 2-BKR-268-2/4-B, Breaker 4, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[148] **PLACE** Breaker 2-BKR-268-2/5-B, Breaker 5, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[149] **PLACE** Breaker 2-BKR-268-2/6-B, Breaker 6, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[150] **PLACE** Breaker 2-BKR-268-2/7-B, Breaker 7, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[151] **PLACE** Breaker 2-BKR-268-2/8-B, Breaker 8, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[152] **PLACE** Breaker 2-BKR-268-2/9-B, Breaker 9, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[153] **PLACE** Breaker 2-BKR-268-2/10-B, Breaker 10, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[154] **PLACE** Breaker 2-BKR-268-2/11-B, Breaker 11, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[155] **PLACE** Breaker 2-BKR-268-2/12-B, Breaker 12, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[156] **PLACE** Breaker 2-BKR-268-2/13-B, Breaker 13, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[157] **PLACE** Breaker 2-BKR-268-2/14-B, Breaker 14, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[158] **PLACE** Breaker 2-BKR-268-2/15-B, Breaker 15, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[159] **PLACE** Breaker 2-BKR-268-2/16-B, Breaker 16, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[160] **PLACE** Breaker 2-BKR-268-2/17-B, Breaker 17, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[161] **PLACE** Breaker 2-BKR-268-2/18-B, Breaker 18, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the OFF position. _____

_____ CV

[162] **PLACE** the 480V C&A Bldg Vent Board 2A1-A, Compt 9E Breaker 2-BKR-268-1-A, in the ON position. _____

_____ CV

[163] **VERIFY** Red, POWER ON, Light on Hydrogen Mitigation Transformer Panel, 2-DXF-268-1-A, is OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[164] **VERIFY** the following light indications at Panel 2-M-10, Handswitch 2-HS-268-73, H2 IGNITERS GROUP A: **(Acc Crit)**

A. Green Light ON. _____

B. Red Light OFF. _____

[165] **PLACE** Handswitch 2-HS-268-73, H2 IGNITERS GROUP A, in the ON position. _____

[165.1] **VERIFY** the following light indications at Panel 2-M-10, Handswitch 2-HS-268-73, H2 IGNITER GROUP A. **(Acc Crit)**

A. Green Light OFF. _____

B. Red Light ON. _____

[165.2] **VERIFY** Red, POWER ON, Light is ON at 480V C&A Bldg Vent Board 2A1-A, Compt 9E, Breaker 2-BKR-268-1-A. **(Acc Crit)** _____

[166] **PLACE** 480V C&A Bldg Vent Board 2B1-B, Compt 12C, Breaker 2-BKR-268-2-B in the ON position. _____

_____
CV

[167] **VERIFY** Red, POWER ON, Light on Hydrogen Mitigation Transformer Panel, 2-DXF-268-2-B, is OFF. _____

[168] **VERIFY** the following light indications at Panel 2-M-10, Handswitch 2-HS-268-74, H2 IGNITERS GROUP B: **(Acc Crit)**

A. Green Light ON. _____

B. Red Light OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[169] **PLACE** Handswitch 2-HS-268-74, H2 IGNITERS GROUP B, in the ON position. _____

[169.1] **VERIFY** the following light indications at Panel 2-M-10, Handswitch 2-HS-268-74, H2 IGNITERS GROUP B. (**Acc Crit**)

B. Green Light OFF. _____

C. Red Light ON. _____

[169.2] **VERIFY** Red, POWER ON, Light is ON at 480V C&A Bldg Vent Board 2B1-B, Compt 12C, Breaker 2-BKR-268-2-B. (**Acc Crit**) _____

[170] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, in MCR is CLEAR. _____

[171] **PLACE** AC POWER Breaker CB1, 2-BKR-268-1A-A, at Hydrogen Mitigation Transformer Panel, 2-DXF-268-1-A, in the OFF position.

_____

_____
CV

[172] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

[173] **PLACE** AC POWER Breaker CB1, 2-BKR-268-1A-A, at Hydrogen Mitigation Transformer Panel, 2-DXF-268-1-A, in the ON position. _____

_____
CV

[174] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

Data Package: Page ____ of ____ **Date _____**

6.1 PHMS Control and Alarm Function Tests (continued)

[175] **PLACE** AC POWER Breaker CB1, 2-BKR-268-2A-B, at Hydrogen Mitigation Transformer Panel, 2-DXF-268-2-B, in the OFF position. _____

_____
CV

[176] **VERIFY** Window 102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, ALARMS. _____

[177] **PLACE** AC POWER Breaker CB1, 2-BKR-268-2A-B, at Hydrogen Mitigation Transformer Panel, 2-DXF-268-2-B, in the ON position. _____

_____
CV

[178] **VERIFY** 2-XA-55-5C/102-C, PHMS PWR DIST PNL A/B UV/BKR TRIP, CLEARS. _____

[179] **PLACE** the following Handswitches at MCR Panel 2-M-10 in the OFF position:

A. Handswitch 2-HS-268-73, H2 IGNITERS GROUP A. _____

B. Handswitch 2-HS-268-74, H2 IGNITERS GROUP B. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A

NOTE

Subsections 6.2 and 6.3 may be performed concurrently.

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

[2] **ENSURE** the following PHMS Supply Breaker, Breaker 2-BKR-268-1-A, PERMANENT HYDROGEN MITIGATION SYSTEM 2-DXF-268-1-A, at Compt 9E of Board 2A1-A, is in the ON position. _____

_____
CV

NOTE

Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A is located at COL A12V EL782.

[3] **PLACE** Breaker 2-BKR-268-1/1-A, Breaker 1, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____
CV

[4] **PLACE** Breaker 2-BKR-268-1/2-A, Breaker 2, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[5] **PLACE** Breaker 2-BKR-268-1/3-A, Breaker 3, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[6] **PLACE** Breaker 2-BKR-268-1/4-A, Breaker 4, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[7] **PLACE** Breaker 2-BKR-268-1/5-A, Breaker 5, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position _____

_____ CV

[8] **PLACE** Breaker 2-BKR-268-1/6-A, Breaker 6, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[9] **PLACE** Breaker 2-BKR-268-1/7-A, Breaker 7, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[10] **PLACE** Breaker 2-BKR-268-1/8-A, Breaker 8, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[11] **PLACE** Breaker 2-BKR-268-1/9-A, Breaker 9, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[12] **PLACE** Breaker 2-BKR-268-1/10-A, Breaker 10, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[13] **PLACE** Breaker 2-BKR-268-1/11-A, Breaker 11, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[14] **PLACE** Breaker 2-BKR-268-1/12-A, Breaker 12, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[15] **PLACE** Breaker 2-BKR-268-1/13-A, Breaker 13, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

[16] **PLACE** Breaker 2-BKR-268-1/14-A, Breaker 14, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[17] **PLACE** Breaker 2-BKR-268-1/15-A, Breaker 15, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____
CV

[18] **PLACE** Breaker 2-BKR-268-1/16-A, Breaker 16, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____
CV

[19] **PLACE** Breaker 2-BKR-268-1/17-A, Breaker 17, at Hydrogen Mitigation Distribution Panel 2-DPL-268-1-A, in the ON position. _____

_____
CV

NOTE

Breaker 18, 2-BKR-268-1/18-A, is a spare breaker.

CAUTION

The following steps energize the hydrogen igniters creating fire and safety hazard.

- Before the following steps, inspect each igniter to ensure no flammable material is within 2 feet of the igniters.
- All entrances to the Unit 2 reactor building must be posted with personnel to brief those entering the building after operations announce that the igniters will be energized.

[20] **NOTIFY** operations to announce that Hydrogen Igniter Heaters will be energized in the Containment, **AND**

RECEIVE concurrence to proceed. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[21] **PLACE** Handswitch 2-HS-268-73, H2 IGNITERS GROUP A, in the ON position at MCR Panel 2-M-10, **AND**

RECORD time.

Time _____ _____

[22] **RECORD** Phase-to-Phase bus voltage measurements at Panel 2-DPL-268-1-A, **AND**

VERIFY voltage is between 230.36 V_{AC} and 233.82 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-B _____ V_{AC}

(230.36-233.82 V_{AC})

_____

B.

M&TE _____ Cal Due Date _____

B-C _____ V_{AC}

(230.36-233.82 V_{AC})

_____

C.

M&TE _____ Cal Due Date _____

C-A _____ V_{AC}

(230.36-233.82 V_{AC})

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[23] **IF** any voltage measurement in 6.2[22] is NOT 230.26 to 233.82 V_{AC}, **THEN**

ADJUST potentiometer R13 in 2-DXF-268-268-1-A on control board A1A for Phase A, A1B for Phase B, and A1C for Phase C so that each phase is 230.26 to 233.82 V_{AC}, **AND**

RECORD as-left voltages for each phase below:

A. Phase A to Phase B:

_____ V_{AC}

B. Phase B to Phase C:

_____ V_{AC}

C. Phase C to Phase A:

_____ V_{AC}

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

NOTE

Voltage measurements in the following steps are to be taken to circuit neutral and not to common ground.

[24] **RECORD** Phase-to-Neutral bus voltage measurements at Panel 2-DPL-268-1-A, **AND**

VERIFY voltage is between 132 and 135 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

B.

M&TE _____ Cal Due Date _____

B-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

C.

M&TE _____ Cal Due Date _____

C-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

NOTES

1) Breaker #18 is a spare breaker.
2) The following step verifies both igniters are energized by measuring a current greater than 7.4 amperes at the breaker.
3) If the current reading is between 3.7 and 4.4 amperes one igniter is considered to be operable.
4) Current readings between 4.4 and 7.4 indicate a fault of an indeterminable nature and will require further troubleshooting to resolve.

[25] **VERIFY** 7.4 amperes or greater measured at each breaker (#1 through #17 in any order) at Panel 2-DPL-268-1-A after a minimum of 5 minutes from time recorded in Step 6.2[21].

M&TE _____ Cal Due Date _____

BREAKER NUMBER	AMPERES	BREAKER NUMBER	AMPERES
1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9			

_____

[26] **PLACE** Handswitch 2-HS-268-73, H2 IGNITERS GROUP A, in the OFF position, **AND**

RECORD time:

Time _____ _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[27] **WHEN** the hydrogen igniters have been allowed to cool for at least 30 minutes, **THEN**

PLACE Handswitch 2-HS-268-73, H2 IGNITERS GROUP A, in the ON position, **AND**

RECORD time.

Time _____ _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

NOTES

1) Measurements of igniter temperatures are by line-of-sight view (profile or oblique) using optical thermography and should indicate a stabilized temperature. Directly head-on (end) views of the hydrogen igniter may measure lower than actual temperature and should be avoided. See Appendix C, Temperature Conversion Chart, for conversion from °C to °F, if required.
2) Steps 6.2[28] and 6.2[29] are performed concurrently by breaker number.
3) Igniter Component ID numbers are typical of the following example: (#1 is 2-HTR-268-0001 and #66 is 2-HTR-268-0066).

[28] **WHEN** the hydrogen igniters have warmed up 5 minutes to allow the current to the igniters to stabilize, **THEN**

MEASURE and **RECORD** each of the following hydrogen igniter heater temperatures (in any order by breaker number) using an optical infrared thermometer or a contact thermometer: (See Figures 1 thru 5 for igniter locations)

HYDROGEN IGNITER HEATER	TEMPERATURE	HYDROGEN IGNITER HEATER	TEMPERATURE	BREAKER NUMBER
#1	°F	#32	°F	BKR #1
#2	°F	#23	°F	BKR #2
#5	°F	#6	°F	BKR #3
#7	°F	#8	°F	BKR #4
#13	°F	#14	°F	BKR #5
#15	°F	#16	°F	BKR #6
#21	°F	#22	°F	BKR #7
#25	°F	#53	°F	BKR #8
#24	°F	#29	°F	BKR #9
#30	°F	#31	°F	BKR #10
#35	°F	#36	°F	BKR #11
#26	°F	#33	°F	BKR #12
#34	°F	#42	°F	BKR #13
#49	°F	#50	°F	BKR #14
#54	°F	#55	°F	BKR #15
#27	°F	#28	°F	BKR #16
#65	°F	#66	°F	BKR #17

M&TE _____ Cal Due Date _____

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

NOTES

1) The following step is performed concurrently with Step 6.2[28] in a manner to obtain measurements as close as possible to the time when igniter temperatures are measured by indicated breaker number.
2) Power Factor of 1.0 is assumed for calculation.

[29] **CALCULATE** total load wattage for each Panel 2-DPL-268-1-A Breaker as follows: **(Acc Crit)**

VOLTMETER M&TE _____ Cal Due Date _____

AMMETER M&TE _____ Cal Due Date _____

[29.1] **RECORD** Volts and Amps measurements for 2-BKR-268-1/1-A, (Breaker 1).

_____ VOLTS _____ AMPS

_____

[29.2] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/1-A, (Breaker 1).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.3] **RECORD** Volts and Amps measurements for 2-BKR-268-1/2-A, (Breaker 2).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.4] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/2-A, (Breaker 2).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.5] **RECORD** Volts and Amps measurements for 2-BKR-268-1/3-A, (Breaker 3).

_____ VOLTS _____ AMPS

_____

[29.6] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/3-A, (Breaker 3).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.7] **RECORD** Volts and Amps measurements for 2-BKR-268-1/4-A, (Breaker 4).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.8] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/4-A, (Breaker 4).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.9] **RECORD** Volts and Amps measurements for 2-BKR-268-1/5-A, (Breaker 5).

_____ VOLTS _____ AMPS

_____

[29.10] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/5-A, (Breaker 5).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.11] **RECORD** Volts and Amps measurements for 2-BKR-268-1/6-A, (Breaker 6).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.12] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/6-A, (Breaker 6).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.13] **RECORD** Volts and Amps measurements for 2-BKR-268-1/7-A, (Breaker 7).

_____ VOLTS _____ AMPS

_____

[29.14] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/7-A, (Breaker 7).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.15] **RECORD** Volts and Amps measurements for 2-BKR-268-1/8-A, (Breaker 8).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.16] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/8-A, (Breaker 8).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.17] **RECORD** Volts and Amps measurements for 2-BKR-268-1/9-A, (Breaker 9).

_____ VOLTS _____ AMPS

_____

[29.18] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/9-A, (Breaker 9).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.19] **RECORD** Volts and Amps measurements for 2-BKR-268-1/10-A, (Breaker 10).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.20] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/10-A, (Breaker 10).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.21] **RECORD** Volts and Amps measurements for 2-BKR-268-1/11-A, (Breaker 11).

_____ VOLTS _____ AMPS

_____

[29.22] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/11-A, (Breaker 11).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.23] **RECORD** Volts and Amps measurements for 2-BKR-268-1/12-A, (Breaker 12).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.24] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/12-A, (Breaker 12).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.25] **RECORD** Volts and Amps measurements for 2-BKR-268-1/13-A, (Breaker 13).

_____ VOLTS _____ AMPS

_____

[29.26] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/13-A, (Breaker 13).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.27] **RECORD** Volts and Amps measurements for 2-BKR-268-1/14-A, (Breaker 14).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.28] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/14-A, (Breaker 14).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.29] **RECORD** Volts and Amps measurements for 2-BKR-268-1/15-A, (Breaker 15).

_____ VOLTS _____ AMPS

_____

[29.30] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/15-A, (Breaker 15).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.31] **RECORD** Volts and Amps measurements for 2-BKR-268-1/16-A, (Breaker 16).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[29.32] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/16-A, (Breaker 16).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.33] **RECORD** Volts and Amps measurements for 2-BKR-268-1/17-A, (Breaker 17).

_____ VOLTS _____ AMPS

_____

[29.34] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-1/17-A, (Breaker 17).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

NOTE

Each igniter is verified to be OFF by observing a current less than 3.7 amperes across the igniter circuit.

[30] **OPEN** 2-BKR-268-1/1-A (Breaker 1). _____

_____
CV

A. **VERIFY** Igniter #1 is observed to be OFF. _____

B. **VERIFY** Igniter #32 is observed to be OFF. _____

[31] **CLOSE** 2-BKR-268-1/1-A (Breaker 1). _____

_____
CV

[32] **OPEN** 2-BKR-268-1/2-A (Breaker 2). _____

_____
CV

A. **VERIFY** Igniter #2 is observed to be OFF. _____

B. **VERIFY** Igniter #23 is observed to be OFF. _____

[33] **CLOSE** 2-BKR-268-1/2-A (Breaker 2). _____

_____
CV

[34] **OPEN** 2-BKR-268-1/3-A (Breaker 3). _____

_____
CV

A. **VERIFY** Igniter #5 is observed to be OFF. _____

B. **VERIFY** Igniter #6 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[35] **CLOSE** 2-BKR-268-1/3-A (Breaker 3). _____

_____
CV

[36] **OPEN** 2-BKR-268-1/4-A (Breaker 4). _____

_____
CV

A. **VERIFY** Igniter #7 is observed to be OFF. _____

B. **VERIFY** Igniter #8 is observed to be OFF. _____

[37] **CLOSE** 2-BKR-268-1/4-A (Breaker 4). _____

_____
CV

[38] **OPEN** 2-BKR-268-1/5-A (Breaker 5). _____

_____
CV

A. **VERIFY** Igniter #13 is observed to be OFF. _____

B. **VERIFY** Igniter #14 is observed to be OFF. _____

[39] **CLOSE** 2-BKR-268-1/5-A (Breaker 5). _____

_____
CV

[40] **OPEN** 2-BKR-268-1/6-A (Breaker 6). _____

_____
CV

A. **VERIFY** Igniter #15 is observed to be OFF. _____

B. **VERIFY** Igniter #16 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[41] **CLOSE** 2-BKR-268-1/6-A (Breaker 6). _____

_____
CV

[42] **OPEN** 2-BKR-268-1/7-A (Breaker 7). _____

_____
CV

A. **VERIFY** Igniter #21 is observed to be OFF. _____

B. **VERIFY** Igniter #22 is observed to be OFF. _____

[43] **CLOSE** 2-BKR-268-1/7-A (Breaker 7). _____

_____
CV

[44] **OPEN** 2-BKR-268-1/8-A (Breaker 8). _____

_____
CV

A. **VERIFY** Igniter #25 is observed to be OFF. _____

B. **VERIFY** Igniter #53 is observed to be OFF. _____

[45] **CLOSE** 2-BKR-268-1/8-A (Breaker 8). _____

_____
CV

[46] **OPEN** 2-BKR-268-1/9-A (Breaker 9). _____

_____
CV

A. **VERIFY** Igniter #24 is observed to be OFF. _____

B. **VERIFY** Igniter #29 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[47] **CLOSE** 2-BKR-268-1/9-A (Breaker 9). _____

_____
CV

[48] **OPEN** 2-BKR-268-1/10-A (Breaker 10). _____

_____
CV

A. **VERIFY** Igniter #30 is observed to be OFF. _____

B. **VERIFY** Igniter #31 is observed to be OFF. _____

[49] **CLOSE** 2-BKR-268-1/10-A (Breaker 10). _____

_____
CV

[50] **OPEN** 2-BKR-268-1/11-A (Breaker 11). _____

_____
CV

A. **VERIFY** Igniter #35 is observed to be OFF. _____

B. **VERIFY** Igniter #36 is observed to be OFF. _____

[51] **CLOSE** 2-BKR-268-1/11-A (Breaker 11). _____

_____
CV

[52] **OPEN** 2-BKR-268-1/12-A (Breaker 12). _____

_____
CV

A. **VERIFY** Igniter #26 is observed to be OFF. _____

B. **VERIFY** Igniter #33 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[53] **CLOSE** 2-BKR-268-1/12-A (Breaker 12). _____

_____
CV

[54] **OPEN** 2-BKR-268-1/13-A (Breaker 13). _____

_____
CV

A. **VERIFY** Igniter #34 is observed to be OFF. _____

B. **VERIFY** Igniter #42 is observed to be OFF. _____

[55] **CLOSE** 2-BKR-268-1/13-A (Breaker 13). _____

_____
CV

[56] **OPEN** 2-BKR-268-1/14-A (Breaker 14). _____

_____
CV

A. **VERIFY** Igniter #49 is observed to be OFF. _____

B. **VERIFY** Igniter #50 is observed to be OFF. _____

[57] **CLOSE** 2-BKR-268-1/14-A (Breaker 14). _____

_____
CV

[58] **OPEN** 2-BKR-268-1/15-A (Breaker 15). _____

_____
CV

A. **VERIFY** Igniter #54 is observed to be OFF. _____

B. **VERIFY** Igniter #55 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[59] **CLOSE** 2-BKR-268-1/15-A (Breaker 15). _____

_____
CV

[60] **OPEN** 2-BKR-268-1/16-A (Breaker 16). _____

_____
CV

A. **VERIFY** Igniter #27 is observed to be OFF. _____

B. **VERIFY** Igniter #28 is observed to be OFF. _____

[61] **CLOSE** 2-BKR-268-1/16-A (Breaker 16). _____

_____
CV

[62] **OPEN** 2-BKR-268-1/17-A (Breaker 17). _____

_____
CV

A. **VERIFY** Igniter #65 is observed to be OFF. _____

B. **VERIFY** Igniter #66 is observed to be OFF. _____

[63] **CLOSE** 2-BKR-268-1/17-A (Breaker 17). _____

_____
CV

NOTE

Breaker 18, 2-BKR-268-1/18-A, is a spare breaker.

[64] **VERIFY** each igniter temperature recorded in step6.2[28] is 1741.2°F or greater. (**Acc Crit**) _____

[65] **VERIFY** wattages recorded in Step 6.2[29] do not individually exceed 1335.3 watts. (**Acc Crit**) _____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[66] **RECORD** Phase-to-Phase bus voltage measurements at Panel 2-DPL-268-1-A, **AND**

VERIFY voltage is between 230.36 V_{AC} and 233.82 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-B _____ V_{AC}

(230.36-233.82 V_{AC})

_____

B.

M&TE _____ Cal Due Date _____

B-C _____ V_{AC}

(230.36-233.82 V_{AC})

_____

C.

M&TE _____ Cal Due Date _____

C-A _____ V_{AC}

(230.36-233.82 V_{AC})

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[67] **IF** any voltage measurement in 6.2[66] is NOT 230.26 to 233.82 V_{AC}, **THEN**

ADJUST potentiometer R13 in 2-DXF-268-268-1-A on control board A1A for Phase A, A1B for Phase B, and A1C for Phase C so that each phase is 230.26 to 233.82 V_{AC}, **AND**

RECORD as-left voltages for each phase below:

A. Phase A to Phase B:

_____ V_{AC}

B. Phase B to Phase C:

_____ V_{AC}

C. Phase C to Phase A:

_____ V_{AC}

_____

Data Package: Page ____ of ____ **Date _____**

6.2 Hydrogen Igniter Functional Tests - Train A (continued)

[68] **RECORD** Phase-to-Neutral bus voltage measurements at Panel 2-DPL-268-1-A, **AND**

VERIFY voltage is between 132 and 135 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

B.

M&TE _____ Cal Due Date _____

B-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

C.

M&TE _____ Cal Due Date _____

C-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

[69] **PLACE** Handswitch 2-HS-268-73, H2 IGNITERS GROUP A, in the OFF position. _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B

NOTE
Subsections 6.2 and 6.3 may be performed concurrently

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

[2] **ENSURE** the following PHMS Supply Breaker, Breaker 2-BKR-268-2-B, PERMANENT HYDROGEN MITIGATION SYSTEM 2-DXF-268-2-B, at Compt 12C of Board 2B1-B, is in the ON position. _____

_____
CV

NOTE
Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B is located at COL A12V, EL 782'.

[3] **PLACE** Breaker 2-BKR-268-2/1-B, Breaker 1, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____
CV

[4] **PLACE** Breaker 2-BKR-268-2/2-B, Breaker 2, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[5] **PLACE** Breaker 2-BKR-268-2/3-B, Breaker 3, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[6] **PLACE** Breaker 2-BKR-268-2/4-B, Breaker 4, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[7] **PLACE** Breaker 2-BKR-268-2/5-B, Breaker 5, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[8] **PLACE** Breaker 2-BKR-268-2/6-B, Breaker 6, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[9] **PLACE** Breaker 2-BKR-268-2/7-B, Breaker 7, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[10] **PLACE** Breaker 2-BKR-268-2/8-B, Breaker 8, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[11] **PLACE** Breaker 2-BKR-268-2/9-B, Breaker 9, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[12] **PLACE** Breaker 2-BKR-268-2/10-B, Breaker 10, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[13] **PLACE** Breaker 2-BKR-268-2/11-B, Breaker 11, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[14] **PLACE** Breaker 2-BKR-268-2/12-B, Breaker 12, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[15] **PLACE** Breaker 2-BKR-268-2/13-B, Breaker 13, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

[16] **PLACE** Breaker 2-BKR-268-2/14-B, Breaker 14, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____ CV

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[17] **PLACE** Breaker 2-BKR-268-2/15-B, Breaker 15, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____
CV

[18] **PLACE** Breaker 2-BKR-268-2/16-B, Breaker 16, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____
CV

[19] **PLACE** Breaker 2-BKR-268-2/17-B, Breaker 17, at Hydrogen Mitigation Distribution Panel 2-DPL-268-2-B, in the ON position. _____

_____
CV

NOTE

Breaker 18, 2-BKR-268-1/18-A, is a spare breaker.

CAUTION

The following steps energize the hydrogen igniters creating fire and safety hazard.

- Before the following steps, inspect each igniter to ensure no flammable material is within 2 feet of the igniters.
- All entrances to the Unit 2 reactor building must be posted with personnel to brief those entering the building after operations announce that the igniters will be energized.

[20] **NOTIFY** operations to announce that Hydrogen Igniter Heaters will be energized in the Containment, **AND**

RECEIVE concurrence to proceed. _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[21] **PLACE** Handswitch 2-HS-268-74, H2 IGNITERS GROUP B, at MRC Panel 2-M-10, in the ON position, **AND**

RECORD time.

Time _____ _____

[22] **RECORD** Phase-to-Phase bus voltage measurements at Panel 2-DPL-268-2-B, **AND**

VERIFY voltage is between 230.36 V_{AC} and 233.82 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-B _____ V_{AC}

(230.36-233.82 V_{AC})

_____

B.

M&TE _____ Cal Due Date _____

B-C _____ V_{AC}

(230.36-233.82 V_{AC})

_____

C.

M&TE _____ Cal Due Date _____

C-A _____ V_{AC}

(230.36-233.82 V_{AC})

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[23] **IF** any voltage measurement in 6.3[22] is NOT 230.26 to 233.82 V_{AC}, **THEN**

ADJUST potentiometer R13 in 2-DXF-268-268-2-B on control board A1A for Phase A, A1B for Phase B, and A1C for Phase C so that each phase is 230.26 to 233.82 V_{AC}, **AND**

RECORD as-left voltages for each phase below:

A. Phase A to Phase B:

_____ V_{AC}

B. Phase B to Phase C:

_____ V_{AC}

C. Phase C to Phase A:

_____ V_{AC}

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[24] **RECORD** Phase-to-Neutral bus voltage measurements at Panel 2-DPL-268-2-B, and

VERIFY voltage is between 132 and 135 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-NEUTRAL _____ V_{AC} (132 - 135 V_{AC})

_____

B.

M&TE _____ Cal Due Date _____

B-NEUTRAL _____ V_{AC} (132 - 135 V_{AC})

_____

C.

M&TE _____ Cal Due Date _____

C-NEUTRAL _____ V_{AC} (132 - 135 V_{AC})

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

NOTE

1) The following step verifies both igniters are energized by measuring a current greater than 7.4 amperes at the breaker.
2) If the current reading is between 3.7 and 4.4 amperes one igniter is considered to be operable.
3) Current readings between 4.4 and 7.4 indicate a fault of an indeterminable nature and will require further troubleshooting to resolve.
4) Breaker #18 is a spare breaker.

[25] **VERIFY** 7.4 amperes or greater measured at each breaker (#1 through #17 in any order) at Panel 2-DPL-268-2-B after a minimum of 5 minutes from time recorded in Step 6.3[21].

M&TE _____ Cal Due Date _____

BREAKER NUMBER	AMPERES	BREAKER NUMBER	AMPERES
1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9			

_____

[26] **PLACE** Handswitch 2-HS-268-74, H2 IGNITERS GROUP B, in the OFF position, **AND**

RECORD time:

Time _____ _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[27] **WHEN** the hydrogen igniters have been allowed to cool for at least 30 minutes, **THEN**

PLACE Handswitch 2-HS-268-74, H2 IGNITERS GROUP B, in the ON position, **AND**

RECORD time.

Time _____ _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

NOTES

1) Measurements of igniter temperatures are by line-of-sight view (profile or oblique) using optical thermography and should indicate a stabilized temperature. Directly head-on (end) views of the hydrogen igniter may measure lower than actual temperature and should be avoided. See Appendix C, Temperature Conversion Chart, for conversion from °C to °F if required.
2) Steps 6.3[28] and 6.3[29] are performed concurrently by breaker number.
3) Igniter Component ID numbers are typical of the following example: (#3 is 2-HTR-268-0003 and #68 is 2-HTR-268-0068).

[28] **WHEN** the hydrogen igniters have warmed up 5 minutes to allow the current to the igniters to stabilize, **THEN**

MEASURE and **RECORD** each of the following hydrogen igniter heater temperatures (in any order by breaker number) using an optical infrared thermometer or a contact thermometer: (See Figures 1 thru 5 for igniter locations)

HYDROGEN IGNITER HEATER	TEMPERATURE	HYDROGEN IGNITER HEATER	TEMPERATURE	BREAKER NUMBER
#3	°F	#48	°F	BKR #1
#4	°F	#37	°F	BKR #2
#9	°F	#10	°F	BKR #3
#11	°F	#12	°F	BKR #4
#17	°F	#18	°F	BKR #5
#19	°F	#20	°F	BKR #6
#38	°F	#39	°F	BKR #7
#43	°F	#44	°F	BKR #8
#41	°F	#59	°F	BKR #9
#45	°F	#46	°F	BKR #10
#40	°F	#47	°F	BKR #11
#51	°F	#52	°F	BKR #12
#56	°F	#57	°F	BKR #13
#58	°F	#60	°F	BKR #14
#61	°F	#62	°F	BKR #15
#63	°F	#64	°F	BKR #16
#67	°F	#68	°F	BKR #17

M&TE _____ Cal Due Date _____

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

NOTES

1) The following step is performed concurrently with Step 6.3[28] in a manner to obtain measurements as close as possible to the time when igniter temperatures are measured by indicated breaker number.
2) Power Factor of 1.0 is assumed for calculation.

[29] **CALCULATE** total load wattage for each Panel 2-DPL-268-2-B Breaker as follows: (**Acc Crit**)

VOLTMETER M&TE _____ Cal Due Date _____

AMMETER M&TE _____ Cal Due Date _____

[29.1] **RECORD** Volts and Amps measurements for 2-BKR-268-2/1-B, (Breaker 1).

_____ VOLTS _____ AMPS

_____

[29.2] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/1-B, (Breaker 1).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.3] **RECORD** Volts and Amps measurements for 2-BKR-268-2/2-B, (Breaker 2).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.4] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/2-B, (Breaker 2).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.5] **RECORD** Volts and Amps measurements for 2-BKR-268-2/3-B, (Breaker 3).

_____ VOLTS _____ AMPS

_____

[29.6] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/3-B, (Breaker 3).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.7] **RECORD** Volts and Amps measurements for 2-BKR-268-2/4-B, (Breaker 4).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.8] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/4-B, (Breaker 4).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.9] **RECORD** Volts and Amps measurements for 2-BKR-268-2/5-B, (Breaker 5).

_____ VOLTS _____ AMPS

_____

[29.10] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/5-B, (Breaker 5).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.11] **RECORD** Volts and Amps measurements for 2-BKR-268-2/6-B, (Breaker 6).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.12] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/6-B, (Breaker 6).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.13] **RECORD** Volts and Amps measurements for 2-BKR-268-2/7-B, (Breaker 7).

_____ VOLTS _____ AMPS

_____

[29.14] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/7-B, (Breaker 7).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.15] **RECORD** Volts and Amps measurements for 2-BKR-268-2/8-B, (Breaker 8).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.16] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/8-B, (Breaker 8).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.17] **RECORD** Volts and Amps measurements for 2-BKR-268-2/9-B, (Breaker 9).

_____ VOLTS _____ AMPS

_____

[29.18] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/9-B, (Breaker 9).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.19] **RECORD** Volts and Amps measurements for 2-BKR-268-2/10-B, (Breaker 10).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.20] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/10-B, (Breaker 10).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.21] **RECORD** Volts and Amps measurements for 2-BKR-268-2/11-B, (Breaker 11).

_____ VOLTS _____ AMPS

_____

[29.22] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/11-B, (Breaker 11).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.23] **RECORD** Volts and Amps measurements for 2-BKR-268-2/12-B, (Breaker 12).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.24] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/12-B, (Breaker 12).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.25] **RECORD** Volts and Amps measurements for 2-BKR-268-2/13-B, (Breaker 13).

_____ VOLTS _____ AMPS

_____

[29.26] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/13-B, (Breaker 13).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.27] **RECORD** Volts and Amps measurements for 2-BKR-268-2/14-B, (Breaker 14).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.28] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/14-B, (Breaker 14).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.29] **RECORD** Volts and Amps measurements for 2-BKR-268-2/15-B, (Breaker 15).

_____ VOLTS _____ AMPS

_____

[29.30] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/15-B, (Breaker 15).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.31] **RECORD** Volts and Amps measurements for 2-BKR-268-2/16-B, (Breaker 16).

_____ VOLTS _____ AMPS

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[29.32] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/16-B, (Breaker 16).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

[29.33] **RECORD** Volts and Amps measurements for 2-BKR-268-2/17-B, (Breaker 17).

_____ VOLTS _____ AMPS

_____

[29.34] **MULTIPLY** Volts and Amps measurements recorded in previous step, **AND**

RECORD total load wattage for 2-BKR-268-2/17-B, (Breaker 17).

_____ Watts

Calculations Performed by: _____

Calculations Verified by: _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

NOTE

Each igniter is verified to be OFF by observing a current less than 3.7 amperes across the igniter circuit.

[30] **OPEN** 2-BKR-268-2/1-B (Breaker 1). _____

_____
CV

A. **VERIFY** Igniter #3 is observed to be OFF. _____

B. **VERIFY** Igniter #48 is observed to be OFF. _____

[31] **CLOSE** 2-BKR-268-2/1-B (Breaker 1). _____

_____
CV

[32] **OPEN** 2-BKR-268-2/2-B (Breaker 2).

A. **VERIFY** Igniter #4 is observed to be OFF. _____

B. **VERIFY** Igniter #37 is observed to be OFF. _____

[33] **CLOSE** 2-BKR-268-2/2-B (Breaker 2). _____

_____
CV

[34] **OPEN** 2-BKR-268-2/3-B (Breaker 3). _____

_____
CV

A. **VERIFY** Igniter #9 is observed to be OFF. _____

B. **VERIFY** Igniter #10 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[35] **CLOSE** 2-BKR-268-2/3-B (Breaker 3). _____

_____
CV

[36] **OPEN** 2-BKR-268-2/4-B (Breaker 4). _____

_____
CV

A. **VERIFY** Igniter #11 is observed to be OFF. _____

B. **VERIFY** Igniter #12 is observed to be OFF. _____

[37] **CLOSE** 2-BKR-268-2/4-B (Breaker 4). _____

_____
CV

[38] **OPEN** 2-BKR-268-2/5-B (Breaker 5). _____

_____
CV

A. **VERIFY** Igniter #17 is observed to be OFF. _____

B. **VERIFY** Igniter #18 is observed to be OFF. _____

[39] **CLOSE** 2-BKR-268-2/5-B (Breaker 5). _____

_____
CV

[40] **OPEN** 2-BKR-268-2/6-B (Breaker 6). _____

_____
CV

A. **VERIFY** Igniter #19 is observed to be OFF. _____

B. **VERIFY** Igniter #20 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[41] **CLOSE** 2-BKR-268-2/6-B (Breaker 6). _____

_____
CV

[42] **OPEN** 2-BKR-268-2/7-B (Breaker 7). _____

_____
CV

A. **VERIFY** Igniter #38 is observed to be OFF. _____

B. **VERIFY** Igniter #39 is observed to be OFF. _____

[43] **CLOSE** 2-BKR-268-2/7-B (Breaker 7). _____

_____
CV

[44] **OPEN** 2-BKR-268-2/8-B (Breaker 8). _____

_____
CV

A. **VERIFY** Igniter #43 is observed to be OFF. _____

B. **VERIFY** Igniter #44 is observed to be OFF. _____

[45] **CLOSE** 2-BKR-268-2/8-B (Breaker 8). _____

_____
CV

[46] **OPEN** 2-BKR-268-2/9-B (Breaker 9). _____

_____
CV

A. **VERIFY** Igniter #41 is observed to be OFF. _____

B. **VERIFY** Igniter #59 is observed to be OFF. _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[47] **CLOSE** 2-BKR-268-2/9-B (Breaker 9). _____

_____
CV

[48] **OPEN** 2-BKR-268-2/10-B (Breaker 10).

A. **VERIFY** Igniter #45 is observed to be OFF. _____

B. **VERIFY** Igniter #46 is observed to be OFF. _____

[49] **CLOSE** 2-BKR-268-2/10-B (Breaker 10). _____

_____
CV

[50] **OPEN** 2-BKR-268-2/11-B (Breaker 11). _____

_____
CV

A. **VERIFY** Igniter #40 is observed to be OFF. _____

B. **VERIFY** Igniter #47 is observed to be OFF. _____

[51] **CLOSE** 2-BKR-268-2/11-B (Breaker 11). _____

_____
CV

[52] **OPEN** 2-BKR-268-2/12-B (Breaker 12). _____

_____
CV

A. **VERIFY** Igniter #51 is observed to be OFF. _____

B. **VERIFY** Igniter #52 is observed to be OFF. _____

[53] **CLOSE** 2-BKR-268-2/12-B (Breaker 12). _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[54] **OPEN** 2-BKR-268-2/13-B (Breaker 13). _____

_____
CV

A. **VERIFY** Igniter #56 is observed to be OFF. _____

B. **VERIFY** Igniter #57 is observed to be OFF. _____

[55] **CLOSE** 2-BKR-268-2/13-B (Breaker 13). _____

_____
CV

[56] **OPEN** 2-BKR-268-2/14-B (Breaker 14). _____

_____
CV

A. **VERIFY** Igniter #58 is observed to be OFF. _____

B. **VERIFY** Igniter #60 is observed to be OFF. _____

[57] **CLOSE** 2-BKR-268-2/14-B (Breaker 14). _____

_____
CV

[58] **OPEN** 2-BKR-268-2/15-B (Breaker 15). _____

_____
CV

A. **VERIFY** Igniter #61 is observed to be OFF. _____

B. **VERIFY** Igniter #62 is observed to be OFF. _____

[59] **CLOSE** 2-BKR-268-2/15-B (Breaker 15). _____

_____
CV

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[60] **OPEN** 2-BKR-268-2/16-B (Breaker 16). _____

_____
CV

A. **VERIFY** Igniter #63 is observed to be OFF. _____

B. **VERIFY** Igniter #64 is observed to be OFF. _____

[61] **CLOSE** 2-BKR-268-2/16-B (Breaker 16). _____

_____
CV

[62] **OPEN** 2-BKR-268-2/17-B (Breaker 17). _____

_____
CV

A. **VERIFY** Igniter #67 is observed to be OFF. _____

B. **VERIFY** Igniter #68 is observed to be OFF. _____

[63] **CLOSE** 2-BKR-268-2/17-B (Breaker 17). _____

_____
CV

NOTE

Breaker 18, 2-BKR-268-2/18-B, is a spare breaker.

[64] **VERIFY** each igniter temperature recorded in Step 6.3[28] is 1741.2°F or greater. (**Acc Crit**) _____

[65] **VERIFY** wattages recorded in Step 6.3[29] do not individually exceed 1335.3 watts. (**Acc Crit**) _____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[66] **RECORD** Phase-to-Phase bus voltage measurements at Panel 2-DPL-268-2-B, **AND**

VERIFY voltage is between 230.36 V_{AC} and 233.82 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-B _____ V_{AC}

(230.36-233.82 V_{AC})

_____

B.

M&TE _____ Cal Due Date _____

B-C _____ V_{AC}

(230.36-233.82 V_{AC})

_____

C.

M&TE _____ Cal Due Date _____

C-A _____ V_{AC}

(230.36-233.82 V_{AC})

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[67] **IF** any voltage measurement in 6.3[66] is NOT 230.26 to 233.82 V_{AC}, **THEN**

ADJUST potentiometer R13 in 2-DXF-268-268-2-B on control board A1A for Phase A, A1B for Phase B, and A1C for Phase C so that each phase is 230.26 to 233.82 V_{AC}, **AND**

RECORD as-left voltages for each phase below:

A. Phase A to Phase B:

_____ V_{AC}

B. Phase B to Phase C:

_____ V_{AC}

C. Phase C to Phase A:

_____ V_{AC}

_____

Data Package: Page ____ of ____ **Date _____**

6.3 Hydrogen Igniter Functional Tests - Train B (continued)

[68] **RECORD** Phase-to-Neutral bus voltage measurements at Panel 2-DPL-268-2-B, **AND**

VERIFY voltage is between 132 and 135 V_{AC}.

A.

M&TE _____ Cal Due Date _____

A-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

B.

M&TE _____ Cal Due Date _____

B-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

C.

M&TE _____ Cal Due Date _____

C-NEUTRAL _____ V_{AC} (132 - 135 V_{AC}) _____

[69] **PLACE** Handswitch 2-HS-268-74, H2 IGNITERS GROUP B, in the OFF position. _____

Data Package: Page ____ of ____ **Date _____**

7.0 POST PERFORMANCE ACTIVITIES

[1] **NOTIFY** the Shift Manager (SM) of the test completion and System alignment. _____

[2] **VERIFY** that Post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed and the results RECORDED on Measuring and Test Equipment (M&TE) Log. _____

_____
CV

8.0 RECORDS

A. QA Records

Completed Test Package

B. Non QA Records

None

Appendix A
(Page 1 of 1)

TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW

Data Package: Page ____ of ____ **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	INITIAL AND DATE. (N/A for no change)
WBN2-83-4001		
FSAR Section 6.2.5A Table 14.2-1 Sht 40 of 89		
2-TSD-268-01		
WBN-VTM-N431-0090		
WBN-VTM-P319-0010		

Appendix B
(Page 1 of 1)

TEMPORARY CONDITION LOG

Data Package: Page ____ of ____ **Date ________**

NOTE
These steps will be N/A'd if no temporary condition existed. Additional copies of this table may be made as necessary.

ITEM NUMBER	TEMPORARY CONDITION DESCRIPTION	PERFORMED		RETURNED TO NORMAL	
		Step Number	Perf. By/Date CV By/Date	Step Number	Returned By/Date CV By/Date

Table 1
(Page 1 of 2)

TEMPERATURE CONVERSION CHART

Data Package: Page ____ of ____ **Date _____**

NOTE

The relation between degrees Fahrenheit and degrees Centigrade (Celsius) is expressed by the following formula:°C = 5/9 (°F - 32) or °F = 9/5 (°C) + 32

DEGREES (°C)	DEGREES (°F)	DEGREES (°C)	DEGREES (°F)	DEGREES (°C)	DEGREES (°F)
862 °C = 1583.6 °F		887 °C = 1628.6 °F		912 °C = 1673.6 °F	
863 °C = 1585.4 °F		888 °C = 1630.4 °F		913 °C = 1675.4 °F	
864 °C = 1587.2 °F		889 °C = 1632.2 °F		914 °C = 1677.2 °F	
865 °C = 1589.0 °F		890 °C = 1634.0 °F		915 °C = 1679.0 °F	
866 °C = 1590.8 °F		891 °C = 1635.8 °F		916 °C = 1680.8 °F	
867 °C = 1592.6 °F		892 °C = 1637.6 °F		917 °C = 1682.6 °F	
868 °C = 1594.4 °F		893 °C = 1639.4 °F		918 °C = 1684.4 °F	
869 °C = 1596.2 °F		894 °C = 1641.2 °F		919 °C = 1686.2 °F	
870 °C = 1598.0 °F		895 °C = 1643.0 °F		920 °C = 1688.0 °F	
871 °C = 1599.8 °F		896 °C = 1644.8 °F		921 °C = 1689.8 °F	
872 °C = 1601.6 °F		897 °C = 1646.6 °F		922 °C = 1691.6 °F	
873 °C = 1603.4 °F		898 °C = 1648.4 °F		923 °C = 1693.4 °F	
874 °C = 1605.2 °F		899 °C = 1650.2 °F		924 °C = 1695.2 °F	
875 °C = 1607.0 °F		900 °C = 1652.0 °F		925 °C = 1697.0 °F	
876 °C = 1608.8 °F		901 °C = 1653.8 °F		926 °C = 1698.8 °F	
877 °C = 1610.6 °F		902 °C = 1655.6 °F		927 °C = 1700.6 °F	
878 °C = 1612.4 °F		903 °C = 1657.4 °F		928 °C = 1702.4 °F	
879 °C = 1614.2 °F		904 °C = 1659.2 °F		929 °C = 1704.2 °F	
880 °C = 1616.0 °F		905 °C = 1661.0 °F		930 °C = 1706.0 °F	
881 °C = 1617.8 °F		906 °C = 1662.8 °F		931 °C = 1707.8 °F	
882 °C = 1619.6 °F		907 °C = 1664.6 °F		932 °C = 1709.6 °F	
883 °C = 1621.4 °F		908 °C = 1666.4 °F		933 °C = 1711.4 °F	
884 °C = 1623.2 °F		909 °C = 1668.2 °F		934 °C = 1713.2 °F	
885 °C = 1625.0 °F		910 °C = 1670.0 °F		935 °C = 1715.0 °F	
886 °C = 1626.8 °F		911 °C = 1671.8 °F		936 °C = 1716.8 °F	

Table 1
(Page 2 of 2)

TEMPERATURE CONVERSION CHART

Data Package: Page ____ of ____ **Date _____**

NOTE

The relation between degrees Fahrenheit and degrees Centigrade (Celsius) is expressed by the following formula:°C = 5/9 (°F - 32) or °F = 9/5 (°C) + 32

DEGREES (°C)	DEGREES (°F)	DEGREES (°C)	DEGREES (°F)	DEGREES (°C)	DEGREES (°F)
937 °C = 1718.6 °F		962 °C = 1763.6 °F		987 °C = 1808.6 °F	
938 °C = 1720.4 °F		963 °C = 1765.4 °F		988 °C = 1810.4 °F	
939 °C = 1722.2 °F		964 °C = 1767.2 °F		989 °C = 1812.2 °F	
940 °C = 1724.0 °F		965 °C = 1769.0 °F		990 °C = 1814.0 °F	
941 °C = 1725.8 °F		966 °C = 1770.8 °F		991 °C = 1815.8 °F	
942 °C = 1727.6 °F		967 °C = 1772.6 °F		992 °C = 1817.6 °F	
943 °C = 1729.4 °F		968 °C = 1774.4 °F		993 °C = 1819.4 °F	
944 °C = 1731.2 °F		969 °C = 1776.2 °F		994 °C = 1821.2 °F	
945 °C = 1733.0 °F		970 °C = 1778.0 °F		995 °C = 1823.0 °F	
946 °C = 1734.8 °F		971 °C = 1779.8 °F		996 °C = 1824.8 °F	
947 °C = 1736.6 °F		972 °C = 1781.6 °F		997 °C = 1826.6 °F	
948 °C = 1738.4 °F		973 °C = 1783.4 °F		998 °C = 1828.4 °F	
949 °C = 1740.2 °F		974 °C = 1785.2 °F		999 °C = 1830.2 °F	
950 °C = 1742.0 °F		975 °C = 1787.0 °F		1000 °C = 1832.0 °F	
951 °C = 1743.8 °F		976 °C = 1788.8 °F		1001 °C = 1833.8 °F	
952 °C = 1745.6 °F		977 °C = 1790.6 °F		1002 °C = 1835.6 °F	
953 °C = 1747.4 °F		978 °C = 1792.4 °F		1003 °C = 1837.4 °F	
954 °C = 1749.2 °F		979 °C = 1794.2 °F		1004 °C = 1839.2 °F	
955 °C = 1751.0 °F		980 °C = 1796.0 °F		1005 °C = 1841.0 °F	
956 °C = 1752.8 °F		981 °C = 1797.8 °F		1006 °C = 1842.8 °F	
957 °C = 1754.6 °F		982 °C = 1799.6 °F		1007 °C = 1844.6 °F	
958 °C = 1756.4 °F		983 °C = 1801.4 °F		1008 °C = 1846.4 °F	
959 °C = 1758.2 °F		984 °C = 1803.2 °F		1009 °C = 1848.2 °F	
960 °C = 1760.0 °F		985 °C = 1805.0 °F		1010 °C = 1850.0 °F	
961 °C = 1761.8 °F		986 °C = 1806.8 °F		1011 °C = 1851.8 °F	