



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

May 24, 2011

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-065-02	0	Emergency Gas Treatment System Pressure Test

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

Respectfully,

David Stinson
Watts Bar Unit 2 Vice President

Enclosure
cc (Enclosure):

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Spring City, Tennessee 37381

DD3D
NRK

**WATTS BAR NUCLEAR PLANT
UNIT 2 PREOPERATIONAL TEST**

TITLE: EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST

Instruction No: 2-PTI-065-02

Revision No: 0

PREPARED BY: Bethany B Merriman

PRINT NAME / SIGNATURE

DATE: 3-11-11

REVIEWED BY: Sam Linginfelter

PRINT NAME / SIGNATURE

DATE: 3-11-11

INSTRUCTION APPROVAL

JTG MEETING No: 2-11-009

JTG CHAIRMAN: [Signature]

DATE: 3/15/11

APPROVED BY: [Signature]

DATE: 5/19/11

PREOPERATIONAL STARTUP MANAGER

TEST RESULTS APPROVAL

JTG MEETING No: _____

JTG CHAIRMAN: _____

DATE: _____

APPROVED BY: _____

DATE: _____

PREOPERATIONAL STARTUP MANAGER

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 2 of 59
-----------------------	---	--

Revision Log

Revision or Change Number	Effective Date	Affected Page Numbers	Description of Revision/Change
0000	5/19/11	ALL	This procedure was written using the Unit 1 test procedure PTI-065-02 Rev 1 as a guide.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 3 of 59
-----------------------	---	--

Table of Contents

1.0	INTRODUCTION	5
1.1	Test Objectives	5
1.2	Scope.....	5
2.0	REFERENCES	6
2.1	Performance References	6
2.2	Developmental References.....	6
3.0	PRECAUTIONS AND NOTES.....	10
4.0	PREREQUISITE ACTIONS	12
4.1	Preliminary Actions	12
4.2	Special Tools, Measuring and Test Equipment, Parts, and Supplies.....	14
4.3	Field Preparations.....	15
4.4	Approvals and Notifications	18
5.0	ACCEPTANCE CRITERIA	19
6.0	PERFORMANCE.....	21
6.1	Containment Annulus Vacuum Control Subsystem	22
6.2	EGTS Air Cleanup Unit Subsystem	28
6.3	EGTS Time Response	40
7.0	POST PERFORMANCE ACTIVITIES	49
8.0	RECORDS.....	50
Appendix A:	TEST PROCEDURES/INSTRUCTIONS REFERENCE REVIEW	51
Appendix B:	TEMPORARY CONDITION LOG	52
Appendix C:	PERMANENT PLANT INSTRUMENTATION LOG.....	53
Appendix D:	SWITCH LINEUP	54
Appendix E:	ELECTRICAL LINEUP.....	56

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 4 of 59
-----------------------	---	--

Table of Contents (continued)

Appendix F: SIMULTANEOUS INITIATION DEVICE 57

Data Sheet 1: EGTS Total Flow Measurement 58

Data Sheet 2: EGTS Annulus Inleakage Flow Measurement 59

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 5 of 59
-----------------------	---	--

Data Package: Page ____ of ____

Date _____

1.0 INTRODUCTION

1.1 Test Objectives

Demonstrate the Emergency Gas Treatment System (EGTS) is capable of providing pressure control and cleanup of the atmosphere in the Unit 2 Containment Annulus.

1.2 Scope

NOTE

All manual and automatic controls and indications were tested in 2-PTI-065-01.

- A. Demonstrate proper operation of the Containment Annulus Vacuum Control Subsystem.

Annulus Vacuum Fans and pressure control dampers work to maintain a specified negative pressure in the annulus during normal operating conditions.

- B. Demonstrate proper operation of the EGTS Air Cleanup Unit Subsystem.

EGTS fans and pressure control dampers work to maintain a specified negative pressure, total flow, and inleakage, during post-LOCA (Loss of Coolant Accident) conditions.

EGTS fans work to achieve a specified minimum flow within a certain time period post-LOCA.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 6 of 59
-----------------------	---	--

Data Package: Page ____ of ____

Date _____

2.0 REFERENCES

2.1 Performance References

- A. SMP-9.0, Conduct of Test
- B. 2-SOI-30.02, Containment Purge System
- C. 2-SOI-30.03, Containment HVAC and Pressure Control
- D. SOI-30.05, Auxiliary Bldg HVAC Systems
- E. SOI-90.05, Post-Accident Rad Monitors
- F. GTM-05, HVAC Air Balance

2.2 Developmental References

- A. Final Safety Analysis Report, Amendment 103
 - 1. Section 6.2.3, Secondary Containment Functional Design
 - 2. Table 6.2.3.2, Failure Modes and Effects Analysis Emergency Gas Treatment System
 - 3. Table 14.2-1, Sheets 41/42, Secondary Containment Ventilation System Test Summary
- B. Drawings
 - 1. Flow Diagrams
 - a. 2-47W866-1, Rev 2, Heating and Ventilation Air Flow
DRAs 53232-040, -041, -042, Rev 0
DRA 53809-053, Rev 0
 - b. 1-47W866-2, Rev 27, Heating, Cooling, & Ventilating Air Flow
 - c. 1-47W866-10, Rev 33, Heating & Ventilating Air Flow
 - d. 1-47W866-11, Rev 27, Heating, Cooling, & Ventilating Air Flow

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 7 of 59
-----------------------	---	--

Data Package: Page ____ of ____

Date _____

2.2 Developmental References (continued)

2. Electrical Diagrams

- a. 1-45W760-65-1, Rev 12, Emergency Gas Treatment System Schematic Diagram
- b. 2-45W760-65-2, Rev 1, Emergency Gas Treatment System Schematic Diagrams
DRAs 53290-55, -71, Rev 1
- c. 2-45W600-65-1, Rev 0, Emergency Gas Treatment System Schematic Diagram
DRA 53534-64, Rev 0
DRA 52453-124, Rev 0
- d. 2-45W600-65-2, Rev 0, Emergency Gas Treatment System Schematic Diagram
DCAs 52641-02-61, -62, Rev 0
DCAs 52641-03-57, -58, Rev 0
- e. 2-45W600-65-3, Rev 0, Emergency Gas Treatment System Schematic Diagram
DRA 53534-65, Rev 0
- f. 2-45W600-57-5, Rev 1, Separation & Misc Aux Relays Schematic Diagrams
DCA 52641-02-63, Rev 0
DCA 52641-03-59, Rev 0
- g. 2-45W600-57-22, Rev 1, Separation & Misc Aux Relays Schematic Diagrams
DRA 52378-75, Rev 0
- h. 2-45W600-30-9, Rev 0, Ventilating System Schematic Diagrams
- i. 2-45W600-30-11, Rev 0, Ventilating System Schematic Diagrams
- j. 2-45W756-9, Rev 0, 480V Cont & Aux Bldg Vt Bd 2A1-A Single Line
DRA 53534-60, Rev 0
DRA 53290-99, Rev 0
- k. 2-45W756-10, Rev 0, 480V Cont & Aux Bldg Vt Bd 2B1-B Single Line
DRA 53534-61, Rev 0
DRA 53290-106, Rev 0

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 8 of 59
-----------------------	---	--

Data Package: Page ____ of ____

Date _____

2.2 Developmental References (continued)

- l. 45N2676-5, Rev 10, Solid State Protection Sys Train A Connection Diagram
 - m. 45N2677-5, Rev 9, Solid State Protection Sys Train B Connection Diagram
 - n. 2-47B601-55-1, Electrical Instrument Tabulation, [Later]
DRA 52453-04, Rev 0
 - o. 2-47B601-55-2, Electrical Instrument Tabulation, [Later]
DRA 52453-05, Rev 0
- 3. Mechanical Drawings
 - a. 47W920-24, Rev 42, Heating, Ventilating, and Air Conditioning
- 4. Logic/Control Diagrams
 - a. 2-47W610-65-1, Rev 3, Control Diagram Emergency Gas Treatment System
DRAs 53534-44, -45, -46, -47, -67, Rev 0
DRA 52378-473, Rev 0
DRA 53232-2, Rev 0
DRA 53809-101, Rev 0
 - b. 2-47W610-65-1A, Rev 0, Control Diagram Emerg Gas Treatment System
DCAs 52641-02-1, -2, Rev 0
DCAs 52641-03-14, -15, Rev 0
DRAs 53232-3, -4, Rev 0
DRA 53809-13, Rev 1
DRAs 53809-14, -102, Rev 0
 - c. 2-47W610-30-1, Rev 1, Control Diagram Ventilation System
DRA 52378-450, Rev 0
 - d. 2-47W611-65-1, Rev 2, Logic Diagram Emergency Gas Treatment System
DRAs 52378-605, -635, Rev 0
 - e. 2-47W611-65-2, Rev 1, Logic Diagram Emergency Gas Treatment System

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 9 of 59
-----------------------	---	--

Data Package: Page ____ of ____

Date _____

2.2 Developmental References (continued)

- f. 2-47W611-65-3, Rev 0, Logic Diagram Emergency Gas Treatment System
DCA 52641-02-3, Rev 0
DCA 52641-03-16, Rev 0
- g. 2-47W611-30-1, Rev 1, Logic Diagram Ventilation System

C. Documents

- 1. WBN2-65-4001, Rev 2, System Description for Emergency Gas Treatment System
- 2. 2-TSD-65-2, Rev 0, Emergency Gas Treatment System
- 3. 2-PTI-065-01, Rev 0, Emergency Gas Treatment System Logic Test
- 4. G-37, Rev 4, General Engineering Specification for Testing and Balancing of HVAC Systems During Installation, Modification, and Maintenance
- 5. Unit 1 Technical Specifications, Surveillance Requirement 3.6.15.1

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 10 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

3.0 PRECAUTIONS AND NOTES

- A. Standard precautions shall be followed for working around energized electrical equipment in accordance with TVA Safety Manual Procedure 1021.
- B. Steps may be repeated if all components cannot be tested in a step. However, if the test has been exited, prerequisite steps must be re-verified and a Chronological Test Log (CTL) entry made.
- C. Discrepancies between component ID tags and the description in a procedure/instruction if the UNIDs match, exclusive of place keeping zeros and train designators (e.g.; 2-HS-31-468 vs. 2-HS-031-0468) and the noun description is sufficient to identify the component. This condition does not require a TDN in accordance with SMP-14.0. If the component label needs to be changed, a Tag Request Form (TR Card) should be processed in accordance with TI-12.14. Make an entry in the CTL and continue testing.
- D. All wires removed/lifted from a terminal shall be identified and taped or covered with an insulator to prevent personnel or equipment hazard and possible spurious initiations. The wires should be grouped together and labeled with the work implementing document number that required them to be lifted if left unattended.
- E. All open problems are to be tracked by a corrective action document and entered on the appropriate system punchlist.
- F. Problems identified during the test shall be annotated on the Chronological Test Log from SMP-9.0 including a description of the problem, the procedure step when/where the problem was identified, corrective action steps taken to resolve the problem, and the number of the corrective action document, if one was required.
- G. Observe all Radiation Protection requirements when working in or near radiological areas.
- H. Ensure there are no adverse effects to the operation of Unit 1 structures, systems, or components.
- I. Test personnel will coordinate with Unit 1 Operations when manipulating Unit 1 equipment if required.
- J. Unit 1/Unit 2 common duct is used for discharging to the atmosphere during operation of the Containment Annulus Vacuum Control Subsystem. U2 Annulus Vacuum Control Fan (AVF) operation may affect U1 annulus vacuum, refer to U1 Tech Spec SR 3.6.15.1.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 11 of 59
-----------------------------	---	---

Data Package: Page ____ of ____

Date _____

3.0 PRECAUTIONS AND NOTES (continued)

- K. During the performance of this procedure visual observation of duct and components is required. This includes steady state and transient operations (fan stops and starts). Confirm by sight, sound, and touch, that vibration is NOT excessive.
- L. If vibration is determined to be excessive the Startup Test Engineer (STE) shall initiate a Test Deficiency Notice (TDN).
- M. Vibration testing of this system is performed during GTM-05.
- N. Termination of lifted leads requires the restored bend radius to be equal to or greater than the as found condition.
- O. All terminal points and connections are to be considered energized. Instrumentation must be used to determine if the circuits are de-energized.
- P. Units of measure for differential pressure are recorded in this instruction as in WG (inches water gage). This is equivalent to in WC (inches water column) and in H₂O, which are typical units that may be found on instrumentation used for verification of acceptance criteria.
- Q. This procedure requires the performer to determine when system equilibrium occurs by observing various Main Control Room instrumentation. Equilibrium has been reached when the respective instrumentation indicates steady output (no cycling).

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 12 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.0 PREREQUISITE ACTIONS

NOTE

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

4.1 Preliminary Actions

- [1] **VERIFY** the test/performance copy of this Preoperational Test Instruction (PTI) is the current revision including any change notices and as needed, each test person assisting in this test has the current revision including any change notices. _____
- [2] **OBTAIN** copies of the applicable forms from the latest revision of SMP-9.0, **AND**

ATTACH to this PTI for use during the performance of this PTI. _____
- [3] **ENSURE** changes to the references listed on Appendix A, Test Procedures/Instructions Reference Review, have been reviewed, and determined NOT to adversely affect the test performance. _____
- [4] **VERIFY** current revisions and change papers for referenced drawings have been reviewed and determined NOT to adversely affect the test performance, **AND**

ATTACH documentation of current drawing revision numbers and change papers to data package. _____
- [5] **EVALUATE** open items in Watts Bar Integrated Task Equipment List (WITEL) **AND**

ENSURE they will NOT adversely affect the test performance. _____
- [6] **ENSURE** required Component Testing has been completed prior to start of test. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 13 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.1 Preliminary Actions (continued)

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

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

- [8] **ENSURE** a review of outstanding Clearances has been coordinated with U2 Operations for impact to the test performance, **AND**

IF items are found, **THEN**

RECORD in Appendix B, Temporary Condition Log. _____

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

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

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

- [12] **ENSURE** that communications are available in areas where testing is to be conducted. _____

- [13] **OBTAIN** a copy of the Special Instructions For EGTS Dedicated Operator During Performance Of EGTS Testing (or equivalent), to protect Unit 1 during the performance of this PTI, **AND**

ENSURE that a dedicated operator is available to support these instructions. _____

- [14] **REVIEW** preventative maintenance for systems/components covered by this test, **AND**

VERIFY no conditions exist that will impact test performance. _____

- [15] **VERIFY** 2-PTI-065-01 has been completed. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 14 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.1 Preliminary Actions (continued)

- [16] **VERIFY** GTM-05, HVAC Air Balance, has been completed,
AND

ATTACH a copy of the completed GTM-05 package to this
PTI. _____

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

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

COMPLETE the following table: _____

DESCRIPTION	MINIMUM RANGE	REQUIRED ACCURACY	M&TE ID NUMBER	CALIBRATION DUE DATE
Digital Stopwatch	0-60 min	60 minutes ± 0.1 sec		NA
Pocket Thermometer	30-120°F	± 2°F		
Barometer	27-31 in HG	± 0.4% of range		
Inclined Manometer	0-10 in WG	± 0.01 in WG for 0-1 in WG range, ± 0.1 in WG for ≥ 1 in WG range		NA
Hotwire Anemometer	30-2500 fpm	± 5% of reading		

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

- [3] **OBTAIN** the following items:

- A. Sense line connectors and manometer tubing
(Step 4.3[7]) _____
- B. Adjustable wrench, 1.5" minimum (Step 4.3[13]) _____
- C. Simultaneous Initiation Device (Refer to Appendix F)
(Subsection 6.3) _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 15 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.3 Field Preparations

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

- A. System 30, Ventilation _____
- B. System 32, Control Air System _____
- C. System 214, 480V Control and Auxiliary Building Vent Power System _____
- D. System 235, 120V AC Vital Power System _____
- E. System 236, 125V DC Vital Power System _____

[2] **VERIFY** the following U1 EGTS components are NOT RUNNING:

- A. 0-FAN-65-23, EMERGENCY GAS TREATMENT FAN A-A [757/A11V] _____
- B. 0-FAN-65-42, EMERGENCY GAS TREATMENT FAN B-B [757/A11V] _____

[3] **VERIFY** the following U1 EGTS components are available and have no scheduled maintenance or U1 Surveillance Instructions that could interfere with performance of this test:

- A. 0-FAN-65-23, EMERGENCY GAS TREATMENT FAN A-A _____
- B. 0-FAN-65-42, EMERGENCY GAS TREATMENT FAN B-B _____
- C. 0-LPP-65-21, EGTS TRAIN A FILTER BANK DP _____
- D. 0-LPP-65-40, EGTS TRAIN B FILTER BANK DP _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 16 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.3 Field Preparations (continued)

[4] **VERIFY** there are no Unit 2 ØA Containment Isolation Signals present by Window 1, ØA, NOT LIT on the following panels on 2-M-6:

A. TR-A MASTER ISOLATION SIGNAL STATUS PANEL
(2-XX-55-6C) _____

B. TR-B MASTER ISOLATION SIGNAL STATUS PANEL
(2-XX-55-6D) _____

[5] **VERIFY** there are no Unit 1 ØA Containment Isolation Signals present by Window 1, ØA, NOT LIT on the following panels on 1-M-6:

A. TR-A MASTER ISOLATION SIGNAL STATUS PANEL
(1-XX-55-6C) _____

B. TR-B MASTER ISOLATION SIGNAL STATUS PANEL
(1-XX-55-6D) _____

NOTE

When 2-RE-90-400, SHIELD BLDG VT MON SYS SAMPLE DETECTION SKID, radiation monitor is inoperable, Offsite Dose Calculation Manual (ODCM) compensatory actions for monitor inoperability will be required.

[6] **ENSURE** 2-RE-90-400, SHIELD BLDG VT MON SYS SAMPLE DETECTION SKID [729/A11], and its associated isokinetic sampler is IN SERVICE per SOI-90.05 (NA if 2-RE-90-400 is inoperable with compensatory actions in place). _____

[7] **INSTALL** the 10 inch manometer (obtained in Subsection 4.2) across the calibration tees of 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE [782/A5V], on 2-PNL-276-L44, **AND**

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

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WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 17 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.3 Field Preparations (continued)

- [8] **ENSURE** plant instruments required for test performance, listed on Appendix C, Permanent Plant Instrumentation Log, have been (as required) filled, vented, and placed in service, and are within their calibration interval, **AND**

RECORD data on Appendix C:

A. SubSection 6.1 _____

B. SubSection 6.2 _____

C. SubSection 6.3 _____

- [9] **PERFORM** Switch Lineup, Appendix D. _____

- [10] **PERFORM** Electrical Lineup, Appendix E. _____

- [11] **ENSURE** the containment annulus pressure boundary is established to the extent necessary to support testing (penetrations sealed and sealant cured, blast doors closed, etc.). _____

- [12] **ENSURE** the annulus drain loop seal in the Unit 2 EL 692 penetration room has been filled. _____

NOTE

Radiation Protection must be notified before performance of the following step.

- [13] **REMOVE** duct access door, located between 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV [757/A12V], and the Annulus Vacuum Fans (47W920-24), from EGTS ductwork. _____

1st

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- [14] **ENSURE** Containment Purge and Instrument Room Purge are SHUT DOWN in accordance with 2-SOI-30.02. _____

- [15] **ENSURE** Containment Vent Air Cleanup Units are SHUT DOWN in accordance with 2-SOI-30.03. _____

- [16] **ENSURE** Auxiliary Building General Ventilation is RUNNING in accordance with SOI-30.05. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 18 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

4.3 Field Preparations (continued)

- [17] **ENSURE** NO Hydrocarbon Permits which may affect EGTS will be in effect OR issued during performance of this test. _____

4.4 Approvals and Notifications

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

Preoperational Startup Manager
Signature

Date

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

U2 US/SRO/SM Signature

Date

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

U1 US/SRO/SM Signature

Date

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 19 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

5.0 ACCEPTANCE CRITERIA

NOTES

- 1) All differential pressure values in this instruction are negative, i.e., the annulus is at a lower pressure than the location it is being compared with.
 - For example:
 $X \geq 5.1$ in WG \rightarrow X shall be MORE NEGATIVE or equal to -5.1 in WG
- 2) Instrument inaccuracies for the EGTS Air Cleanup Units' flow measurements are included within the below stated tolerance, per G-37.

[1] Containment Annulus Vacuum Control Subsystem

- A. Each Containment Annulus Vacuum Control Fan (AVF) can maintain the annulus at a differential pressure ≥ 5.1 in WG (5.0 in WG + 0.1 in WG for M&TE inaccuracy) without a Fuel Handling Exhaust (FHE) fan running.
 - 2-FAN-65-77, step 6.1[7]
 - 2-FAN-65-74, step 6.1[11]
- B. Each AVF can maintain the annulus at a differential pressure ≥ 5.1 in WG (5.0 in WG + 0.1 in WG for M&TE inaccuracy) with an FHE fan running.
 - 2-FAN-65-77, step 6.1[5]
 - 2-FAN-65-74, step 6.1[18]
- C. Each pressure control damper modulates to maintain the annulus at a differential pressure ≥ 5.1 in WG (5.0 in WG + 0.1 in WG for M&TE inaccuracy).
 - 2-PCO-65-1, step 6.1[11]
 - 2-PCO-65-2, step 6.1[14]

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 20 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

[2] EGTS Air Cleanup Unit Subsystem

A. Each EGTS fan can maintain the annulus at a differential pressure ≥ 0.62 in WG (0.61 in WG + 0.01 in WG for M&TE inaccuracy) at elevation 783 with respect to the atmosphere, with a total flow of 3600 CFM to 4400 CFM (4000 CFM $\pm 10\%$), with all four Containment Purge Exhaust valves OPEN.

- 0-FAN-65-23, steps 6.2[10], 6.2[11]
- 0-FAN-65-42, steps 6.2[19], 6.2[20]

B. Each EGTS fan can maintain the annulus at a differential pressure ≥ 0.62 in WG (0.61 in WG + 0.01 in WG for M&TE inaccuracy) at elevation 783 with respect to the atmosphere, with an annulus inleakage of ≤ 237.5 CFM (250 CFM - 12.5 CFM for M&TE inaccuracy), with all four Containment Purge Exhaust valves OPEN.

- 0-FAN-65-23, steps 6.2[10], 6.2[12]
- 0-FAN-65-42, steps 6.2[19], 6.2[21]

C. Each pressure control damper modulates to maintain the annulus at a differential pressure ≥ 0.62 in WG (0.61 in WG + 0.01 in WG for M&TE inaccuracy) at elevation 783 with respect to the atmosphere.

- 2-PCO-65-80, step 6.2[10]
- 2-PCO-65-88, step 6.2[10]
- 2-PCO-65-82, step 6.2[19]
- 2-PCO-65-89, step 6.2[19]

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 21 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

5.0 ACCEPTANCE CRITERIA (continued)

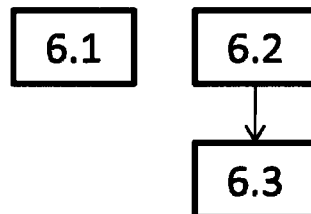
D. Each EGTS fan starts and achieves a flow of 3600 CFM to 4400 CFM within 18 seconds (20 seconds - 2 seconds for initiating signal) of receiving a simulated Unit 2 Phase A Containment Isolation Signal (ØA CIS).

- 0-FAN-65-23, step 6.3[7]B
- 0-FAN-65-42, step 6.3[15]B

6.0 PERFORMANCE

NOTES

- 1) Subsections of this test shall be performed in the order shown in the flow diagram below. Subsection 6.1 may be performed at any time. Subsection 6.3 can only be performed after completion of Subsection 6.2. Steps within subsections shall be performed in the order written, unless otherwise noted.



- 2) Valve, damper, and fan status shall be determined by local observation throughout Section 6.0, unless otherwise stated.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 22 of 59
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Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem

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

NOTES

- 1) The following handswitches spring return to A AUTO from the OPEN position:
 - 2-HS-65-5, U2 ANN VAC FAN SUCT
 - 2-HS-65-4, U2 ANN VAC FAN SUCT
- 2) The following handswitches spring return to AUTO from the OPEN and CLOSE positions:
 - 2-HS-65-95, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR
 - 2-HS-65-96, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR
- 3) The following handswitches spring return to A-P AUTO from the START and STOP positions:
 - 2-HS-65-77A, ANN VAC FAN 2A & SUCT FCO
 - 2-HS-65-74A, ANN VAC FAN 2B & SUCT FCO

- [2] **ENSURE** the following valves/dampers are OPEN, as indicated by the status lights on their respective handswitches:

- A. 2-FCV-65-5, CNTMT ANN VAC FANS SUCT [757/A12V], as indicated at 2-HS-65-5, U2 ANN VAC FAN SUCT [0-M-27B]

- Green Light OFF _____
- Red Light ON _____

- B. 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV [757/A12V], as indicated at 2-HS-65-4, U2 ANN VAC FAN SUCT [0-M-27B]

- Green Light OFF _____
- Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 23 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem (continued)

C. 2-PCO-65-95, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR [757/A12V], as indicated at 2-HS-65-95, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR [0-JB-292-1165, 757/A12V]

- Green Light OFF _____
- Red Light ON _____

[3] **ENSURE** Damper 2-PCO-65-96, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR [757/A12V], is CLOSED, as indicated by the status lights on 2-HS-65-96, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR [0-JB-292-1165, 757/A12V]:

- Green Light ON _____
- Red Light OFF _____

[4] **PLACE** Breaker 2-BKR-65-77, EGTS CNTMT ANN VAC FAN 2A (2-FAN-65-77) [480V C&A Vent Bd 2A1-A Compt 13C], in ON, **AND**

ENSURE Fan 2-FAN-65-77, EGTS CNTMT ANN VAC FAN 2A [757/A12V], is ON, as indicated by the status lights on Handswitch 2-HS-65-77A, ANN VAC FAN 2A & SUCT FCO [0-M-27B]:

- A. Green Light OFF _____
- B. Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 24 of 59
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Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem (continued)

NOTE

Annulus vacuum is being provided by AVF 2A WITH an FHE fan running, and is controlled by 2-PCO-65-1, AUX BLDG PURGE AIR MOD DMPR. The following step is to be performed after the annulus pressure has had sufficient time to stabilize.

- [5] **RECORD** the differential pressure at which the annulus is being maintained, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE [782/A5V], on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 5.1 in WG

- [6] **ENSURE** Auxiliary Building General Ventilation is SHUT DOWN in accordance with SOI-30.05.

NOTE

Annulus vacuum is being provided by AVF 2A WITHOUT an FHE fan running, and is controlled by 2-PCO-65-1, AUX BLDG PURGE AIR MOD DMPR. The following step is to be performed after the annulus pressure has had sufficient time to stabilize.

- [7] **RECORD** the differential pressure at which the annulus is being maintained, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE, on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 5.1 in WG

- [8] **PLACE** Breaker 2-BKR-65-74, EGTS CNTMT ANN VAC FAN 2B (2-MTR-65-74) [480V C&A Vent Bd 2B1-B Compt 13C], in ON.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 25 of 59
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Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem (continued)

[9] **PLACE** Handswitch 2-HS-65-77A, ANN VAC FAN 2A & SUCT FCO, to STOP. _____

[10] **ENSURE** Fan 2-FAN-65-74, EGTS CNTMT ANN VAC FAN 2B [757/A12V], is ON, as indicated by the status lights on Handswitch 2-HS-65-74A, ANN VAC FAN 2B & SUCT FCO [0-M-27B]:

A. Green Light OFF _____

B. Red Light ON _____

NOTE

Annulus vacuum is being provided by AVF 2B WITHOUT an FHE fan running, and is controlled by 2-PCO-65-1, AUX BLDG PURGE AIR MOD DMPR. The following step is to be performed after the annulus pressure has had sufficient time to stabilize.

[11] **RECORD** the differential pressure at which the annulus is being maintained, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE, on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 5.1 in WG

[12] **PLACE** Handswitch 2-HS-65-95, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR, to CLOSE. _____

[13] **PLACE** Handswitch 2-HS-65-96, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR, to OPEN. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 26 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem (continued)

NOTE

Annulus vacuum is being provided by AVF 2B WITHOUT an FHE fan running, and is controlled by 2-PCO-65-2, AUX BLDG PURGE AIR MOD DMPR. The following step is to be performed after the annulus pressure has had sufficient time to stabilize.

- [14] **RECORD** the differential pressure at which the annulus is being maintained, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE, on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 5.1 in WG

- [15] **PLACE** Handswitch 2-HS-65-96, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR, to CLOSE. _____
- [16] **PLACE** Handswitch 2-HS-65-95, EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR, to OPEN. _____
- [17] **PLACE** Auxiliary Building General Ventilation IN SERVICE in accordance with SOI-30.05. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 27 of 59
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Data Package: Page ____ of ____

Date _____

6.1 Containment Annulus Vacuum Control Subsystem (continued)

NOTE

Annulus vacuum is being provided by AVF 2B WITH an FHE fan running, and is controlled by 2-PCO-65-1, AUX BLDG PURGE AIR MOD DMPR. The following step is to be performed after the annulus pressure has had sufficient time to stabilize.

- [18] **RECORD** the differential pressure at which the annulus is being maintained, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE, on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 5.1 in WG

- [19] **PLACE** the following breakers in OFF:

- A. 2-BKR-65-77, EGTS CNTMT ANN VAC FAN 2A
(2-FAN-65-77)
- B. 2-BKR-65-74, EGTS CNTMT ANN VAC FAN 2B
(2-MTR-65-74)

- [20] **PLACE** the following handswitches to CLOSE:

- A. 2-HS-65-5, U2 ANN VAC FAN SUCT
- B. 2-HS-65-4, U2 ANN VAC FAN SUCT

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 28 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem

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

NOTES

- 1) The following handswitches spring return to A AUTO from the OPEN position:
 - 2-HS-30-61, PURGE AIR EXH UNIT A SUCT VALVE
 - 2-HS-30-62, PURGE AIR EXH UNIT B SUCT VALVE
- 2) The following handswitches spring return to A AUTO from the START and STOP positions:
 - 0-HS-65-23A, EGTS FAN A & DISCH DMPR
 - 0-HS-65-42A, EGTS FAN B & DISCH DMPR
- 3) Handswitch 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL, spring returns to A AUTO from the OPEN position, and controls the following valves:
 - 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL
 - 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION
- 4) Handswitch 2-HS-65-83/87, U2 EGTS-ANN Δ P CNTLR B ISOL, spring returns to A AUTO from the OPEN position, and controls the following valves:
 - 2-PCV-65-83, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL
 - 2-PCV-65-87, EGTS CNTMT ANNULUS ISOLATION

Start of Critical Step(s)

- [2] **IF** Unit 1 is in Modes 1-4, **THEN**

ENSURE a dedicated operator is assigned to this activity, to implement special instructions that will protect Unit 1 in the event of a Unit 1 Phase A Containment Isolation Signal.

End of Critical Step(s)

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 29 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

[3] **ENSURE** the following valves/dampers are OPEN, as indicated by the status lights on their respective handswitches:

- A. 2-FCV-65-9, EGTS TRAIN A UNIT 2 SUCT ISOL [757/A12V], as indicated at 2-HS-65-9, EGTS TR-A U2 SUCT DMPR [0-M-27B]
 - Green Light OFF _____
 - Red Light ON _____
- B. 2-FCO-65-46, EGTS TO U2 SHIELD BLDG [757/A12V], as indicated at 2-HS-65-46, EGTS TO U2 SHIELD BLDG [0-M-27B]
 - Green Light OFF _____
 - Red Light ON _____
- C. 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL [ANN 834/AZ360], as indicated at 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL [0-M-27B]
 - Green Light OFF _____
 - Red Light ON _____
- D. 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION [ANN 834/AZ360], as indicated at 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL
 - Green Light OFF _____
 - Red Light ON _____
- E. 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV [757/A12V], as indicated at 2-HS-65-4, U2 ANN VAC FAN SUCT [0-M-27B]
 - Green Light OFF _____
 - Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 30 of 59
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Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

- [4] **ENSURE** Valve 2-FCV-65-5, CNTMT ANN VAC FANS SUCT [757/A12V], is CLOSED, as indicated by the status lights on 2-HS-65-5, U2 ANN VAC FAN SUCT [0-M-27B]:

- Green Light ON _____
- Red Light OFF _____

CAUTION

If the following valves must be operated, personnel must be stationed in the Unit 2 EL 713 Penetration Room prior to operating the valves, to ensure personnel and equipment are clear of moving parts.

- [5] **RECORD** the as-found position of the following valves, as indicated on their respective handswitches:

- A. 2-FCV-30-61, PURGE AIR EXH UNIT A SUCT VALVE [713/A15U], as indicated at 2-HS-30-61, PURGE AIR EXH UNIT A SUCT VALVE [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

- B. 2-FCV-30-62, PURGE AIR EXH UNIT B SUCT VALVE [713/A15U], as indicated at 2-HS-30-62, PURGE AIR EXH UNIT B SUCT VALVE [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 31 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

C. 2-FCV-30-213, CNTMT PURGE EXHAUST FAN 2A
DISCH [713/A15U], as indicated at 2-HS-30-213, PURGE
AIR EXH VENT A ISOL VLV [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

D. 2-FCV-30-216, CNTMT PURGE EXHAUST FAN 2B
DISCH [713/A15U], as indicated at 2-HS-30-216, PURGE
AIR EXH UNIT B ISOL VLV [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

[6] **ENSURE** the following valves are OPEN, as indicated by the
status lights on their respective handswitches:

A. 2-FCV-30-61, PURGE AIR EXH UNIT A SUCT VALVE,
as indicated at 2-HS-30-61, PURGE AIR EXH UNIT A
SUCT VALVE

- Green Light OFF _____
- Red Light ON _____

B. 2-FCV-30-62, PURGE AIR EXH UNIT B SUCT VALVE,
as indicated at 2-HS-30-62, PURGE AIR EXH UNIT B
SUCT VALVE

- Green Light OFF _____
- Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 32 of 59
---------------	---	--

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

C. 2-FCV-30-213, CNTMT PURGE EXHAUST FAN 2A DISCH, as indicated at 2-HS-30-213, PURGE AIR EXH VENT A ISOL VLV

- Green Light OFF _____
- Red Light ON _____

D. 2-FCV-30-216, CNTMT PURGE EXHAUST FAN 2B DISCH, as indicated at 2-HS-30-216, PURGE AIR EXH UNIT B ISOL VLV

- Green Light OFF _____
- Red Light ON _____

[7] **ENSURE** test personnel assigned to measure air flows are stationed in the Unit 2 containment annulus. _____

[8] **PLACE** Handswitch 0-HS-65-23A, EGTS FAN A & DISCH DMPR [0-M-27B], to START. _____

NOTE

If 2-PDIC-65-80, CNTMT ANNULUS DP, continues to cycle in the step below (system equilibrium cannot be reached), associated damper positions may need to be adjusted, and/or the pressure controller may need to be field tuned. Air flow measurements are difficult to obtain with unstable operation of the pressure control loop.

[9] **VERIFY** system equilibrium as indicated by steady output (no cycling) on 2-PDIC-65-80, CNTMT ANNULUS DP [0-M-27B], for a minimum of 15 minutes. _____

[10] **RECORD** the differential pressure at which the annulus is being maintained relative to the atmosphere, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE [782/A5V], on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG

Acc Crit: ≥ 0.62 in WG

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 33 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

- [11] **MEASURE AND CALCULATE** the total flow (from the annulus EL 830, AZ 7) for 0-FAN-65-23, EMERGENCY GAS TREATMENT FAN A-A [757/A11V], using Data Sheet 1, **AND**

RECORD the total flow below:

_____ CFM
Acc Crit: 3600 CFM to 4400 CFM

- [12] **MEASURE AND CALCULATE** the annulus inleakage flow (from the shield building stack, annulus EL 830, AZ 7) for 0-FAN-65-23, EMERGENCY GAS TREATMENT FAN A-A, using Data Sheet 2, **AND**

RECORD the inleakage flow below:

_____ CFM
Acc Crit: ≤ 237.5 CFM

- [13] **PLACE** Handswitch 0-HS-65-23A, EGTS FAN A & DISCH DMPR, to STOP.

- [14] **ENSURE** the following valves/dampers are CLOSED, as indicated by the status lights on their respective handswitches:

- A. 2-FCV-65-9, EGTS TRAIN A UNIT 2 SUCT ISOL, as indicated at 2-HS-65-9, EGTS TR-A U2 SUCT DMPR
- Green Light ON
 - Red Light OFF
- B. 2-FCO-65-46, EGTS TO U2 SHIELD BLDG, as indicated at 2-HS-65-46, EGTS TO U2 SHIELD BLDG
- Green Light ON
 - Red Light OFF

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 34 of 59
-----------------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

C. 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL, as indicated at 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL

- Green Light ON _____
- Red Light OFF _____

D. 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION, as indicated at 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL

- Green Light ON _____
- Red Light OFF _____

E. 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV, as indicated at 2-HS-65-4, U2 ANN VAC FAN SUCT

- Green Light ON _____
- Red Light OFF _____

[15] **ENSURE** the following valves/dampers are OPEN, as indicated by the status lights on their respective handswitches:

A. 2-FCV-65-29, EGTS TRAIN B UNIT 2 SUCT ISOL [757/A12V], as indicated at 2-HS-65-29, EGTS TR-B U2 SUCT DMPR [0-M-27B]

- Green Light OFF _____
- Red Light ON _____

B. 2-FCO-65-45, EGTS TO U2 SHIELD BLDG [757/A12V], as indicated at 2-HS-65-45, EGTS TO U2 SHIELD BLDG [0-M-27B]

- Green Light OFF _____
- Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 35 of 59
---------------	---	--

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

C. 2-PCV-65-83, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL [ANN 834/AZ360], as indicated at 2-HS-65-83/87, U2 EGTS-ANN ΔP CNTLR B ISOL [0-M-27B]

- Green Light OFF _____
- Red Light ON _____

D. 2-PCV-65-87, EGTS CNTMT ANNULUS ISOLATION [ANN 834/AZ360], as indicated at 2-HS-65-83/87, U2 EGTS-ANN ΔP CNTLR B ISOL

- Green Light OFF _____
- Red Light ON _____

E. 2-FCV-65-5, CNTMT ANN VAC FANS SUCT, as indicated at 2-HS-65-5, U2 ANN VAC FAN SUCT

- Green Light OFF _____
- Red Light ON _____

[16] **ENSURE** test personnel assigned to measure air flows are stationed in the Unit 2 containment annulus. _____

[17] **PLACE** Handswitch 0-HS-65-42A, EGTS FAN B & DISCH DMPR [0-M-27B], to START. _____

NOTE

If 2-PDIC-65-80, CNTMT ANNULUS DP, continues to cycle in the step below (system equilibrium cannot be reached), associated damper positions may need to be adjusted, and/or the pressure controller may need to be field tuned. Air flow measurements should not be obtained during unstable operation of the pressure control loop.

[18] **VERIFY** system equilibrium as indicated by steady output (no cycling) on 2-PDIC-65-80, CNTMT ANNULUS DP, for a minimum of 15 minutes. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 36 of 59
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Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

- [19] **RECORD** the differential pressure at which the annulus is being maintained relative to the atmosphere, as indicated on the manometer at 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE, on 2-PNL-276-L44, installed in Step 4.3[7], **AND**

VERIFY it meets the acceptance criteria below:

_____ in WG
Acc Crit: ≥ 0.62 in WG

- [20] **MEASURE AND CALCULATE** the total flow (from the annulus EL 830, AZ 7) for 0-FAN-65-42, EMERGENCY GAS TREATMENT FAN B-B [757/A11V], using Data Sheet 1, **AND**

RECORD the total flow below:

_____ CFM
Acc Crit: 3600 CFM to 4400 CFM

- [21] **MEASURE AND CALCULATE** the annulus inleakage flow (from the shield building stack, annulus EL 830, AZ 7) for 0-FAN-65-42, EMERGENCY GAS TREATMENT FAN B-B, using Data Sheet 2, **AND**

RECORD the inleakage flow below:

_____ CFM
Acc Crit: ≤ 237.5 CFM

- [22] **PLACE** Handswitch 0-HS-65-42A, EGTS FAN B & DISCH DMPR, to STOP.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 37 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

[23] **ENSURE** the following valves/dampers are CLOSED, as indicated by the status lights on their respective handswitches:

- A. 2-FCV-65-29, EGTS TRAIN B UNIT 2 SUCT ISOL, as indicated at 2-HS-65-29, EGTS TR-B U2 SUCT DMPR
 - Green Light ON _____
 - Red Light OFF _____
- B. 2-FCO-65-45, EGTS TO U2 SHIELD BLDG, as indicated at 2-HS-65-45, EGTS TO U2 SHIELD BLDG
 - Green Light ON _____
 - Red Light OFF _____
- C. 2-PCV-65-83, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL, as indicated at 2-HS-65-83/87, U2 EGTS-ANN Δ P CNTLR B ISOL
 - Green Light ON _____
 - Red Light OFF _____
- D. 2-PCV-65-87, EGTS CNTMT ANNULUS ISOLATION, as indicated at 2-HS-65-83/87, U2 EGTS-ANN Δ P CNTLR B ISOL
 - Green Light ON _____
 - Red Light OFF _____
- E. 2-FCV-65-5, CNTMT ANN VAC FANS SUCT, as indicated at 2-HS-65-5, U2 ANN VAC FAN SUCT
 - Green Light ON _____
 - Red Light OFF _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 38 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

[24] **RESTORE** the as-found position of the following valves to that found in Step 6.2[5], **AND**

RECORD the as-left position as indicated on their respective handswitches:

A. 2-FCV-30-61, PURGE AIR EXH UNIT A SUCT VALVE,
as indicated at 2-HS-30-61, PURGE AIR EXH UNIT A
SUCT VALVE [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

B. 2-FCV-30-62, PURGE AIR EXH UNIT B SUCT VALVE,
as indicated at 2-HS-30-62, PURGE AIR EXH UNIT B
SUCT VALVE [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

C. 2-FCV-30-213, CNTMT PURGE EXHAUST FAN 2A
DISCH, as indicated at 2-HS-30-213, PURGE AIR EXH
VENT A ISOL VLV [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

D. 2-FCV-30-216, CNTMT PURGE EXHAUST FAN 2B
DISCH, as indicated at 2-HS-30-216, PURGE AIR EXH
UNIT B ISOL VLV [2-M-9]

- Green Light _____
- Red Light _____
- Handswitch position _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 39 of 59
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Data Package: Page ____ of ____

Date _____

6.2 EGTS Air Cleanup Unit Subsystem (continued)

[25] **NOTIFY** Operations that the dedicated operator assigned in Step 6.2[2] is no longer necessary.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 40 of 59
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Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response

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

[2] **ENSURE** Subsection 6.2 has been completed. _____

CAUTION

Work in Solid State Protection Cabinets 2-R-48 and 2-R-51 involves energized circuits.

NOTES

- 1) The following handswitches spring return to A AUTO from the OPEN position:
 - 2-HS-65-5, U2 ANN VAC FAN SUCT
 - 2-HS-65-4, U2 ANN VAC FAN SUCT
- 2) The following handswitches spring return to A AUTO from the START and STOP positions:
 - 0-HS-65-23A, EGTS FAN A & DISCH DMPR
 - 0-HS-65-42A, EGTS FAN B & DISCH DMPR
- 3) Handswitch 2-HS-65-81/86, U2 EGTS-ANN ΔP CNTLR A ISOL, spring returns to A AUTO from the OPEN position, and controls the following valves:
 - 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL
 - 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION
- 4) Handswitch 2-HS-65-83/87, U2 EGTS-ANN ΔP CNTLR B ISOL, spring returns to A AUTO from the OPEN position, and controls the following valves:
 - 2-PCV-65-83, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL
 - 2-PCV-65-87, EGTS CNTMT ANNULUS ISOLATION

Start of Critical Step(s)

[3] **IF** Unit 1 is in Modes 1-4, **THEN**

ENSURE a dedicated operator is assigned to this activity, to implement special instructions that will protect Unit 1 in the event of a Unit 1 Phase A Containment Isolation Signal. _____

End of Critical Step(s)

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 41 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

[4] **LIFT** Train A wires from 2-R-48, per Appendix F, **AND**

INSTALL the Simultaneous Initiation Device (SID).

1st

CV

[5] **LIFT** Vendor (Internal) Wire GBP2 from Terminal Point 9 on TB 629 in 2-R-48 (aligned to the Normally Closed contacts on the SID).

1st

CV

[6] **ENSURE** the following lineup:

A. Handswitch 2-HS-65-9, EGTS TR-A U2 SUCT DMPR [0-M-27B], indicates Valve 2-FCV-65-9, EGTS TRAIN A UNIT 2 SUCT ISOL [757/A12V], is CLOSED and in A AUTO:

- Green Light ON _____
- Red Light OFF _____
- Handswitch position A AUTO _____

B. Handswitch 2-HS-65-29, EGTS TR-B U2 SUCT DMPR [0-M-27B], indicates Valve 2-FCV-65-29, EGTS TRAIN B UNIT 2 SUCT ISOL [757/A12V], is CLOSED and in A AUTO:

- Green Light ON _____
- Red Light OFF _____
- Handswitch position A AUTO _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 42 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

C. Handswitch 2-HS-65-46, EGTS TO U2 SHIELD BLDG [0-M-27B], indicates Damper 2-FCO-65-46, EGTS TO U2 SHIELD BLDG [757/A12V], is CLOSED and in A AUTO:

• Green Light ON _____

• Red Light OFF _____

• Handswitch position A AUTO _____

D. Handswitch 2-HS-65-45, EGTS TO U2 SHIELD BLDG [0-M-27B], indicates Damper 2-FCO-65-45, EGTS TO U2 SHIELD BLDG [757/A12V], is CLOSED and in A AUTO:

• Green Light ON _____

• Red Light OFF _____

• Handswitch position A AUTO _____

E. Handswitch 2-HS-65-5, U2 ANN VAC FAN SUCT [0-M-27B], indicates Valve 2-FCV-65-5, CNTMT ANN VAC FANS SUCT [757/A12V], is OPEN and in A AUTO:

• Green Light OFF _____

• Red Light ON _____

F. Handswitch 2-HS-65-4, U2 ANN VAC FAN SUCT [0-M-27B], indicates Valve 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV [757/A12V], is OPEN and in A AUTO:

• Green Light OFF _____

• Red Light ON _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 43 of 59
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Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

G. Handswitch 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL [0-M-27B], indicates Valves 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL [ANN 834/AZ360], and 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION [ANN 834/AZ360], are CLOSED and in A AUTO:

- Green Light ON, 81 _____
- Red Light OFF, 81 _____
- Green Light ON, 86 _____
- Red Light OFF, 86 _____
- Handswitch position A AUTO _____

H. Handswitch 2-HS-65-83/87, U2 EGTS-ANN Δ P CNTLR B ISOL [0-M-27B], indicates Valves 2-PCV-65-83, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL [ANN 834/AZ360], and 2-PCV-65-87, EGTS CNTMT ANNULUS ISOLATION [ANN 834/AZ360], are CLOSED and in A AUTO:

- Green Light ON, 83 _____
- Red Light OFF, 83 _____
- Green Light ON, 87 _____
- Red Light OFF, 87 _____
- Handswitch position A AUTO _____

I. Handswitch 0-HS-65-23A, EGTS FAN A & DISCH DMPR [0-M-27B], indicates Fan 0-FAN-65-23, EMERGENCY GAS TREATMENT FAN A-A [757/A11V], is OFF and in A AUTO:

- Green Light ON _____
- Red Light OFF _____
- Handswitch position A AUTO _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 44 of 59
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Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

J. Handswitch 0-HS-65-42A, EGTS FAN B & DISCH DMPR [0-M-27B], indicates Fan 0-FAN-65-42, EMERGENCY GAS TREATMENT FAN B-B [757/A11V], is OFF and in A AUTO:

- Green Light ON _____
- Red Light OFF _____
- Handswitch position A AUTO _____

NOTES

- 1) The following step performs a timing measurement. M&TE (stopwatch) should be readied and personnel should agree on a countdown method.
- 2) 0-PDI-65-21, EGTS TRAIN A FILTER BANK DP, at steady output indicates that system equilibrium has been reached. Flow rates at system equilibrium were verified previously in Step 6.2[11].

[7] **PERFORM** the following simultaneously:

- A. **PRESS AND RELEASE** the plunger on the SID to simulate a Train A, U2 ØA CIS. _____
- B. **RECORD** the time from when the plunger is pressed until 0-PDI-65-21, EGTS TRAIN A FILTER BANK DP [0-M-27B], indicates steady output (no cycling).

_____ seconds

Acc Crit: ≤ 18 seconds

[8] **VERIFY** Handswitch 2-HS-65-5, U2 ANN VAC FAN SUCT, indicates Valve 2-FCV-65-5, CNTMT ANN VAC FANS SUCT, is CLOSED:

- A. Green Light ON _____
- B. Red Light OFF _____

[9] **PLACE** Handswitch 0-HS-65-23A, EGTS FAN A & DISCH DMPR, to STOP. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 45 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

[10] **REMOVE** the SID from Train A per Appendix F.

1st

CV

[11] **LAND** Vendor (Internal) Wire GBP2 on Terminal Point 9 on TB 629 in 2-R-48.

1st

CV

[12] **LIFT** Train B wires from 2-R-51, per Appendix F, **AND**
INSTALL the Simultaneous Initiation Device (SID).

1st

CV

[13] **LIFT** Vendor (Internal) Wire GBN2 from Terminal Point 9 on TB 629 in 2-R-51 (aligned to the Normally Closed contacts on the SID).

1st

CV

[14] **ENSURE** the following lineup:

A. Handswitch 2-HS-65-9, EGTS TR-A U2 SUCT DMPR, indicates Valve 2-FCV-65-9, EGTS TRAIN A UNIT 2 SUCT ISOL, is CLOSED and in A AUTO:

- Green Light ON
- Red Light OFF
- Handswitch position A AUTO

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 46 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

B. Handswitch 2-HS-65-46, EGTS TO U2 SHIELD BLDG, indicates Damper 2-FCO-65-46, EGTS TO U2 SHIELD BLDG, is CLOSED and in A AUTO:

- Green Light ON _____
- Red Light OFF _____
- Handswitch position A AUTO _____

C. Handswitch 2-HS-65-5, U2 ANN VAC FAN SUCT, indicates Valve 2-FCV-65-5, CNTMT ANN VAC FANS SUCT, is OPEN and in A AUTO:

- Green Light OFF _____
- Red Light ON _____

D. Handswitch 2-HS-65-4, U2 ANN VAC FAN SUCT [0-M-27B], indicates Valve 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV, is OPEN and in A AUTO:

- Green Light OFF _____
- Red Light ON _____

E. Handswitch 2-HS-65-81/86, U2 EGTS-ANN Δ P CNTLR A ISOL, indicates Valves 2-PCV-65-81, EGTS UNIT 2 SHIELD BLDG EXHAUST VENT ISOL, and 2-PCV-65-86, EGTS CNTMT ANNULUS ISOLATION, are CLOSED and in A AUTO:

- Green Light ON, 81 _____
- Red Light OFF, 81 _____
- Green Light ON, 86 _____
- Red Light OFF, 86 _____
- Handswitch position A AUTO _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 47 of 59
-----------------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

NOTES

- 1) The following step performs a timing measurement. M&TE (stopwatch) should be readied and personnel should agree on a countdown method.
- 2) 0-PDI-65-40, EGTS TRAIN B FLTR PLENUM DIFF PRESS, at steady output indicates that system equilibrium has been reached. Flow rates at system equilibrium were verified previously in Step 6.2[20].

[15] **PERFORM** the following simultaneously:

- A. **PRESS AND RELEASE** the plunger on the SID to simulate a Train B, U2 ØA CIS. _____
- B. **RECORD** the time from when the plunger is pressed until 0-PDI-65-40, EGTS TRAIN B FLTR PLENUM DIFF PRESS [0-M-27B], indicates steady output (no cycling).

_____ seconds

Acc Crit: ≤ 18 seconds

[16] **VERIFY** Handswitch 2-HS-65-4, U2 ANN VAC FAN SUCT, indicates Valve 2-FCV-65-4, CNTM ANNULUS VAC FANS ISLN VLV, is CLOSED:

- A. Green Light ON _____
- B. Red Light OFF _____

[17] **PLACE** Handswitch 0-HS-65-42A, EGTS FAN B & DISCH DMPR, to STOP. _____

[18] **REMOVE** the SID from Train B per Appendix F. _____

1st

CV

[19] **LAND** Vendor (Internal) Wire GBN2 on Terminal Point 9 on TB 629 in 2-R-51. _____

1st

CV

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 48 of 59
-----------------------	---	---

Data Package: Page ____ of ____

Date _____

6.3 EGTS Time Response (continued)

[20] **PLACE** the following Handswitches in CLOSE:

A. 2-HS-65-29, EGTS TR-B U2 SUCT DMPR _____

B. 2-HS-65-45, EGTS TO U2 SHIELD BLDG _____

C. 2-HS-65-5, U2 ANN VAC FAN SUCT _____

D. 2-HS-65-4, U2 ANN VAC FAN SUCT _____

E. 2-HS-65-83/87, U2 EGTS-ANN Δ P CNTLR B ISOL _____

[21] **NOTIFY** Operations that the dedicated operator assigned in Step 6.3[3] is no longer necessary. _____

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 49 of 59
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Data Package: Page ____ of ____

Date _____

7.0 POST PERFORMANCE ACTIVITIES

NOTES

- 1) Post-performance steps may be performed in any order unless otherwise stated and should be completed as close in time as practicable to the end of the instruction performance.
- 2) Step 7.0[4] may be identified as NA if the respective condition does not apply to this test.

- [1] **REMOVE** the 10 inch manometer (installed in Step 4.3[7]) from across the calibration tees of 2-PDT-65-80, EGTS CNTMT ANNULUS DIFFERENTIAL PRESSURE [782/A5V], on 2-PNL-276-L44.

1st

CV

- [2] **REPLACE** duct access door, located between 2-FCV-65-4, CNTMT ANNULUS VAC FANS ISLN VLV [757/A12V], and the Annulus Vacuum Fans (47W920-24), on EGTS ductwork.

1st

CV

- [3] **VERIFY** that post-test calibration of the M&TE used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

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

- [4] **VERIFY** that post-test calibration of permanent plant instruments used to record quantitative acceptance criteria has been satisfactorily performed, **AND**

RECORD the results on Appendix C, Permanent Plant Instrumentation Log.

- [5] **NOTIFY** the Unit 2 US/SRO of the test completion and system alignment.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 50 of 59
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Data Package: Page ____ of ____

Date _____

7.0 POST PERFORMANCE ACTIVITIES (continued)

[6] **NOTIFY** the Unit 1 US/SRO of the test completion and system alignment. _____

8.0 RECORDS

A. QA Records

Completed Test Package.

B. Non-QA Records

None

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 53 of 59
-----------------------	---	---

**Appendix C
(Page 1 of 1)**

PERMANENT PLANT INSTRUMENTATION LOG

Data Package: Page ____ of ____

Date _____

INSTRUMENT OR INSTRUMENT LOOP #	CAL DUE DATE	FILLED AND VENTED ¹	PLACED IN SERVICE ¹	USED FOR QUANTITATIVE ACC CRIT		POST-TEST CAL DATE ²	POST-TEST CALIBRATION ACCEPTABLE ² INITIAL/DATE
		INIT/DATE	INIT/DATE	YES	NO		
2-FS-65-91		NA			X	NA	NA
2-FS-65-92		NA			X	NA	NA
2-LPP-65-80		NA			X	NA	NA
2-LPP-65-82		NA			X	NA	NA
2-LPP-30-126		NA			X	NA	NA
2-LPP-30-127		NA			X	NA	NA

¹ These items may be initialed and dated by personnel performing the task. Instrumentation not required to be filled and vented may be identified as Not Applicable. (NA)

² May be identified as Not Applicable (NA) if instrument was not used to verify/record quantitative acceptance criteria data.

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 54 of 59
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**Appendix D
(Page 1 of 2)**

SWITCH LINEUP

Data Package: Page ____ of ____

Date _____

SWITCH UNID	LOCATION	DESCRIPTION	POSITION	INITIALS
2-HS-65-5	0-M-27B	U2 ANN VAC FAN SUCT	CLOSE	
2-HS-65-4	0-M-27B	U2 ANN VAC FAN SUCT	CLOSE	
2-HS-65-9	0-M-27B	EGTS TRAIN A UNIT 2 SUCT ISOL	CLOSE	
2-HS-65-29	0-M-27B	EGTS TRAIN B UNIT 2 SUCT ISOL	CLOSE	
2-HS-65-46	0-M-27B	EGTS TO U2 SHIELD BLDG	CLOSE	
2-HS-65-45	0-M-27B	EGTS TO U2 SHIELD BLDG	CLOSE	
2-HS-65-81/86	0-M-27B	U2 EGTS-ANN ΔP CNTLR A ISOL	CLOSE	
2-HS-65-83/87	0-M-27B	U2 EGTS-ANN ΔP CNTLR B ISOL	CLOSE	
2-HS-65-7	0-M-27B	EGTS FAN A U2 SUCT DMPR	CLOSE	
2-HS-65-50	0-M-27B	EGTS TR-B U2 SUCT DMPR	CLOSE	
2-HS-65-95	0-JB-292-1165, 757/A12V	EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR	CLOSE return to AUTO	
2-HS-65-96	0-JB-292-1165, 757/A12V	EGTS CNTMT ANN VAC FANS PURGE ISOL DMPR	CLOSE return to AUTO	
2-HS-65-77A	0-M-27B	ANN VAC FAN 2A & SUCT FCO	A-P AUTO	
2-HS-65-74A	0-M-27B	ANN VAC FAN 2B & SUCT FCO	A-P AUTO	

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 55 of 59
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**Appendix D
(Page 2 of 2)
SWITCH LINEUP**

Data Package: Page ____ of ____

Date _____

SWITCH UNID	LOCATION	DESCRIPTION	POSITION	INITIALS
2-HS-30-61	2-M-9	PURGE AIR EXH UNIT A SUCT VALVE	CLOSE	
2-HS-30-62	2-M-9	PURGE AIR EXH UNIT B SUCT VALVE	CLOSE	
2-HS-30-213	2-M-9	PURGE AIR EXH VENT A ISOL VLV	CLOSE	
2-HS-30-216	2-M-9	PURGE AIR EXH UNIT B ISOL VLV	CLOSE	

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 56 of 59
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**Appendix E
(Page 1 of 1)**

ELECTRICAL LINEUP

Data Package: Page ____ of ____

Date _____

BREAKER UNID	LOCATION	DESCRIPTION	POSITION	INITIALS
2-BKR-65-77	480V C&A Vent Bd 2A1-A Compt 13C	EGTS CNTMT ANN VAC FAN 2A (2-FAN-65-77)	OFF	
2-BKR-65-74	480V C&A Vent Bd 2B1-B Compt 13C	EGTS CNTMT ANN VAC FAN 2B (2-MTR-65-74)	OFF	
2-BKR-235-1/11	120V VIPB 2-I, BKR 11	AUX RELAY RACK A BUS TO PNL 2-R-75	ON	
2-BKR-235-2/9	120V VIPB 2-II, BKR 9	AUX RELAY RACK B BUS TO PNL 2-R-75	ON	
1-BKR-235-1/19	120V VIPB 1-I, BKR 19	GAS TREATMENT FAN A-A PANEL 0-L-429	ON	
1-BKR-235-2/19	120V VIPB 1-II, BKR 19	GAS TREATMENT FAN B-B PANEL 0-L-428	ON	
1-BKR-235-3/36	120V VIPB 1-III BKR 36	FLUID DYNAMIC FLOW SENSORS	ON	

WBN Unit 2	EMERGENCY GAS TREATMENT SYSTEM PRESSURE TEST	2-PTI-065-02 Rev. 0000 Page 57 of 59
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**Appendix F
(Page 1 of 1)**

SIMULTANEOUS INITIATION DEVICE

Data Package: Page ____ of ____

Date _____

NOTE

A Simultaneous Initiation Device (SID) is utilized to simulate a Train A or Train B, Unit 2 Phase A Containment Isolation Signal to the EGTS devices listed below.

The SID consists of a plunger type relay that can be manually depressed. It shall have a minimum of 5 sets of normally open (NO) contacts and 1 set of normally closed (NC) contacts. Connection is from the listed field-side terminals to the designated SID contacts.

TRAIN A DEVICE	2-R-	TB	TERMINAL (WIRE NUMBER)	TERMINAL (WIRE NUMBER)	SID CONTACTS	Installed 1st/CV	Removed 1st/CV
0-FAN-65-23	48	637	5 (Wire 4D3)	6 (Wire 4D5)	NO	/	/
2-FCO-65-46	48	630	1 (Wire GBM5)	2 (Wire GBM6)	NO	/	/
2-PCV-65-81 & 86	48	630	3 (Wire GBW4)	4 (Wire GBW5)	NO	/	/
2-FCV-65-9	48	637	1 (Wire GBF5)	2 (Wire GBF6)	NO	/	/
2-FAN-65-77	48	629	5 (Wire 13CX)	6 (Wire 13C16)	NO	/	/
2-FCV-65-5	48	629	9 (Wire GBP2)	10 (Wire GBP5)	NC	/	/
TRAIN B DEVICE	2-R-	TB	TERMINAL (WIRE NUMBER)	TERMINAL (WIRE NUMBER)	SID CONTACTS	Installed 1st/CV	Removed 1st/CV
0-FAN-65-42	51	637	5 (Wire 4D3)	6 (Wire 4D5)	NO	/	/
2-FCO-65-45	51	630	1 (Wire GBL5)	2 (Wire GBL6)	NO	/	/
2-PCV-65-83 & 87	51	630	3 (Wire GBX4)	4 (Wire GBX5)	NO	/	/
2-FCV-65-29	51	637	1 (Wire GBK5)	2 (Wire GBK6)	NO	/	/
2-FAN-65-74	51	629	5 (Wire 13CX)	6 (Wire 13C16)	NO	/	/
2-FCV-65-4	51	629	9 (Wire GBN2)	10 (Wire GBN5)	NC	/	/

**Data Sheet 1
(Page 1 of 1)**

EGTS Total Flow Measurement

	<p>NOTE</p> <p>Seal around test instrument at the test port while traversing</p>
<p>Duct Size = 12" x 24" Duct Area (A) = 2 square feet</p>	

EGTS Train: _____

TEST POINT	VELOCITY (fpm)	TEST POINT	VELOCITY (fpm)
A1		B1	
A2		B2	
A3		B3	
A4		B4	

$\Sigma VA =$ _____ $\Sigma VB =$ _____

$$V_{avg} = (\Sigma \text{Velocities}) / 8 = (\Sigma VA + \Sigma VB) / 8 = \frac{(\quad) + (\quad)}{8} \text{ fpm} = \quad \text{ fpm}$$

Test Port Caps reinstalled: _____; CV: _____

Barometric Pressure (B): _____ in Hg; Air Temperature (T): _____ °F

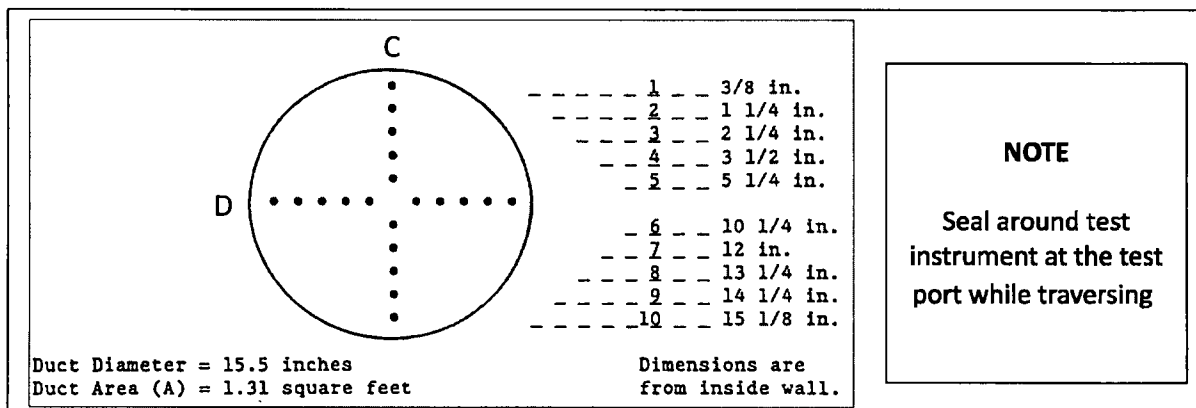
$$\text{TotalFlow} = 0.05645 * \text{Area} * V_{AVG} \left(\frac{460 + T}{B} \right) = 0.05645 * 2 * \quad \left(\frac{460 + \quad}{\quad} \right)$$

EGTS Train _____ TotalFlow = _____ CFM

Data Taken by: _____; Calculations Performed by: _____; Calculations Verified by: _____

**Data Sheet 2
(Page 1 of 1)**

EGTS Annulus Inleakage Flow Measurement



EGTS Train: _____

TEST PT	VEL (fpm)	TEST PT	VEL (fpm)
C1		D1	
C2		D2	
C3		D3	
C4		D4	
C5		D5	
C6		D6	
C7		D7	
C8		D8	
C9		D9	
C10		D10	

ΣVC = _____ ΣVD = _____

$$V_{avg} = (\sum \text{Velocities}) / 20 = (\sum VC + \sum VD) / 20 = \frac{(\quad) + (\quad)}{20} \text{ fpm} = \quad \text{ fpm}$$

Test Port Caps reinstalled: _____; CV: _____

Barometric Pressure (B): _____ in Hg; Air Temperature (T): _____ °F

$$\text{InleakageFlow} = 0.05645 * \text{Area} * V_{avg} \left(\frac{460 + T}{B} \right) = 0.05645 * 1.31 * \quad \left(\frac{460 + \quad}{\quad} \right)$$

EGTS Train _____ InleakageFlow = _____ CFM

Data Taken by: _____; Calculations Performed by: _____; Calculations Verified by: _____