JUL 2 9 1997 (21) Station 34

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 161455

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	FDNW TWRS Engineering Services	N/A
5. Proj./Prog./Dept./Div.:	**6. Design Authority/ Design Agent/Cog. Engr.:**	**7. Purchase Order No.:**
Interim Stabilization	J. R. Kriskovich	N/A
8. Originator Remarks:		**9. Equip./Component No.:**
Acceptance Test Plan for 500 CFM Portable Exhauster POR-006, Skid D.		POR-006, Skid D
		10. System/Bldg./Facility: N/A
11. Receiver Remarks: **11A. Design Baseline Document?** [X] Yes [] No		**12. Major Assm. Dwg. No.:**
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-SD-WM-ATP-200		0	ATP for the portable 500 CFM Exhauster POR-006 SKID D	SQ	1		

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	/	Design Authority J.R. Kriskovich		7-21-97	R1-56
1	/	Des. Cog. Eng. O.D. Nelson		7/21/97	R3-24
1	/	Proj. Mgr. E.M. Veith		7/21/97	R5-59
1	/	Progr. Mgr. D.W. Crass		7/21/97	H5-61
1	/	QA T.J. Volkman		7/21/97	T4-07
1	/	Safety L.S. Krogstad		7/21/97	T4-07
1	/	TWRS HVAC System Cog. Eng. T.D. Kaiser		7/21/97	T4-07

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	/	Fab. Supr. L.A. Mercer		7-21-97	T1-31
		Central Files			A3-88

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
Signature of EDT Originator 7-18-97 Date	Authorized Representative for Receiving Organization Date	Design Authority/ Cognizant Manager 7-21-97 Date	[] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (05/96) GEF097

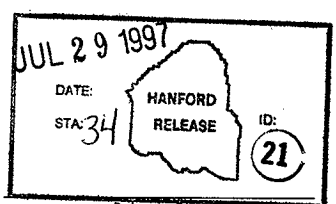
ATP FOR THE PORTABLE 500 CFM EXHAUSTER POR-006 SKID D

Craig M. Keller
Fluor-Daniel Northwest, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 161455 UC: 2030
Org Code: 04E00 Charge Code: C13697
B&R Code: EW3120072 Total Pages: 96 KN

Key Words: Portable Exhauster, Saltwell Pumping, Waste Tank Ventilation, Flammable Gas Mitigation

Abstract: This Acceptance Test Plan is for a 500 CFM Portable Exhauster POR-006 to be used for saltwell pumping. The Portable Exhauster System will be utilized to eliminate potential flammable gases that may exist within the dome space of the tank. This Acceptance Plan will test and verify that the exhauster meets the specified design criteria, safety requirements, operations requirements, and will provide a record of the functional test results.



Karen L. Noland 7/29/97
Release Approval Date

Release Stamp

Approved for Public Release

TANK FARM ACCEPTANCE TEST PROCEDURE	SYSTEM INTERIM STABILIZATION

ATP FOR THE PORTABLE 500 CFM EXHAUSTER, POR-006, SKID D

CONTINUOUS USE

TEST EXECUTION SHEET

Date: Document Number: HNF-SD-WM-ATP-200 REV. 0

EXHAUSTER Unit Number: POR-006

TEST PERSONNEL

COGNIZANT DESIGN ENGINEER: Owen Nelson

TEST DIRECTOR: Terry Kaiser

ALT TEST DIRECTOR: Owen Nelson

ALT TEST DIRECTOR: Jim Dunks

TEST EXECUTION

Test Director Date

TEST APPROVAL AND ACCEPTANCE

_____ Without Exception _____ With Exception/Resolved _____ With Exception/Outstanding

Test Director Date

Quality Assurance Date

Safety Date

Cognizant Design Engineer Date

TABLE OF CONTENTS

1.0 PURPOSE

1.1 The purpose of this Acceptance Test Procedure is to test and verify that the portable 500 CFM Exhauster meets the specified Design Criteria, Safety requirements, Engineering requirements, and to assure adequacy of fabrication. It will also provide a record of the functional test results.

1.2 There is a concern that flammable gases may exceed the Lower Flammability Limit during interim stabilization of identified waste storage tanks. The Portable Exhauster System will be utilized to reduce potential flammable gases that exist within the dome vapor space of the tank.

2.0 INFORMATION

2.1 SCOPE

The systems/functions that will be tested are the following:

2.1.1 **CONDENSATE DRAIN TEST**

This check will verify that the condensate drain lines in the filter train are free of obstruction permitting liquids to drain to the seal pot.

2.1.2 **POWER SYSTEM CHECK**

This check will verify that there is power to the Exhauster systems.

2.1.3 **PRESSURE DECAY TEST**

This will check integrity of the Exhauster train assembly air boundary, including the Seal Pot.

2.1.4 **EXHAUSTER FAN CHECK**

This check will verify that the Exhauster Fan rotates in the correct direction.

2.1.5 **HEAT TRACE CHECK**

This check will verify that the Heat Trace functions properly.

2.1.6 **FILTER # 1 INTERLOCK/ALARM CHECK**

This check will verify that 1st HEPA filter interlocks perform as required to specific alarm conditions for rupture or plugging of the HEPA.

2.1 SCOPE (continued)

2.1.7 **FILTER # 2 INTERLOCK/ALARM CHECK**

This check will verify that 2nd HEPA filter interlocks perform as required to specific alarm conditions for rupture or plugging of the HEPA.

2.1.8 **FILTER #1 & #2 INTERLOCK/ALARM CHECK**

This check will verify that 1st & 2nd HEPA filter interlocks perform as required to specific alarm conditions for rupture or plugging of the HEPA.

2.1.9 **PRE-FILTER ALARM CHECK**

This check will verify that Pre-filter alarm perform as required to specific alarm conditions if the pre-filter starts plugging.

2.1.10 **STACK FLOW INTERLOCK/ALARM CHECK**

This check will verify that Stack Flow interlocks perform as required to specific alarm conditions to shutdown the exhauster.

2.1.11 **SEAL POT INTERLOCK/ALARM CHECK**

This check will verify that Seal Pot interlocks perform as required to specific alarm conditions to shutdown the exhauster.

2.1.12 **GLYCOL SYSTEM LEAK TEST**

This will check integrity of the Glycol System assembly.

2.1.13 **THERMOCOUPLE INTERLOCK/ALARM CHECK**

This check will verify that 1st HEPA filter interlocks perform as required to specific alarm conditions to shutdown the glycol heating system.

2.1.14 **GLYCOL HEATER CHECK**

This check will verify that the Heater and Glycol Circulation Pump function properly.

2.2 TERMS AND DEFINITIONS

2.2.1 ATP - Acceptance Test Procedure

2.2.2 DMM - Digital Multimeter

2.2 TERMS AND DEFINITIONS (Continued)

2.2.3 DPT - Differential Pressure Transmitter

2.2.4 DS - Disconnect Switch

2.2.5 HEPA - High Efficiency Particulate Air

2.2.6 MPZ - Mini Power Zone

2.2.7 MSDS - Material Safety Data Sheet

2.2.8 NO - Normally Open

2.2.9 SLC - Small Logic Controller

2.2.10 QC - Quality Control

2.2.11 IN W.C.- inches Water Column

2.3 RESPONSIBILITIES

2.3.1 The Maintenance craft personnel are responsible for the following:

- Schedule the test as required.
- Provide the test supplies found in step 4.1.
- Provide assistance during the test.

2.3.2 Design Cognizant Engineer is responsible for the following:

- Designate a Test Director.
- Coordinate testing with facility management.
- Ensure field testing and inspection has been completed.
- Schedule a pre-ATP meeting with test participants prior to start of testing.
- Sign Test Execution Sheet as cognizant engineer when the ATP is approved and accepted.
- Take necessary action to clear exceptions to the ATP.
- Sign Exception Sheet when exception has been resolved.
- Provide a distribution list for the approved and accepted ATP.

2.3 RESPONSIBILITIES (Continued)

- Retain the working copy and a copy of the master in the field project files.
- Compile information and issue Acceptance Test Report.

2.3.3 Test Director is responsible for the following:

- Coordinate all acceptance testing.
- Notify all concerned parties when a change is made in the testing schedule.
- Conduct pre-job safety meeting.
- Conduct pre-job system walkdown.
- Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- Obtain from the Design Cognizant Engineer, any information or changes necessary to clear or resolve objections.
- Stop any test which may cause damage to the system until the test procedure has been revised.
- Observe tests, record test data and maintain test log.
- Evaluate recorded data, discrepancies, and exceptions.
- Approve and record authorized field changes to the ATP using the red line method.
- Sign and date every procedure section on the working copy as it is completed.
- Sign Test Execution Sheet when ATP has been performed.
- Sign Test Exception Sheet when retest has been executed and accepted.
- Record exceptions and test steps that are not performed on the ATP EXCEPTION RECORD. Add additional ATP EXCEPTION RECORD sheets as needed.
- Transfer the final test results with Quality Control's signatures and dates for each applicable section to the master in ink or type.

2.3.4 Quality Assurance is responsible for the following:

2.3 RESPONSIBILITIES (Continued)

- Approval of testing by signing Test Execution sheet.
- Approval of Acceptance Test Report.

2.3.5 Quality Control is responsible for the following:

- Verifying/Witnessing results of testing to established criteria as identified in the Test Procedure.
- Signing and verifying completion of sections 5.3 Pressure Decay Test and 5.13 Glycol System Leak Check.
- Signing Test Data Sheets.
- Approval of test exceptions by signing ATP Exception Records

2.3.6 Safety is responsible for the following:

- Signing Test Execution sheet.

2.4 REFERENCES

2.4.1 The following documents were used to write or are referenced in this procedure:

- HNF-PRO-079, PRE-JOB SAFETY PLANNING and HNF-PRO-088, ELECTRICAL WORK SAFETY.
- WHC-CM-6-1 EP 4.2., STANDARD ENGINEERING PRACTICE, "TESTING REQUIREMENTS"
- WHC-IP-1026 APP M, ENGINEERING PRACTICE GUIDELINES "ACCEPTANCE TEST PROCEDURES AND REPORTS"
- H-14-100867, 500 CFM PORTABLE EXHAUSTER'S B, C, &D (Mechanical drawings)
- H-14-100868, EXHAUSTER B, C, &D CONNECTION DIAGRAM (Electrical drawings)
- H-14-100869, ELECTRICAL EXHAUSTER B, C, & D SKID ELEVATIONS AND PLAN drawings
- H-14-100807, ELECTRICAL EXHAUSTER B, C, & D SKID DETAILS drawings
- H-14-100916, ELECTRICAL SAMPLE CABINET, (GEMS drawings)

2.4 REFERENCES (Continued)

- H-14-020160, EXHAUSTER PIPING & INSTRUMENT DIAGRAM
- ASME, 1989a, Nuclear Power Plant Air-Cleaning Units and Components, ASME N509-1989, American Society of Mechanical Engineers (ASME), New York.
- ASME, 1989b, Testing of Nuclear Air Treatment Systems, ASME N510-1989, ASME, New York.
- VENDOR INFORMATION

2.5 SAFETY

Warning - Energized circuits and leads are contained inside the cabinets. Observe appropriate electrical precautions. Comply with HNF-PRO-088, ELECTRICAL WORK SAFETY.

Caution - Do not apply Megger voltage to the Variable Frequency Drive VTP-VFD-001. Damage to the drive may result.

2.5.1 The following administrative procedures control work performed in this procedure:

- 277W Boiler Shop Emergency Preparedness Plan
- Industrial Hygiene Manual, WHC-CM-4-40
- Safety Manual, WHC-CM-1-10

2.6 QUALITY ASSURANCE

A Quality Assurance Engineer will be provided by Lockheed Martin Hanford Company. Quality Assurance will approve the Acceptance Test Plan document, Test Execution sheet, and the Acceptance Test Report.

A Quality Control representative will provide witnessing and verification of testing activities as defined in Section 2.3.5 of this document. It is anticipated that Dyncorp Fabrication Services will provide Quality Control personnel to support testing activities. Substitute Quality Control personnel may be used at the discretion of the Test Director and the Quality Assurance Engineer.

2.7 GENERAL INFORMATION

2.7.1 Complete each procedure step in the given order, unless otherwise noted, or as directed by the Test Director.

2.7.2 All entries recorded in this procedure shall be made in black ink except for those noted using the redline method.

2.7.3 Editorial changes required to this ATP may be made per the red line method by the Test Director as long as they do not impact operational facility safety function or performance, and will not compromise or influence the test data. Any changes affecting the above stated criteria shall be made in accordance with WHC-CM-6-1, Standard Engineering Practices, EP-2.2, Engineering Document Change Control Requirements.

2.7.4 Any non-conformance of the instrumentation, unexpected results, or exceptions during testing shall be sequentially numbered and recorded in the ATP EXCEPTION LOG. Thus, case-by-case resolution, recording, approval, and distribution of each exception will be achieved.

2.7.5 Do not perform any part of this procedure on faulty equipment. If faulty equipment is discovered, STOP the execution of this procedure and resolve the problem (i.e. repair equipment or write up faulty equipment as an exception and continue).

2.7.6 At the completion of daily ATP testing, or if testing is suspended for any reason, ensure that the 500 CFM Portable Exhauster is shutdown and in a safe de-energized state.

2.7.7 The intent of this ATP is to provide a method for documenting the condition and capabilities of the as-built Exhauster unit. The attached ATP Exception Log and Exception Record provides the means of documenting Acceptance Testing results and equipment conditions. Additional sheets are to be used as necessary to delineate the progress of the ATP.

2.7.8 The performance of this test may take several days. At the end of each day the power to all circuits must be turned off. The Test Director will ensure proper power is restored as needed.

2.7.9 There are no special training requirements beyond Hanford General Employee Training for testing personnel.

2.7.10 During operation of the alarm interlock checks the message view may display "Fan Shutdown" before the initial alarm. This is NOT an exception and may be cleared any time it is displayed.

3.0 RECORDS

3.1 The completed working copy of this procedure and all exception logs and exception records generated by this procedure will be kept as permanent records.

4.0 PREREQUISITES

4.1 The following supplies will be needed to perform this procedure:

- Yokogawa hand held transmitter configurer BT-200.
- Digital Multi-Meter: Portable, 0-600 volts AC, ± 2% accuracy.
- Propylene Glycol (An amount that will fill system to 60% of volume with a 50/50 mixture of propylene glycol and deionized water).
- Pressure measurement device, accurate to ± 0.1 in. wg, approximate range of 0 to 12 in. wg.

  Calibration No. _____ Expiration Date _____

- Pressure measurement device, suitable for water or water/glycol mixture, range from 0 to minimum 15 and maximum 40 psig with maximum 1 psi graduation.

  Calibration No. _____ Expiration Date _____

- Pressure source: water or water/glycol mixture, 0 - 10 psig
- Barometer, accurate to ± 0.01 in. Hg, or use Hanford weather station data (373-2716)

  Reading:_____

- Compressed air source (or blower), pressure reducer (or damper), isolation valve, and safety relief mechanism
- Vacuum source (Capable of producing -12.0 IN W.C) and isolation valve.
- Vibration Instrument, SKF CMVA10 (or as specified by Project Engineer)

  Calibration No. _____ Expiration Date _____

- Desktop/Laptop computer to interface with the Exhauster SLC Logic program.
- 480V, 3 phase power source.

4.0 PREREQUISITES (Continued)

- 1000V and 500V megohmeter.
- Clamp on AC ammeter for indication only
- Portable Calibration System (C-Box) Model 401-18-20 by DrexelBrook.

4.2 The following documents are required to perform this procedure:

- Engineering drawings and appropriate vendor information listed in section 2.4.
- Propylene Glycol MSDS (#01552)

4.3 The following conditions must be met before this test may commence:

4.3.1 **HOLD** a pre-job safety meeting has been held in accordance with IS#, PRE-JOB SAFETY PLANNING, ICF KH ENVIRONMENTAL, SAFETY, AND HEALTH PROGRAM MANUAL. ☐

4.3.2 **VERIFY** that the Exhauster is ready for testing by walking down the test area to identify and clear all hazardous conditions. ☐

4.3.3 **ENSURE** all Exhauster valves are closed.

Valve Number	Closed (√)	Valve Number	Closed (√)
VTP-V-135 (Plenum Inlet)		VTP-V-159 (Seal Pot Fill)	
VTP-V-201 (Glycol Tank outlet)		VTP-V-161 (Seal Pot Overflow)	
VTP-V-202 (Glycol Heater inlet)		VTP-V-160 (Seal Pot Drain)	
VTP-V-204 (Glycol Tank Drain)		VTP-V-158 (Exhaust Fan Drain)	
		VTP-V-136 (Exhaust Fan Inlet)	

4.3.4 **ENSURE/CLOSE** all Exhauster DPT valves are closed, except for the stack pitot valves.

4.0 PREREQUISITES (Continued)

DPT	Valve # HI	Closed (√)	Valve # LO	Closed (√)	Valve # EQUAL	Closed (√)
VTP-PDT-177 (Heater)	V-137		V-138		V-139	
VTP-PDT-178 (Pre-filter)	V-140		V-141		V-142	
VTP-PDT-180 (1st HEPA)	V-143		V-144		V-145	
VTP-PDT-182 (2nd HEPA)	V-149		V-150		V-151	
VTP-PDT-181 (1st & 2nd HEPA)	V-146		V-147		V-148	

4.3.5 **VERIFY** the Exhauster has been electrically grounded. ☐

4.3.6 Test Director **SHALL VERIFY** that section 4.0 is COMPLETE by **SIGNING** below.

_____ _____

Test Director Signature Date

5.0 PROCEDURE

5.1 POWER SYSTEM CHECK

5.1.1 **VERIFY** Main 480V Disconnect Switch VTP-DS-101 is in the OFF position. ☐

5.1.3 **VERIFY** Exhauster Fan VTP-EF-001 Motor 480V Disconnect Switch VTP-DS-102 is in the OFF position. ☐

5.1.2 **VERIFY** Glycol Heater 480V Disconnect Switch VTP-DS-201 is in the OFF position. ☐

5.1.3 **VERIFY** that Mini Power Zone 480V "primary" Circuit Breaker VTP-BRK-101 (located at Mini Power Zone Cabinet VTP-PNL-101) is OFF. ☐

5.1.4 **VERIFY** that Mini Power Zone 120V "secondary" Circuit Breaker VTP-BRK-102 (located at MPZ Cabinet) is OFF. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.5 **VERIFY** the following 120V circuit breakers (located at MPZ Cabinet) are OFF: ☐

- Circuit Breaker # 1 (Enclosure Heaters & Fans, Action Paks, Sample Enclosure Heater & Fan) ☐
- Circuit Breaker # 2 (Future Flammable Gas Monitor) SPARE ☐
- Circuit Breaker # 3 (SLC Power & Message Views, Sampler Flow Control Power Supply) ☐
- Circuit Breaker # 4 (Heat Trace/Flammable Gas Monitor Cab Heat Trace/Sampler Heat Trace) ☐
- Circuit Breaker # 5 (Convenience Receptacle) ☐
- Circuit Breaker # 6 (SLC Control Circuit, Module 8/VFD-001) ☐
- Circuit Breaker # 7 (SLC Control Circuit, (MOD 9)) ☐
- Circuit Breaker # 8 (Air Monitor Vac Pumps / Cabinet Heater & Fan) SPARE ☐

5.1.6 **VERIFY** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the OFF position. ☐

5.1.7 **VERIFY** Glycol Pump Control Switch VTP-HS-102 (located on door of Control Cabinet VTP-CP-105) is in the OFF position. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.8 **VERIFY** Seal Pot Pump Control Selector Switch VTP-HS-101 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the AUTO position. ☐

5.1.9 **VERIFY** CAB HEAT/COOL Selector Switch VTP-HS-105 (Located on door of Control Cabinet VTP-CP-105) is in OFF position. ☐

5.1.10 **VERIFY** CAB HEAT/COOL Selector Switch VTP-HS-104 (Located on door of Heat Trace Cabinet VTP-ENCL-104) is in OFF position. ☐

5.1.11 **INSTALL** Personal Locking Device on Main 480V Disconnect Switch VTP-DS-101. ☐

5.1.12 **DISCONNECT** Exhauster fan motor circuit from the Variable Frequency Drive (VTP-VFD-001) terminals T1, T2 and T3. ☐

> **CAUTION**
> Do not apply Megger voltage to the Variable Frequency Drive VTP-VFD-001. Damage to the drive may result.

5.1.13 **USING** A 1000V Megger, megger between T1, T2 and T3 leads to ground to ENSURE there is NOT a short between the exhauster fan motor windings and ground. ☐

READING:_____ Megohm

5.1.14 **RECONNECT** Exhauster fan motor circuit to the Variable Frequency Drive (VTP-VFD-001) terminals T1, T2 and T3. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.15 **USING** a 1000V Megger, megger test at the Heater Contactor VTP-CON-206 load side (located at Heat Trace Cabinet VTP-ENCL-104), **ENSURE** there is NOT a short between Heater circuits and the Heater housing.

READING:_____ Megohm ☐

5.1.16 **DISCONNECT** neutral lead of the heat trace. ☐

5.1.17 USING a 500V Megger, **VERIFY** that Heat Trace heating leads insulation resistance to ground is greater than 100 Megohms. ☐

READING (H):_____ Megohm

READING (N):_____ Megohm

5.1.18 USING a DMM, **VERIFY** that Heat Trace heating leads resistance is less then 1000 ohms between leads. ☐

5.1.19 **RE-CONNECT** neutral lead of the heat trace. ☐

5.1.20 **CONNECT** the Exhauster to a 480V 3 phase power source. ☐

5.1.21 **REMOVE** Personal Locking Device on Main 480V Disconnect Switch VTP-DS-101. ☐

5.1.22 **POSITION** Main 480V Disconnect Switch VTP-DS-101 to ON position. ☐

5.1 POWER SYSTEM CHECK (Continued)

WARNING

Energized circuits and leads are contained inside the cabinet. Observe appropriate electrical precautions. Comply with HNF-PRO-088, ELECTRICAL WORK SAFETY.

5.1.23 **CLOSE** Mini Power Zone 480V "primary" Circuit Breaker VTP-BRK-101 (located at Mini Power Zone Cabinet VTP-PNL-101). ☐

5.1.24 **CLOSE** Mini Power Zone 120V "secondary" Circuit Breaker VTP-BRK-102 (located at MPZ Cabinet). ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.25 **POSITION** the following 120V circuit breakers (located at MPZ Cabinet) to ON:

- Circuit Breaker # 1 (Enclosure Heaters & Fans, Action Paks, Sample Enclosure Heater & Fan)
- Circuit Breaker # 2 (Future Flammable Gas Monitor) SPARE
- Circuit Breaker # 3 (SLC Power & Message Views, Sampler Flow Control Power Supply)
- Circuit Breaker # 4 (Heat Trace/Flammable Gas Monitor Cab Heat Trace/Sampler Heat Trace)
- Circuit Breaker # 5 (Convenience Receptacle)
- Circuit Breaker # (6 SLC Control Circuit, Module 8/VFD-001)
- Circuit Breaker # 7 (SLC Control Circuit, (MOD 9))
- Circuit Breaker # 8 (Air Monitor Vac Pumps / Cabinet Heater & Fan) SPARE

5.1.26 **PRESS** red EMERGENCY STOP button VTP-PB-103 (located on door of Main 480V Disconnect Switch VTP-DS-101).

5.1.27 **VERIFY** the Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 has tripped.

5.1 POWER SYSTEM CHECK (Continued)

5.1.28 **RESET** the Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 to ON position. ☐

5.1.29 **VERIFY** Green FAN OFF light (located on door of exhauster Control Cabinet) is ILLUMINATED. ☐

5.1.30 **VERIFY** Red FAN RUNNING light (located on door of exhauster Control Cabinet) is NOT ILLUMINATED. ☐

5.1.31 **VERIFY** Glycol Heater is OFF by OBSERVING that the Glycol Heater Contactor VTP-CON-206 contactor (located in Heat Trace Cabinet VTP-ENCL-104) is OFF. ☐

5.1.32 **VERIFY** the Glycol Circulation Pump is OFF by LISTENING to and/or FEELING the pump. ☐

5.1.33 **VERIFY** the "HEAT TRACE ON" Indicating Light (located on door of Heat Trace Cabinet VTP-ENCL-104) is NOT ILLUMINATED. ☐

5.1.34 **VERIFY** Exhauster Control Cabinet Heater VTP-HTR-105 is OFF. ☐

5.1.35 **VERIFY** Exhauster Control Cabinet Fan VTP-F-105 is OFF. ☐

5.1.36 **VERIFY** Cabinet Heater VTP-HTR-106 in Intrinsic Barrier Cabinet is OFF. ☐

5.1.37 **VERIFY** Cabinet Fan VTP-F-106 in Intrinsic Barrier Cabinet is OFF. ☐

5.1.38 **VERIFY** Cabinet Heater VTP-HTR-104 in Heat Trace Cabinet is OFF. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.39 **VERIFY** Cabinet Fan VTP-F-104 in Heat Trace Cabinet is OFF. ☐

5.1.40 **VERIFY** Alarm Cabinet Heater VTP-HTR-107 is OFF. ☐

5.1.41 **VERIFY** Alarm Cabinet Fan VTP-F-107 is OFF. ☐

5.1.42 **POSITION** Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 to OFF position. ☐

5.1.43 **REMOVE** electrical panel cover at MPZ cabinet. ☐

5.1.44 **POSITION** Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 to ON position. ☐

5.1 POWER SYSTEM CHECK (Continued)

WARNING

Energized circuits and leads are contained inside the cabinet. Observe appropriate electrical precautions. Comply with HNF-PRO-088, ELECTRICAL WORK SAFETY.

5.1.45 **USING** a DMM, **VERIFY** 120V at the following circuit breakers (located at MPZ cabinet):

- Circuit Breaker # 1 (Enclosure Heaters & Fans, Action Paks, Sample Enclosure Heater & Fan) ☐
- Circuit Breaker # 2 (Future Flammable Gas Monitor) SPARE ☐
- Circuit Breaker # 3 (SLC Power & Message Views, Sampler Flow Control Power Supply) ☐
- Circuit Breaker # 4 (Heat Trace/Flammable Gas Monitor Cab Heat Trace/Sampler Heat Trace) ☐
- Circuit Breaker # 5 (Convenience Receptacle) ☐
- Circuit Breaker # 6 SLC Control Circuit, Module 8/VFD-001 ☐
- Circuit Breaker # 7 (SLC Control Circuit, (MOD 9)) ☐
- Circuit Breaker # 8 (Air Monitor Vac Pumps / Cabinet Heater & Fan) SPARE ☐

5.1.46 **PRESS** Ground Fault Circuit Interrupter button at Circuit Breaker #5 (located at MPZ Cabinet). ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.47 **VERIFY** circuit breaker #5 has tripped. ☐

5.1.48 **RESET** circuit Breaker #5. ☐

5.1.49 **PRESS** the button of Ground Fault Protection for Equipment (located at MPZ Cabinet Circuit Breaker #4). ☐

5.1.50 **VERIFY** circuit Breaker #4 (located at MPZ Cabinet) has tripped. ☐

5.1.51 **RESET** circuit Breaker #4. ☐

5.1.52 **POSITION** Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 to OFF position. ☐

5.1.53 **RE-INSTALL** electrical panel cover at MPZ cabinet. ☐

5.1.54 **POSITION** Main 480V Disconnect Switch Circuit Breaker VTP-DS-101 to ON position. ☐

NOTE: The following steps verify proper operation of the Cabinet Cooling Fans and Cabinet Heaters.

5.1.55 **SET** the Alarm Cabinet Heater VTP-HTR-107 thermostat temperature to above the ambient temperature. ☐

5.1.56 **SET** the Control Cabinet Heater VTP-HTR-105 thermostat temperature to above the ambient temperature. ☐

5.1.57 **POSITION** the Control Cabinet Selector switch "CAB HEAT/COOL Selector" VTP-HS-105 to "SUMMER". ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.58 **VERIFY** the following:

- Control Cabinet Cooling Fan VTP-F-105 is rotating. ☐
- Control Cabinet Cooling Fan VTP-F-105 air flow is flowing from the outside to the inside of the cabinet. ☐
- Alarm Cabinet Cooling Fan VTP-F-107 is rotating. ☐
- Alarm Cabinet Cooling Fan VTP-F-107 air flow is flowing from the outside to the inside of the cabinet. ☐
- Control Cabinet Heater VTP-HTR-105 is OFF. ☐
- Alarm Cabinet heater VTP-HTR-107 is OFF. ☐

5.1.59 **POSITION** the control cabinet selector switch "CAB HEAT/COOL" VTP-HS-105 to "Winter". ☐

5.1.60 **VERIFY** the following:

- Control Cabinet Cooling Fan VTP-F-105 is OFF. ☐
- Alarm Cabinet Cooling Fan VTP-F-107 is OFF. ☐
- Control Cabinet Heater VTP-HTR-105 is ON. ☐
- Alarm Cabinet Heater VTP-HTR-107 is ON. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.61 **SET** the Control Cabinet Heater VTP-HTR-105 thermostat temperature to below the ambient temperature. ☐

5.1.62 **VERIFY** Control Cabinet Heater element VTP-HTR-105 is OFF and Heater fan is ON. ☐

5.1.63 **SET** the Alarm Cabinet Heater VTP-HTR-107 thermostat temperature to below the ambient temperature. ☐

5.1.64 **VERIFY** Alarm Cabinet Heater element VTP-HTR-107 is OFF and Heater fan is ON. ☐

5.1.65 **POSITION** the Control Cabinet Selector Switch "CAB HEAT/COOL" VTP-HS-105 to OFF. ☐

5.1.66 **POSITION** the Heat Trace Cabinet Selector switch "CAB HEAT/COOL Selector" VTP-HS-104 to "SUMMER". ☐

5.1.67 **VERIFY** the following:

- Heat Trace Cabinet Cooling Fan VTP-F-104 is rotating. ☐
- Heat Trace Cabinet Cooling Fan VTP-F-104 air flow is flowing from the outside to the inside of the cabinet. ☐
- Intrinsic Barrier Cooling Fan VTP-F-106 is rotating. ☐
- Heat Trace Cabinet Heater VTP-HTR-104 is OFF. ☐
- Intrinsic Barrier Cabinet heater VTP-HTR-106 is OFF. ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.68 **POSITION** the Heat Trace cabinet selector switch "CAB HEAT/COOL" VTP-HS-104 to "Winter". ☐

5.1.69 **VERIFY** the following:

- Heat Trace Cabinet Cooling Fan VTP-F-104 is OFF. ☐
- Intrinsic Barrier Cabinet Cooling Fan VTP-F-106 is OFF. ☐
- Heat Trace Cabinet Heater VTP-HTR-104 is ON. ☐
- Intrinsic Barrier Cabinet Heater VTP-HTR-106 is ON. ☐

5.1.70 **SET** the Heat Trace Cabinet Heater VTP-HTR-104 thermostat temperature to below the ambient temperature. ☐

5.1.71 **VERIFY** Heat Trace Cabinet Heater element VTP-HTR-104 is OFF and Heater fan is ON. ☐

5.1.72 **SET** the Intrinsic Barrier Cabinet Heater VTP-HTR-106 thermostat temperature to below the ambient temperature. ☐

5.1.73 **VERIFY** Intrinsic Barrier Cabinet Heater element VTP-HTR-106 is OFF and Heater fan is ON. ☐

5.1.74 **POSITION** the Heat Trace Cabinet Selector Switch "CAB HEAT/COOL" VTP-HS-104 to OFF. ☐

5.1 POWER SYSTEM CHECK (Continued)

WARNING

Energized circuits and lead are contained inside the cabinet. Observe Appropriate electrical precautions. Comply with HNF-PRO-88, ELECTRICAL WORK SAFETY.

5.1.75 **USING** a DMM, **VERIFY** 120V at the Mini Power Zone Cabinet (VTP-PNL-101) Receptacle. ☐

5.1.76 **USING** a DMM, **VERIFY** 120V at the Alarm Cabinet (VTP-ENCL-107) Receptacle. ☐

5.1.77 **VERIFY** the Wilkerson indicators are illuminated by visual inspection. Fill in the following table.

Indicators	OK (√)	Indicators	OK (√)
VTP-PDI-177		VTP-LI-185	
VTP-PDI-178		VTP-LI-205	
VTP-PDI-180		VTP-TI-179	
VTP-PDI-182		VTP-TI-176	
VTP-PDI-181		VTP-TI-183	
VTP-FI-184			

5.1.78 **VERIFY** the Green FAN OFF indicating light (located on the door of the Exhauster Control Cabinet VTP-CP-105) is ILLUMINATED: ☐

5.1 POWER SYSTEM CHECK (Continued)

5.1.79 **VERIFY** the digital readouts on the following six DPTs. ☐

Transmitter	OK (✓)	Transmitter	OK (✓)
VTP-DPT-177 (Heater)		VTP-DPT-182 (2nd HEPA)	
VTP-DPT-178 (Pre-filter)		VTP-DPT-181 (1st & 2nd HEPA)	
VTP-DPT-180 (1st HEPA)		VTP-FI-184 (Stack)	

5.1.80 **POSITION** the following 120V circuit breakers (located at MPZ Cabinet) to OFF. ☐

- Circuit Breaker #2 (Future Flammable Gas Monitor) SPARE ☐
- Circuit Breaker #8 (Air Monitor Vac Pumps / Cabinet Heater & Fan) ☐

5.1.81 Test Director **SHALL VERIFY** that section 5.2 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.2 CONDENSATE DRAIN TEST

This section of the procedure will verify that the condensate drains are free of obstructions and capable of draining liquids to the seal pot. Depending on the system configuration, some of the condensate drains may not be accessible for testing.

5.2.1 **REMOVE** the 1st & 2nd stage HEPA filter and Pre-filter access doors. ☐

5.2.2 **REMOVE** blind flange from Seal Pot Drain Valve VTP-V-160. ☐

5.2.3 **OPEN** Seal Pot Overflow Valve VTP-V-161. ☐

5.2.4 **OPEN** Seal Pot Drain Valve VTP-V-160 AND DRAIN any liquids. ☐

5.2.5 **POUR** water into the Pre-Filter Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2.6 **VERIFY** the Pre-Filter Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.7 **POUR** water into the First Test Section Condensate Drain unit it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2.8 **VERIFY** the First Test Section Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.9 **POUR** water into the First Hepa Section Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2 CONDENSATE DRAIN TEST (Continued)

5.2.10 **VERIFY** the First Hepa Section Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.11 **POUR** water into the Second Test Section Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2.12 **VERIFY** the Second Test Section Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.13 **POUR** water into the Second Hepa Section Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2.14 **VERIFY** the Second Hepa Section Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.15 **OPEN** the Fan Condensate Drain Valve VTP-V-158. ☐

5.2.16 **POUR** water into the Fan Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until about 1 gallon of water has been added. ☐

5.2.17 **VERIFY** the Fan Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2.18 **POUR** water into the Heater Section Condensate Drain until it exits the Seal Pot Drain Valve VTP-V-160, or until 1 gallon of water has been added. ☐

5.2.19 **VERIFY** the Heater Section Condensate Drain is functional by observing water exiting the seal pot drain. ☐

5.2 CONDENSATE DRAIN TEST (Continued)

5.2.20 **VERIFY** the Seal Pot Overflow is functional by observing water exiting the Seal Pot Overflow Valve VTP-V-161. ☐

5.2.21 **CLOSE** the Seal Pot Overflow valve VTP-V-161. ☐

5.2.22 **CLOSE** the Seal Pot Drain Valve VTP-V-160. ☐

5.2.23 **INSTALL** the 1st & 2nd stage HEPA filter and Pre-filter access doors UNLESS acceptance testing, including section 5.3, will continue. ☐

5.2.24 Test Director **SHALL VERIFY** that section 5.1 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.3 PRESSURE DECAY TEST

5.3.1 **PERFORM** the following inspections. ☐

5.3.1.1 **REMOVE** filter housing doors. ☐

5.3.1.2 **REPAIR** components as noted on the Exception Resolution. ☐

5.3.1.3 **TIGHTEN** filter housing door latches in a gradual, equal sequence to ensure an even door gasket seal. ☐

5.3.2 **CLOSE** Filter train Inlet valve VTP-V-135. ☐

5.3.3 **CLOSE** Filter train Outlet valve VTP-V-136. ☐

5.3.4 **VERIFY** Seal Pot VTP-SP-001 is empty by opening the seal pot drain valve VTP-V-160. ☐

5.3.5 **VERIFY** Seal Pot Fill Valve VTP-V-159 is CLOSED. ☐

5.3.6 **VERIFY** Seal Pot Overflow Drain Line Valve VTP-V-161 is CLOSED. ☐

5.3.7 **CLOSE** Seal Pot Drain Valve VTP-V-160. ☐

5.3.8 **VERIFY** Fan Drain Line Valve VTP-V-158 is CLOSED. ☐

5.3.9 **UNSCREW** cap on the first stage HEPA Filter Aerosol Injection Port VTP-FTP-002 on the test section next to the Prefilter. ☐

5.3 PRESSURE DECAY TEST (Continued)

5.3.10 **INSTALL AND SEAL** the pressure measuring device into the first stage HEPA Filter Aerosol Injection Port VTP-FTP-002. ☐

5.3.11 **INSTALL** the air supply line (with safety relief mechanism, isolation valve, and pressure reducer) into the second stage HEPA Filter Aerosol Test Port VTP-FTP-003. ☐

NOTE: Next step starts checking positive pressure decay.

5.3.12 **PRESSURIZE** housing/duct assembly to +11.5 ± 0.5 in wg. ☐

5.3.13 **MAINTAIN** constant pressure until temperature remains constant within ± 0.5 °F as indicated by VTP-TI-179 for a minimum of 10 minutes. ☐

5.3.14 **ISOLATE** the air supply from the filter housing while STARTING the clock. ☐

5.3.15 **RECORD** the initial time, barometric pressure, housing pressure, and temperature on Data Sheet 1 (Weather Station 373-2716). ☐

5.3 PRESSURE DECAY TEST (Continued)

5.3.16 **RECORD** pressure and temperature readings a minimum of once a minute, until pressure decays to 75% of the recorded starting pressure (previous step) or for a maximum of 15 minutes, which ever comes first on the following table. ☐

Barometric Pressure:_____								
Minute	Initial	1	2	3	4	5	6	7
pr (in WC)								
Temp (°F)								
Minute	8	9	10	11	12	13	14	15
pr (in WC)								
Temp (°F)								

5.3.17 **RECORD** final time, barometric pressure, and temperature on Data Sheet 1. ☐

5.3.18 **PERFORM** the leak rate calculations per Data Sheet 1. ☐

5.3.19 **ENSURE** the leak rate calculations are verified independently by QC. ☐

5.3.20 **IF** $Q < L_s$ then **RECORD** "PASS" on Data Sheet 1. Otherwise, **RECORD** "RETEST" on Data Sheet 1. ☐

5.3 PRESSURE DECAY TEST (Continued)

5.3.21 **IF** a retest is needed, then **PERFORM** the following: ☐

5.3.21.1 **REPEAT** steps 5.2.14 through 5.2.24 using new data sheets ☐

5.3.22 **DISCONNECT** the air supply. ☐

5.3.23 **SLOWLY RELIEVE** pressure from Filter Train housing through valve manifold assembly. ☐

5.3.24 **CONNECT** a vacuum source to the Pressure Test Assembly at Aerosol Injection Port VTP-FTP-003. ☐

NOTE: Next step starts checking negative pressure decay.

5.3.25 **DECREASE** Filter Train housing internal pressure to -11.5 ± 0.5 IN W.C. as INDICATED by the Pressure measuring device. ☐

5.3.26 **MAINTAIN** constant pressure until temperature remains constant within ± 0.5 °F for a minimum of 10 minutes. ☐

5.3.27 **ISOLATE** the vacuum source from the filter housing while starting the clock. ☐

5.3.28 **RECORD** the initial time, barometric pressure, pressure, and temperature on Data Sheet 2 (Weather Station 373-2716). ☐

5.3 PRESSURE DECAY TEST (Continued)

5.3.29 **RECORD** pressure and temperature readings a minimum of once a minute, UNTIL pressure decays to 75% of the recorded starting pressure (previous step) or for a maximum of 15 minutes, which ever comes first on the following table.

☐

Barometric Pressure:_____								
Minute	Initial	1	2	3	4	5	6	7
pr (in WC)								
Temp (°F)								
Minute	8	9	10	11	12	13	14	15
pr (in WC)								
Temp (°F)								

5.3.30 **RECORD** final time, barometric pressure, and temperature on Data Sheet 2.

☐

5.3.31 **PERFORM** the leak rate calculations per Data Sheet 2.

☐

5.3.32 **ENSURE** the leak rate calculations are verified independently by QC.

☐

5.3.33 **IF** $Q < L_s$ then **RECORD** "PASS" on Data Sheet 2 **AND GO TO** step 5.2.36. Otherwise, **RECORD** "RETEST" on Data Sheet 2.

☐

5.3 PRESSURE DECAY TEST (Continued)

5.3.34 **IF** a retest is needed, then **PERFORM** the following: ☐

5.3.34.1 **DETERMINE** the leak path(s) and **REPAIR** leaks as noted on the Exception Resolution. ☐

5.3.34.2 **REPEAT** steps 5.2.28 through 5.2.37 using new data sheets. ☐

5.3.35 **DISCONNECT** the test equipment. ☐

5.3.36 **SLOWLY** equalize Filter Train housing pressure to atmospheric through the valve manifold assembly. ☐

5.3.37 **REINSTALL** the test port plugs. ☐

5.3.38 **OPEN** Filter Train Inlet valve VTP-V-135. ☐

5.3.39 **OPEN** Filter Train outlet valve VTP-V-136. ☐

5.3.40 **OPEN** Fan Drain Line Valve VTP-V-158. ☐

5.3.41 Test Director **SHALL VERIFY** that section 5.3 is COMPLETE by SIGNING below.

_____ _____
Test Director Signature Date

5.3.42 QC Inspector **SHALL VERIFY** that section 5.3 is COMPLETE by SIGNING below.

_____ _____
QC Inspector Signature Date

5.4 EXHAUSTER FAN CHECK

5.4.1 **INSTALL** all filters.

Filter Position	Filter Number	Filter In place (√)
Pre-Filter	VTP-FLT-001	
HEPA Filter 1	VTP-FLT-002	
HEPA Filter 2	VTP-FLT-003	

5.4.2 **POSITION** the EXHAUSTER FAN MOTOR DISCONNECT SWITCH VTP-DS-102 to ON. ☐

5.4.3 **VERIFY** Fan VTP-EF-001 does NOT start automatically. ☐

5.4.4 **VERIFY** Green FAN OFF light (located on door of Exhauster Control Cabinet VTP-CP-105) is ILLUMINATED. ☐

5.4.5 **VERIFY** Red FAN RUNNING light (located on door of Exhauster Control Cabinet VTP-CP-105) is NOT ILLUMINATED. ☐

5.4.6 **POSITION** Fan/Off/Enable Control Switch VTP-HS-103 to "ENABLE" position (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.4.7 **PRESS** Fan Start Button VTP-PB-101 **AND THEN QUICKLY PRESS** Fan Stop Button VTP-PB-102 (i.e. bump the fan)(located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.4.8 **VERIFY** that direction of rotation of the Exhaust fan VTP-EF-001 shaft is in the DIRECTION of the arrow on the fan housing or motor shroud. ☐

5.4 EXHAUSTER FAN CHECK (Continued)

5.4.9 **IF** Exhauster Fan VTP-EF-001 rotation direction is correct, **GO TO** step 5.4.11 ☐

5.4.10 **IF** direction of rotation of the Exhauster Fan VTP-EF-001 is in the incorrect direction, then **PERFORM** the following:

5.4.10.1 **DO NOT EXECUTE** any further part of 5.3 in this ATP UNTIL next step through 5.4.10.5 are COMPLETED. ☐

5.4.10.2 **POSITION** Fan Motor Disconnect Switch VTP-DS-102A to OFF. ☐

5.4.10.3 **INSTALL** Personal Locking Device on Fan Motor Disconnect Switch VTP-DS-102. ☐

5.4.10.4 **CORRECT** the Exhauster Fan VTP-EF-001 rotation direction by CORRECTING the leads at the Fan Motor Disconnect Switch VTP-DS-101. ☐

5.4.10.5 **INSTALL** Personal Locking Device on Fan Motor Disconnect Switch VTP-DS-102. ☐

5.4.10.6 **POSITION** Fan Motor Disconnect Switch VTP-DS-102 to ON. ☐

5.4.10.7 **REPEAT** steps 5.4.2 through 5.4.8. ☐

5.4 EXHAUSTER FAN CHECK (Continued)

5.4.11 **OPEN** the High and Low valves **AND CLOSE** Equalizing valve on each three valve manifold for the following DPTs: ☐

DPT	Valve # HI	Open (√)	Valve # LO	Open (√)	Valve # EQUAL	Closed (√)
VTP-PDT-177 (Heater)	V-137		V-138		V-139	
VTP-PDT-178 (Pre-filter)	V-140		V-141		V-142	
VTP-PDT-180 (1st HEPA)	V-143		V-144		V-145	
VTP-PDT-182 (2nd HEPA)	V-149		V-150		V-151	
VTP-PDT-181 (1st & 2nd HEPA)	V-146		V-147		V-148	

5.4.12 **POSITION** Fan Motor Disconnect Switch VTP-DS-102 to OFF. ☐

5.4.13 **REMOVE** Fan VTP-EF-001 shaft guard as required to allow access to shaft bearings. ☐

5.4.14 **POSITION** Fan Motor Disconnect Switch VTP-DS-101 to ON. ☐

5.4.15 **CONNECT** operation control console (computer) to the SLC 500 CPU. ☐

5.4.16 **FORCE** the exhaust SLC Program to run the exhaust fan at 3450 rpm. ☐

5.4.17 **POSITION** Fan/Off/Enable Control Switch VTP-HS-103 to "ENABLE" position (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.4 EXHAUSTER FAN CHECK (Continued)

5.4.18 **PRESS** Fan Start Button VTP-PB-101 (Located on door of Exhauster Control Cabinet VTP-CP-105) to turn ON Exhauster Fan VTP-EF-001. ☐

5.4.19 **VERIFY** Green FAN OFF light (located on door of Exhauster Control Cabinet VTP-CP-105) is NOT ILLUMINATED. ☐

5.4.20 **VERIFY** Red FAN RUNNING light (located on door of Exhauster Control Cabinet VTP-CP-105) is ILLUMINATED. ☐

5.4.21 **ENSURE** fan is operating normally with no unusual noise. ☐

NOTE - Next step starts the Exhauster Fan VTP-EF-001 vibration test. The testing is based on ASME N509 requirements for 3450 rpm.

5.4.22 **USING** the vibration instrument, **RECORD** the measured data in the table at next step. ☐

Plane	Axial	OK (√)	Horizontal	OK (√)	Vertical	OK (√)
Sheave End Fan Shaft Bearing Displacement (Mils) Velocity (IN/SEC)						
Fan End Fan Shaft bearing Displacement (Mils) Velocity (IN/SEC)						

5.4 EXHAUSTER FAN CHECK (Continued)

5.4.23 **VERIFY** that the Filtered Bearing Vibration Levels on the fan shaft bearings should meet the following criteria: ☐

- Displacement <.6 MILS (PK-TO-PK) at one times the fan speed.

- OR -

- Velocity < .11 IN/SEC (PK) at one times the fan speed.

5.4.24 **PRESS** Fan Stop Button VTP-PB-102 (located on door of Exhauster Control Cabinet VTP-CP-105) to turn OFF Exhauster Fan. ☐

5.4.25 **VERIFY** Exhauster fan has SHUTDOWN. ☐

5.4.26 **REMOVE** force from the exhauster SLC Program. ☐

5.4.27 **POSITION** Fan Motor Disconnect Switch VTP-DS-102 to OFF. ☐

5.4.28 **REPLACE** Fan VTP-EF-001 shaft guard. ☐

5.4.29 **POSITION** Fan Motor Disconnect Switch VTP-DS-102 to ON. ☐

5.4.30 Test Director **SHALL VERIFY** that section 5.4 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.5 HEAT TRACE CHECK

5.5.1 **ENSURE** Heat Trace 120V circuit breaker #4 (located at MPZ Cabinet VTP-PNL-101) is ON. ☐

5.5.2 **USING** a DMM, **VERIFY** 0 V at terminals TB1HTC-11 and TB2HTC-11 (located at Heat Trace Cabinet VTP-ENCL-104). ☐

5.5.3 **IMMERSE** Heat trace thermostat probe in ice. ☐

5.5.4 **WAIT** 2-5 minutes. ☐

5.5.5 **USING** a DMM, **VERIFY** 120V at terminals TB1HTC-11 and TB2HTC-11 (located at Heat Trace Cabinet VTP-ENCL-104). ☐

5.5.6 **VERIFY** Heat Trace ON amber light (located at door of Heat Trace Cabinet VTP-ENCL-104) is ILLUMINATED. ☐

5.5.7 **REMOVE** ice from the heat trace thermostat probe. ☐

5.5.8 **VERIFY** Heat Trace ON amber light (located at door of Heat Trace Cabinet VTP-ENCL-104) is NOT ILLUMINATED after probe heats up. ☐

5.5.9 **USING** a DMM, **VERIFY** 0 V at terminals TB1HTC-11 and TB2HTC-11 (located at Heat Trace Cabinet VTP-ENCL-104). ☐

5.5.10 **POSITION** Heat Trace 120V circuit breaker #4 (located at MPZ Cabinet VTP-PNL-101) to OFF. ☐

5.5 HEAT TRACE CHECK (Continued)

5.5.11 Test Director **SHALL VERIFY** that section 5.5 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Transmitter Range 0-10")

5.6.1 **ENSURE** the High, Low and Equalizing valve on VTP-DPT-180's three valve manifold are CLOSED or OPEN as indicated below:

DPT	Valve # HI	Open (√)	Valve # LO	Open (√)	Valve # EQUAL	CLosed (√)
VTP-PDT-180	V-179		V-144		V-145	

5.6.2 **REMOVE** back cover from VTP-PDT-180. ☐

5.6.3 **CONNECT** a BT-200 to the transmitter VTP-PDT-180. ☐

5.6.4 **ENSURE** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the Enable position. ☐

5.6.5 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.6.6 **WAIT** for the Exhauster fan to come up to speed. ☐

5.6.7 **SET** the BT-200 to test at 045.0%. This is equal to 4.5 IN W.C. ☐

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.8 **VERIFY** the following:

- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED. ☐
- Red FAN RUNNING light is ILLUMINATED. ☐
- Green FAN OFF light is NOT ILLUMINATED. ☐
- Message View Displays VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAY "FILTER 1 DP HI". ☐

5.6.9 **RECORD** the pressure indicated by the Wilkerson indicator VTP-PDI-180 (located on door of Exhauster Control Cabinet VTP-CP-105).

Indicated Pressure:_____ ☐

5.6.10 **ACKNOWLEDGE** the alarm by **PRESSING** the 1 button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.6.11 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.6.12 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "FILTER 1 DP HI". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.6.13 **SET** the BT-200 to test at 054.0%. This is equivalent to 5.4 IN W.C. ☐

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.14 **VERIFY** the following:

- Exhauster Fan VTP-EF-001 has SHUTDOWN.
- Red FAN RUNNING light is NOT ILLUMINATED.
- Green FAN OFF light is ILLUMINATED.
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED.
- Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "FILTER 1 DP HIHI". Any secondary alarms that are still in alarm condition will also be indicated.

5.6.15 **RECORD** the pressure indicated by the Wilkerson indicator VTP-PDI-180 (located on door of Exhauster Control Cabinet VTP-CP-105).

Indicated Pressure:_____

5.6.16 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared

5.6.17 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.18 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "FILTER 1 DP HIHI". Note: Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.6.19 **CLEAR** the BT-200 test setting. ☐

5.6.20 **FORCE** the rate of change logic. ☐

5.6.21 **PRESS** Fan Start Button PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.6.22 **WAIT** for the Exhauster fan to come up to speed. ☐

5.6.23 **SET** the BT-200 to test at 000.9%. This is equivalent to approximately 0.1 IN W.G. ☐

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.24 **VERIFY** the following:

- Exhauster Fan VTP-EF-001 has SHUTDOWN after 10 seconds.
- Red FAN RUNNING light is NOT ILLUMINATED.
- Green FAN OFF light is ILLUMINATED.
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED.
- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "Filter 1 ROC" and "FILTER 1 DP LO". Any secondary alarms that are still in alarm condition will also be indicated.

5.6.25 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared

5.6.26 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED.

5.6.27 **CLEAR** the BT-200 test setting.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.28 **REMOVE** force on the rate of change logic. ☐

5.6.29 **PRESS** the Fan Start Button PB-101 (located on the door of Exhauster Control Cabinet VTP-CP-105). ☐

5.6.30 **WAIT** 2 minutes for the fan to come up to speed. ☐

5.6.31 **RECORD** VTP-PDT-180 reading. ☐

Reading:_____

5.6.32 **SET** the BT-200 to test at 0.5 IN W.C. less then the value recorded in the previous step from transmitter VTP-PDT-180. ☐

5.6.33 **RECORD** the BT-200 setting. ☐

Setting:_____

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Continued)

5.6.34 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED. ☐
- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Exhauster fan VTP-EF-001 has shutdown. ☐
- Message view display VTP-MV-101 (located at alarm cabinet swing out panel) DISPLAYS "Filter 1 DP ROC". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.6.35 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared ☐

5.6.36 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.6.37 **DISCONNECT** BT-200 from transmitter VTP-PDT-180. ☐

5.6.38 **REPLACE** back cover on transmitter VTP-PDT-180. ☐

5.6.39 Test Director **SHALL VERIFY** that section 5.6 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Transmitter Range 0-6")

5.7.1 **ENSURE** the High, Low and Equalizing valves on VTP-DPT-182 three valve manifold are CLOSED or OPEN as indicated below:

DPT	Valve # HI	OPEN (√)	Valve # LO	OPEN (√)	Valve # EQUAL	CLOSED (√)
VTP-PDT-182	V-149		V-150		V-151	

5.7.2 **REMOVE** back cover from the transmitter VTP-PDT-182. ☐

5.7.3 **CONNECT** a BT-200 to the transmitter VTP-PDT-182. ☐

5.7.4 **ENSURE** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the Enable position. ☐

5.7.5 **PRESS** Fan Start Button PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.7.6 **WAIT** for the Exhauster fan to come up to speed. ☐

5.7.7 **SET** BT-200 to test at 053.4%. This is equivalent to 3.2 IN W.C. ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.8 **VERIFY** the following:

- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED. ☐
- Red FAN RUNNING light is ILLUMINATED. ☐
- Green FAN OFF light is NOT ILLUMINATED. ☐
- Message View Displays VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAY "FILTER 2 DP HI". ☐

5.7.9 **RECORD** value from Wilkerson indicator VTP-PDI-182 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

READING:_____IN W.C.

5.7.10 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.7.11 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.7.12 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "FILTER 2 DP HI". ☐

5.7.13 **SET** the BT-200 to test at 061.7%. This is equivalent to 3.7 IN W.C. ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.14 **VERIFY** the following:

- Exhauster Fan VTP-EF-001 has SHUTDOWN. ☐
- Red FAN RUNNING light is NOT ILLUMINATED. ☐
- Green FAN OFF light is ILLUMINATED. ☐
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED. ☐
- Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "FILTER 2 DP HIHI". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.7.15 **RECORD** value from Wilkerson indicator VTP-PDI-182 (located on door of Exhauster Control Cabinet VTP-CP-105).

READING:_____ IN W.C. ☐

5.7.16 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.7.17 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.7.18 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "FILTER 2 DP HIHI". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.19 **CLEAR** the BT-200 test setting. ☐

5.7.20 **FORCE** the rate of change logic. ☐

5.7.21 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.7.22 **WAIT** for the Exhauster fan to come up to speed. ☐

5.7.23 **SET** the BT-200 to test at 001.6%. This is equivalent to 0.1 IN W.C. ☐

5.7.24 **VERIFY** the following: ☐

- Exhauster Fan VTP-EF-001 has SHUTDOWN after 10 seconds. ☐
- Red FAN RUNNING light is NOT ILLUMINATED. ☐
- Green FAN OFF light is ILLUMINATED. ☐
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED. ☐
- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "Filter 2 ROC" and "FILTER 1 DP LO". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.25 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.7.26 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.7.27 **CLEAR** the BT-200 test setting. ☐

5.7.28 **REMOVE** force on the rate of change logic. ☐

5.7.29 **PRESS** the Fan Start Button PB-101 (located on the door of Exhauster Control Cabinet VTP-CP-105). ☐

5.7.30 **WAIT** 2 minutes for the fan to come up to speed. ☐

5.7.31 **RECORD** VTP-PDT-182 reading.

Reading:_____ ☐

5.7.32 **SET** the BT-200 to test at 0.5 IN W.C. less then the value recorded in the previous step from transmitter VTP-PDT-182. ☐

5.7.33 **RECORD** the BT-200 setting.

Setting:_____ ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.34 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED. ☐
- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Exhauster fan VTP-EF-001 has shutdown. ☐
- Message view display VTP-MV-101 (located at alarm cabinet swing out panel) DISPLAYS "Filter 2 DP ROC". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.7.35 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared ☐

5.7.36 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.7.37 **RESET** BT-200. ☐

5.7.38 **DISCONNECT** BT-200 from transmitter VTP-PDT-182. ☐

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Continued)

5.7.39 **REPLACE** back cover on transmitter VTP-PDT-182. ☐

5.7.40 Test Director **SHALL VERIFY** that section 5.7 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Transmitter Range 0-6")

5.8.1 **ENSURE** the High, Low and Equalizing valves on VTP-DPT-181 three valve manifold are CLOSED or OPEN as indicated below:

DPT	Valve # HI	OPEN (√)	Valve # LO	OPEN (√)	Valve # EQUAL	CLOSED (√)
VTP-PDT-181	V-146		V-147		V-148	

5.8.2 **REMOVE** back cover on the transmitter VTP-PDT-181. ☐

5.8.3 **CONNECT** a BT-200 to the transmitter VTP-PDT-181. ☐

5.8.4 **ENSURE** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the Enable position. ☐

5.8.5 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.8.6 **WAIT** for the Exhauster fan to come up to speed. ☐

5.8.7 **SET** the BT-200 to test at 090.1%. This is equivalent to 5.4 IN W.C. ☐

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.8 **VERIFY** the following:

- Exhauster Fan VTP-EF-001 has SHUTDOWN. ☐
- Red FAN RUNNING light is NOT ILLUMINATED. ☐
- Green FAN OFF light is ILLUMINATED. ☐
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED. ☐
- Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "FILTERS 1 & 2 DP HIHI". Any secondary alarms that are still in alarm condition will also be indicated. ☐
- Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "FILTERS 1 & 2 DP HIHI" secondary alarms that are still in alarm condition will also be indicated. ☐

5.8.9 **RECORD** value from Wilkerson indicator VTP-PDI-181 (located on door of Exhauster Control Cabinet VTP-CP-105).

READING:_____ IN W.C. ☐

5.8.10 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.8.11 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.12 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "FILTER 1&2 DP HIHI". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.8.13 **CLEAR** the BT-200 test setting. ☐

5.8.14 **FORCE** the rate of change logic. ☐

5.8.15 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.8.16 **WAIT** for the Exhauster fan to come up to speed. ☐

5.8.17 **SET** the BT-200 to test at 001.6%. This is equivalent to approximately 0.1 IN W.C. ☐

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.18 **VERIFY** the following:

- Exhauster Fan VTP-EF-001 has SHUTDOWN after 10 seconds.
- Red FAN RUNNING light is NOT ILLUMINATED.
- Green FAN OFF light is ILLUMINATED.
- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED.
- Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "Filter 1&2 ROC" and "FILTER 1&2 DP LO". Any secondary alarms that are still in alarm condition will also be indicated.
- Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "FILTER 1&2 DP LO". Any secondary alarms that are still in alarm condition will also be indicated.

5.8.19 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then three times "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel). For any secondary alarms repeat this step until all alarms are cleared.

5.8.20 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED.

5.8.21 **CLEAR** the BT-200 test setting.

5.8.22 **REMOVE** force on the rate of change logic.

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.23 **PRESS** the Fan Start Button PB-101 (located on the door of Exhauster Control Cabinet VTP-CP-105). ☐

5.8.24 **WAIT** approximately 2 minutes for the fan to come up to speed. ☐

5.8.25 **RECORD** VTP-PDT-181 reading. ☐

Reading:_____

5.8.26 **SET** the BT-200 to test at <0.5 IN W.G. of VTP-PDT-181 reading. ☐

5.8.27 **RECORD** the BT-200 setting. ☐

Setting:_____

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.28 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED. ☐
- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Exhauster fan VTP-EF-001 has shutdown. ☐
- Message view display VTP-MV-101 (located at alarm cabinet swing out panel) DISPLAYS "Filter 1 & 2 DP ROC". Any secondary alarms that are still in alarm condition will also be indicated. ☐

5.8.29 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared ☐

5.8.30 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.8.31 **DISCONNECT** BT-200 from transmitter VTP-PDT-181. ☐

5.8.32 **REPLACE** back cover on transmitter VTP-PDT-181. ☐

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK (Continued)

5.8.33 Test Director **SHALL VERIFY** that section 5.8 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.9 PREFILTER DP INTERLOCK/ALARM CHECK (Transmitter Range 0-2")

5.9.1 **ENSURE** the High, Low and Equalizing valve on VTP-DPT-178 three valve manifold are CLOSED or OPEN as indicated below:

DPT	Valve # HI	OPEN (√)	Valve # LO	OPEN (√)	Valve # EQUAL	CLOSED (√)
VTP-PDT-178	V-140		V-141		V-142	

5.9.2 **REMOVE** back cover on transmitter VTP-PDT-178. ☐

5.9.3 **CONNECT** a BT-200 to the transmitter VTP-PDT-178. ☐

5.9.4 **ENSURE** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the Enable position. ☐

5.9.5 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.9.6 **WAIT** for the Exhauster fan to come up to speed. ☐

5.9.7 **SET** the BT-200 to test at 050.5%. This is equivalent to 1.0 IN W.C. ☐

5.9 PREFILTER DP INTERLOCK/ALARM CHECK (Continued)

5.9.8 **VERIFY** the following:

- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED. ☐
- Red FAN RUNNING light is ILLUMINATED. ☐
- Green FAN OFF light is NOT ILLUMINATED. ☐
- Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "PRE-FILTER DP HI". ☐

5.9.9 **RECORD** value from Wilkerson indicator VTP-PDI-178 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

READING:_____ IN W.C.

5.9.10 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.9.11 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.9.12 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "PRE-FILTER DP HI". ☐

5.9.13 **DISCONNECT** BT-200. ☐

5.9.14 **REPLACE** back cover on transmitter VTP-PDT-178. ☐

5.9 PREFILTER DP INTERLOCK/ALARM CHECK (Continued)

5.9.15 Test Director **SHALL VERIFY** that section 5.9 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.10 STACK FLOW INTERLOCK/ALARM CHECK

5.10.1 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.10.2 **WAIT** for the Exhauster fan to come up to speed. ☐

5.10.3 **FORCE** fan input to 500 CFM. ☐

5.10.4 **VERIFY** fan operation continues. ☐

5.10.5 **RECORD** value indicated by Wilkerson indicator VTP-FT-184 (located on door of Exhauster Control Cabinet VTP-CP-105).

READING:_____ ☐

5.10.6 **VERIFY** Wilkerson indicator VTP-FT-184 (located on door of Exhauster Control Cabinet VTP-CP-105) is READING within a range of 495 CFM and 505 CFM. ☐

5.10.7 **FORCE** fan input to 530 CFM. ☐

5.10 STACK FLOW INTERLOCK/ALARM CHECK (Continued)

5.10.8 **PERFORM** the following:

- **RECORD** value indicated on Wilkerson indicator VTP-FI-184 (located on door of Exhauster Control Cabinet VTP-CP-105), corresponding to transmitter FT-184.

  READING:_____ ☐

- **VERIFY** Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED. ☐

- **VERIFY** Wilkerson indicator VTP-FI-184 (located on door of Exhauster Control Cabinet VTP-CP-105), corresponding to transmitter FT-184, is READING a flow rate within a range of 525 CFM and 535 CFM. ☐

- **VERIFY** Message View Display MV-101 and MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "STACK FLOW HI". ☐

5.10.9 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.10.10 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.10.11 **VERIFY** Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) CLEARS alarm message. ☐

5.10.12 **CLEAR** force. ☐

5.10.13 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.10 STACK FLOW INTERLOCK/ALARM CHECK (Continued)

5.10.14 **WAIT** for the Exhauster fan to come up to speed. ☐

5.10.15 **FORCE** rate of change and low flow. ☐

5.10.16 **FORCE** fan input to 230 CFM. ☐

5.10.17 **RECORD** the value indicated on the Wilkerson indicator VTP-FI-184 (located on door of Exhauster Control Cabinet VTP-CP-105), corresponding to transmitter FT-184.

READING:_____ ☐

5.10.18 **VERIFY** the Wilkerson indicator VTP-FI-184 (located on door of Exhauster Control Cabinet VTP-CP-105), corresponding to transmitter FT-184, is READING a flow rate within a range of 225 CFM and 235 CFM. ☐

5.10.19 **REMOVE** rate of change and low flow forces. ☐

5.10.20 **VERIFY** after 10 second the Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED. ☐

5.10 STACK FLOW INTERLOCK/ALARM CHECK (Continued)

5.10.21 **VERIFY** the following after 30 seconds:

- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Exhauster fan VTP-EF-001 has shutdown. ☐
- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "STACK FLOW LO". ☐

5.10.22 **ACKNOWLEDGE** the alarm by PRESSING the "1" button, then PRESSING the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.10.23 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.10.24 **VERIFY** Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) CLEARS alarm message. ☐

5.10.25 **REMOVE** all fan input forces. ☐

5.10.26 Test Director **SHALL VERIFY** that section 5.10 is COMPLETE by SIGNING below.

_____ _____
Test Director Signature Date

5.11 SEAL POT INTERLOCK/ALARM CHECK

5.11.1 **ENSURE** Seal Pot Drain Valve VTP-V-160 is in the CLOSED position. ☐

5.11.2 **ENSURE** Seal Pot Overflow Drain Line Outlet Valve VTP-V-161 is in the FULL OPEN position. ☐

5.11.3 **REMOVE** Seal Pot fill cap at VTP-V-159. ☐

5.11.4 **OPEN** Seal Pot fill inlet valve VTP-V-159. ☐

5.11.5 **Add** water to Seal Pot reservoir UNTIL the seal pot reservoir is 50±5% full. ☐

5.11.6 **RECORD** the Seal Pot Level from the Wilkerson Indicator VTP-LI-185.

READING:_____ ☐

5.11.7 **ENSURE** Fan/Off/Enable Control Selector Switch VTP-HS-103 (located on door of Exhauster Control Cabinet VTP-CP-105) is in the Enable position. ☐

5.11.8 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.11.9 **WAIT** for the Exhauster fan to come up to speed. ☐

5.11.10 **ADD** water to the Seal Pot UNTIL the rotating beacon is ILLUMINATED, OR UNTIL a seal pot level of 65% is indicated on LI-105. ☐

5.11 SEAL POT INTERLOCK/ALARM CHECK (Continued)

5.11.11 **VERIFY** that the Seal Pot Level Wilkerson Indicator VTP-LI-185 is INDICATING a liquid level corresponding to 65% FULL. ☐

5.11.12 **VERIFY** the following:

- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "SEAL POT LEVEL HI". ☐
- The exhaust Fan VTP-EF-001 has shutdown. ☐
- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED. ☐

5.11.13 **ACKNOWLEDGE** the alarm by PRESSING the "1" button, then PRESSING the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.11.14 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.11.15 **OPEN** the Seal Pot drain valve VTP-V-160. ☐

5.11.16 **SLOWLY DRAIN** the Seal Pot until the alarm message clears. ☐

5.11.17 **CLOSE** the Seal Pot drain valve VTP-V-160. ☐

5.11 SEAL POT INTERLOCK/ALARM CHECK (Continued)

5.11.18 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) CLEARS alarm message at an approximate liquid level that is LESS THAN 60% FULL, as indicated by the SEAL POT LEVEL Wilkerson indicator VTP-LI-185. ☐

5.11.19 **PRESS** Fan Start Button VTP-PB-101 (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.11.20 **WAIT** for the Exhauster fan to come up to speed. ☐

5.11.21 **CONTINUALLY DRAIN** the Seal Pot until rotating beacon ILLUMINATES again, **QUICKLY CLOSE** the Seal Pot drain valve VTP-V-160. ☐

5.11.22 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED. ☐
- Red fan running light is NOT ILLUMINATED. ☐
- Green fan off light is ILLUMINATED. ☐
- Exhauster fan VTP-EF-001 has shutdown. ☐

5.11.23 **RECORD** the Seal Pot Level indicated by Wilkerson Indicator VTP-LI-185.

READING:_____ ☐

5.11.24 **VERIFY** the Seal Pot Level Wilkerson Indicator VTP-LI-185 INDICATES a liquid level of 30±5% FULL. ☐

5.11 SEAL POT INTERLOCK/ALARM CHECK (Continued)

5.11.25 **VERIFY** that the Message View Display VTP-MV-101 and VTP-MV-102 DISPLAYS "SEAL POT LEVEL LO". ☐

5.11.26 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then pressing the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.11.27 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.11.28 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) STILL DISPLAYS "SEAL POT LO". ☐

5.11.29 **ADD** water to the seal pot reservoir UNTIL the reservoir is 50±5% FULL. ☐

5.11.30 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) message has cleared. ☐

5.11.31 **CLOSE** Seal Pot fill inlet valve VTP-V-159. ☐

5.11.32 **REINSTALL** seal pot fill cap. ☐

5.11.33 Test Director **SHALL VERIFY** that section 5.11 is COMPLETE by SIGNING below.

_____ _____
Test Director Signature Date

5.12 GLYCOL INTERLOCK/ALARM CHECK

5.12.1 **ENSURE** Glycol Reservoir Tank VTP-TK-001 drain valve VTP-V-204 is closed. ☐

5.12.2 **ENSURE** Glycol Heater Piping isolation valves are open.

Valve Number	Open (√)	Valve Number	Open (√)
VTP-V-135 Plenum Inlet		VTP-V-202 Glycol Heater inlet	
VTP-V-201 Glycol Tank outlet			

5.12.3 **POSITION** Circuit Breaker #3 (located at MPZ Cabinet) to OFF. ☐

5.12.4 **DISCONNECT** probe leads from transmitter VTP-LT-205. ☐

5.12.5 **CONNECT** Drexelbrook C-Box to transmitter probe side of transmitter VTP-LT-205. ☐

5.12.6 **CONNECT** 3-terminal wire to capacitance unit. ☐

5.12.7 **SET** range switch to NORMAL. ☐

5.12.8 **CONNECT** Drexelbrook C-Box meter leads in series with VTP-LT-205 - OUTPUT. ☐

5.12.9 **CONNECT** terminal wire to meter. ☐

5.12.10 **SET** meter range to 4-20 mA. ☐

5.12 GLYCOL INTERLOCK/ALARM CHECK (Continued)

5.12.11 **PRESS** meter ONLY button ON (down). ☐

5.12.12 **POSITION** Circuit Breaker #3 (located at MPZ Cabinet) to ON. ☐

5.12.13 **SET** Vernier Dial to 14.5 Picofarads (pf). This is equivalent to 4 mA. ☐

5.12.14 **INCREASE** Vernier Dial to 60 pf. This is equal to approximately 60% volume (13.6 mA). ☐

5.12.15 **ENSURE** circuit breaker #6 (SLC Control Circuit, Module 8 / VFD-001) is ON (located in the MPZ cabinet VTP-DP-101). ☐

5.12.16 **POSITION** Glycol Circulation Pump Control Switch VTP-HS-102 to ON (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.12.17 **VERIFY/RECORD** the following:

- Glycol Level Wilkerson Indicator VTP-LI-205 displays a readout corresponding to a 60% level.

  READING:_____ ☐

- Glycol Circulation Pump is OPERATING by LISTENING to and/or FEELING the pump. ☐

- Glycol System has no leaks. ☐

5.12.18 **POSITION** Glycol Pump Control Switch VTP-HS-102 to OFF (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.12 GLYCOL INTERLOCK/ALARM CHECK (Continued)

5.12.19 **ACKNOWLEDGE** the PUMP OFF alarm by PRESSING the "1" button, then **PRESSING** the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.12.19.1 **POSITION** the Glycol Heater Disconnect Switch VTP-DS-102 to OFF ☐

5.12.20 **REMOVE** the thermostat cover on top of Glycol Heater VTP-HTR-001. ☐

5.12.21 **ENSURE** the Heater Thermostat is set to 190°F. ☐

5.12.22 **REPLACE** the thermostat cover of Glycol Heater VTP-HTR-001. ☐

5.12.23 **POSITION** the Glycol Heater Disconnect Switch VTP-DS-201 to ON. ☐

5.12.24 **POSITION** Glycol Circulation Pump Control Switch VTP-HS-102 to ON (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.12 GLYCOL INTERLOCK/ALARM CHECK (Continued)

WARNING

Energized circuits and lead are contained inside the cabinet. Observe Appropriate electrical precautions. Comply with HNF-PRO-88, ELECTRICAL WORK SAFETY.

5.12.25 **VERIFY** the Glycol Heater has STARTED by USING the DMM at the Glycol Heater Contactor VTP-CON-206 (located at Heat Trace Cabinet VTP-ENCL-104) and PERFORMING the following:

5.12.25.1 **RECORD** voltage between Terminal T1 and Terminal T2.

READING:_____ ☐

5.12.25.2 **VERIFY** there is a voltage between Terminal T1 and Terminal T2. ☐

5.12.25.3 **RECORD** voltage between Terminal T1 and Terminal T3.

READING:_____ ☐

5.12.25.4 **VERIFY** there is a voltage between Terminal T1 and Terminal T3. ☐

5.12.25.5 **RECORD** voltage between Terminal T2 and Terminal T3.

READING:_____ ☐

5.12.25.6 **VERIFY** there is a voltage between Terminal T2 and Terminal T3. ☐

5.12.26 **REDUCE** the impedance to simulate 50% Volume 52 pf (12 mA) on the Glycol Liquid Level Transmitter VTP-LT-205. ☐

5.12.27 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED.

5.12 GLYCOL INTERLOCK/ALARM CHECK (Continued)

☐

- Glycol Heater has SHUTDOWN by OBSERVING that the Glycol Heater Contactor VTP-CON-206 (located at Control Cabinet VTP-CP-105) is OPEN.

☐

- Glycol Circulation Pump VTP-P-001 has SHUTDOWN by LISTENING to and/or FEELING the pump.

☐

- Message Display VTP-MV-101 and VTP-MV-102 DISPLAYS "GLYCOL LEVEL LO".

☐

5.12.28 **RECORD** the liquid level indication on the Wilkerson liquid level indicator VTP-LI-205.

READING:_____ ☐

5.12.29 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared.

☐

5.12.30 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED.

☐

5.12.31 **VERIFY** Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) CLEARS alarm message.

☐

5.12.32 **POSITION** Circuit Breaker #3 (located at MPZ Cabinet) to OFF.

☐

5.12.33 **DISCONNECT** the DrexelBrook Calibrator from the Glycol Liquid Level Transmitter VTP-LT-205.

☐

5.12.34 **RECONNECT** probe leads to transmitter VTP-LT-205.

5.12 GLYCOL INTERLOCK/ALARM CHECK (Continued)

☐

5.12.35 Test Director **SHALL VERIFY** that section 5.12 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.13 GLYCOL SYSTEM LEAK CHECK

This test verifies that the glycol heater, reservoir, and associated piping do not leak to the environment. A visual leak check will be performed followed by a pressure decay test. The following cautions apply to this test section:

CAUTION

- The system under test shall be pressurized by means of a manifold consisting of a pressure gauge, pressure relief valve, isolation valve, pressure source, and a pressure release valve.
- All system components shall have pressure ratings equal to or greater than the system test pressure.
- The test gauge shall have a dial graduated from zero over a range that in no case shall be less than 1-1/2 or more than four times the intended maximum pressure.
- The pressure relief valve shall be set to operate at a pressure that does not exceed 110% of the test pressure. The relief valve pressure setting shall be verified by use of a calibrated test instrument.
- The flow capacity of the pressure relief valve shall not be less than 125% of the flow capacity of the pressurizing device.
- A means for immediately shutting off and releasing the pressure shall be provided to prevent damage if the relief valve or other critical system components fail to operate in case of over-pressurization.
- All test equipment shall be maintained in good operating condition and be capable of withstanding test pressures.
- The Material Safety Data Sheet for Glycol should be reviewed prior to working with that chemical.

5.13 GLYCOL SYSTEM LEAK CHECK (Continued)

5.13.1 **OPEN** Glycol Heater Piping isolation valves.

Valve Number	Open (√)	Valve Number	Close (√)
VTP-V-135 Plenum Inlet		VTP-V-204 Glycol Tank Drain	
VTP-V-201 Glycol Tank Outlet			
VTP-V-202 Glycol Heater Inlet			

5.13.2 **REMOVE** the fill cap from the heater reservoir. ☐

5.13.3 **CONNECT** the pressure supply manifold to the reservoir fill port. ☐

5.13.4 **SLOWLY PRESSURIZE** the heater reservoir and piping to 10 psig. ☐

5.13.5 **VISUALLY INSPECT** for leaks indicated by localized wetting. Perform this step for a minimum of 15 minutes. ☐

5.13.6 **REPAIR** any leaks per Test Director direction. ☐

5.13.7 **ENSURE** the heater reservoir and piping are pressurized to 10±2 psig. ☐

5.13.8 **ISOLATE** the pressure source by closing the manifold isolation valve. ☐

5.13 GLYCOL SYSTEM LEAK CHECK (Continued)

5.13.9 **RECORD** the initial pressure and time.

	PRESSURE (psig)	TIME
INITIAL:	_____	_____
FINAL:	_____	_____

5.13.10 **WAIT** 10 minutes. ☐

5.13.11 **RECORD** the final pressure and time. ☐

5.13.12 **VERIFY** there was no pressure drop during the 10 minute time period.

_____ _____
Quality Control Signature Date

5.13.13 **RELIEVE** pressure from the system by slowly opening the manifold release valve. ☐

5.13.14 **DISCONNECT** and **REMOVE** the pressure supply and manifold. ☐

5.13.15 Test Director **SHALL VERIFY** that section 5.13 is COMPLETE by SIGNING below.

_____ _____
Test Director Signature Date

5.13.16 QC Inspector **SHALL VERIFY** that section 5.13 is COMPLETE by SIGNING below.

_____ _____
QC Inspector Signature Date

5.14 THERMOCOUPLE INTERLOCK/ALARM CHECK

5.14.1 **REMOVE** thermocouple TE-179 from the thermowell. ☐

5.14.2 **POSITION** the Glycol Heater Disconnect Switch VTP-DS-201 to ON. ☐

5.14.3 **ENSURE** circuit breaker #6 (SLC Control Circuit, Module 8 / VFD-001) is ON (located in the MPZ cabinet VTP-DP-101). ☐

5.14.4 **POSITION** Glycol Circulation Pump Control Switch VTP-HS-102 to ON (located on door of Exhauster Control Cabinet VTP-CP-105). ☐

5.14.5 **VERIFY** Glycol Heater has STARTED by OBSERVING that the Glycol Heater Contactor VTP-CON-206 (located at Control Cabinet VTP-CP-105) is CLOSED. ☐

5.14.6 **HEAT** thermocouple TE-179 with a Hot Air Gun UNTIL the Wilkerson Indicator VTP-TI-179 is indicating >200°F. ☐

5.14.7 **VERIFY** the following:

- Clear Rotating Beacon VTP-XA-101 (located on stack support framing) is ILLUMINATED. ☐
- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "HEATER AIR TEMP HI". ☐
- Glycol Heater has SHUTDOWN by OBSERVING that the Glycol Heater Contactor VTP-CON-206 (located at the Control Cabinet VTP-CP-105) is OPEN. ☐

5.14 THERMOCOUPLE INTERLOCK/ALARM CHECK (Continued)

5.14.8 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.14.9 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.14.10 **VERIFY** Message View Display VTP-MV-101 (located at Alarm Cabinet Swing Out Panel) CLEARS alarm message. ☐

5.14.11 **ALLOW** thermocouple TE-179 to cool to <100°F. ☐

5.14.12 **PLACE** thermocouple TE-179 in a cup of ice. ☐

5.14.13 **VERIFY** the following AFTER the thermocouple indicates <40°F on Wilkerson Indicator VTP-TI-179: ☐

- Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED.

- **RECORD** indication on Wilkerson indicator TI-179 (located on door of Exhauster Control Cabinet VTP-CP-105) corresponding to VTP-TE-176.

READING:_____ ☐

- Message View Display VTP-MV-101 and VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS "HEATER TEMP LO". ☐

5.14.14 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the Message View Display VTP-MV-101 (located at Alarm Cabinet VTP-ENCL-107 Swing Out Panel) three times. For any secondary alarms repeat this step until all alarms are cleared. ☐

5.14 THERMOCOUPLE INTERLOCK/ALARM CHECK (Continued)

5.14.15 **VERIFY** Clear Rotating Beacon VTP-XA-101 is NOT ILLUMINATED. ☐

5.14.16 **VERIFY** Message View Display VTP-MV-102 (located at Alarm Cabinet Swing Out Panel) DISPLAYS alarm message. ☐

5.14.17 **POSITION** Circuit Breaker #3 (located at MPZ Cabinet) to OFF. ☐

5.14.18 **REPLACE** Thermocouple TE-179 into the thermowell. ☐

5.14.19 Test Director **SHALL VERIFY** that section 5.14 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

5.15 GLYCOL HEATER TEST

5.15.1 **VERIFY** Glycol Reservoir Tank VTP-TK-001 is approximately 60±5% full by observing level sight glass VTP-LG-201. ☐

5.15.2 **ENSURE** the Glycol Heater Piping isolation valves are OPEN or CLOSED as indicated below: ☐

Valve Number	Open (√)	Valve Number	Open (√)
VTP-V-135 Plenum Inlet		VTP-V-202 Glycol Heater inlet	
VTP-V-201 Glycol Tank outlet		VTP-V-158 Fan Drain Valve	
VTP-V-136 Plenum Outlet			Closed (√)
		VTP-V-204 Drain Valve	

5.15.3 **POSITION** circuit breaker #6 (located in the MPZ cabinet VTP-DP-101) to OFF. ☐

5.15.4 **REMOVE** the thermostat cover on top of Glycol Heater VTP-HTR-001. ☐

5.15.5 **ENSURE** the heater thermostat is set to 190°F. ☐

5.15.6 **REPLACE** the thermostat cover on top of Glycol Heater VTP-HTR-001. ☐

5.15.7 **POSITION** circuit breaker #6 (located in the MPZ cabinet VTP-DP-101) to ON. ☐

5.15.8 **POSITION** the EXHAUSTER FAN MOTOR DISCONNECT SWITCH VTP-DS-102 to ON. ☐

5.15 GLYCOL HEATER TEST (Continued)

5.15.9 **PRESS** Fan Start Button VTP-PB-101 (Located on door of Exhauster Control Cabinet VTP-CP-105) to turn ON Exhauster Fan VTP-EF-001. ☐

5.15.10 **POSITION** the Glycol Heater Disconnect Switch VTP-DS-201 to ON. ☐

5.15.11 **POSITION** Glycol Circulation Pump Control Switch VTP-HS-102 to ON (located on door of Exhauster Control Cabinet VTP-CP-105) and record initial values for time, inlet temperature, and outlet temperature below. ☐

	INITIAL	FINAL
Time and Date		
Inlet temperature (°F), VTP-TI-176		
Outlet temperature (°F), VTP-TI-179		

5.15.12 **CONTINUE** exhauster operation until the airflow temperature indicated by thermocouple VTP-TI-179 has stabilized to vary ± 2°F or less. ☐

5.15.13 **RECORD** final values for time, inlet temperature, and outlet temperature. ☐

5.15.14 **VERIFY** the final outlet temperature is AT LEAST 20°F greater then the final inlet temperature. ☐

5.15.15 **POSITION** the Glycol Heater Disconnect Switch VTP-DS-201 to OFF. ☐

5.15.16 **POSITION** Glycol Circulation Pump Control Switch VTP-HS-102 to Off (located on door of Exhauster Control Cabinet VTP-CM-105). ☐

5.15 GLYCOL HEATER TEST (Continued)

5.15.17 **POSITION** the EXHAUSTER FAN MOTOR DISCONNECT SWITCH VTP-DS-102 to OFF. ☐

5.15.18 Test Director **SHALL VERIFY** that section 5.15 is COMPLETE by SIGNING below.

_____ _____

Test Director Signature Date

DATA SHEET 1 - LEAKAGE RATE CALCULATION (This page may be reproduced as necessary)

DATE: **TEST #:**

	INITIAL	FINAL
Time	ti =	tf =
Pressure (psig)	Pi =_____ IN W.C./ 27.7 =	Pf =_____ IN W.C. / 27.7 =
Barometric pr (IN Hg)	BPi=_____ IN Hg x 0.491 =	BPf=_____ IN Hg x 0.491 =
Duct pr (psfa)	DPi=(Pi + Bpi)(144) =	DPf=(Pf + Bpf)(144) =
Temperature (°R)	Ti =_____°F + 460 =	Tf =_____°F + 460 =

Test Volume: V = _____ cubic feet

Gas constant: R = 53.35 ft lb/(lb*degR)

Test Duration: Δt = (tf - ti) = _____ minutes

Q = (DPi/Ti - DPf/Tf)V /(R x Δt x 0.075) = _____ SCFM

Q is the Average total leak rate per ASME N510-1989, Section 6.5.3.9, in standard ft^3/min (SCFM).

L_s = Allowable Leak Rate = 0.3 SCFM

_____ _____ _____ _____

Test Director Signature Date QC Signature Date

_____ _____

Checker Signature Date

DATA SHEET 2 - LEAKAGE RATE CALCULATION (This page may be reproduced as necessary)

DATE: **TEST #:**

	INITIAL	FINAL
Time	ti =	tf =
Pressure (psig)	Pi =_____ IN W.C./ 27.7 =	Pf =_____ IN W.C. / 27.7 =
Barometric pr (IN Hg)	BPi=_____ IN Hg x 0.491 =	BPf=_____ IN Hg x 0.491 =
Duct pr (psfa)	DPi=(Pi + Bpi)(144) =	DPf=(Pf + Bpf)(144) =
Temperature (°R)	Ti =_____°F + 460 =	Tf =_____°F + 460 =

Test Volume: V = _____ cubic feet

Gas constant: R = 53.35 ft lb/(lb*degR)

Test Duration: Δt = (tf - ti) = _____ minutes

Q = (DPi/Ti - DPf/Tf)V /(R x Δt x 0.075) = _____ SCFM

Q is the Average total leak rate per ASME N510-1989, Section 6.5.3.9, in standard ft^3/min (SCFM).

L_s = Allowable Leak Rate = 0.3 SCFM

_____ _____ _____ _____

Test Director Signature Date QC Signature Date

_____ _____

Checker Signature Date

ATP EXCEPTION LOG

This page may be reproduced as necessary PAGE _____ of_____

ATP EXCEPTION LOG		
Number	Date	Description

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number:	ATP Exception Log Number:
Description of Exception:	
Resolution of Exception:	
Date of Resolution:	
Test Director signature:	
Cognizant Engineer signature:	
Quality Control signature:	