JUL 24 1998

STATION 4 26 Q

ENGINEERING DATA TRANSMITTAL

1. EDT 624762

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
SST Retrieval Projects	SST Retrieval Projects	624378
5. Proj./Prog./Dept./Div.:	**6. Design Authority/ Design Agent/Cog. Engr.:**	**7. Purchase Order No.:**
W-320	John Bailey	NA
8. Originator Remarks:		**9. Equip./Component No.:**
For Approval and Release		POR-007/POR-008
		10. System/Bldg./Facility: West Tank Farms
11. Receiver Remarks: **11A. Design Baseline Document?** [ ] Yes [X] No		**12. Major Assm. Dwg. No.:** H-14-102610
		13. Permit/Permit Application No.:
		14. Required Response Date: July 22, 1998

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-2688		0	ATR for Portable Exhauster POR-007/Skid E	Q	1,2	1	
2	HNF-2689		0	ATR for Portable Exhauster POR-008/Skid F	Q	1,2	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	1	Design Authority J.W. Bailey	J.W. Bailey	7/23/98	S2-48
		Design Agent			
1	1	Cog.Eng.TD Kaiser	RE Larson for TDK	7/22/98	T4-07
1	1	Cog. Mgr.RE Larson	RE Larson	7/22/98	T4-07
1		QA KC Conrad	Keith Conrad	7-23-98	S2-48
		Safety	Emmanuel	7-23-98	
		Env.			

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
3		W-320 Project Files			
3		JR Bellomy III			S2-48
3		SW Shaw			S2-48
1	1	JR Kriskovich	Jim Kriskovich	7-23-98	R1-56

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
S.W. Shaw 7/21/98	J.W. Lentsch	J. W. Bailey 7/23/98	[ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments
Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	Design Authority/ Cognizant Manager / Date	

ACCEPTANCE TEST REPORT FOR PORTABLE EXHAUSTER POR-007/SKID E

J.R. Kriskovich
Lockheed Martin Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 624762 UC: 510
Org Code: LK400 Charge Code: D2M41
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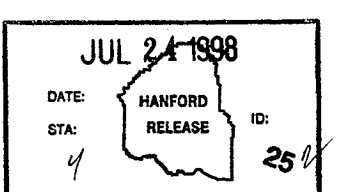
Key Words: Acceptance Test, Portable Exhauster, W320, Annulus, Ventilation

Abstract:

This document describes Acceptance Testing performed on Portable Exhauster POR-007/Skid E. It includes measurements of bearing vibration levels, pressure decay testing, programable logic controller interlocks, high vacuum, flow and pressure control functional testing.



Release Stamp

Release Approval 7/24/98 Date

Approved for Public Release

HNF-2688
Rev. 0

ACCEPTANCE TEST REPORT FOR PORTABLE EXHAUSTER POR-007/SKID E

by

S. W. Shaw
July 20, 1998

contact

J. R. Bellomy III

EXECUTIVE SUMMARY

INTRODUCTION

Portable Exhauster POR-OO7 was procured via HNF-0490, "Specification for a Portable Exhauster System for Waste Tank Ventilation." Prior to taking ownership, Acceptance testing was performed at the vendors. However at the conclusion of testing a number of issues remained that required resolution before the exhausters could be used by Project W-320.

The purpose of Acceptance testing documented by this report was to demonstrate compliance of the exhausters with the performance criteria established within HNF-0490, Rev. 1 following a repair and upgrade effort at Hanford. In addition, data obtained during this testing is required for the resolution of outstanding Non-conformance Reports (NCR), and finally, to demonstrate the functionality of the associated software for the pressure control and high vacuum exhauster operating modes provided for by W-320.

Additional testing not required by the ATP was also performed to assist in the disposition and close out of recieving inspection report and for application design information (system curve). Results of this testing are also captured within this document.

OBSERVATIONS AND CONCLUSIONS

A number of procedural deficentcies were noted in the ATP as identified by the redline/strike out comments captured in this test report. The redline comments noted have been incorporated into the ATP via ECN 647640. A listing of exceptions encountered during the ATP begins on page 108. All exceptions were resolved during testing.

A "technical" exception observed during testing occured during efforts to operate the exhausters in flow control mode at 1000 CFM (intended to simulate operation connected to a primary tank) while attached to the inlet station and HEPA filter used for testing. When operating in this configuration, exhauster inlet vacuums exceeded the 3.5 INWC interlock value, and shut down the exhauster. Upon consideration this was resolved by removing the G-1 Filter housing cover, by-passing the HEPA filter. A roughing filter was placed over the 12" diameter opening leading to the hose connection, and the butterfly damper (EW-1) was used to establish the 3 INWC vacuum required at the exhauster inlet while operating at 1000 CFM.

Noise levels produced by the exhausters were measured during the course of testing at 1000 SCFM, and found to be below the 86 dB allowed by HNF-0490 at a distance of 1 meter from the stack exit. Data obtained during sound level testing is included as Attachment 17.

Although not required by the ATP, system curves were obtained for the exhauster while operating in the high vacuum mode. High efficiency mist eliminators had been removed, seal pot drain lines in the plenum had been plugged, and the exhauster was connected to a G-1 filter housing equipped with a 1000 CFM HEPA filter by way of a 12 inch diameter hose. Using this data to plot a system curve for both the portable exhauster and the 102-AY annulus it can be shown that POR-007 should be capable of producing a flow of approximately 830 SCFM through the annulus. POR-008 appears a better fit for the 102-AY annulus, and is capable of producing

approximately 880 SCFM. Both these values assume clean HEPA filters. Test data and associated graphs for each of the exhausters is included as Attachment 18.

The functionality of the Programmable Logic Controller (PLC) interlocks and message view panel alarm displays were demonstrated successfully

The ability to isolate the seal pot from the plenum using 1" test plugs was demonstrated via the pressure decay testing performed in Section 5.22. As part of that testing it was learned that the methodology to employ for leak testing when using the plugs is to first insert the plug and pressurize the seal pot. Access is then provided to the plugs via the plenum, and the plug seal can be quickly checked using a liquid leak detector. Once the integrity of the plugs within the plenum drains has been established, the plenum is then sealed (HEME and HEPA, and pre-filter covers replaced), and pressure testing of the plenum performed. For the purposes of the ATP, pressure decay testing of the plenum was performed with the seal pot open to atmosphere to ensure that any leakage would be detected.

ATP FOR PORTABLE EXHAUSTERS
POR-007/SKID E

TEST EXECUTION SHEET

Date:

Document Number: HNF-2687 Rev 0

Exhauster Unit Numbers: POR-007/Skid E

TEST PERSONNEL

COGNIZANT ENGINEER: Terry Kaiser

Test Director: S.W. Shaw
Alt Test Director: O.D. Nelson
Test Engineer: C.S. Ghormley

TEST EXECUTION

Test Director — Date: 7/16/98

Acceptance Inspector — Date: 7/16/98

TEST APPROVAL AND ACCEPTANCE

Without ----- Exception

With ✓ ----- Exception/Resolved

With ----- Exception/Outstanding

Test Director — Date: 7/21/98

Test Engineer — Date: 7/21/1998

Cognizant Engineer — Date: 7/22/98

A/I — Date: 7/23/98

QC Inspector — Date: 7.21.98

Quality Assurance — Date: 7-23-98

Safety — Date: 7/23/98

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This Acceptance Test Procedure will ensure that the Exhauster meets the functional, operational, and safety criteria specified in HNF-S-0490, Rev 1. The components that will be tested are listed in the scope section that follows. Fan and pressure testing shall comply with ASME N509 and N510.

1.2 SCOPE

1.2.1 This procedure applies to the Emergency Backup 1000 CFM Portable Exhauster (POR-007-VTP/SKID E).

NOTE: All component identification numbers referenced in this procedure are preceded with POR-007. These prefixes will not be repeated throughout the remainder of this document.

1.2.2 The systems/functions that will be tested are:

1.2.2.1 **POWER SYSTEM CHECK**

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

1.2.2.2 **PRESSURE DECAY TEST**

This test demonstrates the integrity of the Exhauster train assembly air boundary, including the Seal Pot.

1.2.2.3 **GLYCOL SYSTEM DECAY TEST**

This test demonstrates the integrity of the glycol heater, reservoir and associated glycol piping.

1.2.2.4 **EXHAUSTER FAN CHECK**

This check will verify that the Exhauster Fan is rotating in the correct direction, and that fan shaft bearing vibration levels are within allowables defined by ANSI N-509.

1.2 SCOPE (Cont.)

1.2.2.5 **HEAT TRACE THERMOSTAT CHECK**

This check will verify that the Heat Trace thermostat functions properly.

1.2.2.6 **FILTER # 1 DP INTERLOCK/ALARM TEST**

This test will verify that 1st HEPA filter high-high, low, and Rate-of-Change (ROC) differential pressure interlocks stop the exhaust fan when conditions that simulate the rupture or plugging of the 1st HEPA filter are caused.

1.2.2.7 **FILTER # 2 DP INTERLOCK/ALARM TEST**

This test will verify that 2nd HEPA filter high-high, low, and ROC differential pressure interlocks stop the exhaust fan when conditions that simulate the rupture or plugging of the 2nd HEPA filter are caused.

1.2.2.8 **FILTER #1 & #2 DP INTERLOCK/ALARM TEST**

This test will verify that HEPA filter train high-high, low, and ROC differential pressure interlocks stop the exhaust fan when conditions that simulate the rupture or plugging of the HEPA filter train are caused.

1.2.2.9 **STACK FLOW INTERLOCK/ALARM TEST**

This test will verify that Stack High and Low Flow interlocks stop the exhaust fan when conditions outside operating set points exist .

1.2.2.10 **SEAL POT INTERLOCK/ALARM TEST**

This test will verify that Seal Pot high and low level interlocks stop the exhaust fan when conditions outside operating set points exist, and verify the operation of the seal pot pump.

1.2 SCOPE (Cont.)

1.2.2.11 **GLYCOL INTERLOCK/ALARM CHECK**

This check will:

- verify that the Glycol System low coolant level interlock illuminates the rotating beacon, shuts down the glycol system recirculation pump and coolant heater when coolant levels drop below the operational set point.
- verifies operation of the glycol recirculation pump.
- verifies that the glycol system heater is correctly wired.

1.2.2.12 **THERMOCOUPLE INTERLOCK/ALARM TEST**

This test will verify that 1st HEPA filter high and low temperature interlocks perform as required when inlet air temperatures exceed the operational set points.

1.2.2.13 **PLENUM PRESSURE DP INTERLOCK/ALARM TEST**

This test will verify that plenum pressure high vacuum and high pressure interlocks shut down the exhaust fan when operational set points are exceeded.

1.2.2.14 **GLYCOL HEATER TEST**

This test will verify that the Heater and Glycol Circulation Pump function properly, and raise the inlet air temperature 20 degrees F above ambient inlet temperature.

1.2.2.15 **FAN INLET VACUUM INTERLOCK/ALARM CHECK-PRESSURE CONTROL**

This check will verify that the high vacuum interlock and low vacuum alarm are actuated when alarm set points are exceeded with the exhauster operating in its pressure control mode.

1.2 SCOPE (Cont.)

1.2.2.16 **STACK FLOW INTERLOCK/ALARM CHECK-PRESSURE CONTROL**

This check will verify the stack flow high interlock and stack flow low alarm function as required when alarm set points are exceeded with the exhauster in its pressure control mode.

1.2.2.17 **HIGH INLET VACUUM INTERLOCK CHECK - HIGH VACUUM**

This check will verify the high vacuum interlock shuts down the fan when the fan inlet allowable vacuum is exceed when the exhauster is in its high vacuum operating mode.

1.2.2.18 **STACK FLOW ALARM CHECK - HIGH VACUUM**

This check will verify that the high stack flow alarm is activated when the alarm set point is exceeded with the exhauster configured in high vacuum operating mode.

1.2.2.19 **FUNCTIONAL TEST - FLOW CONTROL (1000 SCFM)**

This test will verify that the exhauster is capable of maintaining steady state operation at 1000 SCFM using the exhauster's flow control logic.

1.2.2.20 **FUNCTIONAL TEST - FLOW CONTROL (500 SCFM)**

This test will verify that the exhauster is capable of maintaining steady state operation at 500 SCFM using the exhauster's flow control logic.

1.2.2.21 **FUNCTIONAL TEST - PRESSURE CONTROL**

This test will demonstrate the ability of the exhauster to ventilate the 102-AY annulus using the exhauster's programmable logic controller's pressure control algorithms.

1.2 SCOPE (Cont.)

1.2.2.22 **FUNCTIONAL TEST - HIGH VACUUM**

This test will demonstrate the ability of the exhauster to ventilate the 102-AY annulus using the exhauster's programmable logic controller's high vacuum operation algorithms.

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

2.1.1 DMM -Digital Multimeter

2.1.2 DPT -Differential Pressure Transmitter

2.1.3 DS -Disconnect Switch

2.1.4 HEPA -High Efficiency Particulate Air

2.1.5 MPZ -Mini Power Zone

2.1.6 ROC -Rate of Change

2.1.7 SLC -Small Logic Controller

2.1.8 INWC -Inches Water Column

2.2 RESPONSIBILITIES

2.2.1 Craft:

- Provide assistance during ATP testing
- Provide equipment for performance of this ATP.

2.2.2 A/I Inspector:

- Witness Testing and review recorded test data for accuracy and completeness.

2.2.3 Quality Assurance

- Review acceptance test procedure for accuracy and completeness.
- Review acceptance test report for accuracy and completeness.

2.2 RESPONSIBILITIES (Cont.)

2.2.4 LOCKHEED MARTIN QC Inspector:

- Witness Testing and review recorded test data for accuracy and completeness for resolution of items identified in Non-conformance reports.

2.2.5 Test Director:

- Verifies prerequisites complete prior to start of test
- Maintaining control of the testing process and change record authorization for this ATP
- Ensures all required data is collected
- Ensures Safe and productive accomplishment of testing
- Ensure safe working conditions and practices
- Ensure compliance with test documents
- Ensures review and approval of all modifications to test procedures are completed prior to return to testing
- Acts as direct line of communication and centralized point of control during normal, abnormal, and casualty situations
- Conduct pretest briefings as required
- Schedule/reschedule tests as required
- Conduct pre-job system walkdowns
- Review test documents to validate acceptance

2.2 RESPONSIBILITIES (Cont.)

2.2.6 Test Engineer:

- Provide technical support during testing.
- Provide programming support during testing.
- Review test documents to validate acceptance.
- Record equipment status and data per this procedure.
- Record data exceptions and other notes as required on the ATP Data Sheets.
- Prepare post testing documents.

2.3 REFERENCES

- H-14-102610, "1,000 SCFM Portable Exhauster Piping and Instrumentation Schematic Diagram"
- Vendor Information VI #50024
- FMEF-037, R-3 Standardized Energized Electrical Work Permit.

2.4 GENERAL INFORMATION

2.4.1 CHANGE CONTROL

2.4.1.1 Changes to this procedure that effect technical content shall be made in accordance with HNF-PRO-440.

2.4.1.2 Editorial changes may be made to this procedure as required to accommodate procedural/editorial deficiencies that do not effect technical content. Redline changes shall be entered using red ink, initialed and dated by the Test Director. Documentation of redline changes shall be made in the Acceptance Test Report.

2.4 GENERAL INFORMATION (cont)

2.4.2 EXCEPTIONS

2.4.2.1 Test exceptions are used to document unexpected test results and identify appropriate actions, not to circumvent performance requirements or document procedural deficiencies.

2.4.2.2 All test exceptions shall be given a sequential number and recorded on Attachment 1, ATP TEST LOG.

2.4.2.3 Attachment 2, ATP TEST EXCEPTION REPORT, shall be filled out to record and disposition each test exception.

2.4.3 ALARM RESPONSE

2.4.3.1 This Acceptance Test Procedure identifies all alarms expected as a result of testing and provides instructions for responding to those alarms. During testing of High-High or Low-Low set points, High and Low alarms are also anticipated.

2.4.3.2 Unexpected alarms received during testing, that are associated with this test, shall be logged as test exceptions and evaluated by the Test Director for effect on the test.

2.4 GENERAL INFORMATION (Cont.)

2.4.4 If during performance of this procedure, any of the following conditions are found, **IMMEDIATELY** notify the assigned Test Director, his alternate, or Test Engineer:

- Any equipment malfunction which could prevent fulfillment of functional requirements
- Personnel error or procedural inadequacy which could prevent fulfillment of procedural requirements
- Any other unexpected anomalies.

Test Director shall assess the effect on the equipment and the test and direct either continuation of the test in the same section, proceeding to another attachment or section of the test, or suspension of the test per step 2.4.11 and establishing a safe condition for equipment.

2.4 GENERAL INFORMATION (Cont.)

2.4.5 Comply with the Hanford Site Wide Lock and Tag policy requirements, HNF-PRO-81.

2.4.6 All Measuring and Test Equipment (M&TE) used during performance of this procedure to collect qualitative data, with the exception of "timing devices", shall meet the following requirements:

- Be within its current calibration cycle as evidenced by an affixed calibration label
- Be capable of the desired range

All exhauster instrumentation shall be set-up per the direction of the cognizant engineer (calibration stickers not required).

2.4.7 Time keeping shall be made with commercially available timing devices.

2.4.8 It is recommended that the computer be connected to the SLC 500 CPU (per vendor data) throughout the test. However, the computer may be connected and disconnected as required to facilitate exhauster access, test schedule, and changing weather conditions.

Reference STEP 5.2.3 7/15/98

2.4.9 Testing in Sections 5.1 through 5.18 with the exception of Sections ~~5.2 and~~ 5.10 may be performed either by placing a force on the seal pot, or by filling the seal pot to the prescribed level as identified in Section 5.4. Sections ~~5.2,~~ 5.10, and 5.19 through 5.21 must be performed with the seal pot filled. Section 5.22 may be performed with a force on the seal pot or with a filled seal pot at the discretion of the Test Director. Step 5.4.1 may be performed at any time during the test as necessary to fill the seal pot.

2.4.10 A 12" 45 degree elbow may be attached to the exhauster during testing to accomodate schedule and interference considerations.

Per EX. 9: Acknowledge alarms on HV-101 anytime after MP2-1 is re-energized. CSC 7/8/98

2.4 GENERAL INFORMATION (Cont.)

2.4.11 SYSTEM STATUS

2.4.11.1 Record all changes in equipment configuration, comments and observations by participants, and all other data pertinent to the test on Attachment 1, ATP TEST LOG.

2.4.12 SUSPENSION OF TEST AND RESUMING TEST

2.4.12.1 Test Director may unilaterally, for any reason, stop testing, and place equipment in a safe condition. All suspension of testing due to exceptions shall be documented on Attachment 1, ATP TEST LOG.

2.4.12.2 If a section of the test is suspended for any reason prior to completing all steps, the Test Director shall establish initial conditions necessary to resume testing for that section. Previously completed sections need not be repeated unless directed by the Test Director to establish conditions required to resume the test.

2.4.12.3 Sections of this ATP may be performed out of sequence, per Test Directors instructions.

2.5 RECORDS

The performance copy of the ATP and all completed attachments shall be filed as a permanent test record (Acceptance Test Report).

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

Warning - Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" and the energized electrical work permit in the work package.

Warning - Exposed piping and valves on the glycol system may be thermally hot.

Warning - Fan shaft guard shall not be in place during testing to facilitate vibration and temperature readings. Observe caution and comply with barricades per HNF-PRO-101.

Caution - Heat Trace wires become Hot when energized. Use caution around Heat Trace wires and conduits.

Caution - Watch out for badgers.

4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

The following supplies shall be available at the work place:

- Yokogawa hand held transmitter configurer BT-200
- Digital Multi-Meter: Portable, 0-600 volts AC, ± 5% accuracy
  Cal Serial No. 646-45-08-172 Expiration Date 4/2/99
- Vibration Instrument
  Make IRD Model 890
  Cal Serial No. 641-84-02-001 Expiration Date 3/4/99

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES (cont)

- Type J Thermocouple Simulator and connection wire

  Cal Serial No. 545-13-55-030 Expiration Date 2/10/99

- * Pressure measurement device, ~~accurate~~ with resolution to ± 0.1 INWC, approximate range of -25 to +25 INWC. exception 01 7/7/98 10/8/98

  Cal Serial No. ~~378-31-04-036~~ 6A6-31-04-085 Expiration Date 2/23/99

- Barometer (use the Hanford weather station, 373-2716)

- Compressed air source (or blower), pressure reducer (or damper), isolation valve, and safety relief mechanism (rated to relieve at +/- 20" w.g.)

- Vacuum source (Capable of producing -20.0 INWC) and isolation valve

- Computer (to interface SLC Logic program)

- Ice Water

- Portable Calibration System (C-Box) Model 401-18-20 by DrexelBrook.

* See ATTACHMENT 9 for which device was used on any given pressure test. 7/7/98

4.2 PERFORMANCE DOCUMENTS

The following documents may be needed to perform this procedure:

- Low Tox Antifreeze Material Safety Data Sheet (#MSDSP355)
- Operating Instructions for Yokogawa hand held transmitter configurer BT-200

4.3 CONDITIONS AND ACTIONS

NOTE - Steps in Section 4.3 may be performed in any order.

NOTE - A daily pre-job briefing shall be performed by the Test Director and documented in Attachment 1, ATP TEST LOG.

4.3.1 **CONDUCT** an initial pretest briefing for all personnel involved in the performance of this ATP.

TEST DIRECTOR INITIALS/DATE: 7/6/98 /

4.3.2 **PERFORM** a walkdown inspection of the work area for unusual and/or hazardous conditions.

TEST DIRECTOR INITIALS/DATE: 7/6/98 /

4.3.3 **ENSURE** the official ATP copy and all other photocopies to be used during testing are the latest approved revision.

TEST DIRECTOR INITIALS/DATE: 7/6/98 /

4.3 CONDITIONS AND ACTIONS (Cont.)

NOTE - Signature Sheet requirement is ongoing as new individuals become involved in the procedure.

4.3.4 **ENSURE** all personnel to be involved with performance of this procedure have completed Attachment 3, ATP SIGNATURE SHEET.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

4.3.5 **ENSURE** the following filters are in place:

- Prefilter
- First and Second Stage HEPA Filters
- Roughing Filter over Exhauster Inlet when appropriate.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

4.3.6 **ENSURE** "GLYCOL EXPANSION RESERVOIR TANK" VTP-TK-001 is approximately 60±5% full by observing "GLYCOL LEVEL GAUGE" VTP-LG-201.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

4.3.7 **ENSURE** exhauster valves are aligned per Attachment 5, ATP Initial Valve Lineup prior to the start of testing.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

4.3.8 **ENSURE** NEC field inspection is complete.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

COGNIZANT ENGINEER INITIALS/DATE: 7/6/98 [signature] RED 7/22/98

4.3.9 **ENSURE** electrical circuit breakers are aligned per Attachment 4, ATP Initial Electrical Lineup prior to the start of testing.

TEST DIRECTOR INITIALS/DATE: 7/6/98 / [signature]

4.3 CONDITIONS AND ACTIONS (Cont.)

4.3.10 **ENSURE** the exhauster has been connected to a 480V, 3-Phase power source.

TEST DIRECTOR INITIALS/DATE: 7/6/98 [signature]

4.3.11 **ENSURE** that all exhauster instrumentation has been set-up for testing.

TEST DIRECTOR INITIALS/DATE: 7/6/98 [signature]

COGNIZANT ENGINEER INITIALS/DATE: 7/6/98 [signature] Rev 7/22/98

4.3.12 **ENSURE** that ARMAFLEX insulation pads are installed between exhauster skid pads and ground.

TEST DIRECTOR INITIALS/DATE: 7/6/98 [signature]

4.3.13 **ENSURE** 5 Point checks of VTP-FT-184 and VTP-PDT-170 are completed per Attachments 6 and 7.

TEST DIRECTOR INITIALS/DATE: 7/6/98 [signature]

COGNIZANT ENGINEER INITIALS/DATE: [signature] 7/6/98 Rev 7/22/98

5.0 PROCEDURE

NOTE- For all testing completed in Section 5, if "EXHAUST FAN MOTOR" VTP-M-001 does not start when "START PUSH BUTTON" VTP-PB-101 is pressed, then "STOP PUSH BUTTON" VTP-PB-102 to reset VFD and then PUSH VTP-PB-101.

5.1 POWER SYSTEM CHECK

Warning - Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" and the energized electrical work permit in the work package.

5.1.1 **ENSURE** all enclosure doors are closed and test personnel are clear of voltage hazard.

5.1.2 **ENSURE** 480 V, 3 phase power to the Exhauster is connected and turned on.

Initial: K Date: 7/6/98

ADD STEP Exception 001 K 7/6/98 7/6/98

5.1.3 **POSITION** "480 VOLT MAIN DISCONNECT" VTP-DS-101 to ON.
POSITION ~~Turn on~~ VTP-BRK-101, BRK-102, MPZ 1, MPZ2 to ON.

5.1.4 **PUSH** red "PUSH BUTTON EMERGENCY STOP" VTP-PB-103 (located on door of "480 VOLT MAIN DISCONNECT" VTP-DS-101).

5.1.5 **ENSURE** the "480 VOLT MAIN DISCONNECT" VTP-DS-101 has tripped **AND PERFORM** the following using a DMM:

5.1.5.1 **OPEN** the "480 VOLT MAIN DISCONNECT" VTP-DS-101 cabinet door.

5.1.5.2 **RECORD** voltage between Terminal L1 and Terminal L2.

READING: 0 INITIALS: K

5.1.5.3 **VERIFY** 0 V between Terminal L1 and Terminal L2.

5.1.5.4 **RECORD** voltage between Terminal L1 and Terminal L3.

READING: 0 INITIALS: K

5.1.5.5 **VERIFY** 0 V between Terminal L1 and Terminal L3.

5.1 POWER SYSTEM CHECK (Cont.)

5.1.5.6 **RECORD** voltage between Terminal L2 and Terminal L3.

READING: 0 INITIALS: CK

5.1.5.7 **VERIFY** 0 V between Terminal L2 and Terminal L3.

5.1.5.8 **CLOSE** the "480 VOLT MAIN DISCONNECT" VTP-DS-101 cabinet door.

5.1.6 **RESET** the "480 VOLT MAIN DISCONNECT" VTP-DS-101 by turning to OFF then to ON position.

WARNING

Energized circuits and leads are contained inside the cabinet. Comply with HNF-PRO-088, "Electrical Work Safety". Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" and the energized electrical work permit in the work package.

Delete Per Exception 001 7/16/98 KW

~~5.1.7 **POSITION** Mini-Power Zone 480V MAIN "MPZ PRIMARY BREAKER" VTP-BRK-101 to ON (located at Mini-Power Zone VTP-DP-101).~~

~~5.1.8 **POSITION** Mini-Power Zone 240V SECONDARY MAIN "MPZ SECONDARY BREAKER" VTP-BRK-102 to ON.~~

5.1.9 **POSITION** the following MPZ 120V circuit breakers to ON:

CIRCUIT BREAKER NUMBER	DESCRIPTION	ON (√)
MPZ-1	ACTION PAK RELAYS, POWER SUPPLIES, WILKERSON DISPLAY METERS	✓
MPZ-2	GLYCOL PUMP, SEAL POT PUMP, SHUNT TRIP, PILOT LIGHTS, ALARM BEACON	✓
MPZ-3	HEAT TRACE, GLYCOL CONTACTOR, HEAT TRACE LIGHT	✓
MPZ-4	CABINET HEATERS AND FANS	✓
MPZ-5	CONVENIENCE RECEPTACLE	✓

5.1 POWER SYSTEM CHECK (Cont.)

5.1.10 **VERIFY** the Wilkerson indicators are illuminated by visual inspection **AND COMPLETE** the following table.

INDICATORS	(√)	INDICATORS	(√)	INDICATORS	(√)	INDICATORS	(√)
VTP-PI-170	✓	VTP-FI-171	✓	VTP-FI-172	✓	VTP-FI-184	✓
VTP-PI-173	✓	VTP-FI-174	✓	VTP-FI-175	✓	VTP-PDI-177	✓
VTP-PDI-178	✓	VTP-PDI-180	✓	VTP-PDI-182	✓	VTP-PDI-181	✓
VTP-TI-176	✓	VTP-TI-179	✓	VTP-LI-185	✓	VTP-LI-205	✓
VTP-TI-183							

5.1.11 **VERIFY** the Green "ILOFF" indicating light (located on the door of "CONTROL CABINET" VTP-CP-105) is ILLUMINATED:

5.1.12 **VERIFY** the digital readouts on the following DPTs are illuminated.

Transmitter Readout Illuminated	(√)	Transmitter Readout Illuminated	(√)
VTP-PDT-170 (PLENUM)	✓	VTP-PDT-181 (FILTER #1 & #2)	✓
VTP-PDT-178 (PREFILTER)	✓	VTP-PDT-182 (HEPA FILTER #2)	✓
VTP-PDT-177 (HEATER/DEMISTER)	✓	VTP-FT-184 (STACK FLOW)	✓
VTP-PDT-180 (HEPA FILTER #1)	✓		

5.1.13 Test Director **VERIFY** section 5.1 is complete.

Test Director Signature _____ Date 6/16/98

5.1.14 A/I Inspector **VERIFY** section 5.1 is complete.

A/I Signature _____ Date 7/6/98 SEE EXCEPTION #2

5.2 PRESSURE DECAY TEST

5.2.1 **PERFORM** valve line-up per Attachment 5, "ATP Initial Valve Lineup"

5.2.2 **REMOVE** blind flange from VTP-V-160.

5.2.3 **ENSURE** "SEAL POT" VTP-SP-001 is empty by opening the "SEAL POT DRAIN VALVE" VTP-V-160.

- IF not empty, allow to empty through VTP-V-160.

5.2.4 **CLOSE** "SEAL POT DRAIN VALVE" VTP-V-160.

5.2.5 **REPLACE** blind flange on VTP-V-160.

5.2.6 **INSTALL** pneumatic pressure testing manifold (with gauge, pressure relief valve, isolation valve, and pressure regulator) into "1st HEPA TEST PORT" VTP-FTP-002.

5.2.7 **INSTALL** pressure gauge into "2nd HEPA TEST PORT" VTP-FTP-004.

5.2.8 **CONNECT** pressure test air source to testing manifold.

5.2.9 **PRESSURIZE** housing/duct assembly to +19.5 $\pm$ 0.5 INWC.

5.2.10 **ISOLATE** the air supply from the filter housing.

5.2.11 **MAINTAIN** pressure until temperature remains constant within $\pm$1 °F as indicated by "1st HEPA INLET TEMPERATURE" VTP-TI-179 for a minimum of 10 minutes.

NOTE - Next step starts checking positive pressure decay.

5.2.12 **RECORD** the initial time (t_i), barometric pressure (BP_i), housing pressure (P_i), and temperature (T_i) on the table provided in Attachment 9.

- **RECORD** pressure and temperature readings once a minute for 15 minutes on Attachment 9.

5.2.13 **RECORD** final time (t_f), barometric pressure (BP_f), housing pressure (P_f) and temperature (T_f) on the table **AND TRANSFER** required information to Attachment 10.

5.2.14 **PERFORM** the leak rate calculations per Attachment 10.

5.2 PRESSURE DECAY TEST (Cont.)

5.2.15 **IF** Q < L_s then **RECORD** "PASS" on Attachment 10 and proceed to step 5.2.17.

- Otherwise, **RECORD** "RETEST" on Attachment 10.

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

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

5.2.16.2 **REPEAT** steps 5.2.9 through 5.2.15 using new data sheets.

5.2.17 **DISCONNECT** the air supply.

5.2.18 **RELIEVE** pressure slowly from housing/duct assembly through Testing Manifold assembly.

5.2.19 **CONNECT** a vacuum source to the Pressure Testing Manifold Assembly.

5.2.20 **DECREASE** housing/duct internal pressure to $-20 \pm .5$ ~~-14.5 (± 0.5)~~ INWC as indicated by the pressure measuring device.

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5.2.21 **ISOLATE** the vacuum source from the filter housing.

5.2.22 **MAINTAIN** constant pressure until temperature remains constant within ± 1 °F as indicated by "1st HEPA INLET TEMPERATURE" VTP-TI-179 for a minimum of 10 minutes.

5.2 PRESSURE DECAY TEST (Cont.)

NOTE - Next step starts checking negative pressure decay.

5.2.23 **RECORD** the initial time (t_i), barometric pressure (BP_i), housing pressure (P_i), and temperature (T_i) on the table in Attachment 9.

- **RECORD** pressure and temperature readings once a minute for 15 minutes on Attachment 9.

5.2.24 **RECORD** final time (t_f), barometric pressure (BP_f), housing pressure (P_f) and temperature (T_f) on table **AND TRANSFER** required information to Attachment 10.

5.2.25 **PERFORM** the leak rate calculations per Attachment 10.

5.2.26 **IF** $Q < L_s$ then **RECORD** "PASS" on Attachment 10 and go to step 5.2.27.

- Otherwise, **RECORD** "RETEST" on Attachment 10.

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

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

5.2.26.3 **REPEAT** steps 5.2.20 through 5.2.26 using new data sheets.

5.2 PRESSURE DECAY TEST (Cont.)

5.2.27 **SLOWLY EQUALIZE** housing/duct pressure to atmospheric through the Testing Manifold Assembly.

5.2.28 **DISCONNECT** the test equipment.

5.2.29 **REINSTALL** the test port plugs.

5.2.30 **OPEN** High Isolation Valve Main Airstream VTP-V-135.

5.2.31 **OPEN** Low Isolation Valve Main Airstream VTP-V-136.

5.2.32 Test Director **VERIFY** section 5.2 is complete.

7/7/98
Test Director Signature Date

5.2.33 A/I Inspector **VERIFY** section 5.2 is complete.

7/8/98
A/I Signature Date

5.2.34 QC Inspector **VERIFY** section 5.2 is complete.

7.8.98
QC Signature Date

5.3 GLYCOL SYSTEM LEAK TEST

5.3.1 **ENSURE** glycol heater piping isolation valves are open.

Valve Number	Open (✓)	Valve Number	Open (✓)
VTP-V-201	✓	VTP-V-203	✓
VTP-V-202	✓	VTP-V-204	✓

5.3.2 **OPEN** the fill cap on the expansion tank

5.3.3 **CONNECT** the air pressure supply manifold (with gauge, pressure relief valve, isolation valve and pressure regulator) to the expansion tank fill port.

5.3.4 **SLOWLY PRESSURIZE** the heater reservoir and piping to 115.0 (+/- 2) INWC (4.15 +/- 0.72 PSI).

READING: 115.1 INITIALS: JL

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

5.3.6 **RELEASE PRESSURE** from glycol system.

5.3.7 **REPAIR** any leaks and add additional coolant to the expansion tank per Test Director direction.

5.3.8 **SLOWLY PRESSURIZE** the heater reservoir and piping to 115.0 (+/- 2) INWC.

5.3.9 **ISOLATE** the pressure source by closing the manifold isolation valve.

5.3.10 **RECORD** the initial pressure and time below.

	PRESSURE	TIME
Initial:	115.3	10:50

5.3.11 **WAIT** 10 minutes

5.3.12 **RECORD** the final pressure and time.

	PRESSURE	TIME
Final:	115.6	11:00

5.3 GLYCOL SYSTEM LEAK CHECK (Cont.)

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

Test Director 7/9/98 Date

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

5.3.14 **DISCONNECT** and **REMOVE** the pressure supply and manifold.

5.3.15 Test Director **VERIFY** section 5.3 is complete.

Test Director Signature 7/9/98 Date

5.3.16 A/I Inspector **VERIFY** section 5.3 is complete.

A/I Signature 7/9/98 Date

5.3.17 QC Inspector **VERIFY** section 5.3 is complete.

PJ Klemendorf
QC Signature 7.9.98 Date

5.4 EXHAUSTER FAN CHECK

Note - Step 5.4.1 is optional, and may be replaced by a force on the seal pot per 2.4.9.

5.4.1 **FILL** VTP-SP-001 "SEAL POT" by performing the following:

5.4.1.1 **REMOVE** fill cover plug attached to VTP-V-162 "SEAL POT FILL PORT VALVE".

5.4.1.2 **OPEN** VTP-V-162 "SEAL POT FILL PORT VALVE".

5.4.1.3 **ADD** water to the seal pot until VTP-LI-185 "SEAL POT LEVEL" reads 60% +/- 5% of volume.

Placed Force on SEALPOT

Initial: NA JWL Date: 7/6/98

5.4.1.4 **CLOSE** VTP-V-162 "SEAL POT FILL PORT VALVE".

5.4.1.5 **REPLACE** the fill plug attached to VTP-V-162 "SEAL POT FILL PORT VALVE".

✓ 5.4.2 **POSITION** the "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to ON.

✓ 5.4.3 **ENSURE** "EXHAUST FAN MOTOR" VTP-M-001 does NOT start automatically.

✓ 5.4.4 **ENSURE** Green "ILOFF" light (located on door of "CONTROL CABINET" VTP-CP-105) is ILLUMINATED.

✓ 5.4.5 **ENSURE** Red "ILRUN" light (located on door of "CONTROL CABINET" VTP-CP-105) is NOT ILLUMINATED.

✓ 5.4.6 **POSITION** "FAN CONTROL" VTP-HS-103 to "ENABLE" (located on door of "CONTROL CABINET" VTP-CP-105).

✓ 5.4.7 **ENSURE** exhauster PLC control is in "Flow Control" operating mode.

Test Engineer 7/6/1998 Date

✓ 5.4.8 **PRESS** "STOP PUSH BUTTON" VTP-PB-102 (located on door of "CONTROL CABINET" VTP-CP-105) to reset VFD.

✓ 5.4.9 **PRESS** "START PUSH BUTTON" VTP-PB-101 **AND THEN QUICKLY PRESS** "STOP PUSH BUTTON" VTP-PB-102 (i.e. bump the fan).

5.4 EXHAUSTER FAN CHECK (Cont.)

5.4.10 **VERIFY** the direction of rotation of the "EXHAUST FAN MOTOR" VTP-M-001 shaft is counter clockwise when viewed from the motor side of the fan housing.

5.4.11 **IF** "EXHAUST FAN MOTOR" VTP-M-001 rotation direction is correct,
GO TO step 5.4.13.

5.4.12 **IF** direction of rotation of the "EXHAUST FAN MOTOR" VTP-M-001 is in the incorrect direction,
THEN perform steps 5.4.11.1 through 5.4.11.5.

5.4.12.1 **POSITION** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to OFF.

5.4.12.2 **INSTALL** Personal Locking Device on "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102.

5.4.12.3 **CORRECT** the "EXHAUST FAN" VTP-EF-001 rotation direction by CORRECTING the leads at the fan pigtail.

5.4.12.4 **REMOVE** Personal Locking Device from "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102.

5.4.12.5 **REPEAT** steps 5.4.2 through 5.4.11.

5.4.13 **OPEN** the High and Low valves on each three valve manifold for the following DPTs:

TRANSMITTER	Valve # HI	Open (√)	Valve # LO	Open(√)
VTP-FT-184 (PLENUM)	VTP-V-155	✓	VTP-V-156	✓
VTP-PDT-178 (PREFILTER)	VTP-V-140	✓	VTP-V-141	✓
VTP-PDT-177 (HEATER/DEMISTER)	VTP-V-137	✓	VTP-V-138	✓
VTP-PDT-180 (HEPA FILTER #1)	VTP-V-143	✓	VTP-V-144	✓
VTP-PDT-181 (FILTER #1 & #2)	VTP-V-146	✓	VTP-V-147	✓
VTP-PDT-182 (HEPA FILTER #2)	VTP-V-149	✓	VTP-V-150	✓

5.4.14 **POSITION** the "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to ON.

5.4 EXHAUSTER FAN CHECK (Cont.)

5.4.15 **ENSURE** VTP-V-155, "HIGH ISOLATION VALVE STACK FLOW TRANSMITTER" and VTP-V-156, "LOW ISOLATION VALVE STACK FLOW TRANSMITTER" are **CLOSED.**

5.4.16 **SET** timer T4 setpoint to 600 seconds. JWL 7/6/98

5.4.17 **PRESS** "STOP PUSH BUTTON" VTP-PB-102 to reset VFD.

5.4.18 **PRESS** "START PUSH BUTTON" VTP-PB-101 to turn on "EXHAUST FAN" VTP-EF-001.

5.4.19 **VERIFY** Green "ILOFF" light (located on door of "CONTROL CABINET" VTP-CP-105) is OFF.

5.4.20 **VERIFY** Red "ILRUN" light (located on door of "CONTROL CABINET" VTP-CP-105) is ILLUMINATED.

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

NOTE: Next step starts the "EXHAUST FAN" VTP-EF-001 vibration test. It may be necessary to start the fan several times to acquire all the required data.

5.4.22 **MEASURE** and **RECORD** the fan vibration data required in the table below with the fan at 60 HZ.

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

- Displacement ≤ 0.6 MILS (PK-TO-PK) at one times the fan speed

  OR

- Velocity ≤ 0.11 IN/SEC (PK) at one times the fan speed JWL 7/6/98

Plane	Axial	OK (✓)	Horiz.	OK (✓)	Vert.	OK (✓)
Coupling End Shaft Bearing	.054	✓	.104	✓	.110	✓
Fan End Shaft Bearing	.062	✓	.086	✓	.080	✓

in/sec in/sec in/sec

5.4 EXHAUSTER FAN CHECK (Cont.)

5.4.24 **PRESS** "STOP PUSH BUTTON" VTP-PB-102 (located on door of "CONTROL CABINET" VTP-CP-105) to turn off Exhauster Fan.

5.4.25 **VERIFY** Exhauster fan has SHUTDOWN.

5.4.26 **RESET** timer T4: Setpoint to 10. LWL 7/6/98

5.4.27 **POSITION** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to OFF.

5.4.28 **REPLACE** CAUTION TAPE around fan if required.

5.4.29 **OPEN** "HIGH ISOLATION VALVE STACK FLOW TRANSMITTER" VTP-V-155
AND "LOW ISOLATION VALVE STACK FLOW TRANSMITTER" VTP-V-156.

5.4.30 Test Director **VERIFY** section 5.4 is complete.

L W L 7/6/98
Test Director Signature Date

5.4.31 A/I Inspector **VERIFY** section 5.4 is complete.

E Enloe JR 7/6/98
A/I Signature Date

5.4.32 QC Inspector **VERIFY** section 5.4 is complete.

PJ Glanzdorf 7.6.98
QC Signature Date

5.5 HEAT TRACE CHECK

Warning - Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" the energized electrical work permit in the work package.

5.5.1 **REMOVE** rheostat cover from "HEAT TRACE THERMOSTAT" VTP-TS-001 (located on side of "CONTROL CABINET" VTP-CP-105).

NOTE: To perform this test outside temperature must be above 40°F.

5.5.2 **SET** "HEAT TRACE THERMOSTAT" VTP-TS-001 at 40°F.

5.5.3 **ENSURE** 0 V at terminals TB6HTC-1 and TB6HTC-2 (located in "HEAT TRACE CABINET" VTP-ENCL-104) using a DMM.

5.5.4 **PLACE** bag of ice water around "HEAT TRACE THERMOSTAT" VTP-TS-001 probe.

5.5.5 **WAIT** 2-5 minutes.

5.5.6 **VERIFY** 120V at terminals TB6HTC-1 and TB6HTC-2 using a DMM.

Initial: CK Date: 7/6/98

5.5.7 **VERIFY** "HEAT TRACE ON" amber light (located at door of "HEAT TRACE CABINET" VTP-ENCL-104) is ILLUMINATED.

5.5.8 **REMOVE** ice from the "HEAT TRACE THERMOSTAT" VTP-TS-001 probe.

5.5.9 **VERIFY** "HEAT TRACE ON" amber light is OFF after probe warms up (1-5 minutes) .

5.5.10 **VERIFY** 0 V at terminals TB6HTC-1 and TB6HTC-2 using a DMM.

5.5.11 **REPLACE** rheostat cover on "HEAT TRACE THERMOSTAT" VTP-TS-001.

5.5 HEAT TRACE CHECK (Cont.)

5.5.12 Test Director **VERIFY** section 5.5 is complete.

L W [illegible] 7/6/98
Test Director Signature Date

5.5.12.1 A/I Inspector **VERIFY** section 5.5 is complete.

E J Enlow 7/6/98
A/I Signature Date

5.5.12.2 QC Inspector **VERIFY** section 5.5 is complete.

RJ Clemendorf 7.6.98
QC Signature Date

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK

NOTE - • Sections 5.6 - 5.18 are intended to test specific interlock set points and operations. Any alarm messages other than those described in the current step of the procedure shall be considered secondary alarms

• Transmitter VTP-PDT-180 range is 0 - 10".

NOTE- **ENSURE** that the covers of all Yokogawa and Drexelbrook transmitters and thermocouples **ARE REMOVED** prior to testing on those specific instruments and **RETURNED** after completion of testing.

✓ 5.6.1 **CONNECT** BT-200 to back terminals (plus and minus) of "HEPA FILTER #1 DIFF PRESSURE" VTP-PDT-180.

✓ 5.6.2 **ENSURE** Valve lineup per Attachment 11.

✓ 5.6.3 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.6.4 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.6.5 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.6.6 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.6.7 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.6.8 **SET** the BT-200 to test at 54.0% (53.0%-55.0%).

NOTE - This is equivalent to approximately 5.4 INWC.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Cont.)

5.6.9 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 (located on stack supporting framing) is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated on VTP-MV-101. It may be necessary to wait until the display scrolls through alarms.

- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "FILTER 1 DP HI".

✓ 5.6.10 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated on VTP-MV-101. It may be necessary to wait until the display scrolls through alarms.

✓ 5.6.11 **ENSURE** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "FILTER 1 DP HIHI".

✓ 5.6.12 **RECORD** the pressure indicated by "FILTER #1 DIFF PRESSURE" VTP-PDI-180 (located on door of "CONTROL CABINET" VTP-CP-105).

Indicated Pressure: 5.3 INWC

✓ 5.6.13 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.6.14 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated. It may be necessary to wait until the display scrolls through alarms.

✓ 5.6.15 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "FILTER 1 DP HIHI".

✓ 5.6.16 **CLEAR** the BT-200 test setting.

✓ 5.6.17 **VERIFY** "FILTER #1 DP HI" & "FILTER #1 DP HIHI" have cleared.

✓ 5.6.18 **CLEAR** VTP-MV-101, and **VERIFY** VTP-MV-102 is clear.

✓ 5.6.19 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.6.20 **ENTER** a preset value of 1000 seconds for timer T4:2 (Address T4:2.PRE)

✓ 5.6.21 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.6.22 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.6.23 **SET** the BT-200 to test 1.0% (0.8% - 1.1%).

NOTE - This is equivalent to approximately 0.1 INWC.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.6.24 **VERIFY** the following:

✓ • "EXHAUST FAN" VTP-EF-001 has SHUTDOWN ~~after 10 (9 to 13) seconds.~~ JWL 7/16/98

✓ • Red "ILRUN" light is OFF (per exception 3 9/16/98)

✓ • Green "ILOFF" light is ILLUMINATED

✓ • Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated. It may be necessary to wait until the display scrolls through alarms.

✓ • "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 and VTP-MV-102 display "FILTER 1 DP LO".

✓ 5.6.25 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then PRESSING the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

• Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

✓ 5.6.26 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

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

✓ 5.6.28 **VERIFY** "FILTER 1 DP LO" alarm clears. in MV-102. JWL 7/16/98

✓ 5.6.29 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.6.30 **ENTER** a preset value of 3 seconds for timer T4:2 (Address T4:2.PRE).

✓ 5.6.31 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.6.32 **WAIT** for the Exhauster fan to reach steady state operation.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.6.33 **RECORD** the pressure indicated by "HEPA FILTER #1 DIFF PRESSURE" VTP-PDT-180.

Indicated Pressure: 0.74 INWC

Note - Alarm in VTP-MV-102 will clear as soon as the alarm condtion no longer exists. ROC looks for an increase in flow. Soon after the exhauster has shutdown, there will no longer be a ROC message in VTP-MV-102.

✓ 5.6.34 **SET** the BT-200 to test at 0.5 INWC less than the value recorded in the previous step from VTP-PDI-180, and **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 indicates "FILTER 1 DP ROC" within 3 to 6 seconds.

✓ 5.6.35 **RECORD** the following:

BT-200 SETTING (%)	PDT-180 (INWC)	PDI-180 (INWC)
2.4	0.24	0.23

✓ 5.6.36 **VERIFY** the following:

✓ • "EXHAUST FAN" VTP-EF-001 has SHUTDOWN

✓ • Red "ILRUN" light is OFF

✓ • Green "ILOFF" light is ILLUMINATED

✓ • Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated. It may be necessary to wait until the display scrolls through alarms.

✓ • "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "FILTER 1 DP ROC".

✓ 5.6.37 **ACKNOWLEDGE** the alarm by **PRESSING** the "I" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

• Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

✓ 5.6.38 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

5.6 FILTER #1 DP INTERLOCK/ALARM CHECK (Cont.)

5.6.39 **DISCONNECT** BT-200 from "HEPA FILTER #1 DIFF PRESSURE" VTP-PDT-180.

5.6.40 Test Director **VERIFY** section 5.6 is complete.

7/8/98
Test Director Signature Date

5.6.41 A/I Inspector **VERIFY** section 5.6 is complete.

7/8/98
A/I Signature Date

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK

NOTE - Transmitter VTP-PDT-182 range is 0 - 6"

5.7.1 **CONNECT** BT-200 to back terminals (plus and minus) of "HEPA FILTER #2 DIFF PRESSURE" VTP-PDT-182.

5.7.2 **ENSURE** Valve lineup per Attachment 11.

5.7.3 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

5.7.4 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

5.7.5 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

5.7.6 **PRESS** "START PUSH BUTTON" VTP-PB-101.

5.7.7 **WAIT** for the Exhauster fan to reach steady state operation.

5.7.8 **SET** the BT-200 to test at 061.7% (061.5 to 061.9%).

NOTE - This is equivalent to approximately 3.7 INWC.

5.7.9 **VERIFY** the following:

- "EXHAUST FAN" VTP-EF-001 has SHUTDOWN.
- Red "ILRUN" light is OFF
- Green "ILOFF" light is ILLUMINATED
- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated on VTP-MV-101. It may be necessary to scroll through the alarms by pressing the "↵" button.

- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 DISPLAYS "FILTER 2 DP HI".

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Cont.)

5.7.10 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated on VTP-MV-101. It may be necessary to wait until the display scrolls through alarms.

5.7.11 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 displays "FILTER 2 DP HIHI".

5.7.12 **RECORD** the pressure indicated by "FILTER #2 DIFF PRESSURE" VTP-PDI-182.

READING: 3.69 INWC

5.7.13 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

5.7.14 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

5.7.15 **ENSURE** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 STILL DISPLAYS "FILTER 2 DP HIHI".

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

5.7.17 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

5.7.18 **ENTER** a preset value of 1000 seconds for timer T4:3 (Address T4:3.PRE)

5.7.19 **PRESS** "START PUSH BUTTON" VTP-PB-101.

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.7.20 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.7.21 **SET** the BT-200 to test at 001.6% (001.4-001.8%).

NOTE - This is equivalent to approximately 0.1 INWC.

✓ 5.7.22 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN ~~after 10 (7-13) seconds~~ 7/6/98 LWL ①
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAY "FILTER 2 DP LO".

✓ 5.7.23 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.7.24 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

5.7.25 ~~**VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "FILTER 2 DP LO".~~ 7/6/98 LWL ①

✓ 5.7.26 **CLEAR** the BT-200 test setting.

~~5.7.27 **VERIFY** that "FILTER 2 DP LO" alarm clears.~~ 7/6/98 LWL ①

✓ 5.7.28 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

① Changed per Exception 3 on ~~APP-068 = HNF-2687.~~ LWL 7/6/98 ~~LWL 7/6/98~~

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.7.29 **ENTER** a preset value of 3 seconds for timer T4:3 (Address T4:3.PRE)

✓ 5.7.30 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.7.31 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.7.32 **RECORD** the pressure indicated by "HEPA FILTER #2 DIFF PRESSURE" VTP-PDT-182.

Indicated Pressure: 0.83 INWC

Note - Alarm in VTP-MV-102 will clear as soon as the alarm condtion no longer exists. ROC looks for an increase in flow. Soon after the exhauster has shutdown, there will no longer be a ROC message in VTP-MV-102.

✓ 5.7.33 **SET** the BT-200 to test at 0.5 (0.5-0.55) INWC less than the value recorded in the previous step from VTP-PDI-182, and **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 indicates "FILTER 2 DP ROC" within 3 to 6 seconds.

✓ 5.7.34 **RECORD** the following:

BT-200 SETTING (%)	PDT-182 (INWC)	PDI-182 (INWC)
5.4	0.324	0.33

5.7.35 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN after 3-5 seconds.
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "FILTER 2 DP ROC".

5.7 FILTER #2 DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.7.36 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

✓ 5.7.37 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.7.38 **DISCONNECT** BT-200 from "HEPA FILTER #2 DIFF PRESSURE VTP-PDT-182.

5.7.39 Test Director **VERIFY** section 5.7 is complete.

Test Director Signature 7/8/98 Date

5.7.40 A/I Inspector **VERIFY** section 5.7 is complete.

A/I Signature 7/8/98 Date

5.8 FILTER #1 & #2 DP INTERLOCK/ALARM CHECK

NOTE - Transmitter VTP-PDT-181 range is 0 - 6".

✓ 5.8.1 **CONNECT** BT-200 to back terminals (plus and minus) of "FILTER TRAIN DIFF PRESSURE" VTP-PDT-181.

✓ 5.8.2 **ENSURE** Valve lineup per Attachment 11.

✓ 5.8.3 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.8.4 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.8.5 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.8.6 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.8.7 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.8.8 **SET** the BT-200 to test at 090.0% (89.5-90.5%).

NOTE - This is equivalent to approximately 5.4 INWC.

✓ 5.8.9 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 DISPLAYS "FILTERS 1 & 2 DP HIHI".

5.8.10 **RECORD** the pressure indicated by "FILTER TRAIN 1/2 PRESSURE" VTP-PDI-181.

READING: 5.38 INWC

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

5.8.11 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

5.8.12 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

5.8.13 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "FILTERS 1 & 2 DP HIHI".

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

5.8.15 **VERIFY** "FILTERS 1 & 2 DP HIHI" message has cleared from VTP-MV-102.

5.8.16 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

5.8.17 **PRESS** "START PUSH BUTTON" VTP-PB-101.

5.8.18 **WAIT** for the Exhauster fan to reach steady state operation.

5.8.19 **SET** the BT-200 to test at 001.6% (001.4-001.8%).

NOTE - This is equivalent to approximately 0.1 INWC.

5.8.20 **VERIFY** the following:

- "EXHAUST FAN" VTP-EF-001 has SHUTDOWN ~~after 10 seconds~~ 7/8/98 JWL → Exception 3
- Red "ILRUN" light is OFF
- Green "ILOFF" light is ILLUMINATED
- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "FILTERS 1 & 2 DP LO".

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

✓ 5.8.21 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "←" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.8.22 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.8.23 **CLEAR** the BT-200 test setting.

✓ 5.8.24 **VERIFY** VTP-MV-102 is no longer dsplays "FILTERS 1&2 DP LO".

✓ 5.8.25 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.8.26 **DISCONNECT** BT-200 from "FILTER TRAIN DIFFERENTIAL PRESSURE" VTP-PDT-181.

5.8.27 Test Director **VERIFY** section 5.8 is complete.

7/8/98
Test Director Signature Date

5.8.28 A/I Inspector **VERIFY** section 5.8 is complete.

7/8/98
A/I Signature Date

5.9 STACK FLOW INTERLOCK/ALARM CHECK

NOTE - Transmitter VTP-FT-184 range is 0 - 4".

✓ 5.9.1 **CONNECT** BT-200 to back terminals (plus and minus) of "STACK FLOW" VTP-FT-184.

✓ 5.9.2 **ENSURE** Valve lineup per Attachment 11.

✓ 5.9.3 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.9.4 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.9.5 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.9.6 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.9.7 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.9.8 **RECORD** value indicated by "STACK FLOW" indicator VTP-FI-184.

READING: 1006 SCFM

✓ 5.9.9 **PLACE** the fan in manual mode by setting the auto/manual bit N20:41/6 to 0.

✓ 5.9.10 **SET** the BT-200 to test at 84.5%, or a value that increases "STACK FLOW" VTP-FI-184 to between 1100 and 1105 CFM. (88.5%)

5.9 STACK FLOW INTERLOCK/ALARM CHECK (Cont.)

5.9.11 **PERFORM** the following:

- ✓ **VERIFY** Clear Rotating Beacon VTP-XA-101 is ILLUMINATED
- ✓ **RECORD** value indicated on "STACK FLOW" VTP-FI-184.

  READING: 1101 SCFM
- ✓ **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "STACK FLOW HI"
- ✓ **VERIFY** the fan has shut down after a 10 to 20 second delay.

✓ 5.9.12 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101

✓ 5.9.13 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.9.14 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

✓ 5.9.15 **CLEAR** the BT-200.

✓ 5.9.16 **VERIFY** that the "STACK FLOW HIGH" message has cleared from VTP-MV-102.

✓ 5.9.17 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.9.18 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.9.19 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.9.20 **PLACE** the fan in manual mode by setting the auto/manual bit N20:41/6 to 0.

✓ 5.9.21 **SET** the BT-200 to test at 17.5% or a value required to drop the stack flow bewteen 469 and 464 SCFM as indicated on the stack flow meter VTP-FI-184. (16.0%)

5.9 STACK FLOW INTERLOCK/ALARM CHECK (Cont.)

5.9.22 **RECORD** the value indicated on "STACK FLOW" VTP-FI-184.

READING: 468 SCFM

✓ 5.9.23 **VERIFY** the Clear Rotating Beacon VTP-XA-101 ILLUMINATES after 10 to 15 seconds.

✓ 5.9.24 **VERIFY** the fan stops after 30 to 35 seconds.

✓ 5.9.25 **VERIFY** the following:

- ✓ Clear rotating beacon VTP-XA-101 is ILLUMINATED
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 DISPLAYS "STACK FLOW LO".

✓ 5.9.26 **ACKNOWLEDGE** the alarm by PRESSING the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

5.9 STACK FLOW INTERLOCK/ALARM CHECK (Cont.)

✓ 5.9.27 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.9.28 **CLEAR** the BT-200.

5.9.29 **DISCONNECT** BT-200 from "STACK FLOW" VTP-FT-184.

5.9.30 Test Director **VERIFY** section 5.9 is complete.

Test Director Signature 7/8/98 Date

5.9.31 A/I Inspector **VERIFY** section 5.9 is complete.

A/I Signature 7/8/98 Date

5.10 SEAL POT INTERLOCK/ALARM CHECK

INSERT 5.10.14 HERE PER EXCEPTION 10. LWL 7/9/98

✓ 5.10.1 **OPEN** "SEAL POT PUMP RECYCLE VALVE" VTP-V-163, "SEAL POT PUMP" VTP-V-164, AND "SEAL POT PUMP ENCLOSURE DRAIN VALVE" VTP-V-165.

✓ 5.10.2 **VERIFY** Seal Pot forces are removed (I:3.1).

✓ 5.10.3 **ENSURE** that seal pot has been filled to 60 +/-5%.

✓ 5.10.4 **ENSURE** that the exhauster is configured for either flow or pressure control.

Christopher S Clark — Test Engineer — 7/8/98 — Date

✓ 5.10.5 **ENSURE** key is inserted in "SEAL POT PUMP CONTROL" VTP-HS-101.

✓ 5.10.6 **REMOVE** the top from the seal pot pump enclosure.

✓ 5.10.7 **POSITION** circuit breaker MPZ-1 to OFF.

WARNING

Energized circuits and leads are contained inside the cabinet. Comply with HNF-PRO-088, "Electrical Work Safety". Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" and the energized electrical work permit in the work package.

5.10.8 **CONNECT** Drexelbrook C-Box Meter Calibration Unit leads in series with VTP-LT-185 as follows:

EXCEPTION 4: ADD 5.10.8.*

✓ 5.10.8.1 **OPEN** cabinet CP-105, and locate level tranmitter about midway up on the right hand side of the cabinet.

✓ 5.10.8.2 **REMOVE** the leads attached at SHD and CW on the probe side of the level transmitter.

✓ 5.10.8.3 **LAND** the red lead from the Calibration System's black two wire test lead to the SHD terminal of the level transmitter's probe side.

✓ 5.10.8.4 **LAND** the blue lead from the Calibrations System's black two wire test lead to the CW terminal of the level transmitter's probe side.

LAND THE GREEN LEAD FROM THE CALIBRATION SYSTEM'S BLACK 3-WIRE TEST LEAD TO THE GND TERMINAL OF THE LEVEL TRANSMITTER'S PROBE SIDE. 7/9/98

5.10 SEAL POT INTERLOCK/ALARM CHECK (Cont.)

5.10.8.5 **LIFT** the red lead from the Drexelbrook transmitter's signal positive terminal.

5.10.8.6 **ATTACH** a short (approximately 3") piece of 12 to 18 gauge wire at the signal positive terminal of the Drexelbrook transmitter.

5.10.8.7 **CONNECT** to the wire just attached with the black alligator clip of the ~~black~~ gray test lead of the Calibration system. 7/9/98

5.10.8.8 **CONNECT** the red alligator clip of the ~~black~~ gray test lead to the red lead removed from the transmitter in Step 5.10.8.5. 7/9/98 (Exception 4)

5.10.8.9 **PLUG** gray test lead into the calibration system on the right side of the unit above the meter in accordance with the colors painted on the plug connector.

5.10.8.10 **PLUG** black test lead into the calibration system on the right side of the unit above the knob in accordance with the colored dots painted on the plug connecter.

5.10.8.11 **LAND** ground lead from the black test lead onto the grounding terminal provided on the calibration system.

5.10.9 **SET** range switch to LOW.

5.10.10 **SET** meter range to 4-20 mA.

5.10.11 **PRESS** meter ONLY button ON (down).

5.10.12 **SET** vernier to 22.5 pF.

5.10.13 **POSITION** circuit breaker MPZ-1 to ON.

Exception 10 JWL 7/9/98

5.10.14 ~~**ENSURE Valve lineup per Attachment 11.**~~

5.10.15 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

5.10.16 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

5.10 SEAL POT INTERLOCK/ALARM CHECK (Cont.)

✓ 5.10.17 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.10.18 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.10.19 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.10.20 **SET** vernier to 16 pF (8.3 to 8.8mA) or less than 30% of the seal pot level.

5.10.21 **RECORD** values indicated below:

SEAL POT LEVEL VTP-PI-185	DREXELBROOK VERNIER SETTING (pF)
29	15

5.10.22 **VERIFY** the following:

✓ • "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAY "SEAL POT LEVEL LO"

✓ • The "EXHAUST FAN" VTP-EF-001 has shutdown

✓ • Red "ILRUN" light is OFF

✓ • Green "ILOFF" light is ILLUMINATED

✓ • Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

✓ • Fan motor does NOT energize when the "START PUSH BUTTON" VTP-PB-101 is pressed.

✓ 5.10.23 **ACKNOWLEDGE** the alarm by PRESSING the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

✓ • Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

5.10 SEAL POT INTERLOCK/ALARM CHECK (Cont.)

✓ 5.10.24 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.10.25 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

✓ 5.10.26 **SET** vernier to 22.5 pF.

✓ 5.10.27 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.10.28 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.10.29 **SET** vernier to 29 pF or a value between 70-73% of the seal pot level.

✓ 5.10.30 **RECORD** the values indicated below:

SEAL POT LEVEL VTP-PI-185	DREXELBROOK VERNIER SETTING (pF)
72	29

✓ 5.10.31 **VERIFY** peristaltic pump VTP-P-004 is pumping water by removing insulation and observing hose.

✓ 5.10.32 **SET** vernier to 32 pF or a value greater than 80% of the seal pot level.

✓ 5.10.33 **RECORD** the values indicated below:

SEAL POT LEVEL VTP-PI-185	DREXELBROOK VERNIER SETTING (pF)
81	32

5.10 SEAL POT INTERLOCK/ALARM CHECK (Cont.)

5.10.34 **VERIFY** the following:

- ✓ Clear rotating beacon VTP-XA-101 is ILLUMINATED
- ✓ Red "ILRUN" light is OFF
- ✓ Peristaltic Pump is pumping water
- ✓ Fan motor does NOT energize when the "START PUSH BUTTON" VTP-PB-101 is pressed
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ "EXHAUST FAN" VTP-EF-001 has shutdown.

✓5.10.35 **VERIFY** that the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAY "SEAL POT LEVEL HI".

✓5.10.36 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then PRESSING the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice until all alarms are cleared.

✓5.10.37 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓5.10.38 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "SEAL POT LEVEL HI". 18 pF (19-19 pF) (See TEST LOG #006) (ESP) 7/9/98

✓5.10.39 **SET** vernier to ~~22.5 pF~~ (35% to 40% on VTP-LI-185).

✓5.10.40 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 message has cleared.

✓5.10.41 **VERIFY** Seal Pot Pump has stopped pumping water.

5.10 SEAL POT INTERLOCK/ALARM CHECK (Cont.)

5.10.42 **TURN** "SEAL POT PUMP CONTROL" VTP-HS-101 to "HAND" position.

5.10.43 **VERIFY** Seal Pot Pump is pumping water.

5.10.44 **RELEASE** "SEAL POT PUMP CONTROL" VTP-HS-101 from "HAND" position.

5.10.45 **VERIFY** Seal Pot Pump has stopped pumping water.

5.10.46 **POSITION** circuit breaker MPZ-1 to OFF.

5.10.47 **DISCONNECT** Drexelbrook C-Box.

5.10.48 **RECONNECT** probe leads to "Seal Pot Level Transmitter" VTP-LT-185.

5.10.49 **POSITION** circuit breaker MPZ-1 to ON.

5.10.50 **VERIFY** control cabinet POR-007-VTP-CP-105 digital indicators are illuminated.

5.10.51 **RESTORE** seal pot forces removed in Step 5.10.2 (I:3.1, binary code: 0010 1001 1100 0000).

5.10.52 Test Director **VERIFY** section 5.10 is complete.

L J [illegible] 7/9/98
Test Director Signature Date

5.10.53 A/I Inspector **VERIFY** section 5.10 is complete.

[illegible] 7/9/98
A/I Signature Date

5.11 GLYCOL INTERLOCK/ALARM CHECK

5.11.1 **ENSURE** the following glycol system isolation valves are open:

Valve Number	Open (✓)	Valve Number	Open (✓)
VTP-V-201	✓	VTP-V-203	✓
VTP-V-202	✓	VTP-V-204	✓

✓ 5.11.2 **ENSURE** Circuit Breaker MPZ-1 is OFF.

✓ 5.11.3 **CONNECT** Drexelbrook C-Box meter calibration unit leads in series with VTP-LT-205 as follows:

5.11.3.1 **REMOVE** Drexelbrook level probe transmitter cover.

5.11.3.2 **REMOVE** de-term the leads attached at SHD and CW on the probe side of the level transmitter.

5.11.3.3 **LAND** the red lead from the Calibration System's black ~~two~~ three wire test lead to the SHD terminal of the level transmitter's probe side. JWL 7/10/98

5.11.3.4 **LAND** the blue lead from the Calibrations System's black ~~two~~ three wire test lead to the CW terminal of the level transmitter's probe side. JWL 7/10/98

5.11.3.5 **LIFT** the red lead (FB2-20) from the Drexelbrook transmitter's signal positive terminal.

5.11.3.6 **ATTACH** a short (approximately 3") piece of 12 to 18 gauge wire at the signal positive terminal of the Drexelbrook transmitter.

5.11.3.7 **CONNECT** to the wire just attached with the black alligator clip of the ~~black~~ gray test lead of the Calibration system. Ex.4 9/9/98

Exception #4

5.11.3* LAND THE GREEN LEAD FROM THE CALIBRATION SYSTEM'S BLACK THREE-WIRE TEST LEAD TO THE GND TERMINAL OF THE LEVEL TRANSMITTER'S PROBE SIDE. JWL 7/10/98

5.11 GLYCOL INTERLOCK/ALARM CHECK (Cont.)

Exception 4 gray ~~black~~ 7/10/98

5.11.3.8 **CONNECT** the red alligator clip of the ~~black~~ test lead to the red lead removed from the transmitter in Step 5.11.3.5.

5.11.3.9 **PLUG** gray test lead into the calibration system on the right side of the unit above the meter in accordance with the colors painted on the plug connector.

left Exception 4 7/10/98

5.11.3.10 **PLUG** black test lead into the calibration system on the ~~right~~ side of the unit above the knob in accordance with the colored dots painted on the plug connecter.

5.11.3.11 **LAND** ground lead from the black test lead onto the grounding terminal provided on the calibration system.

5.11.4 **SET** range switch to NORMAL.

5.11.5 **SET** meter range to 4-20 mA.

5.11.6 **PRESS** meter ONLY button ON (down).

5.11.7 **POSITION** Circuit Breaker MPZ-1 to ON.

5.11.8 **SET** Vernier Dial to 71 pf.

NOTE - This is equal to greater than 60-65% volume (13.6 mA).

5.11.9 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 to ON.

5.11.10 **VERIFY/RECORD** the following:

- Value on "GLYCOL LEVEL" VTP-LI-205

  READING: 60%

- Glycol Circulation Pump is operating by listening to and/or feeling the pump

- Glycol System has no visible leaks.

5.11 GLYCOL INTERLOCK/ALARM CHECK (Cont.)

WARNING

Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" the energized electrical work permit in the work package.

✓ 5.11.11 **ENSURE** VTP-DS-201 "GLYCOL HEATER DISCONNECT" is OFF.

✓ 5.11.12 **REMOVE** the thermostat cover on "GLYCOL HEATER" VTP-HTR-001.

✓ 5.11.13 **ENSURE** the Heater Thermostat is set to 180°F.

✓ 5.11.14 **REPLACE** the thermostat cover on VTP-HTR-001.

✓ 5.11.15 **OPEN** door on "GLYCOL HEATER DISCONNECT" VTP-DS-201 cabinet.

✓ 5.11.16 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to ON.

✓ 5.11.17 **ENSURE** MPZ-3 is **ON.**

✓ 5.11.18 **VERIFY** the Glycol Heater has started by using the DMM at the "GLYCOL HEATER CONTACTOR" VTP-CON-206 (located at "GLYCOL HEATER DISCONNECT" VTP-DS-201) and performing the following:

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

READING: 489

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

READING: 487

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

READING: 489

5.11 GLYCOL INTERLOCK/ALARM CHECK (Cont.)

5.11.19 **REDUCE** the impedance to 61 pF, or a value equal to 48-50% Volume on the "GLYCOL TANK LEVEL" VTP-LT-205.

5.11.20 **VERIFY** the following:

- Clear rotating beacon VTP-XA-101 is ILLUMINATED
- Glycol Heater has shutdown by observing that the "GLYCOL HEATER CONTACTOR" VTP-CON-206 is OPEN
- "GLYCOL CIRCULATION PUMP" VTP-P-001 has shutdown by listening to and/or feeling the pump
- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAY "GLYCOL LEVEL LO".

5.11.21 **RECORD** the liquid level indication on "GLYCOL LEVEL" indicator VTP-LI-205.

READING: 49

5.11.22 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

5.11.23 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

5.11.24 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

5.11.25 **POSITION** Circuit Breaker MPZ-1 to OFF.

5.11.26 **DISCONNECT** the DrexelBrook Calibrator from the "GLYCOL TANK LEVEL" transmitter VTP-LT-205.

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

EXCEPTIONS 7/8/1998 JWK

→ POSITION MPZ-1 to ON.

5.11.28 **VERIFY** control cabinet POR-007-VTP-CP-105 digital indicators are illuminated.

5.11 GLYCOL INTERLOCK/ALARM CHECK (Cont.)

✓ 5.11.29 **POSITION** "GLYCOL PUMP" VTP-HS-102 to OFF.

✓ 5.11.30 **POSITION** VTP-DS-201 "GLYCOL HEATER DISCONNECT" is OFF.

Ex. 7 SG 7/8/98 → POSITION MPZ-1 to OFF.

5.11.31 Test Director **VERIFY** section 5.11 is complete.

L. W. 7/8/98
Test Director Signature Date

5.11.32 A/I Inspector **VERIFY** section 5.11 is complete.

O J Enloe 7/8/98
A/I Signature Date

5.12 THERMOCOUPLE INTERLOCK/ALARM CHECK

WARNING

Energized circuits and leads are contained inside the cabinets. Comply with HNF-PRO-088, "Electrical Work Safety" and the energized electrical work permit in the work package.

✓ 5.12.1 **REMOVE** cover from thermocouple VTP-TE-179 and connect thermocouple simulator to thermocouple wires.

✓ 5.12.2 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to ON.

✓ 5.12.3 **POSITION** circuit breaker MPZ-1 to ON.

✓ 5.12.4 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 to ON.

✓ 5.12.5 **VERIFY** Glycol Heater has started by observing that the "GLYCOL HEATER CONTACTOR" VTP-CON-206 is CLOSED.

✓ 5.12.6 **PROGRAM** the thermocouple simulator to input a temperature to "1st HEPA INLET TEMPERATURE" VTP-TI-179 200-210°F).

5.12.7 **VERIFY** the following:

- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED
- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "HEATER AIR TEMPERATURE HI"
- ✓ **RECORD** "1st HEPA INLET TEMPERATURE" VTP-TI-179

  READING: 201 °F
- ✓ Glycol Heater has shutdown by observing that the "GLYCOL HEATER CONTACTOR" VTP-CON-206 is OPEN.

Per Ex. 8: "5.12.* ENSURE MPZ-1 is OFF. "NOTE: SET thermocouple simulator to 100°F prior to connecting to input terminals."

7/8/98

5.12 THERMOCOUPLE INTERLOCK/ALARM CHECK(Cont.)

5.12.8 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

5.12.9 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

5.12.10 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

5.12.11 **PROGRAM** the thermocouple simulator to input a temperature to "1st HEPA INLET TEMPERATURE" VTP-TI-179 <40°F.

5.12.12 **VERIFY** the following

- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED
- **RECORD** "1st HEPA INLET TEMPERATURE" VTP-TI-179

  READING: 39 °F
- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAY "HEATER TEMPERATURE LO".

  7/8/98 JWL

5.12.13 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

5.12.14 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

5.12.15 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 DISPLAYS alarm message.

5.12.16 **REMOVE** thermocouple wires from thermocouple simulator **AND RECONNECT** to thermocouple terminals.

5.12.17 **VERIFY** display is indicating.

5.12 THERMOCOUPLEINTERLOCK/ALARM CHECK(Cont.)

✓ 5.12.18 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to OFF.

5.12.19 Test Director **VERIFY** section 5.12 is complete.

[signature] 7/8/98
Test Director Signature Date

5.12.20 A/I Inspector **VERIFY** section 5.12 is complete.

[signature] 7/8/98
A/I Signature Date

5.13 PLENUM PRESSURE DP INTERLOCK/ALARM CHECK

NOTE - Transmitter VTP-PDT-170 range is -5 to +5 INWC.

5.13.1 **CONNECT** BT-200 to back terminals (plus and minus) of "PLENUM DIFF PRESSURE" VTP-PDT-170.

5.13.2 **ENSURE** Valve lineup per Attachment 11.

5.13.3 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

5.13.4 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

5.13.5 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

5.13.6 **PRESS** "START PUSH BUTTON" VTP-PB-101.

5.13.7 **WAIT** for the Exhauster fan to reach steady state operation.

5.13.8 **SET** the BT-200 to test at 14.9% (13-17%), or a value greater than -3.5 INWC vacuum.

5.13.9 **VERIFY** the following:

- "EXHAUST FAN" VTP-EF-001 has SHUTDOWN
- Red "ILRUN" light is OFF
- Green "ILOFF" light is ILLUMINATED
- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "PLENUM VACUUM 1 HI".

5.13 PLENUM PRESSURE DP INTERLOCK/ALARM CHECK (Cont.)

5.13.10 **RECORD** the following indications:

BT-200 SETTING (%)	VTP-PDT-170 (INWC)	VTP-PI-170 (INWC)
14.9	-3.51	-3.5

✓ 5.13.11 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.13.12 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

✓ 5.13.13 **ENSURE** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "PLENUM VACUUM 1 HI".

✓ 5.13.14 **CLEAR** the BT-200 test setting.

✓ 5.13.15 **VERIFY** the "PLENUM VACUUM 1 HI" message has cleared from VTP-MV-102.

✓ 5.13.16 **ACKNOWLEDGE** any secondary alarms.

✓ 5.13.17 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.13.18 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.13.19 **SET** the BT-200 to test at ~~49% (48-50%)~~ 100% (100-102%). Exception (g) This is equivalent to approximately ~~-0.1~~ +5.0 INWC.

5.13 PLENUM PRESSURE DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.13.20 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN after 10 seconds
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "PLENUM ~~1~~ PRESSURE 1 HI". CSG WL 7/8/98

✓ 5.13.21 **RECORD** the following indications:

BT-200 SETTING (%)	VTP-PDT-170 (INWC)	VTP-PI-170 (INWC)
100.0	5.0	5.01

✓ 5.13.22 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.13.23 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

✓ 5.13.24 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still DISPLAYS "PLENUM ~~1~~ PRESSURE 1 HI". CSG WL 7/8/98

✓ 5.13.25 **CLEAR** the BT-200 test setting.

5.13 PLENUM PRESSURE DP INTERLOCK/ALARM CHECK (Cont.)

✓ 5.13.26 **DISCONNECT** BT-200 from "1st PLENUM PRESSURE" VTP-PDT-170.

5.13.27 Test Director **VERIFY** that section 5.13 is complete.

7/8/98

Test Director Signature Date

5.13.28 A/I Inspector **VERIFY** section 5.13 is complete.

7/8/98

A/I Signature Date

5.14 GLYCOL HEATER TEST

✓ 5.14.1 **ENSURE** Valve lineup per Attachment 11.

✓ 5.14.2 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.14.3 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.14.4 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.14.5 **PRESS** "START PUSH BUTTON" VTP-PB-101 to start "EXHAUST FAN" VTP-EF-001.

✓ 5.14.6 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to ON.

✓ 5.14.7 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 to ON **AND RECORD** initial values for time, inlet temperature, and outlet temperature below.

	INITIAL	FINAL
Time and Date	7/8/98 @941	7/8/98 0948
Inlet temperature (°F), VTP-TI-176	85	84
Outlet temperature (°F), VTP-TI-179	89	104

✓ 5.14.8 **CONTINUE** exhauster operation until the airflow temperature indicated by "1st HEPA INLET TEMPERATURE" VTP-TI-179 is 20°F above "INLET TEMPERATURE" VTP-TI-176.

✓ 5.14.9 **RECORD** final values for time, inlet temperature, and outlet temperature.

✓ 5.14.10 **POSITION** HS-102 to OFF.

✓ 5.14.11 **POSITION** DS-201 to OFF.

✓ 5.14.12 **PUSH** "STOP" button.

✓ 5.14.13 **OPEN** VTP-DS-102.

5.14 GLYCOL HEATER TEST (Cont.)

5.14.14 Test Director **VERIFY** section 5.14 is complete.

7/8/98
Test Director Signature Date

5.14.15 A/I Inspector **VERIFY** section 5.14 is complete.

7/8/98
A/I Signature Date

5.15 FAN INLET VACUUM INTERLOCK/ALARM CHECK-PRESSURE CONTROL

Note - Transmitter VTP-PDT-170 range is 0 to -20 INWC.

Note - Some adjustment of VTP-V-135 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception.

✓ 5.15.1 **ENSURE** that the pressure differential transmitter sensing plenum vacuum has been disconnected and the transmitter sensing fan inlet vacuum has been connected.

Ex. 6 Attachments 8, 13, 14. ✓ 7/16/98

5.15.2 **ENSURE** that the PLC 500 has been configured for Pressure Control, with set points as identified in Attachment 13.

✓ 5.15.3 **CONNECT** BT-200 to back terminals (plus and minus) of "PLENUM DIFF PRESSURE" VTP-PDT-170.

✓ 5.15.4 **ENSURE** Valve lineup per Attachment 11.

✓ 5.15.5 **CLOSE** VTP-V-135 to approximately 75% closed.

✓ 5.15.6 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.15.7 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.15.8 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.15.9 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.15.10 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.15.11 **PLACE** PID in Manual Mode (N20:41/6=0)

✓ 5.15.12 **SET** the BT-200 to test at 63.8% (63.5-64%). This is equivalent to 12.75 INWC vacuum.

5.15 FAN INLET VACUUM INTERLOCK/ALARM CHECK-PRESSURE CONTROL (Cont.)

✓ 5.15.13 **VERIFY** the following:

- ✓ "EXHAUST FAN" VTP-EF-001 has SHUTDOWN after 5 to 10 seconds.
- ✓ Red "ILRUN" light is OFF
- ✓ Green "ILOFF" light is ILLUMINATED
- ✓ Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- ✓ "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "INLET VACUUM HI".

✓ 5.15.14 **RECORD** value from PRESSURE TRANSMITTER VTP-PDT-170.

READING: -12.76 INWC

✓ 5.15.15 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.15.16 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

✓ 5.15.17 **ENSURE** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "INLET VACUUM HI".

✓ 5.15.18 **CLEAR** the BT-200 test setting.

✓ 5.15.19 **VERIFY** the "INLET VACUUM HI" message has cleared from VTP-MV-102.

✓ 5.15.20 **ACKNOWLEDGE** any secondary alarms.

5.15 FAN INLET VACUUM INTERLOCK/ALARM CHECK-PRESSURE CONTROL (Cont.)

5.15.21 **PRESS** "START PUSH BUTTON" VTP-PB-101.

5.15.22 **WAIT** for the Exhauster fan to reach steady state operation.

5.15.23 **PLACE** PID in Manual Mode (N20:41/6=0)

5.15.24 **SET** the BT-200 to test at 29.9% (29.5-30.5%). This is equivalent to approximately 6 INWC.

5.15.25 **RECORD** value from PRESSURE TRANSMITTER VTP-PDT-170.

READING: ~5.98 INWC

5.15.26 **VERIFY** the following:

- Clear Rotating Beacon VTP-XA-101 is ILLUMINATED (after 5 to 7 seconds).

NOTE - Any secondary alarms that are still in alarm condition will also be indicated.

- "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "INLET VACUUM LO".

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

5.15.28 **ACKNOWLEDGE** uncleared alarms by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are acknowledged.

5.15.29 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

5.15.30 **DISCONNECT** BT-200 from "1st PLENUM PRESSURE" VTP-PDT-170.

5.15 FAN INLET VACUUM INTERLOCK/ALARM CHECK-PRESSURE CONTROL (Cont.)

5.15.31 Test Director **VERIFY** that section 5.15 is complete.

Test Director Signature 7/8/98 Date

5.15.32 A/I Inspector **VERIFY** section 5.15 is complete.

A/I Signature 7/8/98 Date

5.16 STACK FLOW INTERLOCK/ALARM CHECK-PRESSURE CONTROL

Note - Transmitter VTP-FT-184 range is 0 - 4".

Note - Some adjustment of VTP-V-135 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception.

✓ 5.16.1 **ENSURE** that the pressure differential transmitter sensing plenum vacuum has been disconnected and the transmitter sensing fan inlet vacuum has been connected.

✓ 5.16.2 **ENSURE** that the PLC 500 has been configured for Pressure Control, with set points as identified in Attachment 13.

✓ 5.16.3 **CONNECT** BT-200 to back terminals (plus and minus) of "STACK FLOW" VTP-FT-184.

✓ 5.16.4 **ENSURE** Valve lineup per Attachment 11.

✓ 5.16.5 **CLOSE** VTP-V-135 to approximately 75% closed.

✓ 5.16.6 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.16.7 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.16.8 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.16.9 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.16.10 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.16.11 **RECORD** value indicated by "STACK FLOW" indicator VTP-FI-184.

READING: 765 SCFM

5.16 STACK FLOW INTERLOCK/ALARM CHECK-PRESSURE CONTROL (Cont.)

✓ 5.16.12 **PLACE** the fan in manual mode by setting the auto/manual bit N20:41/6 to 0.

✓ 5.16.13 **SET** the BT-200 to test at 73%, or at a value sufficient to cause a flow indication of between 1000 and 1005 SCFM at VTP-FI-184, "STACK FLOW". (+5.5%)

✓ 5.16.14 **PERFORM** the following:

- ✓ **VERIFY** Clear Rotating Beacon VTP-XA-101 is ILLUMINATED
- ✓ **RECORD** value indicated on "STACK FLOW" VTP-FI-184.

  READING: 1000 SCFM
- ✓ **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "STACK FLOW HI"
- ✓ **VERIFY** the fan has shut down.

✓ 5.16.15 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101

✓ 5.16.16 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.16.17 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

✓ 5.16.18 **CLEAR** the BT-200.

✓ 5.16.19 **VERIFY** "STACK FLOW HI" message has cleared from VTP-MV-102.

✓ 5.16.20 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.16.21 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.16.22 **WAIT** for the Exhauster fan to reach steady state operation.

5.16 STACK FLOW INTERLOCK/ALARM CHECK-PRESSURE CONTROL (Cont.)

✓ 5.16.23 **PLACE** the fan in manual mode by setting the auto/manual bit N20:41/6 to 0.

✓ 5.16.24 **SET** the BT-200 to test at 32.5% or a value required to drop the stack flow between 675 and 670 SCFM as indicated on the stack flow meter VTP-FI-184. (34.0)

✓ 5.16.25 **RECORD** the value indicated on "STACK FLOW" VTP-FI-184.

READING: 673 SCFM

✓ 5.16.26 **VERIFY** the following:

✓ • Clear rotating beacon VTP-XA-101 is ILLUMINATED after 10 to 15 seconds.

✓ • "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 DISPLAYS "STACK FLOW LO".

✓ 5.16.27 **CLEAR** the BT-200.

✓ 5.16.28 **ACKNOWLEDGE** uncleared alarms by PRESSING the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

- Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101.

✓ 5.16.29 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.16.30 **DISCONNECT** BT-200 from "STACK FLOW" VTP-FT-184.

5.16.31 Test Director **VERIFY** section 5.16 is complete.

L C Hall 7/8/98
Test Director Signature Date

5.16.32 A/I Inspector **VERIFY** section 5.16 is complete.

E J Enlow Jr 7/8/98
A/I Signature Date

5.17 HIGH INLET VACUUM INTERLOCK CHECK-HIGH VACUUM

Note - Transmitter VTP-PDT-170 range is 0 to -20 INWC.

Note - Some adjustment of VTP-V-135 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception.

✓ 5.17.1 **ENSURE** that the pressure differential transmitter sensing plenum vacuum has been disconnected and the transmitter sensing fan inlet vacuum has been connected.

✓ 5.17.2 **ENSURE** that the PLC 500 has been configured for High Vacuum Operation, with set points as identified in Attachment 14.

✓ 5.17.3 **CONNECT** BT-200 to back terminals (plus and minus) of "PLENUM DIFF PRESSURE" VTP-PDT-170.

✓ 5.17.4 **ENSURE** Valve lineup per Attachment 11.

✓ 5.17.5 **CLOSE** VTP-V-135 to approximately 75% closed.

✓ 5.17.6 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.17.7 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.17.8 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.17.9 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.17.10 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.17.11 **SET** the BT-200 to test at 97.6% (97.5-98.0%), or a value required to increase the inlet vacuum to 19.5 INWC as indicated on VTP-PDT-170.

5.17 HIGH VACUUM INTERLOCK CHECK-HIGH VACUUM (Cont.)

✓ 5.17.12 **VERIFY** the following:

7/8/98

✓ • "EXHAUST FAN" VTP-EF-001 has SHUTDOWN ~~after~~ after 5-7 seconds.

✓ • Red "ILRUN" light is OFF

✓ • Green "ILOFF" light is ILLUMINATED

✓ • Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

NOTE – Any secondary alarms that are still in alarm condition will also be indicated.

✓ • "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 displays "INLET VACUUM HI".

✓ 5.17.13 **RECORD** value from PRESSURE TRANSMITTER VTP-PDT-170.

READING: −19.52 INWC

✓ 5.17.14 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

• Wait for any secondary alarms and repeat this step until all alarms are cleared.

✓ 5.17.15 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

NOTE – Any secondary alarms that are still in alarm condition will also be indicated.

✓ 5.17.16 **ENSURE** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 still displays "INLET VACUUM HI".

✓ 5.17.17 **CLEAR** the BT-200 test setting.

✓ 5.17.18 **VERIFY** "INLET VACUUM HI" has cleared from VTP-MV-102.

✓ 5.17.19 **ACKNOWLEDGE** any secondary alarms.

✓ 5.17.20 **DISCONNECT** BT-200 from "1st PLENUM PRESSURE" VTP-PDT-170.

5.17 HIGH VACUUM INTERLOCK CHECK-HIGH VACUUM (Cont.)

5.17.21 Test Director **VERIFY** that section 5.17 is complete.

Test Director Signature 7/8/98 Date

5.17.22 A/I Inspector **VERIFY** section 5.17 is complete.

A/I Signature 7/8/98 Date

5.18 STACK FLOW ALARM CHECK-HIGH VACUUM

Note - Transmitter VTP-FT-184 range is 0 - 4".

Note - Some adjustment of VTP-V-135 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception.

✓ 5.18.1 **ENSURE** that the PLC 500 has been configured for High Vacuum Operation, with set points as identified in Attachment 14.

✓ 5.18.2 **CONNECT** BT-200 to back terminals (plus and minus) of "STACK FLOW" VTP-FT-184.

✓ 5.18.3 **ENSURE** Valve lineup per Attachment 11.

✓ 5.18.4 **CLOSE** VTP-V-135 to approximately 75% closed.

✓ 5.18.5 **ENSURE** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 is ON.

✓ 5.18.6 **ENSURE** "FAN CONTROL" VTP-HS-103 (located on door of "CONTROL CABINET" VTP-CP-105) is in the ENABLE position.

✓ 5.18.7 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

✓ 5.18.8 **PRESS** "START PUSH BUTTON" VTP-PB-101.

✓ 5.18.9 **WAIT** for the Exhauster fan to reach steady state operation.

✓ 5.18.10 **RECORD** value indicated by "STACK FLOW" indicator VTP-FI-184.

READING: 812 SCFM

✓ 5.18.11 **SET** the BT-200 to test at 73%, or a value between 1000-1005 SCFM. (75.5%)

5.18 STACK FLOW ALARM CHECK-HIGH VACUUM (Cont.)

✓ 5.18.12 **PERFORM** the following:

✓ • **VERIFY** Clear Rotating Beacon VTP-XA-101 is ILLUMINATED

✓ • **RECORD** value indicated on "STACK FLOW" VTP-FI-184.

READING: 1005 SCFM

✓ • **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 **AND** VTP-MV-102 DISPLAYS "STACK FLOW HI"

✓ 5.18.13 **ACKNOWLEDGE** the alarm by **PRESSING** the "1" button, then **PRESSING** the "↵" button on the "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-101 twice.

• Wait for any secondary alarms and repeat this step until all alarms are cleared on VTP-MV-101

✓ 5.18.14 **VERIFY** Clear Rotating Beacon VTP-XA-101 is OFF.

✓ 5.18.15 **VERIFY** "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" VTP-MV-102 maintains alarm message.

✓ 5.18.16 **CLEAR** the BT-200.

✓ 5.18.17 **ACKNOWLEDGE** any secondary alarms on VTP-MV-101.

✓ 5.18.18 **DISCONNECT** BT-200 from "STACK FLOW" VTP-FT-184.

5.18.19 Test Director **VERIFY** section 5.18 is complete.

Test Director Signature 7/8/98 Date

5.18.20 A/I Inspector **VERIFY** section 5.18 is complete.

A/I Signature ✓ 7/8/98 Date

5.19 FUNCTIONAL TEST - FLOW CONTROL (1000 CFM)

5.19.1 **CONNECT** exhauster to the portable inlet filter station, flex hoses and throttle valve per Figure 1. Remove inlet filter lid & INSERT Pre-filter per Exception 012. 7/15/98 LWL

NOTE- Figure 1 is a schematic showing a test setup to mimic connecting the portable exhauster to a waste tank.

5.19.2 **ENSURE** exhauster programming is set-up for "flow control" with operating, alarm, and interlock set points as identified in Attachment 8.

5.19.3 **PERFORM** valve line-up per Attachment 11.

5.19.4 **ENSURE** EW-1 is OPEN.

5.19.5 **PERFORM** electrical alignment per Attachment 12.

5.19.6 **POSITION** the "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to ON.

5.19.7 **PRESS** "START PUSH BUTTON" VTP-PB-101 to start "EXHAUST FAN" VTP-EF-001. is Heater 7/16/98

5.19.8 ENSURE LWL 7/15/98 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 ~~to~~ **ON.**

5.19.9 ENSURE LWL 7/15/98 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 ~~to~~ **ON.** is Glycol 7/16/98

5.19.10 **RECORD** the values as identified in the table below.

Date: 7/15/98 Time: 1045 Initials: ESG

INDICATOR	NAME	READING
VTP-FI-184	STACK FLOW	1000
VTP-VFD-001	VARIABLE FREQUENCY DRIVE	45.5
VTP-PI-170	1st PLENUM PRESSURE	-0.94
VTP-PI-177	HEATER DIFF PRESSURE	0.54
VTP-PI-178	PREFILTER DIFF PRESSURE	0.20
VTP-PI-181	FILTER 1/2 DIFF PRESSURE	3.04
VTP-TI-176	INLET TEMP	89
VTP-TI-179	1st HEPA INLET TEMP	105

5.19 FUNCTIONAL TEST - FLOW CONTROL (1000 CFM) (Cont.)

✓ 5.19.11 **SLOWLY CLOSE** EW-1 until VTP-PI-170 indicates a vacuum of 3.0 +/- 0.5 INWC.

5.19.12 **RECORD** the values requested in the Table below after the exhauster has operated for 1 hour.

Date: 7/15/98 Time: 1145 Initials: DSG

INDICATOR	NAME	READING
VTP-FI-184	STACK FLOW	1000
VTP-VFD-001	VARIABLE FREQUENCY DRIVE	53.1
VTP-PI-170	1st PLENUM PRESSURE	-3.2
VTP-PI-177	HEATER DIFF PRESSURE	0.58
VTP-PI-178	PREFILTER DIFF PRESSURE	0.22
VTP-PI-181	FILTER 1/2 DIFF PRESSURE	3.2
VTP-TI-176	INLET TEMP	93
VTP-TI-179	1st HEPA INLET TEMP	137

✓ 5.19.13 **PRESS** "STOP PUSH BUTTON" VTP-PB-102.

5.19.14 Test Director **VERIFY** section 5.19 is complete.

Test Director Signature 7/15/98 Date

5.19.15 A/I Inspector **VERIFY** section 5.19 is complete.

EJ Eakle Jr 7/15/98
A/I Signature Date

5.20 FUNCTIONAL TEST - FLOW CONTROL (500 CFM)

5.20.1 **CONNECT** exhauster to the portable inlet filter station, flex hoses and throttle valve per Figure 1.

NOTE- Figure 1 is a schematic showing a test setup to mimic connecting the portable exhauster to a waste tank.

5.20.2 **ENSURE** exhauster programming is set-up for "flow control" with operating, alarm, and interlock set points as identified in Attachment 8.

5.20.3 **SET** Stack Flow operating point (F8:6) to 500 SCFM.

✓ 5.20.4 **PERFORM** valve line-up per Attachment 11.

✓ 5.20.5 **ENSURE** EW-1 is OPEN.

✓ 5.20.6 **PERFORM** electrical alignment per Attachment 12.

✓ 5.20.7 **POSITION** "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 **ON**.

✓ 5.20.8 **PRESS** "START PUSH BUTTON" VTP-PB-101 to start "EXHAUST FAN" VTP-EF-001.

✓ 5.20.9 **POSITION** "GLYCOL HEATER DISCONNECT" VTP-DS-201 **ON**.

✓ 5.20.10 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 **ON**.

5.20.11 **RECORD** the values as identified in the table below.

Date: 7/15/98 Time: 1151 Initials: RSG

INDICATOR	NAME	READING
VTP-FI-184	STACK FLOW	500
VTP-VFD-001	VARIABLE FREQUENCY DRIVE	31
VTP-PI-170	1st PLENUM PRESSURE	-1.6
VTP-PI-177	HEATER DIFF PRESSURE	0.16
VTP-PI-178	PREFILTER DIFF PRESSURE	0.07
VTP-PI-181	FILTER 1/2 DIFF PRESSURE	1.09
VTP-TI-176	INLET TEMP	95
VTP-TI-179	1st HEPA INLET TEMP	143

5.20 FUNCTIONAL TEST - FLOW CONTROL (500 CFM) (Cont.)

5.20.12 **SLOWLY CLOSE** EW-1 until VTP-PI-170 indicates a vacuum of 3.0 +/- 0.5 INWC.

5.20.13 **RECORD** the values requested in the Table below after the exhauster has operated for 1 hour.

Date: 7/15/98 Time: ~~1256~~ 1251 Initials: CKG

INDICATOR	NAME	READING
VTP-FI-184	STACK FLOW	500
VTP-VFD-001	VARIABLE FREQUENCY DRIVE	36.15
VTP-PI-170	1st PLENUM PRESSURE	-2.97
VTP-PI-177	HEATER DIFF PRESSURE	0.17
VTP-PI-178	PREFILTER DIFF PRESSURE	0.08
VTP-PI-181	FILTER 1/2 DIFF PRESSURE	1.10
VTP-TI-176	INLET TEMP	96
VTP-TI-179	1st HEPA INLET TEMP	~~158~~ 157

5.20.14 **PRESS** "STOP PUSH BUTTON" VTP-PB-102.

5.20.15 Test Director **VERIFY** section 5.20 is complete.

Test Director Signature 7/15/98 Date

5.20.16 A/I Inspector **VERIFY** section 5.20 is complete.

A/I Signature 7/15/98 Date

5.21 FUNCTIONAL TEST - PRESSURE CONTROL

Note - Some adjustment of VTP-V-135 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception.

5.21.1 **CONNECT** exhauster to the portable inlet filter station, flex hoses and throttle valve per Figure 1.

Note- Figure 1 is a schematic showing a test setup to mimic connecting the portable exhauster to a waste tank.

5.21.2 **ENSURE** that exhauster has been reconfigured with VTP-PDT-170 sensing fan inlet vacuum.

Test Director Signature 7/15/98 Date

5.21.3 **ENSURE** exhauster programming is set-up for "pressure control" with set, alarm, and interlock points as identified in Attachment 13.

Test Director Signature 7/15/98 Date

✓ 5.21.4 **PERFORM** valve line-up per Attachment 11.

✓ 5.21.5 **CLOSE** VTP-V-135 to approximately 75% closed.

✓ 5.21.6 **CLOSE** VTP-V-158 "FAN ISOLATION VALVE"

✓ 5.21.7 **PERFORM** electrical alignment per Attachment 12.

✓ 5.21.8 **ENSURE** the "EXHAUST FAN MOTOR DISCONNECT" VTP-DS-102 to ON.

✓ 5.21.9 **OPEN** EW-1.

✓ 5.21.10 **PRESS** "START PUSH BUTTON" VTP-PB-101 to start "EXHAUST FAN" VTP-EF-001.

Note- Valves must be positioned very slowly with the fan operational to prevent a ROC shutdown of the exhauster. If fan shutdown does occur, the Test Director may direct the restart of the fan, and clearing of alarms and does not constitute an exception to the ATP.

5.21.11 **SLOWLY OPEN** VTP-V-136 until VTP-VI-184 "STACK FLOW" indicates 925 (+/-25) SCFM. 7/15/98

5.21 FUNCTIONAL TEST - PRESSURE CONTROL (Cont.)

✓ 5.21.12 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to ON.

✓ 5.21.13 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 to **ON.**

5.21.14 **RECORD** the values as identified in the table below.

Date: 7/15/98 Time: 1306 Initials:

INDICATOR	NAME	READING
VTP-FI-184	FAN INLET STACK FLOW 7/15/98	925
VTP-PDT-170	1st PLENUM PRESSURE	-11.55
VTP-PDT-177	HEATER DIFF PRESSURE	0.710
VTP-PDT-178	PREFILTER DIFF PRESSURE	0.220
VTP-PDT-181	FILTER 1/2 DIFF PRESSURE	2.910
VTP-TI-176	INLET TEMP	99
VTP-TI-179	1st HEPA INLET TEMP	148

5.21.15 **SLOWLY CLOSE** EW-1 until VTP-FI-184 indicates that flow has been reduced to 700 (+/- 25) SCFM.

5.21.16 **RECORD** the readings indicated in the table below.

Date: 7/15/98 Time: 1311 Initials: CSE

INDICATOR	NAME	READING
VTP-FI-184	STACK FLOW	688
VTP-PDT-170	1st PLENUM PRESSURE	-11.98

FAN INLET CSE 7/15/98

5.21 FUNCTIONAL TEST - PRESSURE CONTROL (Cont.)

5.21.17 **RECORD** the values requested in the Table below after the exhauster has operated for 1 hour.

Date: 7/15/98 Time: 1411 Initials: CES

INDICATOR	NAME	READING
VTP-FI-184	FAN IN ~~STACK FLOW~~	689
VTP-PDT-170	~~1st~~ PLENUM PRESSURE	-12.00
VTP-PDT-177	HEATER DIFF PRESSURE	+0.357
VTP-PDT-178	PREFILTER DIFF PRESSURE	0.144
VTP-PDT-181	FILTER 1/2 DIFF PRESSURE	1.810
VTP-TI-176	INLET TEMP	96
VTP-TI-179	1st HEPA INLET TEMP	150

√5.21.18 **PRESS** "STOP PUSH BUTTON" VTP-PB-102.

5.21.19 **VERIFY** section 5.21 is complete.

L W [signature] 7/15/98
Test Director Signature Date

[signature] 7/15/98
A/I Signature Date

5.22 FUNCTIONAL TEST - HIGH VACUUM

5.22.1 **CONNECT** exhauster to the portable inlet filter station, flex hoses and throttle valve per Figure 1.

NOTE- Figure 1 is a schematic showing a test setup to mimic connecting the portable exhauster to a waste tank.

5.22.2 **ENSURE** that exhauster has been configured with VTP-PDT-170 sensing fan inlet vacuum.

Test Director Signature _____ Date 7/15/98

5.22.3 **ENSURE** exhauster programming is set-up for high vacuum operation, with operating, alarm, and interlock set points as identified in Attachment 14.

5.22.4 **PERFORM** valve line-up per Attachment 5.

5.22.5 **DISCONNECT** PDT-170 sensing line from the fan inlet transition, and **CAP** transition.

5.22.6 **CLOSE** VTP-V-158, "FAN ISOLATION VALVE"

5.22.7 **PERFORM** electrical alignment per Attachment 4.

5.22.8 **REMOVE** HEME and HEPA, and pre-filters per the direction of the Test Director.

5.22.9 **INSTALL** 7-1" test plugs in plenum drain lines, and **REPLACE** HEPA and pre-filters and all covers.

Test Director Signature _____ Date 7/15/98

NOTE- Perform pressure/vacuum decay test to ensure exhauster plenum has been isolated from the seal pot.

5.22.10 **REMOVE** blind flange from VTP-V-160.

5.22 FUNCTIONAL TEST - HIGH VACUUM (cont.)

5.22.11 **ENSURE** "SEAL POT" VTP-SP-001 is empty by opening the "SEAL POT DRAIN VALVE" VTP-V-160.

- **IF** not empty, allow to empty through VTP-V-160.

5.22.12 **INSTALL** pneumatic pressure testing manifold (with gauge, pressure relief valve, isolation valve, pressure gauge, and pressure regulator) into "1st HEPA TEST PORT" VTP-FTP-002.

Test Log #7: Add STEP → "Ensure main disconnect DS-101, MPZ Main BRK-101, & MPZ-1 are ON." LWL 7/15/98

5.22.13 **CONNECT** pressure test air source to testing manifold.

5.22.14 **PRESSURIZE** housing/duct assembly to +19.5 ± 0.5 INWC.

5.22.15 **ISOLATE** the air supply from the filter housing.

5.22.16 **MAINTAIN** pressure until temperature remains constant within ±1 °F as indicated by "1st HEPA INLET TEMPERATURE" VTP-TI-179 for a minimum of 10 minutes.

NOTE - Next step starts checking positive pressure decay.

5.22.17 **RECORD** the initial time (t_i), barometric pressure (BP_i), housing pressure (P_i), and temperature (T_i) on the table provided in Attachment 9.

- **RECORD** pressure and temperature readings once a minute for 15 minutes on Attachment 9.

5.22.18 **RECORD** final time (t_f), barometric pressure (BP_f), housing pressure (P_f) and temperature (T_f) on the table **AND TRANSFER** required information to Attachment 10.

5.22.19 **PERFORM** the leak rate calculations per Attachment 10.

5.22 FUNCTIONAL TEST - HIGH VACUUM (cont.)

5.22.20 **IF** Q < L_s then **RECORD** "PASS" on Attachment 10 and proceed to step 5.22.22.

- Otherwise, **RECORD** "RETEST" on Attachment 10.

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

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

5.22.21.2 **REPEAT** steps 5.22.14 through 5.22.20 using new data sheets.

5.22.22 **DISCONNECT** the air supply.

5.22.23 **RELIEVE** pressure slowly from housing/duct assembly through Testing Manifold assembly.

5.22.24 **CONNECT** a vacuum source to the Pressure Testing Manifold Assembly.

Exception 002 JWL 7/7/98

5.22.25 **DECREASE** housing/duct internal pressure to ~~-14.5 (±0.5)~~ -20 ± 0.5 INWC as indicated by the pressure measuring device.

5.22.26 **ISOLATE** the vacuum source from the filter housing.

5.22.27 **MAINTAIN** constant pressure until temperature remains constant within ±1 °F as indicated by "1st HEPA INLET TEMPERATURE" VTP-TI-179 for a minimum of 10 minutes.

5.22 FUNCTIONAL TEST - HIGH VACUUM (Cont.)

NOTE - Next step starts checking negative pressure decay.

5.22.28 **RECORD** the initial time (t_i), barometric pressure (BP_i), housing pressure (P_i), and temperature (T_i) on the table in Attachment 9.

- **RECORD** pressure and temperature readings once a minute for 15 minutes on Attachment 9.

5.22.29 **RECORD** final time (t_f), barometric pressure (BP_f), housing pressure (P_f) and temperature (T_f) on table **AND TRANSFER** required information to Attachment 10.

5.22.30 **PERFORM** the leak rate calculations per Attachment 10.

5.22.31 **IF** $Q < L_s$ then **RECORD** "PASS" on Attachment 10 and go to step 5.22.32.

- Otherwise, **RECORD** "RETEST" on Attachment 10.

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

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

5.22.31.3 **REPEAT** steps 5.22.25 through 5.22.31 using new data sheets.

5.22 FUNCTIONAL TEST - HIGH VACUUM (Cont.)

5.22.32 **SLOWLY EQUALIZE** housing/duct pressure to atmospheric through the Testing Manifold Assembly.

5.22.33 **DISCONNECT** the test equipment.

5.22.34 **REINSTALL** the test port plugs.

5.22.35 **OPEN** High Isolation Valve Main Airstream VTP-V-135.

5.22.36 **OPEN** Low Isolation Valve Main Airstream VTP-V-136.

5.22.37 **RECONNECT** VTP-PT-170 sensing line removed in Step 5.22.5

5.22.38 Test Director **VERIFY** pressure decay testing is complete.

Test Director Signature 7/15/98 Date

5.22.39 A/I Inspector **VERIFY** pressure decay testing is complete.

A/I Signature 7/15/98 Date

Note- During High Vacuum Testing of the exhauster, it may be necessary to throttle VTP-V-135 and VTP-V-136 to balance the system (unstable flow condition). The Test Director may authorize positioning of these valves as required at any time during this test.

5.22.40 **PERFORM** valve line-up per Attachment 11.

5.22.41 **POSITION** damper EW-1 approximately 75% closed.

5.22.42 **ENSURE** VTP-V-158 "FAN ISOLATION VALVE" is fully closed.

5.22.43 **PERFORM** Electrical Line-up per Attachment 12.

5.22.44 **ENSURE** all alarms are cleared on VTP-MV-101 "MESSAGE VIEW INTERACTIVE DISPLAY TERMINAL" (located on "ALARM CABINET" VTP-ENCL-107 swing out panel).

5.22 FUNCTIONAL TEST - HIGH VACUUM (Cont.)

5.22.45 **PRESS** "START PUSH BUTTON" VTP-PB-101 to start "EXHAUST FAN" VTP-EF-001.

Note- EW-1 must be operated very slowly to prevent an ROC shutdown of the exhauster. If fan shutdown does occur, the Test Director may direct the restart of the fan, and does not constitute an exception to the ATP.

Note - Some adjustment of VTP-V-135 and EW-1 may be required at start up to prevent high/low stack flow set points from being exceeded. Such adjustments do not qualify as a Test Exception. Objective is to have VTP-V-135 full open, and make flow adjustments at EW-1.

5.22.46 **RECORD** fan inlet vacuum (INDICATOR FOR VTP-PDT-170)

~~14.08~~ 14.05 INWC

5.22.47 **POSITION** the "GLYCOL HEATER DISCONNECT" VTP-DS-201 to ON.

5.22.48 **POSITION** "GLYCOL PUMP" Control Switch VTP-HS-102 to ON **AND RECORD** initial values for time, inlet temperature, and 1st HEPA Inlet temperature below.

"INLET TEMPERATURE" VTP-TI-176

READING: 83

7:16 Am

"1st HEPA INLET TEMPERATURE" VTP-TI-179

READING: 95

Note - Low Stack Flow alarm may cause fan shutdown during performance of the next step. If this should occur, Test Director may authorize restart of the fan after EW-1 has been repositioned. Testing at flows prescribed in Step 5.22.49 below stack flow alarm point is not required, and a Test Exception is not required.

NOTE- Exhauster may not be able to achieve the higher flow rates identified in the table below. Enter the maximum flow rate and associated vacuum as identified by the Test Director. Enter NA for test points above the maximum ability of the exhauster.

5.22 FUNCTIONAL TEST - HIGH VACUUM (Cont.)

Note- If EW-1 lacks sufficient control to perform the next step, the Test Director may authorize adjustments to flow using VTP-V-135. Use of VTP-V-135 to make the adjustments below does not constitute a Test Exception.

5.22.49 **SLOWLY CLOSE** EW-1 to reduce "STACK FLOW" VTP-FI-184 in 100 SCFM (+/- 15 SCFM) increments. Record VTP-PDT-170 vacuum levels and FI-184 flow rates at each change until table below is completely filled out, or maximum vacuum capacity of the fan is obtained. Enter NA if not applicable.
THEN PROCEED.

TARGET FLOWS SCFM	900	800	700	600	500
ACTUAL FLOW SCFM	900	804	704	606	505
FAN INLET VACUUM	12.5	13.06	13.55	13.95	14.25

5.22.50 **SLOWLY OPEN** VTP-V-135 OR EW-1 **UNTIL**

- VTP-FI-184 exceeds 800 SCFM

OR

- VTP-PDT-170 exceeds -14 INWC.

5.22.51 **PERFORM** the following after exhauster has operated for 1 hour:

5.22.51.1 **RECORD** "STACK FLOW" VTP-FI-184

READING: 790 CFM

5.22.51.2 **RECORD** VTP-~~DPT~~-PDT-170

READING: 12.50 INWC

5.22.51.3 **RECORD** "INLET TEMPERATURE" VTP-TI-176

READING: 85

5.22 FUNCTIONAL TEST - HIGH VACUUM (Cont.)

5.22.51.4 **RECORD** "1st HEPA INLET TEMPERATURE" VTP-TI-179

READING: 145

5.22.52 **PRESS** "STOP PUSH BUTTON" VTP-PB-102.

5.22.53 **ALIGN** exhauster valves per Attachment 15, ATP Final Valve Lineup.

5.22.54 **REMOVE** HEPA and pre-filters per the direction of the Test Director.

5.22.55 **REMOVE** 7-1" test plugs in plenum drain lines, and **REPLACE** HEPA, HEME and pre-filters, and their covers.

Test Director Signature — Date: 7/16/98

5.22.56 Test Director **VERIFY** section 5.22 is complete.

Test Director Signature — Date: 7/16/98

5.22.57 A/I Inspector **VERIFY** section 5.22 is complete.

A/I Signature — Date: 7/16/98

5.23 RESTORATION

NOTE - The following steps will leave the exhauster in a winterization mode because exhauster contains water.

5.23.1 **REMOVE** blind flange from VTP-V-160.

5.23.2 **ENSURE** "SEAL POT" VTP-SP-001 is empty by opening the "SEAL POT DRAIN VALVE" VTP-V-160.

- **IF** not empty, allow to empty through VTP-V-160.

5.23.3 **CLOSE** "SEAL POT DRAIN VALVE" VTP-V-160.

5.23.4 **REPLACE** blind flange on VTP-V-160.

5.23.5 **ALIGN** exhauster valves per Attachment 15, ATP Final Valve Lineup.

5.23.6 **POSITION** electrical circuit breakers per Attachment 16, ATP Final Electrical Lineup.

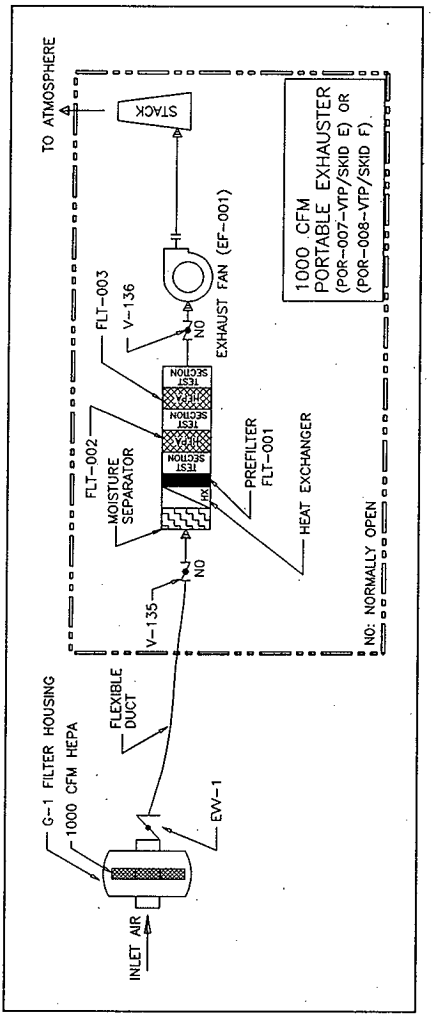


FIGURE 1 FUNCTIONAL TEST HARDWARE CONFIGURATION SCHEMATIC

ATTACHMENT 1 - ATP TEST LOG

(This page may be reproduced as necessary)

PAGE 1 of 4

ATP TEST LOG		
Number	Date	Description
1	7/6/98	Conducted Pre-Job
		Obtained Signatures &
		initials for ATTACH 3. fwk
002	7/6/98	Shunt Trip Failure
003	7/6/98	Incorporated Red line
		comments / procedure changes
		from HNF-2687 generated
		from Test exceptions. fwk
004	7/6/98	NOTE that bearing vibration
		levels in Section 5.4 are
		unfiltered. ANSI N-509 provides
		for filtered levels. (Skid vibration
		subtracted from Pillow blocks).
		Thus, filtered levels would be
		less than those measured. No
		instrument available for filtered readings. fwk

ATTACHMENT 1 - ATP TEST LOG

(This page may be reproduced as necessary)

PAGE 2 of 4

ATP TEST LOG		
Number	Date	Description
005	7/8/98	Changed Message View Messages to all read arabic numerals as opposed to combination of arabic & Roman per telecon w/ Design Authority 7/7/98. JWL
006	7/9/1998	Found suggested vernier setting of 22.5 pF in step 5.10.39 to be incorrect – should be 18 pF (17–19 pF).
007	7/15/98	Step required at 5.22.13: must energize MPZ-1 to read temperature for 5.22.16. DSD 7/15/98.

ATTACHMENT 1 - ATP TEST LOG
(This page may be reproduced as necessary)

PAGE 3 of 4

ATP TEST LOG		
Number	Date	Description
008	7/15/98	During performance of Section 5.22 about 57 minutes into the 60 minute runtime appears to have been some power perturbation which dropped out the fan motor. No alarms, no problem re-starting fan. After some discussion w/ QC & AI, believe was a power supply transient. Will allow fan to operate an additional 60 minutes 7/16/98 JWL
009	7/16/98	Obtained noise level readings to facilitate NCR disposition on 7/13/98. Not Part of ATP. JWL

ATTACHMENT 1 - ATP TEST LOG

(This page may be reproduced as necessary)

PAGE 4 of 4

ATP TEST LOG

Number	Date	Description
010	7/16/98	Completed testing (ATP).
		Performed a quick test
		w/ inlet filter station attached
		~~to~~ & HEME removed, plugs installed
		in seal pot to collect data
		for the generation of a
		system curve. [initials]

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.1.3	ATP Exception Log Number: 001

Description of Exception: Procedure does not ~~lo~~ line (TK 7/6/98) MPZ breakers. Shunt Trip was not energized and did not Trip. Error/omission in procedure breaker line up.

Resolution of Exception: Redline after step 5.1.3 to Turn ON POR-007-VTP-BRK-101 "MPZ PRIMARY Breaker", POR-007-VTP-BRK-102 "MPZ Secondary Breaker", MPZ 1, MPZ-2. Reperform step 5.1.4 (TK 7/6/98) Through 5.1.5.5
Strike steps 5.1.7 & 5.1.8

Date of Resolution:	7/6/98
Test Director signature:	[signature]
Project Engineer signature:	[signature]

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.2.20 & 5.22.25	ATP Exception Log Number: 002
Description of Exception: Procedural deficiency. Steps only require a vacuum of 14.5 INWC, when 20 is required.	
Resolution of Exception: Redline steps 5.2.20 and 5.22.25 to indicate a vacuum of 20.0 ± 0.5 INWC is required.	
Date of Resolution:	7/7/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.7.27	ATP Exception Log Number: 003

Description of Exception: After clearing BT-200 test setting, Filter 2 DP LO alarm did not clear. Further investigation shows that instrument was "set-up" but not zero'd. No criteria for reset condition/value. Program presently resets @ 0.02 INWC

Resolution of Exception: Per Cog Engineer, Reset condition should be "acknowledge MV-101 alarm". Change PLC logic to match. Re-run 5.7.18 through 5.7.27. No 10 second delay logic. Modify procedure step 5.7.22. Also re-run 5.6.20-5.6.28, modify procedure steps 5.6.24 and 5.8.20 to eliminate 10 second delay.

Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.11.3, 5.10.8. (CRD 7/9/98)	ATP Exception Log Number: 004
Description of Exception: Calibration System's black 3-wire lead. Procedure needs to provide for ground connection. 5.11.3.8 lead color identified incorrectly. 5.11.3.10 incorrect side of transmitter called out. Make similar changes to section 5.10.8. (CRD) 7/9/98.	
Resolution of Exception: Redline procedure to accomodate procedural deficiencies as required to hook-up calibration system correctly.	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	Christopher S. Clark

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.11.27	ATP Exception Log Number: 5
Description of Exception: Procedural deficiency. Positioned MPZ-1 to OFF in step 5.11.25. Need to turn back on before step 5.11.28 can be performed.	
Resolution of Exception: Insert step after 5.11.27, "Position MPZ-1 to ON."	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.15.2, 5.13.19 7/8/98	ATP Exception Log Number: 7/8/98 6

Description of Exception: Attachment 8 plenum 1 pressure high set point should be 5.0 INWC per Cog engineer. Also effects Attachments 13 & 14. Also noted difficulty with Filter 1 Temp Lo alarm reset, Vacuum Control setpoints PLC values.

Resolution of Exception: Redline attachments to reflect modified operating parameters and correct values for PLC units. Change step 5.13.19 to read "100% (100-102%)", "+5.0 INWC".

Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.11.30	ATP Exception Log Number: 7
Description of Exception: Procedural deficiency. MPZ-1 not switched off at the end of Section 5.11	
Resolution of Exception: Add step prior to 5.11.31: "POSITION MPZ-1 to OFF"	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.12.1	ATP Exception Log Number: 8
Description of Exception: Thermocouple simulator had a setting higher than high temp setpoint. Caused alarm, prevented glycol heater and pump from operating.	
Resolution of Exception: Add one step, one note prior to 5.12.1:	
Step: "ENSURE MPZ-1 is OFF"	
Note: "Set thermocouple simulator to 100 F prior to connecting to ~~thermocouple~~." input terminals CSG 7/8/98	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.11.10	ATP Exception Log Number: 9
Description of Exception: "Glycol Level Lo" alarm on MV-101 prevented pump operating.	
Resolution of Exception: Add General note to Procedure that states "Acknowledge alarms on MV-101 anytime after MPZ-1 is re-energized. (Add note after 2.4.9) DG 7/8/98	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	Christopher S Chronister

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.10.14	ATP Exception Log Number: 010

Description of Exception: STEP 5.10.1 opens recycle valve, then valve line-up in 5.10.14 closes it. CAUSES SEAL POT PUMP to "dead head" Does not effect interlock checks or other testing, but should be corrected as procedural deficiency.

Resolution of Exception: Move STEP 5.10.14 in front of step 5.10.1

Date of Resolution:	7/9/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

STET

ATP step number: 4.1, ~~2nd~~ 3rd bullet	ATP Exception Log Number: 011
Description of Exception: Nomenclature error. Intent was to have a calibrated pressure gauge with **RESOLUTION** of ± 0.1 INWC.	
Resolution of Exception: Ensure that pressure/vacuum gauges used for testing are calibrated over the required range, and have a resolution of ±0.1 INWC.	
Date of Resolution:	7/8/98
Test Director signature:	
Project Engineer signature:	7/15/98

ATTACHMENT 2 - ATP TEST EXCEPTION REPORT

(This page may be reproduced as necessary)

ATP step number: 5.19.1	ATP Exception Log Number: 012

Description of Exception: Test Step requires connection to a portable inlet station. However, cannot reach 1000 CFM through the inlet station with out exceeding the allowable 3.5 INWC inlet vacuum at the exhauster.

Resolution of Exception: Remove the lid from the G-1 filter station and place the roughing filter over the 12" opening to the damper/hose assembly. Purpose of filter/damper assembly is to mimic tank operation by establishing a partial vacuum at the exhauster inlet. This can be accomplished using the damper EW-1, without flowing air through the HEPA filter. Note that tank inlet filter stations consist of HEPA filter banks (2 or more HEPAs) and will not have similarly large pressure drops at similar flow rates at the test article.

Date of Resolution:	7/15/98
Test Director signature:	
Project Engineer signature:	

ATTACHMENT 3 - ATP SIGNATURE SHEET

All persons participating in the performance of this PROCEDURE shall enter their printed name, signature and initials below.

NAME (PRINT)	SIGNATURE	INITIALS
STEVEN V SHAW		
PJ ELMENDORF	PJ Elmendorf	PJE
Christopher S. Ghormley	Chris S Ghormley	CSG
T.D. KAISER	Terry D Kaiser	K
E.F. BULOW	E F Bulow	EFB
R.J. BRAIM	RJ Braim	RB
R.E. Larson	R E Larson	RE

ATTACHMENT 4 - ATP INITIAL ELECTRICAL LINEUP

COMPONENT #	DESCRIPTION	POSITION	INITIALS
VTP-DS-101	480 VOLT MAIN DISCONNECT	OFF	OK
VTP-DS-102	EXHAUST FAN MOTOR DISCONNECT	OFF	OK
VTP-DS-201	GLYCOL HEATER DISCONNECT	OFF	OK
VTP-BRK-101	MPZ PRIMARY BREAKER "MAIN"	OFF	OK
VTP-BRK-102	MPZ SECONDARY BREAKER "SECONDARY MAIN"	OFF	OK
120V CIRCUIT BREAKERS (LOCATED AT "MINI POWER ZONE" VTP-DP-101)			
MPZ-1	ACTION PAK RELAYS, POWER SUPPLIES, WILKERSON DISPLAY METERS	OFF	OK
MPZ-2	GLYCOL PUMP, SEAL POT PUMP, SHUNT TRIP, PILOT LIGHTS, ALARM BEACON	OFF	OK
MPZ-3	HEAT TRACE, GLYCOL CONTACTOR, HEAT TRACE LIGHT	OFF	OK
MPZ-4	CABINET HEATERS AND FANS	OFF	OK
MPZ-5	CONVENIENCE RECEPTACLE	OFF	OK
MPZ-6	GEMS "GFE" (SPARE)	OFF	OK
MPZ-7	AMS-4 "GFE" (SPARE)	OFF	OK
MPZ-8	FLAMMABLE GAS MONITOR (SPARE)	OFF	OK
MPZ-9	(SPARE)	N/A	N/A
MPZ-10	(SPARE)	N/A	N/A
CONTROL CABINET (VTP-CP-105)			
VTP-HS-103	FAN CONTROL	OFF	OK
VTP-HS-102	GLYCOL PUMP	OFF	OK
VTP-HS-101	SEAL POT PUMP CONTROL	AUTO	OK
VTP-HS-105	CONTROL CABINET HEAT/COOL	OFF	OK
HEAT TRACE CABINET (VTP-ENCL-104)			
VTP-HS-104	HEAT TRACE CABINET HEAT/COOL	OFF	OK

Do Not Exist
7/16/98

ATTACHMENT 5 - ATP INITIAL VALVE LINEUP

VALVE #	DESCRIPTION	POSITION	INITIALS
VTP-V-135	HIGH ISOLATION VALVE MAIN AIRSTREAM	CLOSED	
VTP-V-136	LOW ISOLATION VALVE MAIN AIRSTREAM	CLOSED	
VTP-V-201	HIGH ISOLATION VALVE GLYCOL PUMP	CLOSED	
VTP-V-202	LOW ISOLATION VALVE GLYCOL PUMP	CLOSED	
VTP-V-203	GLYCOL TANK ISOLATION VALVE	CLOSED	
VTP-V-204	HEATER COIL ISOLATION VALVE	CLOSED	
VTP-V-205	GLYCOL SYSTEM DRAIN VALVE	CLOSED	
VTP-V-301	BACKFLOW PREVENTOR OUTLET ISOLATION VALVE	CLOSED	
VTP-V-302	BACKFLOW PREVENTOR INLET ISOLATION VALVE	CLOSED	
VTP-V-158	FAN ISOLATION VALVE	CLOSED	
VTP-V-160	SEAL POT DRAIN VALVE	CLOSED	
VTP-V-161	SEAL POT GRAVITY DRAIN VALVE	CLOSED	
VTP-V-162	SEAL POT FILL PORT VALVE	CLOSED	
VTP-V-163	SEAL POT PUMP RECYCLE VALVE	CLOSED	
VTP-V-164	SEAL POT PUMP VALVE	CLOSED	
VTP-V-165	SEAL POT PUMP ENCLOSURE DRAIN VALVE	CLOSED	
VTP-V-166	SEAL POT PUMP DRAIN VALVE	CLOSED	
VTP-V-137	HIGH ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-138	LOW ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-139	EQUALIZING ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-140	HIGH ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-141	LOW ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	

ATTACHMENT 5 - ATP INITIAL VALVE LINEUP

VALVE #	DESCRIPTION	POSITION	INITIALS
VTP-V-142	EQUALIZING ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-143	HIGH ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-144	LOW ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-145	EQUALIZATION ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-146	HIGH ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-147	LOW ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-148	EQUALIZING ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-149	HIGH ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-150	LOW ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-151	EQUALIZATION ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-153	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-154	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-155	HIGH ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	
VTP-V-156	LOW ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	
VTP-V-157	EQUALIZING ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	

*Stack (pitot) veris tube valves have already been positioned to open.

ATTACHMENT 6 - VTP-FT-184 FIVE POINT CHECK

BT-200 VALUE	DP READING (PREDICTED) (INWC)	DP READING (ACTUAL)	TRANSMITTER OUTPUT (mA) (PREDICTED)	TRANSMITTER OUTPUT (mA) (ACTUAL)
0%	0.0	0.000	4	4.00
25%	1.0	1.000	8	8.00
50%	2.0	2.000	12	12.00
75%	3.0	3.000	16	16.00
100%	4.0	4.000	20	19.99

All actual values are with +/- 5% of predicted values.

Terry D Kaser RET 7/22/98 — 7/6/98
Cognizant Engineer Signature — Date

EJ Enbody Jr — 7/6/98
AI Inspector Signature — Date

EJE 7-6-98 — EJ Enbody Jr PJ Hammond — 7/6/98 7.6.98
QC Inspector Signature — Date

7/6/98
Test Director Signature — Date

ATTACHMENT 7 - VTP-PDT-170 [0-(-20) INWC] FIVE POINT CHECK

BT-200 VALUE	DP READING (PREDICTED) (INWC)	DP READING (ACTUAL)	TRANSMITTER OUTPUT (mA) (PREDICTED)	TRANSMITTER OUTPUT (mA) (ACTUAL)
0%	0.0	0.00	4	4.00
25%	-5.0	-5.00	8	8.00
50%	-10.0	-10.00	12	12.00
75%	-15.0	-15.00	16	16.00
100%	-20.0	-20.00	20	19.99

All actual values are with +/- 5% of predicted values.

Terry D Kaiser RE 7/22/98 — 7/6/98
Cognizant Engineer Signature — Date

[signature] — 7/6/98
AI Inspector Signature — Date

PJ Elmendorf — 7.6.98
QC Inspector Signature — Date

[signature] — 7/6/98
Test Director Signature — Date

ATTACHMENT 8 - OPERATING/ALARM/INTERLOCK SET POINTS

ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N18:3	PRE-FILTER DP HI ALARM RESET	9831	1.00 INWC
N18:5	STACK FLOW ALARM RESET	10560	4.83 INWC
N18:8	FILTER 1 DP HI ALARM RESET	8518	6.50 INWC
N18:11	FILTER 2 DP HI ALARM RESET	9615	7.34 INWC
N18:15	GLYCOL LEVEL LO ALARM RESET	10475	79.92%
N18:16	FILTER 1 TEMP HI ALARM RESET	160	160 F
N18:18	FILTER 1 TEMP LO ALARM RESET	~~13107~~ 45 per Engineering 7/9/98	45 F
N18:19	SEAL POT LEVEL LO ALARM RESET	7864 7/9/98	35%
N18:20	SEAL POT LEVEL HI ALARM RESET	13107	75%
N19:2	PLENUM 1 PRESSURE LO* SET POINT	5240	-3.5 INWC
N19:3	PRE-FILTER DP HI SET POINT	9831	1 INWC
N19:4	STACK FLOW LO SET POINT	16096	470.00 SCFM
N19:5	STACK FLOW HI SET POINT	29242	1100.00 SCFM
N19:6	FILTER 1 LO DP SET POINT	3408	0.10 INWC
N19:7	FILTER 1 DP HIHI SET POINT	10355	5.4 INWC
N19:8	FILTER 1 DP HI SET POINT	9175	4.5 INWC
N19:9	FILTER 2 DP LO SET POINT	3495	0.10 INWC
N19.10	FILTER 2 DP HIHI SET POINT	11360	3.7 INWC
N19.11	FILTER 2 DP HI SET POINT	10267	3.2 INWC
N19:12	FILTERS 1/2 DP LO SET POINT	3495	0.10 INWC
N19:13	FILTERS 1/2 DP HIHI SETPOINT	15073	5.4 INWC
N19:15	GLYCOL LEVEL LO	9831	50%
N19:16	FILTER 1 TEMP HI SET POINT	190	190 F
N18:18	FILTER 1 TEMP LO SET POINT	40	40 F

ATTACHMENT 8 (cont)			
ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N19:19	SEAL POT LEVEL LO SET POINT	7209	30%
N19:20	SEAL POT LEVEL HI SET POINT	13763	80%
N19:25	INLET VACUUM LOW	N/A	N/A
N19:26	INLET VACUUM HIGH	N/A	N/A
N19:27	PLENUM 2 PRESSURE HIGH SETPOINT	5243	-3.5 INWC
N19:36	FILTER 1 ROC SET POINT	655	0.50 INWC
N19:37	FILTER 2 ROC SET POINT	655	0.50 INWC
N19:39	PLENUM 1 PRESSURE HI SETPOINT*	~~14417~~ 16384 per Exception 6	~~-3.5~~ 5.9 INWC
		9/7/98 JWP	
F8:6	FLOW CONTROL SETPOINT	~~27152~~ 1000 Exception 6 7/8/98	1000.00 SCFM
F8.7	VACUUM CONTROL SETPOINT	N/A	INWC

* Bypass these alarms under vacuum control.

ATTACHMENT 9 - DATA ACQUISITION FOR LEAK RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST #: 1

ATP STEP #: 5.2.12

Barometric Pr. (BP_i): 29.520 inHg Initial time (t_i): 1:30 PM

Barometric Pr. (BP_f): 29.509 inHg Final time (t_f): 1:45

TIME	t_i	t_i+1	t_i+2	t_i+3	t_i+4	t_i+5	t_i+6	t_i+7
Pr (INWC)	P_i=20.4	20.5	20.6	20.7	20.8	20.8	20.8	20.9
Temp (°F)	T_i= 90	90	90	90	90	90	90	90
TIME	t_i+8	t_i+9	t_i+10	t_i+11	t_i+12	t_i+13	t_i+14	t_i=t_i+15
Pr (INWC)	20.9	21	21	21.1	21.1	21.2	21.3	P_f=21.3
Temp (°F)	90	90	90	90.0	90	90	90	T_f=90

NOTE: HANFORD WEATHER STATION - 373-2716

Range 506 / 513

Pressure Gauge: Wallace & Tiernan

Cal Serial #: 646-31-04-085

Expiration Date: 10/8/98

ATTACHMENT 9 - DATA ACQUISITION FOR LEAK RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST #: 2

ATP STEP #: 5.2.23

Barometric Pr. (BP_i): 29.232 inHg Initial time (t_i): 3:41

Barometric Pr. (BP_f): 29.227 inHg Final time (t_f): 3:57

TIME	t_i	t_i+1	t_i+2	t_i+3	t_i+4	t_i+5	t_i+6	t_i+7
Pr (INWC)	P_i=20.01	19.89	19.82	19.7	19.61	19.5	19.39	19.32
Temp (°F)	T_i=95	95	95	95	95	95	95	95
TIME	t_i+8	t_i+9	t_i+10	t_i+11	t_i+12	t_i+13	t_i+14	t_i=t_i+15
Pr (INWC)	19.22	19.11	19.04	18.96	18.89	18.76	18.68	P_f= 18.60
Temp (°F)	95	95	95	96	96	96	96	T_f= 96

NOTE: HANFORD WEATHER STATION - 373-2716

Pressure Gauge Manuf: Rochester Instrument Systems

Cal Serial #: 778-31-04-036

Expiration Date: 2/23/99

ATTACHMENT 9 - DATA ACQUISITION FOR LEAK RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST #: 3

ATP STEP #: 5.22.17

Barometric Pr. (BP_i): 29.356 inHg Initial time (t_i): 4:40

Barometric Pr. (BP_f): 29.356 inHg Final time (t_f): 4:55

TIME	t_i	t_i+1	t_i+2	t_i+3	t_i+4	t_i+5	t_i+6	t_i+7
Pr (INWC)	P_i=20.7	20.8	20.8	20.9	20.9	20.9	20.9	20.9
Temp (°F)	T_i= 113	—	—	/	114	—	—	/
TIME	t_i+8	t_i+9	t_i+10	t_i+11	t_i+12	t_i+13	t_i+14	t_f=t_i+15
Pr (INWC)	21.0	21.0	21.0	21.1	21.1	21.1	21.1	P_f= 21.1
Temp (°F)	114	—	—	—	—	—	—	T_f= 114

NOTE: HANFORD WEATHER STATION - 373-2716

ATTACHMENT 9 - DATA ACQUISITION FOR LEAK RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST #: 4

ATP STEP #: 5.22.28

Barometric Pr. (BP_i): 29.347 inHg Initial time (t_i): 5:33

Barometric Pr. (BP_f): 29.345 inHg Final time (t_f): 5:48

TIME	t_i	t_i+1	t_i+2	t_i+3	t_i+4	t_i+5	t_i+6	t_i+7
Pr (INWC)	P_i=19.26	19.17	19.08	18.98	18.90	18.83	18.72	18.64
Temp (°F)	T_i= 115							
TIME	t_i+8	t_i+9	t_i+10	t_i+11	t_i+12	t_i+13	t_i+14	t_f=t_i+15
Pr (INWC)	18.56	18.47	18.42	18.34	18.26	18.19	18.12	P_f= 18.04
Temp (°F)								T_f= 115

NOTE: HANFORD WEATHER STATION - 373-2716

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST* #: 1

	INITIAL	FINAL
Time	t_i = 1:30	t_f = 1:45
Pressure (psig)	P_i = 20.4 INWC / 27.7 = .736	P_f = 21.3 INWC / 27.7 = .769
Barometric pr (inHg)	BP_i = 29.520 inHg x 0.491 = 14.494	BP_f = 29.509 inHg x 0.491 = 14.489
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ = 2193.12	$DP_f=(P_f + BP_f)(144)$ = 2197.15
Temperature (°R)	T_i = 90 °F $T_{iR} = T_i + 460$ = 550 °R	T_f = 90 °F $T_{fR} = T_f + 460$ = 550 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i/T_{iR}^{3.9} - DP_f/T_{fR}^{3.9})V /(R \times \Delta t \times 0.075)$ = 0 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

PASS (PASS/RETEST) — Test Director Signature — 7/7/98 Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST* #: 2

	INITIAL	FINAL
Time	t_i = 3:41	t_f = 3:57
Pressure (psig)	P_i = 20.01 INWC / 27.7 = .722	P_f = 18.60 INWC / 27.7 = .671
Barometric pr (inHg)	BP_i = 29.232 inHg x 0.491 = 14.353	BP_f = 29.227 inHg x 0.491 = 14.350
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ = 2170.8	$DP_f=(P_f + BP_f)(144)$ = 2163.0
Temperature (°R)	T_i = 95 °F; $T_{iR} = T_i + 460$ = 555 °R	T_f = 96 °F; $T_{fR} = T_f + 460$ = 556 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 16 minutes

$Q = (DP_i/T_{iR} - DP_f/T_{fR})V /(R \times \Delta t \times 0.075)$ = ~~3.9~~ ~~3.9~~ ∅ 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

PASS (PASS/RETEST)

Test Director Signature 7/7/98 Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST* #: 1

WORK SHEET

	INITIAL	FINAL
Time	t_i = 130	t_f = 145
Pressure (psig)	P_i = 20.4 INWC / 27.7 = .736	P_f = 21.3 INWC / 27.7 = .769
Barometric pr (inHg)	BP_i = 29.520 inHg x 0.491 = 14.494	BP_f = 29.509 inHg x 0.491 = 14.489
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ .736 14.494 = 2193.12	$DP_f=(P_f + BP_f)(144)$ = 2197.152
Temperature (°R)	T_i = 90 °F $T_{iR} = T_i + 460$ = 550 °R	T_f = 90 °F $T_{fR} = T_f + 460$ = 550 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i/T_{iR} - DP_f/T_{fR})V /(R \times \Delta t \times 0.075)$ = 0 SCFM

3.987 3.994

If first term = 0.01 then approx 0.016 = Q

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

(PASS/RETEST) Test Director Signature Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/7/98 EXHAUSTER: 007 TEST* #: 2

WORK SHEET

	INITIAL	FINAL
Time	t_i = 3:41	t_f = 3:57
Pressure (psig)	P_i = 20.01 INWC / 27.7 = .722	P_f = 18.60 INWC / 27.7 = .671
Barometric pr (inHg)	BP_i = 29.232 inHg x 0.491 = 14.353	BP_f = 29.227 inHg x 0.491 = 14.350
Duct pr (psfa)	$DP_i = (P_i + BP_i)(144)$ = 2170.8	$DP_f = (P_f + BP_f)(144)$ = 2163.0
Temperature (°R)	T_i = 95 °F; $T_{iR} = T_i + 460$ = 555 °R	T_f = 96 °F; $T_{fR} = T_f + 460$ = 556 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 16 minutes

$Q = (DP_i/T_{iR} - DP_f/T_{fR})V / (R \times \Delta t \times 0.075)$ = .016 SCFM (3.911 / 3.89)

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

(PASS/RETEST) Test Director Signature Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST* #: 3

WORKSHEET

	INITIAL	FINAL
Time	t_i = 4:40	t_f = 4:55
Pressure (psig)	P_i = 20.7 INWC / 27.7 = 0.7	P_f = 21.1 INWC / 27.7 = 0.8
Barometric pr (inHg)	BP_i = 29.356 inHg x 0.491 = 14.414	BP_f = 29.356 inHg x 0.491 = 14.414
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ = 2176.4	$DP_f=(P_f + BP_f)(144)$ = 2176.4
Temperature (°R)	T_i = 113 °F $T_{iR} = T_i + 460$ = 573 °R	T_f = 114 °F $T_{fR} = T_f + 460$ = 574 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i/T_{iR}^{3.8} - DP_f/T_{fR}^{3.8})V /(R \times \Delta t \times 0.075)$ = 0 SCFM

0 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

(PASS/RETEST) Test Director Signature Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST* #: 4

Work Sheet

	INITIAL	FINAL
Time	t_i = 5:33	t_f = 5:48
Pressure (psig)	P_i = 19.26 INWC / 27.7 = .7	P_f = 18.04 INWC / 27.7 = .7
Barometric pr (inHg)	BP_i = 29.347 inHg x 0.491 = 14.409	BP_f = 29.345 inHg x 0.491 = 14.408
Duct pr (psfa)	$DP_i = (P_i + BP_i)(144)$ = 2175.7	$DP_f = (P_f + BP_f)(144)$ = 2190.8
Temperature (°R)	T_i = 115 °F; $T_{iR} = T_i + 460$ = 575 °R	T_f = 115 °F; $T_{fR} = T_f + 460$ = 575 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i^{3.8}/T_{iR} - DP_f^{3.8}/T_{fR})V / (R \times \Delta t \times 0.075)$ = 0 SCFM

0 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

_____ (PASS/RETEST) _____ Test Director Signature Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST* #: 3

	INITIAL	FINAL
Time	t_i = 4:40	t_f = 4:55
Pressure (psig)	P_i = 20.7 INWC / 27.7 = 0.7	P_f = 21.1 INWC / 27.7 = 0.8
Barometric pr (inHg)	BP_i = 29.356 inHg x 0.491 = 14.414	BP_f = 29.356 inHg x 0.491 = 14.414
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ = 2176.4	$DP_f=(P_f + BP_f)(144)$ = 2190.8
Temperature (°R)	T_i = 113 °F $T_{iR} = T_i + 460$ = 573 °R	T_f = 114 °F $T_{fR} = T_f + 460$ = 574 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i/T_{iR} - DP_f/T_{fR})V /(R \times \Delta t \times 0.075)$ = 0 SCFM

(3.8 / 3.8)

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

Pass (PASS/RETEST)

Test Director Signature 7/15/98 Date

ATTACHMENT 10 - LEAKAGE RATE CALCULATION

(This page may be reproduced as necessary)

DATE: 7/15/98 EXHAUSTER: 007 TEST* #: 4

	INITIAL	FINAL
Time	t_i = 5:33	t_f = 5:48
Pressure (psig)	P_i = 19.66 INWC / 27.7 = .7	P_f = 18.04 INWC / 27.7 = .7
Barometric pr (inHg)	BP_i = 29.347 inHg x 0.491 = 14.409	BP_f = 29.345 inHg x 0.491 = 14.408
Duct pr (psfa)	$DP_i=(P_i + BP_i)(144)$ = 2175.7	$DP_f=(P_f + BP_f)(144)$ = 2175.6
Temperature (°R)	T_i = 115 °F $T_{iR} = T_i + 460$ = 575 °R	T_f = 115 °F $T_{fR} = T_f + 460$ = 575 °R

* *Same as Test # entered on Attachment 9*

Test Volume: V = 55.7 cubic feet

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

Test Duration: $\Delta t = (t_f - t_i)$ = 15 minutes

$Q = (DP_i/T_{iR} - DP_f/T_{fR})V /(R \times \Delta t \times 0.075)$ = 0 SCFM

3.8 / 3.8

0

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

PASS (PASS/RETEST)

Test Director Signature 7/15/98 Date

ATTACHMENT 11 - FUNCTIONAL TEST VALVE LINEUP

VALVE #	DESCRIPTION	POSITION	INITIALS
VTP-V-135	HIGH ISOLATION VALVE MAIN AIRSTREAM	OPEN	
VTP-V-136	LOW ISOLATION VALVE MAIN AIRSTREAM	OPEN	
VTP-V-201	HIGH ISOLATION VALVE GLYCOL PUMP	OPEN	
VTP-V-202	LOW ISOLATION VALVE GLYCOL PUMP	OPEN	
VTP-V-203	GLYCOL TANK ISOLATION VALVE	OPEN	
VTP-V-204	HEATER COIL ISOLATION VALVE	OPEN	
VTP-V-205	GLYCOL SYSTEM DRAIN VALVE	CLOSED	
VTP-V-301	BACKFLOW PREVENTOR OUTLET ISOLATION VALVE	CLOSED	
VTP-V-302	BACKFLOW PREVENTOR INLET ISOLATION VALVE	CLOSED	
VTP-V-158	FAN ISOLATION VALVE	OPEN	
VTP-V-160	SEAL POT DRAIN VALVE	CLOSED	
VTP-V-161	SEAL POT GRAVITY DRAIN VALVE	CLOSED	
VTP-V-162	SEAL POT FILL PORT VALVE	CLOSED	
VTP-V-163	SEAL POT PUMP RECYCLE VALVE	CLOSED	
VTP-V-164	SEAL POT PUMP VALVE	OPEN	
VTP-V-165	SEAL POT PUMP ENCLOSURE DRAIN VALVE	OPEN	
VTP-V-166	SEAL POT PUMP DRAIN VALVE	OPEN	
VTP-V-137	HIGH ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	OPEN	
VTP-V-138	LOW ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	OPEN	
VTP-V-139	EQUALIZING ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-140	HIGH ISOLATION VALVE PREFILTER TRANSMITTER	OPEN	
VTP-V-141	LOW ISOLATION VALVE PREFILTER TRANSMITTER	OPEN	

VALVE #	DESCRIPTION	POSITION	INITIALS
ATTACHMENT 11 (cont) FUNCTION TEST VALVE LINEUP			
VTP-V-142	EQUALIZING ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-143	HIGH ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	OPEN	
VTP-V-144	LOW ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	OPEN	
VTP-V-145	EQUALIZATION ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-146	HIGH ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	OPEN	
VTP-V-147	LOW ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	OPEN	
VTP-V-148	EQUALIZING ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-149	HIGH ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	OPEN	
VTP-V-150	LOW ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	OPEN	
VTP-V-151	EQUALIZATION ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-153	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-154	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-155	HIGH ISOLATION VALVE STACK FLOW TRANSMITTER	OPEN	
VTP-V-156	LOW ISOLATION VALVE STACK FLOW TRANSMITTER	OPEN	
VTP-V-157	EQUALIZING ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	

*Stack (pitot) veris tube valves have already been positioned to open.

ATTACHMENT 12 - FUNCTIONAL TEST ELECTRICAL LINEUP

COMPONENT #	DESCRIPTION	POSITION	INITIALS
VTP-DS-101	480 VOLT MAIN DISCONNECT	ON	
VTP-DS-102	EXHAUST FAN MOTOR DISCONNECT	ON	
VTP-DS-201	GLYCOL HEATER DISCONNECT	ON	
VTP-BRK-101	MPZ PRIMARY BREAKER "MAIN"	ON	
VTP-BRK-102	MPZ SECONDARY BREAKER "SECONDARY MAIN"	ON	
120V CIRCUIT BREAKERS (LOCATED AT "MINI POWER ZONE" VTP-DP-101)			
MPZ-1	ACTION PAK RELAYS, POWER SUPPLIES, WILKERSON DISPLAY METERS	ON	
MPZ-2	GLYCOL PUMP, SEAL POT PUMP, SHUNT TRIP, PILOT LIGHTS, ALARM BEACON	ON	
MPZ-3	HEAT TRACE, GLYCOL CONTACTOR, HEAT TRACE LIGHT	ON	
MPZ-4	CABINET HEATERS AND FANS	ON	
MPZ-5	CONVENIENCE RECEPTACLE	ON	
MPZ-6	GEMS "GFE" (SPARE)	ON	
MPZ-7	AMS-4 "GFE" (SPARE)	ON	
MPZ-8	FLAMMABLE GAS MONITOR (SPARE)	ON	
MPZ-9	(SPARE)	N/A	N/A
MPZ-10	(SPARE)	N/A	N/A
CONTROL CABINET (VTP-CP-105)			
VTP-HS-103	FAN CONTROL	ON	
VTP-HS-102	GLYCOL PUMP	ON	
VTP-HS-101	SEAL POT PUMP CONTROL	AUTO	
VTP-HS-105	CONTROL CABINET HEAT/COOL	OFF	
HEAT TRACE CABINET (VTP-ENCL-104)			
VTP-HS-104	HEAT TRACE CABINET HEAT/COOL	OFF	

ATTACHMENT 13 - FUNCTIONAL TEST PRESSURE CONTROL OPERATIONAL, ALARM, INTERLOCK SET POINTS

ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N18:3	PRE-FILTER DP HI ALARM RESET	9831	1.00 INWC
N18:5	STACK FLOW ALARM RESET	10560	4.83 INWC
N18:8	FILTER 1 DP HI ALARM RESET	8518	6.50 INWC
N18:11	FILTER 2 DP HI ALARM RESET	9615	7.34 INWC
N18:15	GLYCOL LEVEL LO ALARM RESET	10475	79.92%
N18:16	FILTER 1 TEMP HI ALARM RESET	160	160 F
N18:18	FILTER 1 TEMP LO ALARM RESET	~~13107~~ 45 Ex 6 2/8/98	45 F
N18:19	SEAL POT LEVEL LO ALARM RESET	7864	35%
N18:20	SEAL POT LEVEL HI ALARM RESET	13107	75%
N19:2	PLENUM 1 PRESSURE LO* SET POINT	5240	-3.5 INWC
N19:3	PRE-FILTER DP HI SET POINT	9831	1 INWC
N19:4	STACK FLOW LO SET POINT	20356	675.00 SCFM
N19:5	STACK FLOW HI SET POINT	27152	1000.00 SCFM
N19:6	FILTER 1 LO DP SET POINT	3408	0.10 INWC
N19:7	FILTER 1 DP HIHI SET POINT	10355	5.40 INWC
N19:8	FILTER 1 DP HI SET POINT	9175	4.50 INWC
N19:9	FILTER 2 DP LO SET POINT	3495	0.10 INWC
N19.10	FILTER 2 DP HIHI SET POINT	11360	3.7 INWC
N19.11	FILTER 2 DP HI SET POINT	10267	3.2 INWC
N19:12	FILTERS 1/2 DP LO SET POINT	3495	0.10 INWC
N19:13	FILTERS 1/2 DP HIHI SETPOINT	15073	5.40 INWC
N19:15	GLYCOL LEVEL LO	9831	50%
N19:16	FILTER 1 TEMP HI SET POINT	190	190 F
N19:18	FILTER 1 TEMP LO SET POINT	40	40 F
N19:19	SEAL POT LEVEL LO SET POINT	7209	30%

ATTACHMENT 13 (Cont)

ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N19:20	SEAL POT LEVEL HI SET POINT	13763	80%
N19:25	INLET VACUUM LOW	7209	6 INWC
N19:26	INLET VACUUM HIGH	11633	12.75 INWC
N19:27	PLENUM 2 PRESSURE HIGH SETPOINT	N/A	N/A
N19:36	FILTER 1 ROC SET POINT	655	0.50 INWC
N19:37	FILTER 2 ROC SET POINT	655 CSB 7/8/98 Ex. 6	0.50 INWC
N19:39	PLENUM 1 PRESSURE HI SETPOINT*	~~14417~~ 16384	5 INWC ~~3.5 INWC~~ CSB 7/8/98 Ex. 6
F8:6	FLOW CONTROL SETPOINT	N/A	N/A
F8.7	VACUUM CONTROL SETPOINT	~~11141~~ 12	12 INWC

* Bypass these alarms under vacuum control. Ex. 6 CSB 7/8/98

ATTACHMENT 14 - FUCTIONAL TEST HIGH VACUUM OPERATIONAL, ALARM, INTERLOCK SET POINTS

ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N18:3	PRE-FILTER DP HI ALARM RESET	9831	1.00 INWC
N18:5	STACK FLOW ALARM RESET	10560	4.83 INWC
N18:8	FILTER 1 DP HI ALARM RESET	8518	6.50 INWC
N18:11	FILTER 2 DP HI ALARM RESET	9615	7.34 INWC
N18:15	GLYCOL LEVEL LO ALARM RESET	10475	79.92%
N18:16	FILTER 1 TEMP HI ALARM RESET	160	160 F
N18:18	FILTER 1 TEMP LO ALARM RESET	~~13107~~ 45 Hdl ex. 7/8/98	45 F
N18:19	SEAL POT LEVEL LO ALARM RESET	7864	35%
N18:20	SEAL POT LEVEL HI ALARM RESET	13107	75%
N19:2	PLENUM 1 PRESSURE LO SET POINT	5240	-3.5 INWC
N19:3	PRE-FILTER DP HI SET POINT	9831	1 INWC
N19:4	STACK FLOW LO SET POINT	20356	675.00 SCFM
N19:5	STACK FLOW HI SET POINT	27152	1000 SCFM
N19:6	FILTER 1 LO DP SET POINT	3408	0.10 INWC
N19:7	FILTER 1 DP HIHI SET POINT	10355	5.40 INWC
N19:8	FILTER 1 DP HI SET POINT	9175	4.50 INWC
N19:9	FILTER 2 DP LO SET POINT	3495	0.10 INWC
N19.10	FILTER 2 DP HIHI SET POINT	11360	3.7 INWC
N19.11	FILTER 2 DP HI SET POINT	10267	3.2 INWC
N19:12	FILTERS 1/2 DP LO SET POINT	3495	0.10 INWC
N19:13	FILTERS 1/2 DP HIHI SETPOINT	15073	5.40 INWC
N19:15	GLYCOL LEVEL LO	9831	50%
N19:16	FILTER 1 TEMP HI SET POINT	190	190 F
N19:18	FILTER 1 TEMP LO SET POINT	40	40 F
N19:19	SEAL POT LEVEL LO SET POINT	7209	30%

ATTACHMENT 14 (Cont)			
ADDRESS	DESCRIPTION	PLC	ENGINEERING UNITS
N19:20	SEAL POT LEVEL HI SET POINT	13763	80%
N19:25	INLET VACUUM LOW	7209	6 INWC
N19:26	INLET VACUUM HIGH	16056	19.5 INWC
N19:27	PLENUM 2 PRESSURE HIGH SETPOINT	N/A	N/A
N19:36	FILTER 1 ROC SET POINT	655	0.50 INWC
N19:37	FILTER 2 ROC SET POINT	655 Ex. 6 7/8/98	0.50 INWC
N19:39	PLENUM 1 PRESSURE HI SETPOINT*	~~14417~~ 16384	+5.0 ~~3.5~~ INWC
F8:6	FLOW CONTROL SETPOINT	N/A	N/A
F8.7	VACUUM CONTROL SETPOINT	~~16834~~ ~~16384~~ 7/8/98 N/A 7/8/98	MAXIMUM

* Bypass these alarms under vacuum control.

ATTACHMENT 15 - ATP FINAL VALVE LINEUP

VALVE #	DESCRIPTION	POSITION	INITIALS
VTP-V-135	HIGH ISOLATION VALVE MAIN AIRSTREAM	CLOSED	
VTP-V-136	LOW ISOLATION VALVE MAIN AIRSTREAM	CLOSED	
VTP-V-201	HIGH ISOLATION VALVE GLYCOL PUMP	CLOSED	
VTP-V-202	LOW ISOLATION VALVE GLYCOL PUMP	CLOSED	
VTP-V-203	GLYCOL TANK ISOLATION VALVE	CLOSED	
VTP-V-204	HEATER COIL ISOLATION VALVE	CLOSED	
VTP-V-205	GLYCOL SYSTEM DRAIN VALVE	CLOSED	
VTP-V-301	BACKFLOW PREVENTOR OUTLET ISOLATION VALVE	CLOSED	
VTP-V-302	BACKFLOW PREVENTOR INLET ISOLATION VALVE	CLOSED	
VTP-V-158	FAN ISOLATION VALVE	CLOSED	
VTP-V-160	SEAL POT DRAIN VALVE	CLOSED	
VTP-V-161	SEAL POT GRAVITY DRAIN VALVE	CLOSED	
VTP-V-162	SEAL POT FILL PORT VALVE	CLOSED	
VTP-V-163	SEAL POT PUMP RECYCLE VALVE	CLOSED	
VTP-V-164	SEAL POT PUMP VALVE	CLOSED	
VTP-V-165	SEAL POT PUMP ENCLOSURE DRAIN VALVE	CLOSED	
VTP-V-166	SEAL POT PUMP DRAIN VALVE	CLOSED	
VTP-V-101	HIGH ISOLATION VALVE PLENUM TRANSMITTER	CLOSED	
VTP-V-102	LOW ISOLATION VALVE PLENUM TRANSMITTER	CLOSED	
VTP-V-103	EQUALIZATION ISOLATION VALVE PLENUM TRANSMITTER	CLOSED	
VTP-V-137	HIGH ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-138	LOW ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	
VTP-V-139	EQUALIZING ISOLATION VALVE HEATER/DEMISTER TRANSMITTER	CLOSED	

VALVE #	DESCRIPTION	POSITION	INITIALS
VTP-V-140	HIGH ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-141	LOW ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-142	EQUALIZING ISOLATION VALVE PREFILTER TRANSMITTER	CLOSED	
VTP-V-143	HIGH ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-144	LOW ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-145	EQUALIZATION ISOLATION VALVE HEPA FILTER #1 TRANSMITTER	CLOSED	
VTP-V-146	HIGH ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-147	LOW ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-148	EQUALIZING ISOLATION VALVE HEPA FILTER #1&2 TRANSMITTER	CLOSED	
VTP-V-149	HIGH ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-150	LOW ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-151	EQUALIZATION ISOLATION VALVE HEPA FILTER #2 TRANSMITTER	CLOSED	
VTP-V-153	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-154	STACK (PITOT) VERIS TUBE	OPEN	*N/A
VTP-V-155	HIGH ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	
VTP-V-156	LOW ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	
VTP-V-157	EQUALIZING ISOLATION VALVE STACK FLOW TRANSMITTER	CLOSED	

*Stack (pitot) veris tube valves have already been positioned to open.

ATTACHMENT 16 - ATP FINAL ELECTRICAL LINEUP

COMPONENT #	DESCRIPTION	POSITION	INITIALS
VTP-DS-101	480 VOLT MAIN DISCONNECT	ON	
VTP-DS-102	EXHAUST FAN MOTOR DISCONNECT	OFF	
VTP-DS-201	GLYCOL HEATER DISCONNECT	OFF	
VTP-BRK-101	MPZ PRIMARY BREAKER "MAIN"	ON	
VTP-BRK-102	MPZ SECONDARY BREAKER "SECONDARY MAIN"	ON	
120V CIRCUIT BREAKERS (LOCATED AT "MINI POWER ZONE" VTP-DP-101)			
MPZ-1	ACTION PAK RELAYS, POWER SUPPLIES, WILKERSON DISPLAY METERS	OFF	
MPZ-2	GLYCOL PUMP, SEAL POT PUMP, SHUNT TRIP, PILOT LIGHTS, ALARM BEACON	OFF	
MPZ-3	HEAT TRACE, GLYCOL CONTACTOR, HEAT TRACE LIGHT	ON	
MPZ-4	CABINET HEATERS AND FANS	ON	
MPZ-5	CONVENIENCE RECEPTACLE	OFF	
MPZ-6	GEMS "GFE" (SPARE)	OFF	
MPZ-7	AMS-4 "GFE" (SPARE)	OFF	
MPZ-8	FLAMMABLE GAS MONITOR (SPARE)	OFF	
MPZ-9	(SPARE)	N/A	N/A
MPZ-10	(SPARE)	N/A	N/A
CONTROL CABINET (VTP-CP-105)			
VTP-HS-103	FAN CONTROL	OFF	
VTP-HS-102	GLYCOL PUMP	OFF	
VTP-HS-101	SEAL POT PUMP CONTROL	AUTO	
VTP-HS-105	CONTROL CABINET HEAT/COOL	COOL	
HEAT TRACE CABINET (VTP-ENCL-104)			
VTP-HS-104	HEAT TRACE CABINET HEAT/COOL	COOL	

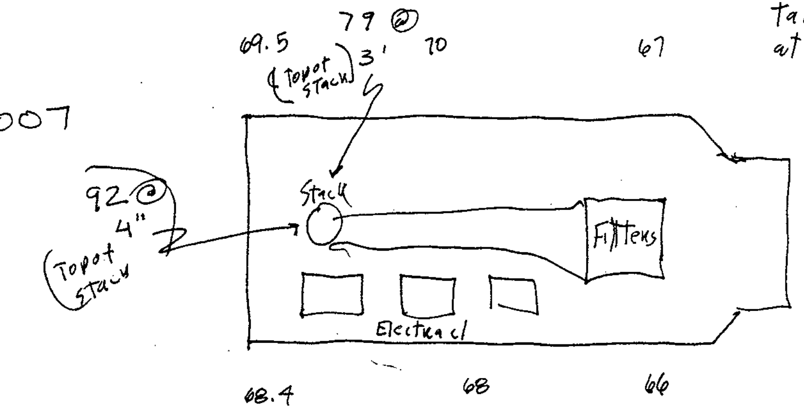
ATTACHMENT 17

NOISE LEVEL TEST DATA

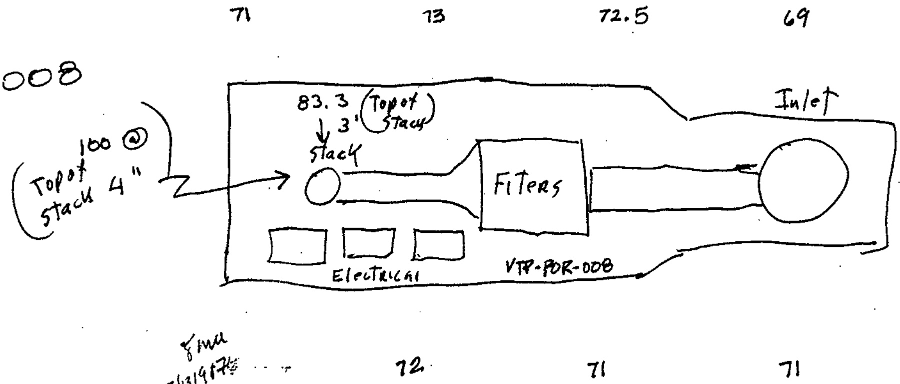
7/13/98 Portable Exhaust Skids Sound levels

Background 67 away from chiller fans ~~[illegible] from chillers~~ [illegible] 7/13/98
69 Side of chiller fans

All readings dBa scale.
Taken ≈ 6 feet from units
at ground level



Meter
Bruel & Kjaer
Type 2231
Ser. # 1735186
Prop # WC53490
Cal Due 9 Mar 99



[illegible] 7/13/98

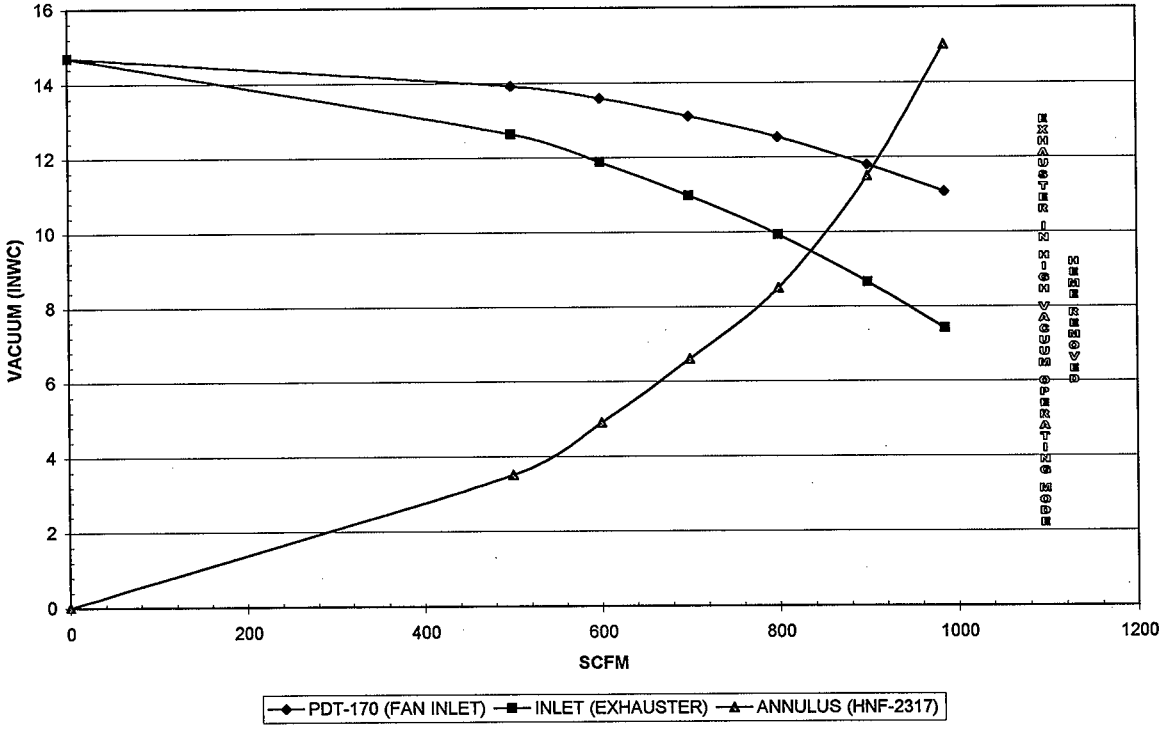
Travis M Amundson CSP.
FFTF Safety
B&W Hanford

ATTACHMENT 18

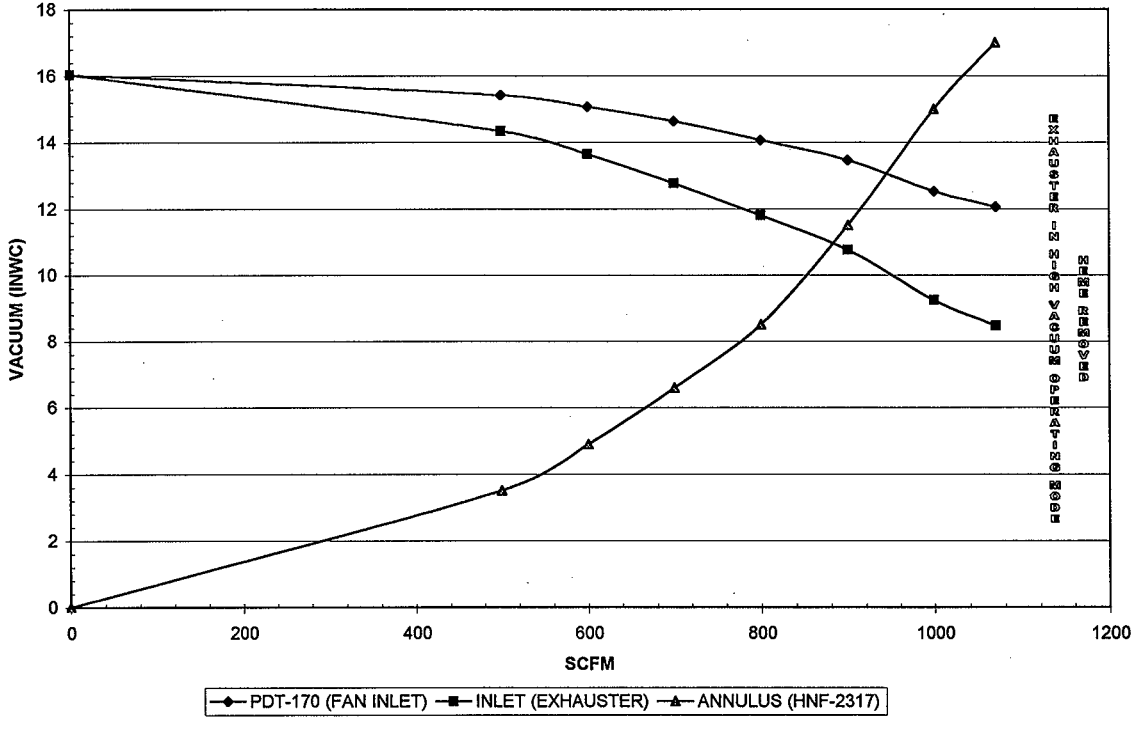
SYSTEM PERFORMANCE TEST DATA

COMPARISON OF POR-007 VS POR-008 VS 102-AY ANNULUS								
FLOW (SCFM)	0	500	600	700	800	900	1000	1070
INLET (EXHAUSTER) 007 VACUUM (INWC)	14.7	12.637	11.874	10.972	9.928	8.645	7.415	
INLET (EXHAUSTER) 008 VACUUM (INWC)	16.04	14.335	13.648	12.775	11.804	10.763	9.234	8.464
ANNULUS (from HNF-2317)	0	3.5	4.9	6.6	8.5	11.5	15	17
TEST DATA FOR POR-007								
FLOW (SCFM)	0	500	600	700	800	900	986	
PDT-170 (FAN INLET) (VACUUM, INWC)	14.7	13.92	13.58	13.1	12.54	11.8	11.07	
PDT-181 (HEPA BANK) (DP, INWC)		1.111	1.484	1.857	2.28	2.76	3.2	
PDT-178 (PRE-FILTER) (DP, INWC)		0.092	0.118	0.144	0.172	0.203	0.231	
PDT-177 (HEATER) (DP, INWC)		0.08	0.104	0.127	0.16	0.192	0.224	
INLET VACUUM (INWC, Calculated)	14.7	12.637	11.874	10.972	9.928	8.645	7.415	
TEST DATA FOR POR-008								
FLOW (SCFM)	0	500	600	700	800	900	1000	1070
PDT-170 (FAN INLET) (VACUUM, INWC)	16.04	15.42	15.08	14.64	14.07	13.47	12.52	12.06
PDT-181 (HEPA BANK) (DP, INWC)		0.935	1.237	1.613	1.963	2.349	2.854	3.13
PDT-178 (PRE-FILTER) (DP, INWC)		0.076	0.1	0.128	0.154	0.182	0.22	0.236
PDT-177 (HEATER) (DP, INWC)		0.074	0.095	0.124	0.149	0.176	0.212	0.23
INLET VACUUM (INWC, Calculated)	16.04	14.335	13.648	12.775	11.804	10.763	9.234	8.464

POR-007 VS 102-AY ANNULUS



POR-008 VS 102-AY ANNULUS



PORTABLE EXHAUSTER COMPARISON