This document was too large to scan as a whole document,
therefore it required breaking into smaller sections.

Document number: SD-W030-TD-002

Section 1 of 2

Title: Preoperational Test Report, Primary
Ventilation System

Date: 11/04/97 Revision: 0

Originator: Clifton FT
Co: NHC

Recipient: _____

Co: _____

References: EDT-622918

Sta 4 (2)
NOV 04 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 2
1. EDT 622918

2. To: (Receiving Organization) W-030 TEST REVIEW BOARD		3. From: (Originating Organization) DISPOSAL PROJECTS		4. Related EDT No.: 616334							
5. Proj./Prog./Dept./Div.: PROJECT W-030		6. Design Authority/ Design Agent/Cog. Engr.: D.B. Cole/W.M. Harty/ JR Kriskovich		7. Purchase Order No.: NA							
8. Originator Remarks: Release of test report for pre-operational test of W-030 Primary Ventilation (K1) System. Project W-030 provides the AY/AZ tank farms ventilation upgrade. 11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No ONE RCR ATTACHED, DATED 10/31/97.				9. Equip./Component No.: NA							
				10. System/Bldg./Facility: AY/AZ Tank Farms							
				12. Major Assm. Dwg. No.: NA							
				13. Permit/Permit Application No.: NA							
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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 Design- ator	(G) Reason for Trans- mittal	(H) Origina- tor Dispo- sition	(I) Receiv- er Dispo- sition			
1	HNF-SD-W030-TD-002	-	0	W030 AY/AZ TANK FARM PREOP. TEST, PRIMARY VENTILATION SYSTEM	Q	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	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
2	1	Design Authority	<i>W.M. Harty</i>	10/31/97	55-13	2	1	GP Hopkins	<i>GP Hopkins</i>	10/30/97	
-	--	Design Agent	NA								
2	1	Cog. Eng.	DB Cole	10/31/97							
2	1	Cog. Mgr.	KA Colosi	10/31/97		2	5	JR Kriskovich	<i>Jim Kriskovich</i>	10-31-97	
2	1	QA	FOR HM Chafin	11/1/97				proj file		RL-29	
3	--	Safety	SU Zaman	-----							
18. <i>W.M. Harty</i> 10/30/97 Signature of EDT Originator			19. <i>Jim Kriskovich</i> 10/31/97 Authorized Representative for Receiving Organization			20. <i>W.M. Harty</i> 10/31/97 Design Authority/ Cognizant Manager			21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments		

REVIEW COMMENT RECORD (RCR)	1. Date 10-31-97	2. Review No. 1
	3. Project No. Project W-030	4. Page 1 of 1

5. Document Number(s)/Title(s) HNF-SD-W030-TD-002, Rev. 0 W-030 AY/AZ Tank Farm Preop. Test, Primary Ventilation System	6. Program/Project/ Building Number Project W-030	7. Reviewer Jim Kriskovich	8. Organization/Group Equipment Engineering	9. Location/Phone 2750/E 373-3686
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17. Comment Submittal Approval: 10. Agreement with indicated comment disposition(s) 11. CLOSED

Organization Manager (Optional)

Date

Reviewer/Point of Contact

Date

Reviewer/Point of Contact

Author/Originator

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Test Exception #13 identifies a requirement for a simulated pressure signal to allow the dampers to respond. Since this is an addition to the test, a retest should have been completed to verify the operation of the system under the conditions. Furthermore, in the OTP itself, the test exception should have been documented.	jrk	This discontinuity will be investigated and dispositioned by either ① ECN, or ② Correction in final POTP-00's Report. Frank Clifton 10/31/97	

PREOPERATIONAL TEST REPORT, PRIMARY VENTILATION SYSTEM

FT CLIFTON

NUMATEC HANFORD COMPANY, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 622918 UC: 2030
Org Code: 8C473 Charge Code: NH107
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Key Words: TEST, COOLING, EXHAUST, UPGRADE

Abstract: Preoperational test report for Primary Ventilation Systems, Project W-030. Project W-030 provides a ventilation upgrade for the four Aging Waste Facility tanks.

The system provides vapor space filtered venting of tanks AY101, AY102, AZ101, AZ102. The tests verify correct system operation and correct indications displayed by the central Monitor and Control System.

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Release Approval

11/4/97
Date

Release Stamp

Approved for Public Release

W030 AY/AZ TANK FARM PREOPERATIONAL TEST REPORT
PRIMARY TANK VENTILATION SYSTEM

ATTACHMENTS

- Attachment 1 - Test Report Checklist.
- Attachment 2 - Copy of original test procedure with recorded data, including its Attachments-1 through -19, described below.
- Attachment 3 - Miscellaneous Supporting Data, including:
 - Engineering Change Notices (ECNs);
 - Fan curve and vendor test data (from vendor data)
 - List of Certified Vendor Information
 - Additional fan vibration data (if available)
- Attachment 4 - Calibration, Grooming, and Alignment (CGA) Plan and data

REFERENCES

- 1. HNF-SD-W030-POTP-002/1A *Preoperational Test Procedure, W-030 Primary Ventilation System*
- 2. WHC-SD-W030-SUP-003/0 *Startup Test Plan, W-030*
- 3. H-2-131075, Rev. 1 *P&ID K1, Primary Tank Ventilation System*
- 4. H-2-131076, Rev. 1 *P&ID K1, Primary Tank Ventilation System*
- 5. H-2-131078, Rev. 1 *P&ID K1, Primary Tank Ventilation System*
- 6. WHC-SD-W030-ATR-006 *W-030 Primary Vent Filter Train (Acceptance Test Report)*

INTRODUCTION

Preoperational Test HNF-SD-W030-POTP-002 was successfully completed in April 1997 in accordance with reference-1. Testing actually began in September 1996 under an earlier version of the procedure.

The tested system (K1) includes the four tank air inlet stations and outlet control valves, one moisture condenser, one High-Efficiency Mist Eliminator (HEME), two parallel Air Cleanup Trains (with fans, heaters, and filters), and the primary tank exhaust stack monitor. In Attachments 1-12 (of Attachment-2), tests verified correct operation of the K1 system in both local and remote modes.

All test actions were initiated and/or verified at the central control room graphic screens of the Monitor and Control System (MCS). All system instrumentation was calibrated and all system instrument loop checks were completed prior to testing in accordance with a Project W030 internal CGA Plan. Data is included in Attachment-4.

Table I below summarizes acceptance criteria which were evaluated in the course of testing. Tables II-V summarize important test data. The primary test objective was to prove that system components, interlocks, controls and alarms function as designed. Recorded system test data was collected primarily for information only. In the absence of formal criteria, values for PID loop tuning, and alarm levels and timing were established during testing

by the MCS cognizant engineer with input from the system Operations cognizant engineer.

The testing met the test objectives as outlined in reference-2 for the applicable system which is designed as shown on references-3, 4, and 5. The K1 System operates as designed, and all components tested by this procedure operate satisfactorily.

A total of six test exceptions were noted and resolved during testing; four additional exceptions were appended after testing. Approved resolutions are documented in Attachments 17, 18. A copy of the master list of W-030 test exceptions is included in Attachment-3.

This test report consists of a copy of the final approved test procedure, annotated with field test data entered and initialed by the Test Engineer. The procedure, originally released as WHC-SD-W030-POTP-002 under EDT-616334, underwent several revisions during testing; in chronological order, see ECN-622257, 193218, 613162, 640742, 640744; a copy of each ECN (page-1 only) is included in Attachment-3. All revisions were incorporated into the implemented procedure and accomplished. ECN-640742 is a complete re-write, resulting in revision-1. ECN-640744 revised certain pages of Attachment-3, -7, -14; only the revised pages were added to the procedure for testing and are identified as revision-1A. Testing began under revision-0 of the procedure and continued through the current revision. Data recorded in early versions was manually transferred forward to the final version (attached) and is noted at the top of the affected pages.

For these tests, a temporary plenum box (4ft X 4ft X 8ft) was used to simulate each of the four waste tanks, connected to the ventilation system by flexible ducts as described in Attachment-2 (19).

SUMMARY OF TEST OBJECTIVES & RESULTS BY ATTACHMENT (1-14)

A. Air Cleanup Train-A (ACT-A)

1. Tests verified correct operation of each automatic isolation damper serving ACT-A, in both manual and automatic modes. All temperature/pressure control logic interlocks and overrides were verified.
2. Tests verified correct operation of the K1 exhaust fan serving ACT-A, in both manual and automatic modes. Fan was operated both at the local speed-control cabinet and remotely from the MCS graphic screens. All flow/pressure control logic interlocks and overrides were verified. Critical system parameters were monitored as the fan was operated at 100% design rotating speed (see 2.1.16); fan vibration data was recorded (2.1.17). For this section, tank outlet flow-control valves were bypassed. Automatic switchover to the standby fan was demonstrated when a fan-failure signal was simulated.
3. Tests verified correct operation of each automatic duct heater serving ACT-A, in both manual and automatic modes. All temperature/pressure

control logic interlocks and overrides were verified. With exhaust fan at full flow, automatic temperature control was observed; simulated over-temperature signals were used to verify high-temperature alarms and switchover to standby train/heater.

4. Tests verified correct MCS alarm response to actual forced high filter differential pressure conditions for each of 3 filter stages in ACT-A (A simulated signal greater than the alarm setpoint was input to the field instrument). Temporary baffles were installed inside the ACT filter spaces to simulate partially-plugged HEPA filters for this and all pre-operational W-030 testing.

B. Air Cleanup Train-B (ACT-B)

5. Tests verified correct operation of each automatic isolation damper serving ACT-B and were identical to attachment-1 above.
6. Tests verified correct operation of the K1 exhaust fan serving ACT-B and were identical to attachment-2 above.
7. Tests verified correct operation of each automatic duct heater serving ACT-B and were identical to attachment-3 above.
8. Tests verified correct MCS alarm response to actual forced high filter differential pressure conditions for each of 3 filter stages in ACT-B.

C. Tank Inlet Stations

9. AY101 - Tests verified correct operation of the Tank AY101 inlet filter train and tank flow control in automatic mode using simulated pressure and flow signals. Automatic control of tank pressure and flow for normal operation was demonstrated. Filter-train heater operation and filter pressure alarms were verified using simulated signals.
10. AY102 - Tests identical to attachment 9 were repeated for Tank AY102 with similar results.
11. AZ101 - Tests identical to attachment 9 were repeated for Tank AZ101 with similar results.
12. AZ102 - Tests identical to attachment 9 were repeated for Tank AZ102 with similar results.

D. MCS Tuning

13. Tests of the K1 System were performed to permit the MCS Cognizant Engineer to evaluate and establish the MCS macro command and alarm-logic time delays, and set final PID loop tuning. All results are considered satisfactory.

E. Stack Monitor Instruments

14. Tests were successfully conducted to evaluate the performance of the K1 stack monitor instrumentation and controls, including the particulate and tritium record samplers. This test was designed by the system supplier (Air Monitor Corp.) with input from Hanford Environmental Engineering and was, in effect, a site acceptance test. Section-7 was a 168-hour test of the stack flow measuring system to verify accuracy, zero drift, and calibration drift; 14 verification field measurements were made in accordance with 6-TF-155 at various intervals and flow rates during the period. Site Environmental Engineering personnel participated in the test and accepted the test results.

TABLE-I - SUMMARY OF ACCEPTANCE CRITERIA AND RESULTS

The following acceptance criteria were evaluated in the course of testing:

ITEM/FUNCTION	ACCEPTANCE CRITERIA	TEST RESULT
LOCAL/REMOTE ACT DAMPER CONTROL	CORRECT LOGIC INTERLOCKS	CRITERIA MET
LOCAL/REMOTE ACT FAN CONTROL	2 FANS CONTROLLED FROM LOCAL VSD & MCS	CRITERIA MET
FAN PERFORMANCE AT NEAR PEAK FLOW	REASONABLY CLOSE TO MFG. CURVE	CRITERIA MET (note-1)
AUTOMATIC PRESSURE/FLOW INTERLOCKS	CORRECT FAN RESPONSE TO UPSET ACTIONS	CRITERIA MET
AUTO FAN SPEED CONTROL	AUTO FAN SPEED CONTROLS TO SETPOINT	CRITERIA MET
FAN VIBRATION AT PEAK SPEED	BASELINE DATA RECORDED	CRITERIA NOT MET (note-2)
SYSTEM INSTRUMENT RESPONSE	ALL SYSTEM INSTRUMENTS RESPOND TO ACTUAL OPERATING CONDITIONS	CRITERIA MET
SYSTEM DATA	DATA APPROXIMATES DESIGN	CRITERIA MET
HEATERS, DAMPERS, VALVES PERFORM	ALL FUNCTION AS DESIGNED	CRITERIA MET
MCS CONTROL LOGIC	ALL DESIGNED LOGIC, INTERLOCKS, ALARMS, TIMING FUNCTION AS DESIGNED	CRITERIA MET
MCS PID TUNING	CONTROLLER TUNING CAN BE SET AS NEEDED	CRITERIA MET
STACK MONITOR	PASS VENDOR TEST	CRITERIA MET
STACK MONITOR	PASS 168-HOUR DRIFT TEST	CRITERIA MET
<p>Note:</p> <ol style="list-style-type: none"> Fan data was collected for information only. However, fan appears to perform near the expected level for the conditions, based on interpolation of manufacturer's 3895-RPM curve, attached. Motor amperage cannot be evaluated due to unknown efficiency of variable-speed drive (VSD) and varying observed line voltage. Fan vibration data at peak speed was to be collected (in Attachments-2 and -6) on each fan for baseline information only. However, initial data indicated vibration levels exceeding the procurement specification requirement and factory test results. Further, both fans showed a resonance condition at two of their mid-range speeds. Accordingly, test exception #23 was added to the report. See Test Notes. 		

SUMMARY OF TEST DATA BY ATTACHMENT

TABLE-II - Attachments 2 & 6; Fan Tests				
Fan ID	AZ-K1-5-1A		AZ-K1-5-1B	
Test Mode ¹ , 100% motor speed	Local	Remote	Local	Remote
Stack Flow, CFM	945	960	940	975
Fan speed, RPM	-	3168	-	3620
Motor amps (volts=526,528)	10.1	10.6	10.6	7.8
Filter Train inlet pressure ²	-14.9	-14.1	-13.1	-13.5
Condenser pressure diff.	4.5	-	4.5	-
HEME pressure diff.	5.2	-	5.2	-
Tank pressures, controlled	-3.0	-	1.7-2.1	-
¹ In "LOCAL" mode, fan was operated from local panel. ² All pressures are measured in inches wc (or wg); tank pressure is measured inside the plenum box which simulates the waste tank.				

TABLE-III - Attachments 3 & 7; Duct Heater Tests				
Heater ID	AZ-K1-2-1A		AZ-K1-2-1B	
Test Mode ¹ , 100% motor speed	Local	Remote	Local	Remote
Heater diff. temperature ² (setpoint=25 F)	30	25	24	25
Rising High-filter-temp. alarm (TAH ² , setpoint >220 F)	226	226	220	220
Rising High-filter-temp alarm (TAHH, setpoint >230 F)	233	234	230	230
Rising High-filter-temp alarm (TAHHH, setpoint >245 F)	247	247	246	245
High-temp alarm at heater inlet (TAH, setpoint >175 F)	175	-	189	-
¹ In "LOCAL" mode, fan was operated from local panel. ² All temperatures are measured in degrees F. Alarm levels are based on simulated input signals. TAH(HH)=Temperature-Alarm High (High-High).				

TABLE-IV - Attachments 9-12; Tank Inlet Station Tests ²				
Tank ID	AY101	AY102	AZ101	AZ102
Stack Flow, CFM	670	430	561	327
Fan speed, RPM	2624	2249	2230	1841
Motor amps	22	17	19	14
Filter Train inlet pressure ¹	-11.1	-8.8	-7.8	-5.5
Inlet pre-filter press. diff.	0.02	0.02	0.01	0
Inlet HEPA press. diff.	0.2	0.3	0.35	0
Inlet air temp., deg. F	42.8	51	42	76
Tank pressure	-2.5	-0.7	-2.5	-2.5
Tank outlet airflow, cfm	77	122	142	95
¹ All pressures are measured in inches wc (or wg); tank pressure is measured inside the plenum box which simulates the waste tank. ² Each tank is tested individually with inlet/outlet control valves in automatic mode using a simulated tank pressure signal.				

TABLE-V - Attachment 13 - MCS FINAL PID LOOP TUNING			
Parameter	PID	Deadband	Filter
PIC-AZK1-1A	0.70, 8.00, 0.02	0.1 TO 0.35	2 sec.
TDIC-AZK12-1A, -1B	0.10, 1.00, 1.00	N/A; limit SP deviation to 15 F	
PIC-AY1K1-1	0.90, 10.00, 0.02	0.01 to 0.05	1 sec.
FIC-AY1K1-2	0.24, 7.00, 0.04	1 to 4 scfm	3 sec.
PIC-AY2K1-1	0.90, 10.00, 0.02	0.01 to 0.05	1 sec.
FIC-AY2K1-2	0.24, 7.00, 0.04	1 to 4 scfm	3 sec.
PIC-AZ1K1-1	0.90, 10.00, 0.02	0.01 to 0.05	1 sec.
FIC-AZ1K1-2	0.24, 7.00, 0.04	1 to 4 scfm	3 sec.
PIC-AZ2K1-1	0.90, 10.00, 0.02	0.01 to 0.05	1 sec.
FIC-AZ2K1-2	0.24, 7.00, 0.04	1 to 4 scfm	3 sec.
PIC-AZK1-1B	0.70, 8.00, 0.02	0.1 TO 0.35	2 sec.

Test Notes:

Even though paragraph 2.3.2 requires that Quality Control (QC) is responsible for witnessing performance of the test procedure, the requirement for QC witness was inadvertently overlooked by test personnel because it was not prominently placed within the procedure (mentioned only in the "Responsibilities" section, without HOLD points or reminders in the body of the document). This omission is considered acceptable for the following reasons:

- o These procedures were rigorous in detail, and performed with a high degree of technical and management oversight in accordance with WHC (now LMHC) Standing Order # 96-29.
- o All field work was performed by qualified Operations crafts personnel.
- o Continuous oversight was provided by a designated Test Director (a trained Operations Shift Manager), a qualified Project Test Engineer, and a qualified Project Control-System Cognizant Engineer.
- o All test work was thoroughly controlled and documented by an on-going work-control process.

The test procedure required a Test Engineer's signature (but not the date of the signature) on some of the test steps. Dates were provided along with signatures on calibrations verification sheets, valve alignment checklists, and valve cycling checklists (see Appendices A, B, and C), as well as the "prerequisite" steps in Sec. 4.0. Performance dates for specific test steps may be verified from archived work packages containing the original test record (see Attachment-1).

Test steps requiring a Test Engineer's signature were those which entailed either recording data, or verifying pretest conditions, system configuration, or expected operating conditions or responses which constitute the acceptance criteria for the test. A signature is considered validation of the required condition.

Test Exception #23 was written after testing to document the results of fan vibration measurements. Because of excessive vibrations noted, a vibration consultant was enlisted to help identify the source of the problem; he discovered through dynamic computer analysis that some of the support-structure anchor bolts were defective and that the quantity may be inadequate. A design ECN was initiated to implement the needed improvements. If available, his report will be included in Attachment-3.

Some CGA loop tests of LDA instruments could not be completed because the applicable piping sections are yet to be installed in the next phase of construction. These tests will be performed prior to system hot startup.

Paragraph 4.7 provides for recording of data for a specific list of equipment and instruments (M&TE) required for testing. However, some of the listed items happen not to be required for this test, and no data are entered. Also,

where a model number is not listed, there was no model number applicable to the device.

This POTP test effectively satisfies previously-deferred test exception TE#13 of construction acceptance testing, reference-6. During the ATP test, sections 12.2 and 13.2, the local temperature controllers for ACT-A and ACT-B were found to be not calibratable at the time. Corrective action was taken and the controllers were tested in section 2.1 of Attachment-3 and -7 of this test.

A procedure validation checklist for the original test procedure is not available and is not included.

CONCLUSION

All testing under this procedure is considered complete and successful.

ATTACHMENT 1 - TEST REPORT CHECKLIST			
ITEM	REQUIRED ACTION TO BE VERIFIED	INITIALS	DATE
1	Test completed per approved procedure	JTC	10/13/97
2	Required enclosures provided	JTC	10/13/97
	a. Summary of test results	JTC	10/13/97
	b. Signed/dated procedure validation sheet	Not available	JTC
	c. Applicable ECNs and NCRs N/A	JTC	10/13/97
	d. Onsite vendor test procedures/reports	JTC	10/27/97
	e. Applicable/important vendor data	JTC	10/13/97
	f. CVI list, Major equipment	JTC	10/13/97
	g. Instrument and Loop calibration data	JTC	10/13/97
3	Test Exceptions (TEs) - Qty. 9	JTC	10/13/97
	a. All listed in TE Log	JTC	10/13/97
	b. All TE reports closed/signed/dated	JTC	10/23/97
4	All applicable test steps signed/dated ⁽¹⁾	JTC	10/13/97
5	Test personnel	JTC	10/13/97
	a. All qualified ⁽²⁾	JTC	10/13/97
	b. All have signed/dated signature log	JTC	10/13/97
6	Recorded test data	JTC	10/13/97
	a. Summary of acceptance criteria incl.	JTC	10/13/97
	b. All required data entered	JTC	10/13/97
	c. All data meets acceptance criteria ⁽³⁾	JTC	10/13/97
7	Related Acceptance Test Report (ATR) ⁽⁴⁾	JTC	10/13/97
	a. Report No: WHC-SD-W030-ATR-006	JTC	10/13/97
	b. TEs covered in this test: #013 ⁽⁴⁾	JTC	10/13/97
8	Filename, original test record 2E-96-00287	JTC	10/13/97

- NOTES: 1. All test steps are signed off by the responsible person. Where the signoff date is not noted, the test summary presents appropriate disposition (Test Notes).
2. No personnel qualification standard was established for this test beyond that required to perform the responsibilities listed in section 2.3. The individuals assigned were deemed qualified by their management.
3. Where acceptance criteria was not specified in the procedure, it is addressed in the test report.
4. For description of ATR issues, see Test Report (Test Notes).

ATTACHMENT 2

COPY OF ORIGINAL TEST PROCEDURE

WITH RECORDED DATA

Author

Keith A. S. Ealden
Print Name/Signature

APPROVAL DESIGNATOR ESQ

PROCEDURE APPROVAL BY TEST REVIEW BOARD (TRB)

TRB Chair	Date	TWRS Operations	Date
TWRS Engineering	Date	TWRS Safety	Date
Construction Projects Startup	Date	Quality Assurance	Date
Project Management	Date	ICF-KH Construction	Date

Note: Revision-Ø release of
this procedure was approved
by all TRB members.

St Clifton 8/22/97

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PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION SY

HNF-SD-W030-POTP-002

Revision No. 1

En

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1 PURPOSE

- 1.1 This procedure has been prepared to verify that the Primary Tank Ventilation System operates in accordance with system design (with the exception of system capacity) and will be performed prior to hot tie-in.

2 INFORMATION

2.1 SCOPE

- 2.1.1 This procedure will demonstrate the operation of the following in the Primary Tank Ventilation System for Tanks AZ101, AZ102, AY101, and AY102:

- Inlet Filter Train heater controls and monitoring, filter pressure differential monitoring and alarms, and automatic valve control.
- Recirc. Ventilation exhaust flow control.
- Condenser pressure differential and shell side temperature monitoring and alarm.
- High Efficiency Mist Eliminator pressure differential monitoring and alarm.
- Exhaust Train Heater controls and monitoring, filter pressure differential monitoring and alarms, damper controls and interlocks, and fan controls, interlocks and performance.
- ~~Encasement leak detection~~ *see TF-22* *AC 10/2/97*

- 2.1.2 This procedure will demonstrate the operation of system interlocks and controls both local and remote as applicable.

2.2 TERMS AND DEFINITIONS

- 2.2.1 HPT - Hearth Physics Technician
2.2.2 OS - Operating Station
2.2.3 LOI - Local Operator Interface device
2.2.4 HS - Hand Switch
2.2.5 ACT - Air Cleanup Train
2.2.6 EEA - Electronic Enclosure Assembly

2.3 RESPONSIBILITIES

2.3.1 The craft personnel (TWRs Maintenance or Construction Forces) are responsible for:

- Providing assistance during the test.
- At least one technician must be a qualified "source user" per WHC-CM-4-14, part 1, section 2.3, to support this test.

2.3.2 Quality Control (QC) is responsible for:

- Witness the performance of the test..

2.3.3 Test Director is responsible for:

- Providing the equipment found in 4.8 of this procedure.
- Safe and productive accomplishment of the tests necessary to achieve startup.
- Ensure safe working conditions and practices.
- Ensure compliance with test documents, Operational Safety Requirements/Documents (OSRs/OSDs) during testing.
- Communicate and coordinate the tests with the East Tank Farm Shift Manager.
- Ensure appropriate review/approval of any modifications to test procedures are completed prior to returning to work
- Direct line of communication and centralized point of control during normal, abnormal, and casualty situations.
- Conducts pre-job planning meeting as necessary.
- Scheduling/rescheduling of the test as required.
- Delegates any of the above responsibilities as needed to a deputy.

2.3.4 The Engineering Personnel are responsible for:

- Providing technical support during testing.
- Providing programming support during testing.
- Forcing data in PLC program during testing.
- Direct preoperational testing.
- Where required, determine simulation methods for test steps.
- Review test documents to validate acceptance.
- Prepare post testing documents.
- Records equipment status and data per this procedure.
- Conducts pre-job system walkdown.
- Recording data exceptions and other notes as required on the POTP Data Sheets.

2.3.5 Operations Personnel are responsible for:

- Observe performance for test for training.

2.4 CHANGE CONTROL

2.4.1 Test procedure administrative or editorial changes required during testing may be accommodated as exceptions in the released test report, if the changes will not affect operating facility safety, function, or performance and will not compromise or influence test data. Requirement changes, changes to acceptance criteria, or changes to Danger, Caution, Special Precautions, or other safety or environmental instructions in test procedures prepared as supporting documents must be made by engineering change notice.

2.5 EXCEPTIONS

2.5.1 Exceptions to results or to the test procedure will be given a sequential number and recorded on Attachment 18, Test Exception log sheet. A test exception report, Attachment 17, will be filled out to record and disposition each test exception.

2.6 REFERENCES

2.6.1 The following documents were used in the preparation of or are referenced in this procedure:

- Project W-030 Startup Test Plan, WHC-SD-W030-SUP-003
- H-2-131076, P & ID K1 Primary Tank Vent System
- H-2-131075, P & ID K1 Primary Tank Vent System
- Tank Farm Ventilation Upgrade, W-030-C2, Sections 13440 and 15500
- Tank Farm Ventilation Upgrade, W-030-C3, Sections 13440 and 15493
- W-030-P3, Primary Ventilation Air Cleanup Trains.
- W-030-P6, Process Instruments.
- W-030-P26, Primary Tank Vent. Control Valves.
- W-030-P28, Process Instruments (Safety Class).
- 6-TF-155, Air Flow Test For Tank Farm Stacks and Ducts.

2.7 ENVIRONMENTAL

2.7.1 Spills of hazardous materials (including propylene glycol) should be reported to Environmental Reports group at 373-4942.

2.7.2 Hazardous and mixed waste should be disposed of according to TO-100-052, or by calling Environmental Waste Operations at 372-1208.

2.8 SAFETY

Warning - In addition to contamination hazards, operators should be aware of the possibility of coming into contact with poisonous snakes and spiders.

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

- Industrial Safety Manual, WHC-CM-1-10.
- Industrial Hygiene Manual, WHC-CM-1-11.
- Environmental Compliance Manual, WHC-CM-7-5
- Tank Farm Health and Safety Plan (HASP),
WHC-SD-WM-HSP-002

2.9 RADIATION AND CONTAMINATION CONTROL

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

- Hanford Site Radiological Control Manual (HSRCM-1)
- WHC Radiological Control Manual, WHC-CM-1-6

2.9.2 When using the check sources, follow the precautions listed in the "source user briefing" sheet.

2.10 QUALITY ASSURANCE

2.10.1 No Quality Assurance witness or holdpoints are required in this procedure. Quality Assurance shall review and approve the test procedure, the final test report and the disposition of all test exceptions.

2.11 GENERAL INFORMATION

None

2.12 LIMITS AND PRECAUTIONS

2.12.1 If during performance of this procedure, any of the following conditions are found, **immediately** notify the Test Engineer:

- Any equipment malfunction which could prevent fulfillment of it's functional requirements.
- Personnel error or procedural inadequacy which could prevent fulfillment of procedural requirements.

The Test Engineer may choose to stop work and place equipment in a safe condition based on the significance of the malfunction, error or inadequacy.

2.12.2 Contact Test Engineer for additional instructions if changing plant conditions affect work or delays in work extend past end of shift.

2.12.3 If any waste is generated during performance of this procedure consult Facility/Plant/Area Hazardous Waste Coordinator for specific instructions to ensure compliance with WHC and DOE environmental standards, as applicable, for disposal.

- 2.12.4 Comply with WHC and plant/facility specific lock and tag or over-tagging requirements, as applicable.
- 2.12.5 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 desired range.
 - Have an accuracy (consistent with state-of-the-art limitations) equal to or greater than the accuracy specified in the procedure.
- 2.12.6 Timing measurements shall be made with commercially available time devices.
- 2.12.7 The Test Engineer has overall control of the testing process and change authorization for this procedure. They are responsible for running the test, data collection, and ensuring compliance with all requirements in this procedure.
- 2.12.8 All readings are to be taken and recorded for each location where the capability exists (i.e. local instrument, LOI, OS).

3 RECORDS

- 3.1 This procedure as well as all completed attachments/appendices are to be kept as a permanent record.

4 PREREQUISITES

Unless otherwise specified, prerequisite actions may be performed in any order.

- 4.1 The test shall be performed prior to any contamination being introduced at any point of the W-030 system.
- 4.2 Perform a pretest briefing for all personnel involved in the performance of this test.
Test Engineer ZB/Navell Date 9/15/96

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PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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- 4.3 Radio communication between the control room and equipment locations has been verified.

Test Engineer Z. Howell Date 9/5/96

- 4.4 The official copy of this OTP and all other copies that will be used during the test have been verified to be the latest revision.

Test Engineer Z. Howell Date 9/5/96

- 4.5 All open items have been evaluated and verified to not affect the performance of this OTP (Quality Assurance Nonconformance Reports, Construction Punch Lists, outstanding Engineering or Field Change Notices, Startup-originated Design Change Requests, Test Deficiency Reports, and Master System Punch List items).

Test Engineer Z. Howell Date 9/5/96

- 4.6 Notify WHC Maintenance (373-9035) 24 hours prior to commencement of testing to facilitate obtaining baseline data on fans and motors by maintenance.

Test Engineer Z. Howell Date 9/5/96

- 4.7 Equipment/Instruments
Supplied by Test Operator unless otherwise noted.

- 4.7.1 Clamp-on Ammeter: 0-40 Ampere.

Manufacturer: Amprobe
Serial No. 988-45-02-006
Cal. Due Date 1/24/97

Model No. ACD-4
Cal. Date. 1/24/96

- 4.7.2 Shorting jumpers with ON-OFF switch (SW): 4 feet long. Quantity of 2 (two) required.

- 4.7.3 Variable Test Pressure Source (VTPS): Range 0 to 50 inches water column.

Manufacturer: Druck
Serial No. 817-35-40-029
Cal. Due Date 8/18/97

Model No. _____
Cal. Date. 8/18/96

See Test Report. Ja

- 4.7.4 Resistance Decade Box (RDB): Range 0.00 to 200.00 ohms.

Manufacturer: _____
Serial No. _____
Cal. Due Date _____

Model No. _____
Cal. Date. _____

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4.7.5 Ohmmeter (OHM): Quantity of 2 (two) required.

Manufacturer: FLUKE Model No. 23
Serial No. 95445-08-005 Cal. Date. 5/28/96
Cal. Due Date 5/28/97

4.7.6 Universal Test Device (UTD): Capable of 4-20 mA variable input (loop internally powered), 4-20 mA variable input (loop externally powered) and 4-20 mA variable output. Includes digital display resolution of 0.1 (minimum), direct reading. Quantity of 3 (three) required.

Manufacturer: _____ Model No. _____
Serial No. _____ Cal. Date. _____
Cal. Due Date _____

4.7.7 Air flow measuring instrumentation (pitot tube, multimeter).

Manufacturer: _____ Model No. _____
Serial No. _____ Cal. Date. _____
Cal. Due Date _____

4.8 Calibration of all installed instrumentation in the system have been verified to be current with calibration sticker affixed and all system loop calibrations are complete.

Test Engineer 7A Howell Date 9/5/96

4.9 Checkout the "check sources" from the HPT office when needed for performing the portion of this test applicable to the Beta Monitor.

Test Engineer Doug Decker Date 3/21/97

4.10 Test engineer has verified initial system field conditions in accordance with Attachment 19.

Test Engineer 7A Howell Date 9/5/96

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5 PROCEDURE

NOTE: Steps 5.1 and 5.5 must be performed before any other sections of this procedure. Once Step 5.1 and 5.5 are complete, then sections or steps within sections of the procedure (except for initial conditions) may be performed out of sequence under direction and authority of the Test Engineer with concurrence of the Test Director.

NOTE: During the performance of this testing, the Test Director will provide direction to the operators for response to alarms received.

- 5.1 Perform testing of ACT Train A Isolation Dampers to procedure steps given in Attachment 1.
- 5.2 Perform testing of ACT Train A Exhaust Fan to procedure steps given in Attachment 2.
- 5.3 Perform testing of ACT Train A Duct Heater to procedure steps given in Attachment 3.
- 5.4 Perform testing of ACT Train A Filter Pressure Differential Monitoring to procedure steps given in Attachment 4.
- 5.5 Perform testing of ACT Train B Isolation Dampers to procedure steps given in Attachment 5.
- 5.6 Perform testing of ACT Train B Exhaust Fan to procedure steps given in Attachment 6.
- 5.7 Perform testing of ACT Train B Duct Heater to procedure steps given in Attachment 7.
- 5.8 Perform testing of ACT Train B Filter Pressure Differential Monitoring to procedure steps given in Attachment 8.
- 5.9 Perform testing of AY101 Air Inlet Filter Train to procedure steps given in Attachment 9.
- 5.10 Perform testing of AY102 Air Inlet Filter Train to procedure steps given in Attachment 10.

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- 5.11 Perform testing of AZ101 Air Inlet Filter Train to procedure steps given in Attachment 11.
 - 5.12 Perform testing of AZ102 Air Inlet Filter Train to procedure steps given in Attachment 12.
 - 5.13 Perform testing of Primary Vent System MCS MACRO command and perform final PID control-loop tuning according to procedure steps given in Attachment 13.
 - 5.14 Perform testing of the Primary Vent Stack Monitor to procedure steps given in Attachment 14.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION
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ATTACHMENT 1 - ACT TRAIN A ISOLATION DAMPER TEST

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ATTACHMENT 1

1 INITIAL CONDITIONS

1.1 VERIFY/PERFORM the following electrical line-up:

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BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	TV
Breaker #3	Primary Vent Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	R.P.	7/13/97
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	R.P.	7/13/97
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	R.P.	7/13/97

Test Engineer

7/13/97

Date

9/15/96

1.2 VERIFY that temporary plenum and ductwork connections detailed in Attachment 19 are complete.

Test Engineer

7/13/97

Date

9/15/96

1.3 All personnel who will be involved with this procedure have provided the required signature verification information in Attachment 15.

Test Engineer

7/13/97

Date

9/15/96

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ATTACHMENT 1 - ACT TRAIN A ISOLATION DAMPER TEST

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2 PROCEDURE

2.1 ACT A Isolation Damper Interlock Test - MK-AZK1-1A.

2.1.1 **VERIFY/SIMULATE** a temperature <230°F at TE-AZK102-3A.

Test Engineer 7/31/97 Date 9/5/96

2.1.2 **SELECT** handswitch HS-AZK1-1AA **AUTO** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.3 **SELECT** handswitch HS-AZK1-1A **OPEN** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.4 **VERIFY** that damper MK-AZK1-1A stays **CLOSED**.

Test Engineer 7/31/97 Date 9/5/96

2.1.5 **SELECT** handswitch HS-AZK1-1AA **MANUAL** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.6 **SELECT** handswitch HS-AZK1-1A **OPEN** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.7 **VERIFY** that damper MK-AZK1-1A **OPENS**.

Test Engineer 7/31/97 Date 9/5/96

2.1.8 **SIMULATE** a temperature >230°F at TE-AZK102-3A.

2.1.9 **VERIFY** that damper MK-AZK1-1A **CLOSES**.

Test Engineer 7/31/97 Date 9/5/96

2.1.10 **REMOVE** temperature simulation at TE-AZK102-3A.

2.1.11 **OPEN** damper MK-AZK1-1A by selecting HS-AZK1-1A **OPEN** command on MCS graphic 17PriExh.v.

2.1.12 **SELECT** handswitch HS-AZK1-1AA **AUTO** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

ATTACHMENT 1 - ACT TRAIN A ISOLATION DAMPER TEST

2.1.13 **VERIFY** that damper MK-AZK1-1A **CLOSES**.

Test Engineer ZAH Date 9/5/96

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2.1.14 **SELECT** handswitch HS-AZK1-12-1AA **MANUAL** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.

2.1.15 **SELECT** handswitch HS-AZK1-12-1A **ON** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.

2.1.16 **VERIFY** that damper MK-AZK1-1A **OPENS**.

Test Engineer ZAH Date 9/5/96

2.1.17 **SELECT** handswitch HS-AZK1-1A **CLOSE** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.18 **VERIFY** that damper MK-AZK1-1A stays **OPEN**.

Test Engineer ZAH Date 9/5/96

2.1.19 **SELECT** handswitch HS-AZK1-1AA **MANUAL** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.20 **SELECT** handswitch HS-AZK1-1A **CLOSE** command for damper MK-AZK1-1A on MCS graphic 17PriExh.v.

2.1.21 **VERIFY** that damper MK-AZK1-1A **CLOSES**.

Test Engineer ZAH Date 9/5/96

2.1.22 **SELECT** handswitch HS-AZK1-12-1A **OFF** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.

2.2 ACT A Isolation Damper Interlock Test - MK-AZK1-2A.

2.2.1 **VERIFY/SIMULATE** a temperature <230°F at TE-AZK102-3A.

Test Engineer ZAH Date 9/5/96

*Data Transfer From Rev. 0 7/5/96*2.2.2 **VERIFY/SIMULATE** a pressure differential <5" w.c. at PDT-AZK104-1A.Test Engineer 7/5/96 Date 9/5/962.2.3 **VERIFY/SIMULATE** a pressure differential <3" w.c. at PDT-AZK110-1A.Test Engineer 7/5/96 Date 9/5/962.2.4 **VERIFY/SIMULATE** a pressure differential <5" w.c. at PDT-AZK104-2A.Test Engineer 7/5/96 Date 9/5/962.2.5 **VERIFY** that a high radiation condition does not exist at RIAS-AZK1-1.Test Engineer 7/5/96 Date 9/5/962.2.6 **SELECT** handswitch HS-AZK1-2AA **AUTO** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.7 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.8 **VERIFY** that damper MK-AZK1-2A stays **CLOSED**.Test Engineer 7/5/96 Date 9/5/962.2.9 **SELECT** handswitch HS-AZK1-2AA **MANUAL** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.
*2 JAA 9/5/96*2.2.10 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.11 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/5/96 Date 9/5/962.2.12 **SIMULATE** a temperature >230°F at TE-AZK102-3A.2.2.13 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/5/96 Date 9/5/96

*Data Transfer From Revision 0 7/31/97*2.2.14 **SIMULATE** a temperature $<230^{\circ}\text{F}$ at TE-AZK102-3A.2.2.15 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.16 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/31/97 Date 9/5/962.2.17 **SIMULATE** a differential pressure $>5"$ w.c. at PDT-AZK104-1A.2.2.18 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/31/97 Date 9/5/962.2.19 **SIMULATE** a differential pressure $<5"$ w.c. at PDT-AZK104-1A.2.2.20 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.21 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/31/97 Date 9/6/962.2.22 **SIMULATE** a differential pressure $>3"$ w.c. at PDT-AZK110-1A.2.2.23 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/31/97 Date 9/17/962.2.24 **SIMULATE** a differential pressure $<3"$ w.c. at PDT-AZK110-1A.2.2.25 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.26 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/31/97 Date 9/17/962.2.27 **SIMULATE** a differential pressure $>5"$ w.c. at PDT-AZK104-2A.

*Data Transferred from Revision 0 10/4 3/3/96*2.2.28 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/5/96 Date 9/6/962.2.29 **SIMULATE** a differential pressure <5" w.c. at PDT-AZK104-2A.2.2.30 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.31 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/5/96 Date 9/6/962.2.32 **SIMULATE** a high radiation condition at RAIS-AZK1-1.2.2.33 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/5/96 Date 9/6/962.2.34 **RETURN** RAIS-AZK1-1 to a **NORMAL** condition.2.2.35 **SELECT** handswitch HS-AZK1-2A **OPEN** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.36 **VERIFY** that damper MK-AZK1-2A **OPENS**.Test Engineer 7/5/96 Date 9/6/962.2.37 **SELECT** handswitch HS-AZK1-2AA **AUTO** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.2.2.38 **VERIFY** that damper MK-AZK1-2A **CLOSES**.Test Engineer 7/5/96 Date 9/6/962.2.39 **SELECT** handswitch HS-AZK1-12-1AA **MANUAL** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.2.2.40 **SELECT** handswitch HS-AZK1-12-1A **ON** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.

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2.2.41 **VERIFY** that damper MK-AZK1-2A **OPENS**.

Test Engineer 7/5/96 Date 9/6/96

2.2.42 **SELECT** handswitch HS-AZK1-2A **CLOSE** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.

2.2.43 **VERIFY** that damper MK-AZK1-2A stays **OPEN**.

Test Engineer 7/5/96 Date 9/6/96

2.2.44 **SELECT** handswitch HS-AZK1-2AA **MANUAL** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.

2.2.45 **SELECT** handswitch HS-AZK1-2A **CLOSE** command for damper MK-AZK1-2A on MCS graphic 17PriExh.v.

2.2.46 **VERIFY** that damper MK-AZK1-2A **CLOSES**.

Test Engineer 7/5/96 Date 9/6/96

2.2.47 **SELECT** handswitch HS-AZK1-12-1A **OFF** command for heater AZ-K1-2-1A on MCS graphic 17PriExh.v.

2.2.48 **REMOVE** simulation from TE-AZK102-3A.

Test Engineer 7/5/96 Date 9/6/96

2.2.49 **REMOVE** simulation from PDT-AZK104-1A.

Test Engineer 7/5/96 Date 9/6/96

2.2.50 **REMOVE** simulation from PDT-AZK110-1A.

Test Engineer 7/5/96 Date 9/6/96

2.2.51 **REMOVE** simulation from PDT-AZK104-2A.

Test Engineer 7/5/96 Date 9/6/96

ATTACHMENT 2 *Data Transfer*
From Rev. 0 *7/8/97*
4/8/97

1 INITIAL CONDITIONS

- 1.1 OPEN damper MK-AZK1-1A by placing handswitch HS-AZK1-1AA in **MANUAL** position and handswitch HS-AZK1-1A in **OPEN** position at MCS graphic 17PriExh.v.
Test Engineer *7/8/97* Date *9/17/96*
- 1.2 OPEN damper MK-AZK1-2A by placing handswitch HS-AZK1-2AA in **MANUAL** position and handswitch HS-AZK1-2A in **OPEN** position at MCS graphic 17PriExh.v.
Test Engineer *7/8/97* Date *9/17/96*
- 1.3 At MCS graphic 15PriIn.v, **SELECT** Tank PIC to **MANUAL** for each tank (PIC-AY1K1-1, PIC-AY2K1-1, PIC-AZ1K1-1, PIC-AZ2K1-1); **OPEN** each inlet flow control valve (MK-AY101K1-1, MK-AY101K1-1, MK-AZ01K1-1, MK-AZ01K1-1). **VERIFY** valves **FULL OPEN**.
Test Engineer *7/8/97* Date *9/17/96*

1.4 VERIFY/PERFORM the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Breaker #6	Primary Vent Fan AZ-K1-5-1B Breaker in Standby Panelboard No.2.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Fan Motor Disconnect	Primary Vent Fan AZ-K1-5-1A, "A" Train Filter Room.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>
Fan Motor Disconnect	Primary Vent Fan AZ-K1-5-1B, "B" Train Filter Room.	CLOSED	<i>R.P.</i>	<i>7/8/97</i>

Test Engineer *7/8/97* Date *9/17/96*

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION
Revision 1 HNF-SD-W030-POTP-002
ATTACHMENT 2 - ACT TRAIN A EXHAUST FAN TEST PR

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1.5 VERIFY/PERFORM the following damper line-up:

Damper	Location	Position	MCS Graphic
MK-AY101K1-1	AY101 Inlet	OPEN	15PriIn.v
MK-AY101K1-2A1	401-AY Recirc. Module	CLOSED	<i>E.P.H</i>
MK-AY101K1-2A2	401-AY Recirc. Module	CLOSED	
MK-AY101K1-2A3	401-AY Recirc. Module	OPEN 50%	
MK-AY101K4-1	401-AY Recirc. Module	CLOSED	10RecAY1.v
MK-AY101K4-2	401-AY Recirc. Module	CLOSED	10RecAY1.v
MK-AY101K4-3	401-AY Recirc. Module	OPEN	10RecAY1.v
MK-AY101K4-4	401-AY Recirc. Module	OPEN	10RecAY1.v
MK-AY101K4-5	401-AY Recirc. Module	OPEN	
MK-AY101K4-6	401-AY Recirc. Module	OPEN	
MK-AY102K1-1	AY102 Inlet	OPEN	15PriIn.v
MK-AY102K1-2A1	402-AY Recirc. Module	CLOSED	
MK-AY102K1-2A2	402-AY Recirc. Module	CLOSED	
MK-AY102K1-2A3	402-AY Recirc. Module	OPEN 50%	
MK-AY102K4-1	402-AY Recirc. Module	CLOSED	11RecAY2.v
MK-AY102K4-2	402-AY Recirc. Module	CLOSED	11RecAY2.v
MK-AY102K4-3	402-AY Recirc. Module	OPEN	11RecAY2.v
MK-AY102K4-4	402-AY Recirc. Module	OPEN	11RecAY2.v
MK-AY102K4-5	402-AY Recirc. Module	OPEN	
MK-AY102K4-6	402-AY Recirc. Module	OPEN	
MK-AZ101K1-1	AZ101 Inlet	OPEN	15PriIn.v
MK-AZ101K1-2A1	401-AZ Recirc. Module	CLOSED	
MK-AZ101K1-2A2	401-AZ Recirc. Module	CLOSED	
MK-AZ101K1-2A3	401-AZ Recirc. Module	OPEN 50%	
MK-AZ101K4-1	401-AZ Recirc. Module	CLOSED	12RecAZ1.v

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Damper	Location	Position	MCS Graphic
MK-AZ101K4-2	401-AZ Recirc. Module	CLOSED	12RecAZ1.v
MK-AZ101K4-3	401-AZ Recirc. Module	OPEN	12RecAZ1.v
MK-AZ101K4-4	401-AZ Recirc. Module	OPEN	12RecAZ1.v
MK-AZ101K4-5	401-AZ Recirc. Module	OPEN	
MK-AZ101K4-6	401-AZ Recirc. Module	OPEN	
MK-AZ102K1-1	AZ102 Inlet	OPEN	15PriIn.v
MK-AZ102K1-2A1	402-AZ Recirc. Module	CLOSED	
MK-AZ102K1-2A2	402-AZ Recirc. Module	CLOSED	
MK-AZ102K1-2A3	402-AZ Recirc. Module	OPEN 50%	
MK-AZ102K4-1	402-AZ Recirc. Module	CLOSED	13RecAZ2.v
MK-AZ102K4-2	402-AZ Recirc. Module	CLOSED	13RecAZ2.v
MK-AZ102K4-3	402-AZ Recirc. Module	OPEN	13RecAZ2.v
MK-AZ102K4-4	402-AZ Recirc. Module	OPEN	13RecAZ2.v
MK-AZ102K4-5	402-AZ Recirc. Module	OPEN	
MK-AZ102K4-6	402-AZ Recirc. Module	OPEN	
MK-AZK108-1A	Vent Cell	OPEN	16PriCoo.v
MK-AZK108-1B	Vent Cell	OPEN	16PriCoo.v
MK-AZK108-1C	Vent Cell	CLOSED	16PriCoo.v
MK-AZK109-1A	Vent Cell	OPEN	16PriCoo.v
MK-AZK109-1B	Vent Cell	OPEN	16PriCoo.v
MK-AZK109-1C	Vent Cell	CLOSED	16PriCoo.v
MK-AZK1-1A	Filter train	OPEN	17PriExh.v
MK-AZK1-2A	Filter train	OPEN	17PriExh.v

Test Engineer ZAH Date 9/17/96

Date Transfer From Rev. 0 - ZAH 4/8/97

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*Data Transferred from Rev. 0 to 1A
4/8/97*

- 1.6 SET initial Proportional/Integral/Derivative (PID) controller setpoints as follows:

Inlet manifold pr.	PIC-AZK1-1A	-10 ins. wc ✓
Heater diff. temp.	TDIC-AZK12-1A	25 °F ✓
Inlet manifold pr.	PIC-AZK1-1B	-10 ins. wc ✓
Heater diff. temp.	TDIC-AZK12-1B	25° F ✓
AY101 Tank pr.	PIC-AY1K1-1	-3.0 ins. wc ✓
AY101 Tank exit flow	FIC-AY1K1-2	100 scfm ✓
AY102 Tank pr.	PIC-AY2K1-1	-3.0 ins. wc ✓
AY102 Tank exit flow	FIC-AY2K1-2	100 scfm ✓
AZ101 Tank pr.	PIC-AZ1K1-1	-3.0 ins. wc ✓
AZ101 Tank exit flow	FIC-AZ1K1-2	100 scfm ✓
AZ102 Tank pr.	PIC-AZ2K1-1	-3.0 ins. wc ✓
AZ102 Tank exit flow	FIC-AZ2K1-2	100 scfm ✓

- 1.7 VERIFY installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19: ✓
- 1.8 INSTALL test jumper with switch in the output of PT-AZK1-1A in termination panel TB-LCU1-2S, TB01 - 157.
- 1.9 INSTALL test jumper with switch in the output of PT-AZK1-1B in termination panel TB-LCU2-2S, TB01 - 157.

2 PROCEDURE

2.1 Fan AZ-K1-5-1A Control from Variable Speed Drive Cabinet.

- 2.1.1 OPEN damper MK-AZK105-1A1 and VERIFY correct indication for the damper at the MCS graphic 17PriExh.v.

Test Engineer *7044* Date *9-17-96*

- 2.1.2 OPEN damper MK-AZK105-1A2 and VERIFY correct indication for the damper at the MCS graphic 17PriExh.v.

Test Engineer *7044* Date *9-17-96*

- 2.1.3 SELECT HS-AZK105-1AA MANUAL command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

ATTACHMENT 2 - ACT TRAIN A EXHAUST FAN TEST PROC.

Data Transfer From Rev. 0. Total 4/8/97

- 2.1.4 **PLACE** Manual Speed Pot at the Variable Speed Drive 1 (VSD1) local control cabinet at the **50%** position
- 2.1.5 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD1 local control cabinet in **REMOTE**.
- 2.1.6 **PRESS RESET** button at the VSD1 local control cabinet.
- 2.1.7 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **HAND** position.
- 2.1.8 **VERIFY** that fan AZ-K1-5-1A does **NOT START**.

Test Engineer D. G. Date 9/17/96

- 2.1.9 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **OFF** position.
- 2.1.10 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD1 local control cabinet in **LOCAL** position.
- 2.1.11 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **HAND** position. **VERIFY** that exhaust fan AZ-K1-5-1A **STARTS**.

Test Engineer D. G. Date 9/17/96

- 2.1.12 **VERIFY** that after fan AZ-K1-5-1A comes up to speed, **50+/-2%** is indicated on the % Speed Meter at the VSD1 local control cabinet. **VERIFY** temporary field conditions are acceptable, i.e. internal pressure of plenum boxes (observe MCS graphic 15PriIn.v), plenum boxes, flex hoses/connections intact.

Test Engineer D. G. Date 9/17/96

- 2.1.13 Slowly **INCREASE** manual speed pot setting at the VSD1 local control cabinet to **100%** and **VERIFY** that 100% is indicated. Again, **MONITOR/VERIFY** acceptable field conditions as speed is increased.

Test Engineer D. G. Date 9/17/96

- 2.1.14 At each of the four Recirculation Modules, gradually **OPEN** the flow control bypass valves to full open position. Again, **MONITOR/VERIFY** acceptable field conditions.

Test Engineer D. G. Date 9/17/96

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4/8/98*

- 2.1.15 **VERIFY** that exhaust fan AZ-K1-5-1A speed increases to $100 \pm 2\%$ indicated on the % Speed Meter at the VSD1 local control cabinet.

Test Engineer D. G. Date 9/17/96

- 2.1.16 After a stabilization period of 15 minutes **RECORD** the following data at MCS graphic 15PriIn.v, 16PriCoo.v, 17PriExh.v:

for exhaust fan AZ-K1-5-1A;

Motor Current	<u>10.1</u>	Amps. (II-AZK105-1A)
Motor Voltage	<u>526</u>	Volts. (M. & T. E.)
Train A Header Press.	<u>-14.9</u>	Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-14.4</u>	Ins w.c. (PIC-AZK1-1B)
Total Airflow	<u>945</u>	cfm (FI-AZK1-3)

for condensor AZ-K1-8-1

Pressure Differential 4.53 Ins w.c. (PDI-AZK18-1)

for HEME AZ-K1-9-1

Pressure Differential 5.24 Ins w.c. (PDI-AZK19-1)

for tank pressures and flows

Tank	Pressure, ins. wc	Flow in, scfm	Flow out, scfm
AY101	PIC-AY1K1-1 <u>-3.0</u>	FI-AY1K1-1 <u>194</u>	FIC-AY1K1-2 <u>263</u>
	PI-AY1K1-2 <u>-3.1</u>		
AY102	PIC-AY2K1-1 <u>-3.0</u>	FI-AY2K1-1 <u>157</u>	FIC-AY1K1-2 <u>208</u>
	PI-AY2K1-2 <u>-2.9</u>		
AZ101	PIC-AZ1K1-1 <u>-3.0</u>	FI-AZ1K1-1 <u>168</u>	FIC-AZ1K1-2 <u>210</u>
	PI-AZ1K1-2 <u>-3.0</u>		
AZ102	PIC-AZ2K1-1 <u>-3.0</u>	FI-AZ2K1-1 <u>260</u>	FIC-AZ1K1-2 <u>302</u>
	PI-AZ2K1-2 <u>-3.1</u>		

Test Engineer D. G. Date 9/17/96

- 2.1.17 Allow exhaust fan AZ-K1-5-1A to operate for sufficient length of time needed to obtain vibration data. **RECORD** on Exhibit A data sheets.

ATTACHMENT 2 - ACT TRAIN A EXHAUST FAN TEST PROCEDURE

2.1.18 **SELECT** HS-AZK105-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.1.19 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**. *data Transfer from Rev. 0. 70WS 4/8/97*

Test Engineer D.L. Date 4/17/96

2.1.20 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S

2.1.21 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D.L. Date 4/8/97

2.1.22 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.1.23 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D.L. Date 4/8/97

2.1.24 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.1.25 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D.L. Date 4/8/97

2.1.26 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S

Test Engineer D.L. Date 4/8/97

2.1.27 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S

Test Engineer D.L. Date 4/8/97

2.1.28 **REMOVE** simulation from FIT-AZK1-3.

Test Engineer D.L. Date 4/8/97

2.1.29 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **OFF** position.

2.1.30 **VERIFY** that exhaust fan AZ-K1-5-1A **STOPS**.

Test Engineer D. J. Date 4/8/92

2.2 Fan AZ-K1-5-1A Control from MCS

2.2.1 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **AUTO** position.

2.2.2 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD1 local control cabinet in **REMOTE**.

2.2.3 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **AUTO** position.

2.2.4 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD2 local control cabinet in **REMOTE**.

2.2.5 **SELECT** HS-AZK15-1AB **NORMAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.6 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.7 **SELECT** HS-AZK15-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.8 **VERIFY** that fan AZ-K1-5-1A does **NOT START**.

Test Engineer D. J. Date 4/8/92

2.2.9 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.10 **SELECT** HS-AZK15-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

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2.2.11 **VERIFY** that fan AZ-K1-5-1A **STARTS**.

Test Engineer D.G. Date 4/8/97

2.2.12 After a stabilization period of 15 minutes **RECORD** the following data for exhaust fan AZ-K1-5-1A:

Motor Current	<u>10.6</u>	Amps. (II-AZK105-1A)	Data Transferred Param Rev. 0. 7/14/97 4/8/97
Motor Voltage	<u>527</u>	Volts. (M. & T. E.)	
Motor Speed	<u>3168 RPM</u>	% (% Speed Meter)	
Train A Header Press.	<u>-14.1</u>	Ins w.c. (PIC-AZK1-1A)	
Train B Header Press.	<u>-13.5</u>	Ins w.c. (PIC-AZK1-1B)	
Total Airflow	<u>960</u>	cfm (FI-AZK1-3)	

2.2.13 **SELECT** HS-AZK15-1AB **OVERRIDE** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.14 **SELECT** HS-AZK15-1BB ~~NORMAL~~ ^{OVERRIDE D.G.} command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.15 **SELECT** HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.16 **CONNECT** variable test pressure source to input side of PT-AZK1-1A and input a negative pressure equal to that recorded in step ~~2.2.11~~ _{2.2.12 D.G.}

2.2.17 **VERIFY** that fan motor speed returns to within $\pm 2\%$ of that recorded in Step ~~2.2.11~~ _{2.2.12 D.G.}

Test Engineer D.G. Date 9/18/96

2.2.18 **SIMULATE** a more negative pressure at PT-AZK1-1A.

2.2.19 **VERIFY** that fan motor speed decreases.

Test Engineer D.G. Date 9/18/96

2.2.20 **SIMULATE** a less negative pressure at PT-AZK1-1A.

2.2.21 **VERIFY** that fan motor speed increases.

Test Engineer D.G. Date 9/18/96

2.2.22 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S

2.2.23 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D. J. Date 4/8/97

2.2.24 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.2.25 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D. J. Date 4/8/97

2.2.26 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.2.27 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D. J. Date 4/8/97

2.2.28 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S

Test Engineer D. J. Date 4/8/97

2.2.29 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D. J. Date 4/8/97

2.2.30 **REMOVE** simulation from FT-AZK1-3.

Test Engineer D. J. Date 4/8/97

2.2.31 **SELECT** HS-AZK15-1AB **NORMAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.32 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

2.2.33 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.
Test Engineer D. J. Date 4/8/97

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2.2.34 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.2.35 **VERIFY** the following:

2.2.35.1 Exhaust fan AZ-K1-5-1A **STOPS**.

2.2.35.2 Exhaust fan AZ-K1-5-1B **STARTS**.

Test Engineer D.J. Date 9/8/97

2.2.36 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer D.J. Date 9/8/97

2.2.37 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S

Test Engineer D.J. Date 9/8/97

2.2.38 **PRESS RESET** button at the VSD1 local control cabinet.

2.2.39 **SELECT** HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.40 **SELECT** HS-AZK15-1B **STOP** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.41 **SELECT** HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.42 **START** exhaust fan AZ -K1-5-1A at the MCS using HS-AZK105-1A **START** command.

2.2.43 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

2.2.44 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D.J. Date 9/8/97

2.2.45 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

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2.2.46 **VERIFY** the following:

2.2.46.1 Exhaust fan AZ-K1-5-1A **STOPS**.

2.2.46.2 Exhaust fan AZ-K1-5-1B **STARTS**.

Test Engineer D.J. Date 9/8/97

2.2.47 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer D.J. Date 9/8/97

2.2.48 **REMOVE** simulation from FT-AZK1-3.

Test Engineer D.J. Date 9/8/97

2.2.49 **PRESS RESET** button at the VSD1 local control cabinet.

2.2.50 **SELECT** HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.51 **SELECT** HS-AZK15-1B **STOP** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.52 **SELECT** HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.53 **START** exhaust fan AZ -K1-5-1A at the MCS using HS-AZK105-1A **START** command.

2.2.54 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.2.55 **VERIFY** that exhaust fan AZ-K1-5-1A does **NOT STOP**.

Test Engineer D.J. Date 9/8/97

2.2.56 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.2.57 **VERIFY** the following:

2.2.57.1 Exhaust fan AZ-K1-5-1A **STOPS**.

2.2.57.2 Exhaust fan AZ-K1-5-1B **STARTS**.

Test Engineer D.J. Date 9/8/97

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2.2.58 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D.J. Date 4/8/97

2.2.59 **REMOVE** simulation from FT-AZK1-3.

Test Engineer D.J. Date 4/8/97

2.2.60 **PRESS RESET** button at the VSD1 local control cabinet.

2.2.61 **SELECT** HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.62 **SELECT** HS-AZK15-1B **STOP** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.63 **START** exhaust fan AZ -K1-5-1A at the MCS using HS-AZK105-1A **START** command.

2.2.64 **SELECT** HS-AZK105-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.65 **VERIFY** that exhaust fan AZ-K1-5-1A **STOPS**.

Test Engineer D.J. Date 4/8/97

2.2.66 **LEAVE** test jumpers installed to support testing of exhaust fan AZ-K1-5-1B.

ATTACHMENT 2 - EXHIBIT A

Primary Tank Ventilation System Data Sheets.

System: Primary Tank Vent. - Train A.	Fan No.: AZ-K1-5-1A	Fan Type: Centrifugal
Drive Type: Belt.	Service: Primary Tank Ventilation	

VIBRATION DATA

1ST READING	MOTOR OUTBOARD	MOTOR INBOARD	FAN/BLWR INBOARD	FAN/BLWR OUTBOARD
HORIZONTAL				
VERTICAL				
AXIAL				

2ND READING	MOTOR OUTBOARD	MOTOR INBOARD	FAN/BLWR INBOARD	FAN/BLWR OUTBOARD
HORIZONTAL				
VERTICAL				
AXIAL				

REMARKS

See TE #023. JTC 10/2/97

Performed by : _____ Date / /

Verified by : _____ Date / /

Any supporting Pitot Traverse Data sheets and/or vibration spectrum printouts are to be appended to this data sheet.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION
Revision 1 A HNF-SD-W030-POTP-002
ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROCED

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ATTACHMENT 3

*Data Transfer From
REV. 0B 7/8/97
4/18/99*

1 INITIAL CONDITIONS

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer 7/8/97 Date 10/22/96

- 1.2 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/8/97
Breaker #4	21kw Primary Vent. Heater Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/8/97
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/8/97
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	7/8/97
Circuit #4	TB-LCU2-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	MTS	7/8/97
Breaker #6	Primary Vent Fan AZ-K1-5-1B Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/8/97
Breaker #4	21kw Primary Vent. Heater Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/8/97
Breaker #7	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/8/97

Test Engineer 7/8/97 Date 10/22/96

ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROC.

- 1.3 **VERIFY** the damper line-up as left after testing completed in Attachment 2.

Data Transfer From Rev. 0B
7094 4/8/99

- Test Engineer 7094 Date 10/22/96
1.4 **OPEN** damper MK-AZK1-1A at MCS graphic 17PriExh.v by selecting handswitch HS-AZK1-1AA **MANUAL** command and handswitch HS-AZK1-1A **OPEN** command.

Test Engineer 7094 Date 10/22/96

- 1.5 **OPEN** damper MK-AZK1-2A at MCS graphic 17PriExh.v by selecting handswitch HS-AZK1-2AA **MANUAL** command and handswitch HS-AZK1-2A **OPEN** command.

Test Engineer 7094 Date 10/22/96

- 1.6 **SELECT** handswitch HS-AZK1-1BA **AUTO** command for damper MK-AZK1-1B at MCS graphic 17PriExh.v.

Test Engineer 7094 Date 10/22/96

- 1.7 **SELECT** handswitch HS-AZK1-2BA **AUTO** command for damper MK-AZK1-2B at MCS graphic 17PriExh.v.

Test Engineer 7094 Date 10/22/96

- 1.8 **SELECT** handswitch HS-AZK12-1BA **AUTO** command for heater AZ-K1-2-1B at MCS graphic 17PriExh.v.

Test Engineer 7094 Date 10/22/96

- 1.9 **SELECT** HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

Test Engineer 7094 Date 10/22/96

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATIC
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ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROC

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- Data Transferred from Rev. 0A 7/8/97*
- 1.10 VERIFY/PLACE damper MK-AZK15-1A1 in the OPEN position.

Test Engineer 7/8/97 Date 10/22/96

- 1.11 VERIFY/PLACE damper MK-AZK15-1A2 in the OPEN position.

Test Engineer 7/8/97 Date 10/22/96

- 1.12 VERIFY/PLACE damper MK-AZK1-3A in the OPEN position.

Test Engineer 7/8/97 Date 10/22/96

- 1.13 VERIFY/PLACE damper MK-AZK1-3B in the OPEN position.

Test Engineer 7/8/97 Date 10/22/96

- 1.14 PLACE the HAND/OFF/AUTO handswitch at the VSD local control cabinet for exhaust fan AZ-K1-5-1A in AUTO position.

Test Engineer 7/8/97 Date 10/22/96

- 1.15 PLACE the LOCAL/REMOTE handswitch at the VSD local control cabinet in for exhaust fan AZ-K1-5-1A in REMOTE.

Test Engineer 7/8/97 Date 10/22/96

- 1.16 At the MCS for exhaust fan AZ-K1-5-1A SELECT handswitch HS-AZK105-1AA MANUAL command.

Test Engineer 7/8/97 Date 10/22/96

ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROCEDURE

2 PROCEDURE

Data Transferred From Rev. 0B ZAH
4/8/99

2.1 Heater AZ-K1-2-1A Control from Electrical Enclosure Assembly on ACT

2.1.1 **VERIFY/PLACE** the heater main disconnect switch on Electrical Enclosure Assembly (EEA) in the **ON** position.Test Engineer ZAH Date 10/23/962.1.2 **VERIFY/PLACE** handswitch on the EEA in the **HAND** position.Test Engineer ZAH Date 10/23/962.1.3 **VERIFY** that heater AZ-K1-2-1A does **NOT ENERGIZE**.Test Engineer ZAH Date 10/23/962.1.4 **START** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **START** command, setting speed control to 100%.2.1.5 **VERIFY** that heater AZ-K1-2-1A **ENERGIZES**.Test Engineer ZAH Date 10/23/962.1.6 **PLACE** HAND/OFF/AUTO handswitch on Heater AZ-K1-2-1A EEA in the **OFF** position.2.1.7 **VERIFY** that heater AZ-K1-2-1A is **DE-ENERGIZED**.Test Engineer ZAH Date 10/23/962.1.8 **PLACE** handswitch on the EEA in the **HAND** position.Test Engineer ZAH Date 10/23/96

Data Transgen from Rev. 0B 7/8/96

2.1.9 **VERIFY** that heater AZ-K1-2-1A is **ENERGIZED**.

Test Engineer 7/8/96 Date 10/23/96

2.1.10 **RECORD** the temperatures indicated at the following instruments after system temperatures have stabilized:

- TI-AZK12-1A 59 °F
- TI-AZK12-3A 91 °F

Test Engineer 7/8/96 Date 10/23/96

2.1.11 **SELECT** L at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1A.

2.1.12 At MCS graphic 17PriExh.v **DECREASE** setpoint at TDIC-AZK12-1A to 15 °F.

2.1.13 **VERIFY** that temperature indicated at TI-AZK12-3A remains **STABLE**.

Test Engineer 7/8/96 Date 10/23/96

2.1.14 **RETURN** setpoint at TDIC-AZK102-1A to 25 °F.

2.1.15 At TIC-AZK102-1A **INPUT** a setpoint of 15 °F.

2.1.16 **VERIFY** that temperature indicated at TIC-AZK102-1A and TI-AZK12-3A **DECREASES**.

Test Engineer 7/8/96 Date 10/23/96

2.1.17 At TIC-AZK102-1A **INPUT** a setpoint to acheive a differential temperature of 25 °F.

2.1.18 **VERIFY** that temperature indicated at TIC-AZK102-1A and TI-AZK12-3A **INCREASES** and **RECORD** the temperatures:

- 2.1.18.1 TIC-AZK102-1A 59 °F
- 2.1.18.2 TI-AZK12-3A 89 °F

Test Engineer 7/8/96 Date 10/23/96

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ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROC.*Data Transfer From Rev. 03 2044
4/8/99*

2.1.19 **SIMULATE** an increasing temperature at TT-AZK102-3A until TAH-AZK12-3A annunciates.

2.1.20 **RECORD** temperature at TI-AZK12-3A and **VERIFY** the following actions DO NOT occur:

2.1.20.1 Damper MK-AZKI-2A **CLOSED**.

2.1.20.2 Heater AZ-K1-2-1A **DE-ENERGIZES**.

2.1.20.3 Heater AZ-K1-2-1B **ENERGIZES**.

2.1.20.4 Dampers MK-AZKI-1B/2B **OPEN**.

TI-AZK102-3A 226 °F (>220 °F expected)

Test Engineer 2044 Date 10/27/96

2.1.21 **ACKNOWLEDGE** TAH-AZK12-3A at the MCS.

2.1.22 **INCREASE** simulation at TT-AZK102-3A until TAHH-AZK12-3A annunciates.

TI-AZK102-3A 233 °F (>230 °F expected)

Test Engineer 2044 Date 10/23/96

2.1.23 **ACKNOWLEDGE** TAHH-AZK12-3A at the MCS.

2.1.24 **INCREASE** simulation at TT-AZK102-3A until TAHHH-AZK12-3A annunciates.

2.1.25 **RECORD** temperature at TI-AZK12-3A and **VERIFY** the following DO NOT occur:

2.1.25.1 Damper MK-AZKI-1A **CLOSED**.

TI-AZK102-3A 247 °F (>245 °F expected)

Test Engineer 2044 Date 10/27/96

2.1.26 **ACKNOWLEDGE** TAHHH-AZK12-3A at the MCS.

2.1.27 **REMOVE** simulation from TT-AZK102-3A.

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ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROCEDURE*Data Transfer From Rev. 0B
20W 4/8/97*

2.1.28 **SIMULATE** an increasing temperature at TT-AZK102-1A until TAH-AZK12-1A annunciates.

2.1.29 **RECORD** temperature at TI-AZK12-1A and **VERIFY** the following:

2.1.29.1 Heater AZ-K1-2-1A stays **ENERGIZED**.

TI-AZK12-1A 175 °F (>175°F expected)

TE-026 *etc*

Test Engineer

78W

Date 10/23/96

2.1.30 **REMOVE** simulation from TT-AZK102-1A.

2.2 Heater AZ-K1-2-1A Control from MCS

NOTE: Graphic 17PriExh.v is used for all MCS actions required in the following steps.

2.2.1 **PLACE** handswitch on Heater AZ-K1-2-1A EEA in the **OFF** position.

2.2.2 **SELECT** HS-AZK12-1AA **MANUAL** command for heater AZ-K1-2-1A at the MCS.

2.2.3 **SELECT** HS-AZK12-1A **ON** command for heater AZ-K1-2-1A at the MCS.

2.2.4 **VERIFY** that heater AZ-K1-2-1A does **NOT ENERGIZE**.

Test Engineer

78W

Date 10/23/96

2.2.5 **SELECT** HS-AZK12-1A **OFF** command for heater AZ-K1-2-1A at the MCS.

2.2.6 **START** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK15-1A **START** command, at a speed setting of 50%.

2.2.7 **SELECT** HS-AZK12-1A **ON** command for heater AZ-K1-2-1A at the MCS.

ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROC

*Data Transfer From Rev. 0B 709H
4/8/96*

2.2.8 **VERIFY** that heater AZ-K1-2-1A does **NOT ENERGIZE**.

Test Engineer _____

709H Date 10/27/96

2.2.9 **SELECT** HS-AZK12-1A **OFF** command for heater AZ-K1-2-1A at the MCS.

2.2.10 **PLACE** handswitch on Heater AZ-K1-2-1A EEA in the **AUTO** position.

2.2.11 **SELECT** R at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1A.

2.2.12 **PLACE** handswitch on Heater AZ-K1-2-1B EEA in the **AUTO** position.

2.2.13 **SELECT** R at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1B.

2.2.14 **SELECT** HS-AZK12-1A **ON** command for heater AZ-K1-2-1A at the MCS.

2.2.15 **VERIFY** the following:

2.2.15.1 Heater AZ-K1-2-1A is **ON**.

Test Engineer _____

709H Date 10/27/96

2.2.16 **RECORD** the temperatures indicated at the following instruments after system temperatures have stabilized:

- TI-AZK12-1A 58 °F
- TI-AZK12-3A 83 °F

Test Engineer _____

709H Date 10/27/96

2.2.17 **DECREASE** setpoint at TDIC-AZK12-1A to 15 °F at the MCS.

2.2.18 **VERIFY** that temperature indicated at TI-AZK12-3A **DECREASES**.

Test Engineer _____

709H Date 10/27/96

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*Na Ta Transfer From Rev. 0B 704
4/8/94*

2.2.19 **INCREASE** setpoint at TDIC-AZK12-1A to 25 °F at the MCS.

2.2.20 **VERIFY** that temperature indicated at TI-AZK12-3A **INCREASES**.

Test Engineer

704 Date *10/27/96*

2.2.21 **SIMULATE** an increasing temperature at TT-AZK102-3A until TAH-AZK12-3A annunciates at the MCS..

2.2.22 **RECORD** temperature at TI-AZK12-3A and **VERIFY** the following:

2.2.22.1 Heater AZ-K1-2-1A **DE-ENERGIZES**.

2.2.22.2 Damper MK-AZKI-2A **CLOSED**.

2.2.22.3 Heater AZ-K1-2-1B **ENERGIZES**.

2.2.22.4 Dampers MK-AZKI-1B/2B **OPEN**.

TI-AZK12-3A 226 °F (>220°F expected)

Test Engineer

704 Date *10/27/96*

2.2.23 **ACKNOWLEDGE** TAH-AZK12-3A alarm at the MCS.

2.2.24 **INCREASE** simulation at TT-AZK102-3A until TAHH-AZK12-3A annunciates.

TI-AZK102-3A 234 °F (>230 °F expected)

Test Engineer

704 Date *10/27/96*

2.2.25 **ACKNOWLEDGE** TAHH-AZK12-3A at the MCS.

2.2.26 **INCREASE** simulation at TT-AZK102-3A until TAHHH-AZK12-3A annunciates.

2.2.27 **RECORD** temperature at TI-AZK12-3A and **VERIFY** the following:

2.2.27.1 Damper MK-AZKI-1A **CLOSED**.

TI-AZK102-3A 247 °F (>245 °F expected)

Test Engineer

704 Date *10/27/96*

Revision 1A

HNF-SD-W030-POTP-002

ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROCED*Data Transferred from Rev. 0B 7/8/97*
*4/8/97*2.2.28 **ACKNOWLEDGE** TAAHHH-AZK12-3A at the MCS.2.2.29 **REMOVE** simulation from TT-AZK102-3A.2.2.30 **SELECT** handswitch HS-AZK12-1BA **AUTO** command for heater AZ-K1-2-1B ^{on} ~~off~~ *10/2/96*
MCS.2.2.31 **SELECT** handswitch HS-AZK1-1AA **AUTO** command for damper MK-AZK1-1A at
MCS graphic 17PriExh.v.2.2.32 **SELECT** handswitch HS-AZK1-2AA **AUTO** command for damper MK-AZK1-2A at
MCS graphic 17PriExh.v.2.2.33 **SELECT** HS-AZK12-1A **ON** command for heater AZ-K1-2-1A at the MCS.2.2.34 **VERIFY** the following:2.2.34.1 Dampers MK-AZK1-1A/2A **OPEN**.2.2.34.2 Heater AZ-K1-2-1A is **ON**.2.2.34.3 Heater AZ-K1-2-1B is **OFF**.Test Engineer *7044* Date *10/27/96*2.2.35 **CLOSE** damper MK-AZK1-1A at the MCS by selecting handswitch HS-AZK1-1AA
MANUAL command and selecting handswitch HS-AZK1-1A **CLOSE** command.2.2.36 **VERIFY** the following:2.2.36.1 Heater AZ-K1-2-1A is **DE-ENERGIZED**.2.2.36.2 Dampers MK-AZK1-1B/2B **OPEN**.2.2.36.3 Heater AZ-K1-2-1B is **ENERGIZED**.Test Engineer *D.G.* Date *11/6/96*2.2.37 **OPEN** damper MK-AZK1-1A at the MCS by selecting handswitch HS-AZK1-1A
OPEN command.2.2.38 **RESET** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command2.2.39 **ENERGIZE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **ON** command.

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- 2.2.40 **DE-ENERGIZE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command
- 2.2.41 **SELECT** handswitch HS-AZK12-1BA **AUTO** command for heater AZ-K1-2-1B on MCS.
- 2.2.42 **CLOSE** damper MK-AZK1-2A at the MCS by selecting handswitch HS-AZK1-2AA **MANUAL** command and selecting handswitch HS-AZK1-2A **CLOSE** command.
- 2.2.43 **VERIFY** the following:
- 2.2.43.1 Heater AZ-K1-2-1A is **DE-ENERGIZED**.
 - 2.2.43.2 Dampers MK-AZK1-1B/2B **OPEN**.
 - 2.2.43.3 Heater AZ-K1-2-1B is **ENERGIZED**.
- Test Engineer D.G. Date 11/6/96
- 2.2.44 **OPEN** damper MK-AZK1-2A at the MCS by selecting handswitch HS-AZK1-2A **OPEN** command.
- 2.2.45 **RESET** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command
- 2.2.46 **ENERGIZE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **ON** command.
- 2.2.47 **DE-ENERGIZE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command
- 2.2.48 **SELECT** HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.49 **SELECT** handswitch HS-AZK12-1BA **MANUAL** command for heater AZ-K1-2-1B at MCS graphic 17PriExh.v.
- 2.2.50 **STOP** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **STOP** command.
- 2.2.51 **VERIFY** that heater AZ-K1-2-1A is **DE-ENERGIZED**.

Test Engineer D.F. Date 11/6/96

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DOH

2.2.52 **VERIFY** the following control switch alignment:

2.2.52.1 Dampers MK-AZK1-1A/2A selected to **AUTO**.

2.2.52.2 Heater AZ-K1-2-1A selected to **MANUAL**.

2.2.52.3 Exhaust fan AZ-K1-5-1A selected to **MANUAL**.

Test Engineer D.G. Date 11/6/96

2.2.53 **PERFORM** the following substeps in a 60 second time frame:

2.2.53.1 **ENABLE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **ON** command.

2.2.53.2 **VERIFY** damper MK-AZK1-2A starts to **OPEN**.

2.2.53.3 **START** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **START** command.

Test Engineer D.G. Date 11/6/96

2.2.54 **VERIFY** the following:

2.2.54.1 Exhaust fan AZ-K1-5-1A **STARTS**.

2.2.54.2 Damper MK-AZK1-2A fully **OPENS**.

2.2.54.3 Heater AZ-K1-2-1A **ENERGIZES**.

Test Engineer D.G. Date 11/6/96

2.2.55 **STOP** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command.

2.2.56 **STOP** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **STOP** command.

2.2.57 **ENABLE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **ON** command.

2.2.58 **VERIFY** Heater AZ-K1-2-1A goes to a fault condition after approximately 60 seconds.

Test Engineer D.G. Date 11/6/96

2.2.59 **RESET** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command

2.2.60 **SELECT** HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

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2.2.61 **SELECT** handswitch HS-AZK12-1BA **AUTO** command for heater AZ-K1-2-1B at MCS graphic 17PriExh.v.

2.2.62 **ENABLE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **ON** command.

2.2.63 **START** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **START** command

2.2.64 **VERIFY** the following:

2.2.64.1 Exhaust fan AZ-K1-5-1A **STARTS**.

2.2.64.2 Damper MK-AZK1-2A fully **OPENS**.

2.2.64.3 Heater AZ-K1-2-1A **ENERGIZES**.

Test Engineer _____

D.F. Date 11/6/96

2.2.65 **SIMULATE** an increasing temperature at TT-AZK102-3A until TAH-AZK12-3A annunciates at the MCS..

2.2.66 **VERIFY** the following:

2.2.66.1 Heater AZ-K1-2-1A **DE-ENERGIZES**.

2.2.66.2 Damper MK-AZK1-2A **CLOSED**.

2.2.66.3 Heater AZ-K1-2-1B **ENERGIZES**.

2.2.66.4 Dampers MK-AZK1-1B/2B **OPEN**.

Test Engineer _____

D.F. Date 11/6/96

2.2.67 **ACKNOWLEDGE** TAH-AZK12-3A alarm at the MCS.

2.2.68 **SIMULATE** a decreasing temperature at TT-AZK102-3A until TAH-AZK12-3A clears at the MCS.

2.2.69 **VERIFY** that heater AZ-K1-2-1A **DOES NOT** energize.

Test Engineer _____

D.F. Date 11/6/96

ATTACHMENT 3 - ACT TRAIN A DUCT HEATER TEST PROCEDURE

2.2.70 **SELECT** HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.71 **STOP** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command.

2.2.72 **STOP** exhaust fan AZ-K1-5-1A at the MCS using HS-AZK105-1A **STOP** command.

2.2.73 **RESET** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command.

2.2.74 **REMOVE** simulation from TT-AZK102-3A.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION
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ATTACHMENT 4 - ACT TRAIN A PRESSURE DIFFERENTIAL M
PROCEDURE

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ATTACHMENT 4

1 INITIAL CONDITIONS

- 1.1 VERIFY installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer D.S. Date 4/5/97

- 1.2 VERIFY damper line-up as ^{LEFT} ~~leave~~ after testing completed in Attachment 2.

Test Engineer D.S. Date 4/5/97

- 1.3 VERIFY/PERFORM the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	D.S.	Py
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	D.S.	Py
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	D.S.	Py

Test Engineer D.S. Date 4/5/97

- 1.4 OPEN damper MK-AZK1-1A at the MCS by selecting handswitch HS-AZK1-1AA MANUAL command and handswitch HS-AZK1-1A OPEN command.

Test Engineer D.S. Date 4/5/97

- 1.5 OPEN damper MK-AZK1-2A at the MCS by selecting handswitch HS-AZK1-2AA MANUAL command and handswitch HS-AZK1-2A OPEN command.

Test Engineer D.S. Date 4/5/97

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**ATTACHMENT 4 - ACT TRAIN A PRESSURE DIFFERENTIAL MONITORING TEST
PROCEDURE**

- 1.6 **VERIFY/PLACE** damper MK-AZK105-1A1 in the **OPEN** position.

Test Engineer D.J. Date 4/2/92

- 1.7 **VERIFY/PLACE** damper MK-AZK105-1A2 in the **OPEN** position.

Test Engineer D.J. Date 4/2/92

- 1.8 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet for exhaust fan AZ-K1-5-1A in **AUTO** position.

Test Engineer D.J. Date 4/2/92

- 1.9 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in for exhaust fan AZ-K1-5-1A in **REMOTE**.

Test Engineer D.J. Date 4/2/92

- 1.10 At the MCS for exhaust fan AZ-K1-5-1A **SELECT** handswitch HS-AZK105-1AA **MANUAL** command.

Test Engineer D.J. Date 4/2/92

2 PROCEDURE

- 2.1 **START** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **START** command.

- 2.2 **WAIT** 10 minutes for system to stabilize.

- 2.3 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-1A.

- 2.4 **RECORD** pressure differential reading at PDI-AZK104-1A and **VERIFY** that PDAH-AZK104-1A annunciates at the MCS.

PDI-AZK104-1A 6.6 Ins. w.c.

Test Engineer D.J. Date 4/2/92

- 2.5 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-1A.

ATTACHMENT 4 - ACT TRAIN A PRESSURE DIFFERENTIAL MONITORING TEST
PROCEDURE

2.6 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK110-1A.

2.7 **RECORD** pressure differential reading at PDI-AZK110-1A and **VERIFY** that PDAH-AZK110-1A annunciates at the MCS.

PDI-AZK110-1A 5.5 Ins. w.c.

Test Engineer D.H. Date 4/2/97

2.8 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK110-1A.

2.9 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-2A.

2.10 **RECORD** pressure differential reading at PDI-AZK104-2A and **VERIFY** that PDAH-AZK104-2A annunciates at the MCS.

PDI-AZK104-2A 5.3 Ins. w.c.

Test Engineer D.H. Date 4/2/97

2.11 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-2A.

2.12 At the MCS for exhaust fan AZ-K1-5-1A **SELECT** handswitch HS-AZK105-1AA **MANUAL** command.

Test Engineer D.H. Date 4/2/97

2.13 **STOP** exhaust fan AZ-K1-5-1A at the MCS using HS -AZK105-1A **STOP** command.

ATTACHMENT 5

*Data Transferred From
Revision 0*

1 INITIAL CONDITIONS

- 1.1 VERIFY damper line-up as left after testing completed in Attachment 2.

Test Engineer

ZAH

Date

9/6/96

- 1.2 VERIFY/PERFORM the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent Fan AZ-K1-5-1B Breaker in Standby Panelboard No.2.	CLOSED	<i>MTS</i>	<i>ZAH</i>
Breaker #7	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	<i>MTS</i>	<i>ZAH</i>
Circuit #4	TB-LCU2-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	<i>MTS</i>	<i>ZAH</i>

Test Engineer

ZAH

Date

9/6/96

- 1.3 VERIFY installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer

ZAH

Date

9/6/96

- 1.4 All personnel who will be involved with this procedure have provided the required signature verification information in Attachment 15.

Test Engineer

ZAH

Date

9/6/96

2 PROCEDURE

*Act Transfer From
Rev. 9.8.96 @ ZAH 3/31/97*

2.1 ACT A Isolation Damper Interlock Test - MK-AZK1-1B.

2.1.1 **VERIFY/SIMULATE** a temperature $<230^{\circ}\text{F}$ at TE-AZK102-3B.Test Engineer ZAH Date 9/6/962.1.2 **SELECT** handswitch HS-AZK1-1BA **AUTO** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.3 **SELECT** handswitch HS-AZK1-1B **OPEN** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.4 **VERIFY** that damper MK-AZK1-1B stays **CLOSED**.Test Engineer ZAH Date 9/6/962.1.5 **SELECT** handswitch HS-AZK1-1BA **MANUAL** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.6 **SELECT** handswitch HS-AZK1-1B **OPEN** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.7 **VERIFY** that damper MK-AZK1-1B **OPENS**.Test Engineer ZAH Date 9/6/962.1.8 **SIMULATE** a temperature $>230^{\circ}\text{F}$ at TE-AZK102-3B.2.1.9 **VERIFY** that damper MK-AZK1-1B **CLOSES**.Test Engineer ZAH Date 9/6/962.1.10 **REMOVE** temperature simulation at TE-AZK102-3B.2.1.11 **OPEN** damper MK-AZK1-1B by selecting HS-AZK1-1B **OPEN** command on MCS graphic 17PriExh.v.2.1.12 **SELECT** handswitch HS-AZK1-1BA **AUTO** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.

Revision 1 HNF-SD-W030-POTP-002ATTACHMENT 5 - ACT TRAIN B ISOLATION DAMPER TEST PROCEDUREData Transferred from
Revised by 0 JAH 3/31/972.1.13 **VERIFY** that damper MK-AZK1-1B **CLOSES**.Test Engineer JAH Date 9/6/962.1.14 **SELECT** handswitch HS-AZK1-12-1BA **MANUAL** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.2.1.15 **SELECT** handswitch HS-AZK1-12-1B **ON** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.2.1.16 **VERIFY** that damper MK-AZK1-1B **OPENS**.Test Engineer JAH Date 9/6/962.1.17 **SELECT** handswitch HS-AZK1-1B **CLOSE** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.18 **VERIFY** that damper MK-AZK1-1B stays **OPEN**.Test Engineer JAH Date 9/6/962.1.19 **SELECT** handswitch HS-AZK1-1BA **MANUAL** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.20 **SELECT** handswitch HS-AZK1-1B **CLOSE** command for damper MK-AZK1-1B on MCS graphic 17PriExh.v.2.1.21 **VERIFY** that damper MK-AZK1-1B **CLOSES**.Test Engineer JAH Date 9/6/962.1.22 **SELECT** handswitch HS-AZK1-12-1B **OFF** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.2.2 **ACT A Isolation Damper Interlock Test - MK-AZK1-2B.**2.2.1 **VERIFY/SIMULATE** a temperature $<230^{\circ}\text{F}$ at TE-AZK102-3B.Test Engineer JAH Date 9/6/96

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

Revision 1 HNFSDW030POTP002

ATTACHMENT 5 - ACT TRAIN B ISOLATION DAMPER TEST PROCEDURE

Data Transfer From Revision 0 JAH
7/31/97

2.2.2 **VERIFY/SIMULATE** a pressure differential $<5"$ w.c. at PDT-AZK104-1B.

Test Engineer JAH Date 9/6/96

2.2.3 **VERIFY/SIMULATE** a pressure differential $<3"$ w.c. at PDT-AZK110-1B.

Test Engineer JAH Date 9/6/96

2.2.4 **VERIFY/SIMULATE** a pressure differential $<5"$ w.c. at PDT-AZK104-2B.

Test Engineer JAH Date 9/6/96

2.2.5 **VERIFY** that a normal condition exists at RIAS-AZK1-1.

Test Engineer JAH Date 9/6/96

2.2.6 **SELECT** handswitch HS-AZK1-2BA **AUTO** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.7 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.8 **VERIFY** that damper MK-AZK1-2B stays **CLOSED**.

Test Engineer JAH Date 9/6/96

2.2.9 **SELECT** handswitch HS-AZK1-2BA **MANUAL** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.
2 JAH 9/6/96

2.2.10 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.11 **VERIFY** that damper MK-AZK1-2B **OPENS**.

Test Engineer JAH Date 9/6/96

2.2.12 **SIMULATE** a temperature $>230^{\circ}\text{F}$ at TE-AZK102-3B.

2.2.13 **VERIFY** that damper MK-AZK1-2B **CLOSES**.

Test Engineer JAH Date 9/6/96

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATIC

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ATTACHMENT 5 - ACT TRAIN B ISOLATION DAMPER TEST PROCEDURE

Data Transfer From Revision 0 7/31/97

2.2.14 **SIMULATE** a temperature $<230^{\circ}\text{F}$ at TE-AZK102-3B.

2.2.15 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.16 **VERIFY** that damper MK-AZK1-2B **OPENS**.

Test Engineer *ZAH* Date *9/6/96*

2.2.17 **SIMULATE** a differential pressure $>5"$ w.c. at PDT-AZK104-1B.

2.2.18 **VERIFY** that damper MK-AZK1-2B **CLOSES**.

Test Engineer *ZAH* Date *9/6/96*

2.2.19 **SIMULATE** a differential pressure $<5"$ w.c. at PDT-AZK104-1B.

2.2.20 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.21 **VERIFY** that damper MK-AZK1-2B **OPENS**.

Test Engineer *ZAH* Date *9/6/96*

2.2.22 **SIMULATE** a differential pressure $>3"$ w.c. at PDT-AZK110-1B.

2.2.23 **VERIFY** that damper MK-AZK1-2BB **CLOSES**.

Test Engineer *ZAH* Date *9/17/96*

2.2.24 **SIMULATE** a differential pressure $<3"$ w.c. at PDT-AZK110-1B.

2.2.25 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.

2.2.26 **VERIFY** that damper MK-AZK1-2B **OPENS**.

Test Engineer *ZAH* Date *9/17/96*

2.2.27 **SIMULATE** a differential pressure $>5"$ w.c. at PDT-AZK104-2B.

ATTACHMENT 5 - ACT TRAIN B ISOLATION DAMPER TEST PROCEDURE*Data Transfer From Revision 0 7/8/96 3/3/97*2.2.28 **VERIFY** that damper MK-AZK1-2B **CLOSES**.Test Engineer 7/8/96 Date 9/6/962.2.29 **SIMULATE** a differential pressure <5" w.c. at PDT-AZK104-2B.2.2.30 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.31 **VERIFY** that damper MK-AZK1-2B **OPENS**.Test Engineer 7/8/96 Date 9/6/962.2.32 **SIMULATE** a high radiation condition at RAIS-AZK1-1.2.2.33 **VERIFY** that damper MK-AZK1-2B **CLOSES**.Test Engineer 7/8/96 Date 9/6/962.2.34 **RETURN** RAIS-AZK1-1 to a **NORMAL** condition.2.2.35 **SELECT** handswitch HS-AZK1-2B **OPEN** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.36 **VERIFY** that damper MK-AZK1-2B **OPENS**.Test Engineer 7/8/96 Date 9/6/962.2.37 **SELECT** handswitch HS-AZK1-2BA **AUTO** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.38 **VERIFY** that damper MK-AZK1-2B **CLOSES**.Test Engineer 7/8/96 Date 9/6/962.2.39 **SELECT** handswitch HS-AZK1-12-1BA **MANUAL** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.2.2.40 **SELECT** handswitch HS-AZK1-12-1B **ON** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.

Revision 1 HNF-SD-W030-POTP-002ATTACHMENT 5 - ACT TRAIN B ISOLATION DAMPER TEST PROCEDURE*Data Transfer From Revision 0 7/31/97*2.2.41 **VERIFY** that damper MK-AZK1-2B **OPENS**.Test Engineer ZAH Date 9/6/962.2.42 **SELECT** handswitch HS-AZK1-2B **CLOSE** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.43 **VERIFY** that damper MK-AZK1-2B stays **OPEN**.Test Engineer ZAH Date 9/6/962.2.44 **SELECT** handswitch HS-AZK1-2BA **MANUAL** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.45 **SELECT** handswitch HS-AZK1-2B **CLOSE** command for damper MK-AZK1-2B on MCS graphic 17PriExh.v.2.2.46 **VERIFY** that damper MK-AZK1-2B **CLOSES**.Test Engineer ZAH Date 9/6/962.2.47 **SELECT** handswitch HS-AZK1-12-1B **OFF** command for heater AZ-K1-2-1B on MCS graphic 17PriExh.v.2.2.48 **REMOVE** simulation from TE-AZK102-3B.Test Engineer ZAH Date 9/6/962.2.49 **REMOVE** simulation from PDT-AZK104-1B.Test Engineer ZAH Date 9/6/962.2.50 **REMOVE** simulation from PDT-AZK110-1B.Test Engineer ZAH Date 9/6/962.2.51 **REMOVE** simulation from PDT-AZK104-2B.Test Engineer ZAH Date 9/6/96

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ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDUREATTACHMENT 6 Data Transferred
From Rev. 0 8/8/94
4/8/97

1 INITIAL CONDITIONS

- 1.1 OPEN damper MK-AZK1-1B by placing handswitch HS-AZK1-1BA in **MANUAL** position and handswitch HS-AZK1-1B in **OPEN** position at MCS graphic 17PriExh.v.

Test Engineer 7/1/96 Date 9/18/96

- 1.2 OPEN damper MK-AZK1-2B by placing handswitch HS-AZK1-2BA in **MANUAL** position and handswitch HS-AZK1-2B in **OPEN** position at MCS graphic 17PriExh.v.

Test Engineer 7/1/96 Date 9/18/96

- 1.3 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	D.J.
Circuit #4	TB-LCU2-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	MTS	D.J.
Breaker #6	Primary Vent Fan AZ-K1-5-1B Breaker in Standby Panelboard No.2.	CLOSED	MTS	D.J.
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	D.J.
Fan Motor Disconnect	Primary Vent Fan AZ-K1-5-1A, "A" Train Filter Room.	CLOSED	MTS	D.J.
Fan Motor Disconnect	Primary Vent Fan AZ-K1-5-1B, "B" Train Filter Room.	CLOSED	MTS	D.J.

Test Engineer D.G. Date 9/18/96

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

- 1.4 **VERIFY** the damper line-up as left after testing completed in Attachment 2. *Da Ta Trans Sea From Rev. 0. 7/8/96 4/8/96*
Test Engineer 7/8/96 Date 9/18/96
- 1.5 **VERIFY** installation of system filters, temporary plenum boxes, and flex hoses in accordance with Attachment 19.
Test Engineer 7/8/96 Date 9/18/96
- 1.6 **INSTALL** test jumper with switch in the output of PT-AZK1-1A in termination panel TB-LCU1-2S, TB01 - 157.
- 1.7 **INSTALL** test jumper with switch in the output of PT-AZK1-1B in termination panel TB-LCU2-2S, TB01 - 157.

2 PROCEDURE

- 2.1 **Fan AZ-K1-5-1B Control from Variable Speed Drive Cabinet.**
- 2.1.1 **OPEN** damper MK-AZK105-1B1 and **VERIFY** correct indication for the damper at the MCS.
Test Engineer 7/8/96 Date 9/18/96
- 2.1.2 **OPEN** damper MK-AZK105-1B2 and **VERIFY** correct indication for the damper at the MCS.
Test Engineer 7/8/96 Date 9/18/96
- 2.1.3 **SELECT** HS-AZK105-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.1.4 **PLACE** Manual Speed Pot at the Variable Speed Drive 2 (VSD2) local control cabinet at the **50%** position
- 2.1.5 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD2 local control cabinet in **REMOTE**.
- 2.1.6 **PRESS RESET** button at the VSD2 local control cabinet.
- 2.1.7 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **HAND** position.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

2.1.8 *Data Transferred From Rev. 0 7/18/97*
VERIFY that fan AZ-K1-5-1B does **NOT START**.

Test Engineer 7/18/96 Date 9/18/96

2.1.9 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **OFF** position.

2.1.10 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD2 local control cabinet in **LOCAL** position.

2.1.11 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **HAND** position. **VERIFY** exhaust fan AZ-K1-5-1B **STARTS**.

Test Engineer 7/18/96 Date 9/18/96

2.1.12 **VERIFY** that after fan AZ-K1-5-1B comes up to speed, $50 \pm 2\%$ is indicated on the % Speed Meter at the VSD2 local control cabinet. **VERIFY** temporary field conditions are acceptable, i.e. internal pressure of plenum boxes (observe MCS graphic 15PriIn.v), plenum boxes, flex hoses/connections intact.

Test Engineer 7/18/96 Date 9/18/96

2.1.13 **VERIFY** that after fan AZ-K1-5-1B comes up to speed, $50 \pm 2\%$ is indicated on the % Speed Meter at the VSD2 local control cabinet.

Test Engineer 7/18/96 Date 9/18/96

2.1.14 Slowly **INCREASE** manual speed pot setting at the VSD2 local control cabinet to **100%** and **VERIFY** that 100% is indicated. Again, **MONITOR/VERIFY** acceptable field conditions as speed is increased.

2.1.15 **VERIFY** that exhaust fan AZ-K1-5-1B speed increases to $100 \pm 2\%$ indicated on the % Speed Meter at the VSD2 local control cabinet.

Test Engineer 7/18/96 Date 9/18/96

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

2.1.16 After a stabilization period of 15 minutes *Data Transfer From Rev. 0 7/24/96* **RECORD** the following data at MCS graphic 15PriIn.v, 16PriCoo.v, 17PriExh.v.:

for exhaust fan AZ-K1-5-1B;

Motor Current	<u>10.6</u>	Amps. (II-AZK105-1B)
Motor Voltage	<u>528</u>	Volts. (M. & T. E.)
Train A Header Press.	<u>-13.3</u>	Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-13.1</u>	Ins w.c. (PIC-AZK1-1B)
Total Airflow	<u>940</u>	cfm (FI-AZK1-3)

for condensor AZ-K1-8-1

Pressure Differential 4.54 Ins w.c. (PDI-AZK18-1)

for HEME AZ-K1-9-1

Pressure Differential 5.22 Ins w.c. (PDI-AZK19-1)

for tank pressures and flows

Tank	Pressure, ins. wc	Flow in, scfm	Flow out, scfm
AY101	PIC-AY1K1-1 <u>-1.8</u>	FI-AY1K1-1 <u>216</u>	FIC-AY1K1-2 <u>260</u>
	PI-AY1K1-2 <u>-1.8</u>		
AY102	PIC-AY2K1-1 <u>-1.7</u>	FI-AY2K1-1 <u>210</u>	FIC-AY1K1-2 <u>256</u>
	PI-AY2K1-2 <u>-1.7</u>		
AZ101	PIC-AZ1K1-1 <u>-1.9</u>	FI-AZ1K1-1 <u>200</u>	FIC-AZ1K1-2 <u>225</u>
	PI-AZ1K1-2 <u>-1.9</u>		
AZ102	PIC-AZ2K1-1 <u>-2.1</u>	FI-AZ2K1-1 <u>210</u>	FIC-AZ1K1-2 <u>245</u>
	PI-AZ2K1-2 <u>-2.1</u>		

Test Engineer 7/24/96 Date 9/18/96

2.1.17 Allow exhaust fan AZ-K1-5-1B to operate for sufficient length of time needed to obtain vibration data. **RECORD** on Exhibit A data sheets.

2.1.18 **SELECT** HS-AZK105-1B **STOP** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.1.19 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer 7/24/96 Date 10/21/96

ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

2.1.20 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

2.1.21 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D.J. Date 4/8/97

2.1.22 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.1.23 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D.J. Date 4/8/97

2.1.24 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.1.25 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D.J. Date 4/8/97

2.1.26 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer D.J. Date 4/8/97

2.1.27 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D.J. Date 4/8/97

2.1.28 **REMOVE** simulation from FIT-AZK1-3.

Test Engineer D.J. Date 4/8/97

2.1.29 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **OFF** position.

2.1.30 **VERIFY** that exhaust fan AZ-K1-5-1B **STOPS**.

*Data Transferred From
Rev. 0 4/8/97*

Test Engineer ZAN Date 10/21/96

2.2 Fan AZ-K1-5-1B Control from MCS

- 2.2.1 PLACE the **HAND/OFF/AUTO** handswitch at the VSD2 local control cabinet in **AUTO** position.
- 2.2.2 PLACE the **LOCAL/REMOTE** handswitch at the VSD2 local control cabinet in **REMOTE**.
- 2.2.3 PLACE the **HAND/OFF/AUTO** handswitch at the VSD1 local control cabinet in **AUTO** position.
- 2.2.4 PLACE the **LOCAL/REMOTE** handswitch at the VSD1 local control cabinet in **REMOTE**.
- 2.2.5 SELECT HS-AZK15-1BB **NORMAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.6 SELECT HS-AZK15-1BA **AUTO** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.7 SELECT HS-AZK15-1B **START** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.8 **VERIFY** that fan AZ-K1-5-1B does **NOT START**.

Test Engineer

D.J.

Date

4/8/97

- 2.2.9 SELECT HS-AZK15-1BA **MANUAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.10 SELECT HS-AZK15-1B **START** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.
- 2.2.11 **VERIFY** that fan AZ-K1-5-1B **STARTS**.

Test Engineer

D.J.

Date

4/8/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION SYSTEM

Revision 1 HNF-SD-W030-POTP-002

ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

Data Transfer From Rev. 0 7/8/97

2.2.12 After a stabilization period of 15 minutes **RECORD** the following data for exhaust fan AZ-K1-5-1B:

Motor Current	<u>7.8</u>	Amps. (II-AZK105-1B)
Motor Voltage	<u>493</u>	Volts. (M. & T. E.)
Motor Speed	<u>3620 RPM</u>	% (% Speed Meter)
Train A Header Press.	<u>-13.5</u>	Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-13.5</u>	Ins w.c. (PIC-AZK1-1B)
Total Airflow	<u>975</u>	cfm (FI-AZK1-3)

2.2.13 **SELECT** HS-AZK15-1BB **VERRIDE** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.14 **SELECT** HS-AZK15-1AB **ORMAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.15 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.16 **CONNECT** variable test pressure source to input side of PT-AZK1-1B and input a negative pressure equal to that recorded in step 2.2.11.

2.2.17 **VERIFY** that fan motor speed returns to within $\pm 2\%$ of that recorded in Step 2.2.11.

Test Engineer 7/8/97 Date 10/22/96

2.2.18 **SIMULATE** a more negative pressure at PT-AZK1-1B.

2.2.19 **VERIFY** that fan motor speed decreases.

Test Engineer 7/8/97 Date 10/22/96

2.2.20 **SIMULATE** a less negative pressure at PT-AZK1-1B.

2.2.21 **VERIFY** that fan motor speed increases.

Test Engineer 7/8/97 Date 10/22/96

2.2.22 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION S
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2.2.23 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D. J. Date 9/8/97

2.2.24 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.2.25 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D. J. Date 9/8/97

2.2.26 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.2.27 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D. J. Date 9/8/97

2.2.28 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer D. J. Date 9/8/97

2.2.29 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D. J. Date 9/8/97

2.2.30 **REMOVE** simulation from FT-AZK1-3.

Test Engineer D. J. Date 9/8/97

2.2.31 **SELECT** HS-AZK15-1BB **NORMAL** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.32 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

2.2.33 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D. J. Date 9/8/97

2.2.34 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION S
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ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

2.2.35 **VERIFY** the following:

2.2.35.1 Exhaust fan AZ-K1-5-1B **STOPS**.

2.2.35.2 Exhaust fan AZ-K1-5-1A **STARTS**.

Test Engineer D. J. Date 9/8/97

2.2.36 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer D. J. Date 9/8/97

2.2.37 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D. J. Date 9/8/97

2.2.38 **PRESS RESET** button at the VSD2 local control cabinet.

2.2.39 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.40 **START** exhaust fan AZ -K1-5-1B at the MCS using HS-AZK105-1B **START** command.

2.2.41 **SELECT** HS-AZK15-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.42 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.43 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1A by opening the test jumper switch at termination panel TB-LCU1-2S.

2.2.44 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.
Test Engineer D. J. Date 9/8/97

2.2.45 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.2.46 **VERIFY** the following:

2.2.46.1 Exhaust fan AZ-K1-5-1B **STOPS**.

2.2.46.2 Exhaust fan AZ-K1-5-1A **STARTS**.

Test Engineer D. J. Date 9/8/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION SYSTEM

Revision 1 HNF-SD-W030-POTP-002

ATTACHMENT 6 - ACT TRAIN B EXHAUST FAN TEST PROCEDURE

2.2.47 **REMOVE** simulation from PT-AZK1-1A by closing the test jumper switch at termination panel TB-LCU1-2S.

Test Engineer J. J. Date 4/8/97

2.2.48 **REMOVE** simulation from FT-AZK1-3.

Test Engineer D. J. Date 4/8/97

2.2.49 **PRESS RESET** button at the VSD1 local control cabinet.

2.2.50 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.51 **SELECT** HS-AZK15-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.52 **START** exhaust fan AZ-K1-5-1B at the MCS using HS-AZK105-1B **START** command.

2.2.53 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.54 **SIMULATE** a pressure of less than -5" w.c. at PT-AZK1-1B by opening the test jumper switch at termination panel TB-LCU2-2S.

2.2.55 **VERIFY** that exhaust fan AZ-K1-5-1B does **NOT STOP**.

Test Engineer D. J. Date 4/8/97

2.2.56 **SIMULATE** an air flow <200 cfm at FIT-AZK1-3.

2.2.57 **VERIFY** the following:

2.2.57.1 Exhaust fan AZ-K1-5-1B **STOPS**.

2.2.57.2 Exhaust fan AZ-K1-5-1A **STARTS**.

Test Engineer D. J. Date 4/8/97

2.2.58 **REMOVE** simulation from PT-AZK1-1B by closing the test jumper switch at termination panel TB-LCU2-2S.

Test Engineer D. J. Date 4/8/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION S
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2.2.59 **REMOVE** simulation from FT-AZK1-3 .

Test Engineer D.J. Date 4/8/97

2.2.60 **PRESS RESET** button at the VSD2 local control cabinet.

2.2.61 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.62 **SELECT** HS-AZK15-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.63 **START** exhaust fan AZ -K1-5-1B at the MCS using HS-AZK105-1B **START** command.

2.2.64 **SELECT** HS-AZK105-1B **STOP** command for exhaust fan AZ-K1-5-1B on MCS graphic 17PriExh.v.

2.2.65 **VERIFY** that exhaust fan AZ-K1-5-1B **STOPS**.

Test Engineer D.J. Date 4/8/97

2.2.66 **REMOVE** test jumpers installed in termination panels TB-LCU1-2S and TB-LCU2-2S.

PREOPERATIONAL TESTING, RECIRCULATION VENTILATION
Revision 1
HNF-SD-W030-POTP-002
ATTACHMENT 6 - EXHIBIT A

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Primary Tank Ventilation System Data Sheets.

System: Primary Tank Vent. - Train B.	Fan No.: AZ-K1-5-1B	Fan Type: Centrifugal
Drive Type: Belt.	Service: Primary Tank Ventilation	

VIBRATION DATA (mil)

1ST READING	MOTOR OUTBOARD	MOTOR INBOARD	FAN/BLWR INBOARD	FAN/BLWR OUTBOARD
HORIZONTAL				
VERTICAL				
AXIAL				

2ND READING	MOTOR OUTBOARD	MOTOR INBOARD	FAN/BLWR INBOARD	FAN/BLWR OUTBOARD
HORIZONTAL				
VERTICAL				
AXIAL				

REMARKS :

SEE TE # 023. JTC 10/2/97

Performed by : _____ Date / /

Verified by : _____ Date / /

Any supporting Pitot Traverse Data sheets and/or vibration spectrum printouts are to be appended to this data sheet.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION
Revision 1A HNF-SD-W030-POTP-002
ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE

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ATTACHMENT 7

Data Transfer From Rev. 0 B
7/24/96 4/2/99

1 INITIAL CONDITIONS

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer 7/24/96 Date 11/7/96

- 1.2 **VERIFY** damper line-up as left after testing completed in Attachment 2

Test Engineer 7/24/96 Date 11/7/96

- 1.3 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan AZ-K1-5-1A Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/24/96
Breaker #4	21kw Primary Vent. Heater Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/24/96
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	7/24/96
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	7/24/96
Circuit #4	TB-LCU2-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	MTS	7/24/96
Breaker #6	Primary Vent Fan AZ-K1-5-1B Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/24/96
Breaker #4	21kw Primary Vent. Heater Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/24/96
Breaker #7	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	7/24/96

Test Engineer 7/24/96 Date 11/7/96

ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE*Data Transfer From Rev. 0B 7/8/97*

- 1.4 **OPEN** damper MK-AZK1-1B at MCS graphic 17PriExh.v by selecting handswitch HS-AZK1-1BA **MANUAL** command and handswitch HS-AZK1-1B **OPEN** command.

Test Engineer 7096 Date 11/7/96

- 1.5 **OPEN** damper MK-AZK1-2B at MCS graphic 17PriExh.v by selecting handswitch HS-AZK1-2BA **MANUAL** command and handswitch HS-AZK1-2B **OPEN** command.

Test Engineer 7096 Date 11/7/96

- 1.6 **SELECT** handswitch HS-AZK1-1AA **AUTO** command for damper MK-AZK1-1A at MCS graphic 17PriExh.v.

Test Engineer 7096 Date 11/7/96

- 1.7 **SELECT** handswitch HS-AZK1-2AA **AUTO** command for damper MK-AZK1-2A at MCS graphic 17PriExh.v.

Test Engineer 7096 Date 11/7/96

- 1.8 **SELECT** handswitch HS-AZK12-1BA **AUTO** command for heater AZ-K1-2-1B at MCS graphic 17PriExh.v. *7096 4/86*

Test Engineer 7096 Date 11/7/96

- 1.9 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

Test Engineer 7096 Date 11/7/96

- 1.10 **VERIFY/PLACE** damper MK-AZK15-1B1 in the **OPEN** position.

Test Engineer 7096 Date 11/7/96

ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE*Data Transfer From Rev. 0 B 7/8/94
4/8/97*

- 1.11
- VERIFY/PLACE**
- damper MK-AZK15-1B2 in the
- OPEN**
- position.

Test Engineer 7/8/94 Date 11/7/96

- 1.12
- VERIFY/PLACE**
- damper MK-AZK1-3A in the
- OPEN**
- position.

Test Engineer 7/8/94 Date 11/7/96

- 1.13
- VERIFY/PLACE**
- damper MK-AZK1-3B in the
- OPEN**
- position.

Test Engineer 7/8/94 Date 11/7/96

- 1.14
- PLACE**
- the
- HAND/OFF/AUTO**
- handswitch at the VSD local control cabinet for exhaust fan AZ-K1-5-1B in
- AUTO**
- position.

Test Engineer 7/8/94 Date 11/7/96

- 1.15
- PLACE**
- the
- LOCAL/REMOTE**
- handswitch at the VSD local control cabinet in for exhaust fan AZ-K1-5-1B in
- REMOTE**
- .

Test Engineer 7/8/94 Date 11/7/96

- 1.16 At the MCS for exhaust fan AZ-K1-5-1B
- SELECT**
- handswitch HS-AZK105-1BA
- MANUAL**
- command.

Test Engineer 7/8/94 Date 11/7/96**2 PROCEDURE**

- 2.1
- Heater AZ-K1-2-1B Control from Electrical Enclosure Assembly on ACT**

- 2.1.1
- VERIFY/PLACE**
- the heater main disconnect switch on Electrical Enclosure Assembly (EEA) in the
- ON**
- position.

Test Engineer 7/8/94 Date 11-7-96

Revision 1A

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ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE*Data Transferred from Rev. 0B 7-5-96 9/8/97*2.1.2 **VERIFY/PLACE** handswitch on the EEA in the **HAND** position.Test Engineer 7-5-96 Date 11-7-962.1.3 **VERIFY** that heater AZ-K1-2-1B does **NOT ENERGIZE**.Test Engineer 7-5-96 Date 11-7-962.1.4 **START** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **START** command.2.1.5 **VERIFY** that heater AZ-K1-2-1B **ENERGIZES**.Test Engineer 7-5-96 Date 11-7-962.1.6 **PLACE** HAND/OFF/AUTO handswitch on Heater AZ-K1-2-1B EEA in the **OFF** position.2.1.7 **VERIFY** that heater AZ-K1-2-1B is **DE-ENERGIZED**.Test Engineer 7-5-96 Date 11-7-962.1.8 **PLACE** handswitch on the EEA in the **HAND** position.Test Engineer 7-5-96 Date 11-7-962.1.9 **VERIFY** that heater AZ-K1-2-1B is **ENERGIZED**.Test Engineer 7-5-96 Date 11-7-96

ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE*Data Transfer From Rev. 0B 7/24/97*

- 2.1.10 **RECORD** the temperatures indicated at the following instruments after system temperatures have stabilized:

- TI-AZK12-1B 57 °F
- TI-AZK12-3B 78 °F

Test Engineer 7/24/97 Date 11/7/96

- 2.1.11 **SELECT L** at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1B.

- 2.1.12 At MCS graphic 17PriExh.v **DECREASE** setpoint at TDIC-AZK12-1B to 15 °F.

- 2.1.13 **VERIFY** that temperature indicated at TI-AZK12-3B remains **STABLE**.

Test Engineer 7/24/97 Date 11-7-96

- 2.1.14 **RETURN** setpoint at TDIC-AZK102-1B to 25 °F.

- 2.1.15 At TIC-AZK102-1B **INPUT** a setpoint of 15 °F.

- 2.1.16 **VERIFY** that temperature indicated at TIC-AZK102-1B and TI-AZK12-3B **DECREASES**.

Test Engineer 7/24/97 Date 11-7-96

- 2.1.17 At TIC-AZK102-1B **INPUT** a setpoint to achieve a differential temperature of 25 °F.

- 2.1.18 **VERIFY** that temperature indicated at TIC-AZK102-1A, TI-AZK12-2A and TI-AZK12-3A **INCREASES** and **RECORD** the temperatures:

- 2.1.18.1 TIC-AZK102-1B 57 °F
- 2.1.18.2 TI-AZK12-3B 81 °F

Test Engineer 7/24/97 Date 11-7-96

Data Transfer from Rev. 06 7/24/97

2.1.19 **SIMULATE** an increasing temperature at TT-AZK102-3B until TAH-AZK12-3B annunciates at the MCS.

2.1.20 **RECORD** temperature at TI-AZK12-3B and **VERIFY** the following actions DO NOT occur:

2.1.20.1 Damper MK-AZK1-2B **CLOSED**.

2.1.20.2 Heater AZ-K1-2-1B **DE-ENERGIZES**.

2.1.20.3 Heater AZ-K1-2-1A **ENERGIZES**.

2.1.20.4 Dampers MK-AZK1-1A/2A **OPEN**.

TI-AZK102-3B 220 °F(>220°F expected)

TE-026 *AC*

Test Engineer

7/24/97

Date 11-7-96

2.1.21 **ACKNOWLEDGE** TAH-AZK12-3B at the MCS.

2.1.22 **INCREASE** simulation at TT-AZK102-3B until TAHH-AZK12-3B annunciates and **RECORD** the temperature.

TI-AZK102-3B 230 °F(>230°F expected)

TE-026 *AC*

Test Engineer

7/24/97

Date 11-7-96

2.1.23 **ACKNOWLEDGE** TAHH-AZK12-3B at the MCS.

2.1.24 **INCREASE** simulation at TT-AZK102-3B until TAHHH-AZK12-3B annunciates.

2.1.25 **RECORD** temperature at TI-AZK12-3B and **VERIFY** the following DO NOT occur:

2.1.25.1 Dampers MK-AZK1-1B **CLOSED**.

TI-AZK102-3B 246 °F(>245°F expected)

Test Engineer

7/24/97

Date 11-7-96

2.1.26 **ACKNOWLEDGE** TAHHH-AZK12-3B at the MCS.

2.1.27 **REMOVE** simulation from TT-AZK102-3B.

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ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE*Data Transferred From Rev. 0B 7/24/97*

2.1.28 **SIMULATE** an increasing temperature at TT-AZK102-1B until TAH-AZK12-1B annunciates at the MCS.

2.1.29 **RECORD** temperature at TI-AZK12-1B and **VERIFY** the following:

2.1.29.1 Heater AZ-K1-2-1B stays **ENERGIZED**.

TI-AZK12-1B 189 °F(>175°F expected)

Test Engineer ZAH Date 11-7-96

2.1.30 **REMOVE** simulation from TT-AZK102-1B.

2.2 *BZAH 11/7/96*
Heater AZ-K1-2-1A Control from MCS

NOTE: Graphic 17PriExh.v is used for all MCS actions required in the following steps.

2.2.1 **PLACE** handswitch on Heater AZ-K1-2-1B EEA in the **OFF** position.

2.2.2 **SELECT** HS-AZK12-1BA **MANUAL** command for heater AZ-K1-2-1B at the MCS.

2.2.3 **SELECT** HS-AZK12-1B **ON** command for heater AZ-K1-2-1B at the MCS.

2.2.4 **VERIFY** that heater AZ-K1-2-1B does **NOT ENERGIZE**.

Test Engineer D.G. Date 11-7-96

2.2.5 **SELECT** HS-AZK12-1B **OFF** command for heater AZ-K1-2-1B at the MCS.

2.2.6 **START** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK15-1B **START** command, at a speed setting of 50%.

2.2.7 **SELECT** HS-AZK12-1B **ON** command for heater AZ-K1-2-1B at the MCS.

2.2.8 **VERIFY** that heater AZ-K1-2-1B does **NOT ENERGIZE**.

Test Engineer D.G. Date 11-7-96

Data Transfer From Rev. 0 B 2/14/97

- 2.2.9 **SELECT** HS-AZK12-1B **OFF** command for heater AZ-K1-2-1B at the MCS.
- 2.2.10 **PLACE** handswitch on Heater AZ-K1-2-1A EEA in the **AUTO** position.
- 2.2.11 **SELECT** R at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1A
- 2.2.12 **PLACE** handswitch on Heater AZ-K1-2-1B EEA in the **AUTO** position.
- 2.2.13 **SELECT** R at the **Local-Remote (L-r)** prompt on the **System** menu at TIC-AZK102-1B
- 2.2.14 **SELECT** HS-AZK12-1B **ON** command for heater AZ-K1-2-1B at the MCS.
- 2.2.15 **VERIFY** the following:

2.2.15.1 Heater AZ-K1-2-1B is **ON**.Test Engineer D. G. Date 11-7-96

- 2.2.16 **RECORD** the temperatures indicated at the following instruments after system temperatures have stabilized:

- TI-AZK12-1B 57 °F
- TI-AZK12-3B 82 °F

Test Engineer D. G. Date 11-7-96

- 2.2.17 **DECREASE** setpoint at TDIC-AZK12-1B to 15 °F at the MCS.
- 2.2.18 **VERIFY** that temperature indicated at TI-AZK12-3B **DECREASES**.

Test Engineer D. G. Date 11-7-96

- 2.2.19 **INCREASE** setpoint at TDIC-AZK12-1B to 25 °F at the MCS.
- 2.2.20 **VERIFY** that temperature indicated at TI-AZK12-3B **INCREASES**.

Test Engineer D. G. Date 11-7-96

PREOPERATIONAL TESTING; PRIMARY TANK VENTILATION S
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2.2.21 **SIMULATE** an increasing temperature at TT-AZK102-3B until TAH-AZK12-3B annunciates at the MCS.

2.2.22 **RECORD** temperature at TI-AZK12-3B and **VERIFY** the following:

- 2.2.22.1 Heater AZ-K1-2-1B **DE-ENERGIZES**.
- 2.2.22.2 Damper MK-AZKI-2B **CLOSED**.
- 2.2.22.3 Heater AZ-K1-2-1A **ENERGIZES**.
- 2.2.22.4 Dampers MK-AZKI-1A/2A **OPEN**.

TI-AZK12-3B 220 °F(>220°F expected)

TE-026 *RC*

Test Engineer

D. G.

Date 11-7-96

2.2.23 **ACKNOWLEDGE** TAH-AZK12-3B at the MCS.

2.2.24 **INCREASE** simulation at TT-AZK102-3B until TAHH-AZK12-3B annunciates and **RECORD** the temperature.

TI-AZK12-3B 230 °F(>230°F expected)

TE-026 *RC*

Test Engineer

D. G.

Date 11-7-96

2.2.25 **ACKNOWLEDGE** TAHH-AZK12-3B at the MCS.

2.2.26 **INCREASE** simulation at TT-AZK102-3B until TAHHH-AZK12-3B annunciates.

2.2.27 **RECORD** temperature at TI-AZK12-3B and **VERIFY** the following:

- 2.2.27.1 Damper MK-AZKI-1B **CLOSED**.

TI-AZK12-3B 245 °F(>245°F expected)

Test Engineer

D. G.

Date 11-7-96

2.2.28 **ACKNOWLEDGE** TAHHH-AZK12-3B at the MCS.

2.2.29 **REMOVE** simulation from TT-AZK102-3B.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCED

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- 2.2.30 **SELECT** handswitch HS-AZK12-1AA **AUTO** command for heater AZ-K1-2-1A on MCS.
- 2.2.31 **SELECT** handswitch HS-AZK1-1BA **AUTO** command for damper MK-AZK1-1B at MCS.
- 2.2.32 **SELECT** handswitch HS-AZK1-2BA **AUTO** command for damper MK-AZK1-2B at MCS.
- 2.2.33 **SELECT** HS-AZK12-1B **ON** command for heater AZ-K1-2-1B at the MCS.
- 2.2.34 **VERIFY** the following:
- 2.2.34.1 Dampers MK-AZK1-1B/2B **OPEN**.
 - 2.2.34.2 Heater AZ-K1-2-1B is **ON**.
 - 2.2.34.3 Heater AZ-K1-2-1A is **OFF**.

Test Engineer D. G. Date 11-7-96

- 2.2.35 **CLOSE** damper MK-AZK1-1B at the MCS by selecting handswitch HS-AZK1-1B **CLOSE** command.

- 2.2.36 **VERIFY** the following:

- 2.2.36.1 Heater AZ-K1-2-1B is **DE-ENERGIZED**.
- 2.2.36.2 Dampers MK-AZK1-1A/2A **OPEN**.
- 2.2.36.3 Heater AZ-K1-2-1A is **ENERGIZED**.

Test Engineer D. G. Date 11-7-96

- 2.2.37 **OPEN** damper MK-AZK1-1B at the MCS by selecting handswitch HS-AZK1-1B **OPEN** command.
- 2.2.38 **RESET** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command.
- 2.2.39 **ENERGIZE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **ON** command.
- 2.2.40 **DE-ENERGIZE** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command.

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ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDU

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2.2.41 **SELECT** handswitch HS-AZK12-1AA **AUTO** command for heater AZ-K1-2-1A on MCS.

2.2.42 **CLOSE** damper MK-AZK1-2B at the MCS by selecting handswitch HS-AZK1-2B **CLOSE** command.

2.2.43 **VERIFY** the following:

2.2.43.1 Heater AZ-K1-2-1B is **DE-ENERGIZED**.

2.2.43.2 Dampers MK-AZK1-1A/2A **OPEN**.

2.2.43.3 Heater AZ-K1-2-1A is **ENERGIZED**.

Test Engineer D.G. Date 11-7-96

2.2.44 **OPEN** damper MK-AZK1-2B at the MCS by selecting handswitch HS-AZK1-2B **OPEN** command.

2.2.45 **RESET** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command.

2.2.46 **ENERGIZE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **ON** command.

2.2.47 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.48 **STOP** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **STOP** command.

2.2.49 **VERIFY** that heater AZ-K1-2-1B is **DE-ENERGIZED**.

Test Engineer D.G. Date 11-7-96

2.2.50 **VERIFY** the following control switch alignment:

2.2.50.1 Dampers MK-AZK1-1B/2B selected to **AUTO**.

2.2.50.2 Heater AZ-K1-2-1B selected to **MANUAL**.

2.2.50.3 Exhaust fan AZ-K1-5-1B selected to **MANUAL**.

Test Engineer D.G. Date 11-7-96

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ATTACHMENT 7 - ACT TRAIN B DUCT HEATER TEST PROCEDURE

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2.2.51 PERFORM the following substeps in a 60 second time frame:

- 2.2.51.1 **ENABLE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **ON** command.
- 2.2.51.2 **VERIFY** damper MK-AZK1-2B starts to **OPEN**.
- 2.2.51.3 **START** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **START** command.

Test Engineer D.G. Date 11-7-96

2.2.52 **VERIFY** the following:

- 2.2.52.1 Exhaust fan AZ-K1-5-1B **STARTS**.
- 2.2.52.2 Damper MK-AZK1-2B fully **OPENS**.
- 2.2.52.3 Heater AZ-K1-2-1B **ENERGIZES**.

Test Engineer D.G. Date 11-7-96

2.2.53 **STOP** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command.

2.2.54 **STOP** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **STOP** command.

2.2.55 **ENABLE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **ON** command.

2.2.56 **VERIFY** Heater AZ-K1-2-1B goes to a fault condition after approximately 60 seconds.

Test Engineer D.G. Date 11-7-96

2.2.57 **RESET** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command

2.2.58 **SELECT** HS-AZK15-1AA **AUTO** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

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2.2.59 **SELECT** handswitch HS-AZK12-1AA **AUTO** command for heater AZ-K1-2-1A at MCS graphic 17PriExh.v.

2.2.60 **ENABLE** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **ON** command.

2.2.61 **START** exhaust fan AZ-K1-5-1B at the MCS using HS-AZK105-1B **START** command

2.2.62 **VERIFY** the following:

2.2.62.1 Exhaust fan AZ-K1-5-1B **STARTS**.

2.2.62.2 Damper MK-AZK1-2B fully **OPENS**.

2.2.62.3 Heater AZ-K1-2-1B **ENERGIZES**.

Test Engineer D.G. Date 11-7-96

2.2.63 **SIMULATE** an increasing temperature at TT-AZK102-3B until TAH-AZK12-3B annunciates at the MCS..

2.2.64 **VERIFY** the following:

2.2.64.1 Heater AZ-K1-2-1B **DE-ENERGIZES**.

2.2.64.2 Damper MK-AZK1-2B **CLOSED**.

2.2.64.3 Heater AZ-K1-2-1A **ENERGIZES**.

2.2.64.4 Dampers MK-AZK1-1A/2A **OPEN**.

Test Engineer D.G. Date 11-7-96

2.2.65 **ACKNOWLEDGE** TAH-AZK12-3B alarm at the MCS.

2.2.66 **SIMULATE** a decreasing temperature at TT-AZK102-3B until TAH-AZK12-3B clears at the MCS.

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2.2.67 VERIFY that heater AZ-K1-2-1B DOES NOT energize.

Test Engineer D.G. Date 11/7/96

2.2.68 **SELECT** HS-AZK15-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.2.69 **STOP** heater AZ-K1-2-1A at the MCS using HS-AZK102-1A **OFF** command.

2.2.70 **STOP** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **STOP** command.

2.2.71 **RESET** heater AZ-K1-2-1B at the MCS using HS-AZK102-1B **OFF** command

2.2.72 REMOVE simulation from TT-AZK102-3B.

Test Engineer D.G. Date 11-7-96

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ATTACHMENT 8 - ACT TRAIN B FILTER PRESSURE DIFFERENTIAL MONITORING TEST PROCEDURE

ATTACHMENT 8

1 INITIAL CONDITIONS

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses are in accordance with Attachment 19.

Test Engineer D.L. Date 9/7/97

- 1.2 **VERIFY** damper line-up as left after testing completed in Attachment 2.

Test Engineer D.L. Date 9/7/97

- 1.3 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent Fan AZ-K1-5-1A Breaker in Standby Panelboard No.2.	CLOSED	D.L.	Prng
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.2.	CLOSED	D.L.	Prng
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-14 (for dampers MK-AZK1-1B/2B)	CLOSED	D.L.	Prng

Test Engineer D.L. Date 9/7/97

- 1.4 **OPEN** damper MK-AZK1-1B at the MCS by selecting handswitch HS-AZK1-1BA **MANUAL** command and handswitch HS-AZK1-1B **OPEN** command.

Test Engineer D.L. Date 9/7/97

- 1.5 **OPEN** damper MK-AZK1-2B at the MCS by selecting handswitch HS-AZK1-2BA **MANUAL** command and handswitch HS-AZK1-2B **OPEN** command.

Test Engineer D.L. Date 9/7/97

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**ATTACHMENT 8 - ACT TRAIN B PRESSURE DIFFERENTIAL MONITORING TEST
PROCEDURE**

- 1.6 **VERIFY/PLACE** damper MK-AZK105-1B1 in the **OPEN** position.

Test Engineer D.J. Date 4/7/97

- 1.7 **VERIFY/PLACE** damper MK-AZK105-1B2 in the **OPEN** position.

Test Engineer D.J. Date 4/7/97

- 1.8 **PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet for exhaust fan AZ-K1-5-1B in **AUTO** position.

Test Engineer D.J. Date 4/7/97

- 1.9 **PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in for exhaust fan AZ-K1-5-1B in **REMOTE**.

Test Engineer D.J. Date 4/7/97

- 1.10 At the MCS for exhaust fan AZ-K1-5-1B **SELECT** handswitch HS-AZK105-1BA **MANUAL** command.

Test Engineer D.J. Date 4/7/97

2 PROCEDURE

- 2.1 **START** exhaust fan AZ-K1-5-1B at the MCS using HS -AZK105-1B **START** command.

- 2.2 **WAIT** 10 minutes for system to stabilize.

- 2.3 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-1B.

- 2.4 **RECORD** pressure differential reading at PDI-AZK104-1B and **VERIFY** that PDAH-AZK104-1B annunciates at the MCS.

PDI-AZK104-1B 6.6 Ins. w.c.

Test Engineer D.J. Date 4/7/97

- 2.5 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-1B.

- 2.6 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK110-1B.

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**ATTACHMENT 8 - ACT TRAIN B PRESSURE DIFFERENTIAL MONITORING TEST
PROCEDURE**

- 2.7 **RECORD** pressure differential reading at PDI-AZK110-1B and **VERIFY** that PDAH-AZK110-1B annunciates at the MCS.

PDI-AZK110-1B 5.5 Ins. w.c.

Test Engineer D.J. Date 4/2/97

- 2.8 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK110-1B.

- 2.9 **DISCONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-2B.

- 2.10 **RECORD** pressure differential reading at PDI-AZK104-2B and **VERIFY** that PDAH-AZK104-2B annunciates at the MCS.

PDI-AZK104-2B 6.6 Ins. w.c.

Test Engineer D.J. Date 4/2/97

- 2.11 **RECONNECT** 1/4" tubing at the **HIGH PRESSURE** port of PDT-AZK104-2B.

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ATTACHMENT 9 -AY101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

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DATA TRANSFERRED FROM REV 0 D.J.
ATTACHMENT 9

3/31/97

1 INITIAL CONDITIONS

NOTE: Any tests required by this section need not be repeated if previously completed and documented.

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer D.J. Date 11/11/98

- 1.2 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	D.J.
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	D.J.
Breaker #2A	AY101 Recirc. Vent. Building Breaker in Distribution Panelboard PP-1.	CLOSED	MTS	D.J.
100A Main Disconnect	AY101 Recirc. Vent. Building Main Disconnect.	CLOSED	MTS	D.J.

ATTACHMENT 9 -AY101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

- 1.3 **VERIFY/PERFORM** valve line-up as left after testing completed in Attachment 2, except as follows:

Data Transferred From Revision 0 7/31/97

Damper	Location	Position
MK-AY101K1-2A1	401-AY Recirc Module	OPEN
MK-AY101K1-2A2	401-AY Recirc Module	OPEN
MK-AY101K1-2A3	401-AY Recirc Module	CLOSED

Test Engineer ZARL Date 11/11/96

- 1.4 **POSITION** Recirc. Vent System dampers in Bypass Mode configuration as indicated in the following table:

Damper	Location	Position
MK-AY101K4-1	401-AY Recirc Module	OPEN
MK-AY101K4-2	401-AY Recirc Module	CLOSED
MK-AY101K4-3	401-AY Recirc Module	OPEN
MK-AY101K4-4	401-AY Recirc Module	OPEN

Test Engineer ZARL Date 11/11/96

- 1.5 **SELECT** Bypass mode on MCS graphic 10RecAY1.v.
- 1.6 **OPEN** damper MK-AZK1-1A by placing handswitch HS-AZK1-1AA in **MANUAL** position and handswitch HS-AZK1-1A in **OPEN** position on MCS graphic 17PriExh.v.
- Test Engineer ZARL Date 11/11/96
- 1.7 **OPEN** damper MK-AZK1-2A by placing handswitch HS-AZK1-2AA in **MANUAL** position and handswitch HS-AZK1-2A in **OPEN** position on MCS graphic 17PriExh.v.
- Test Engineer ZARL Date 11/11/96
- 1.8 On MCS graphic 15PriIn.v, **SELECT** valves MK-AY101K1-1 and MKAY101K1-2 IN **AUTO** mode.

*Data Transfer From Revision 0
ZAH 7/31/97*

2 PROCEDURE

2.1 Tank Pressure Control Valve MK-AY101K1-1 Test

- 2.1.1 **STATION** a field observer at the AY101 plenum box to advise the test engineer of field conditions during test.
- 2.1.2 **CONNECT** Variable Test Pressure Source (VTPS) to PIT-AY101K1-1 and simulate a tank pressure of - 2.5 to - 3.0 "w.c.
- Test Engineer ZAH Date 11/11/96
- 2.1.3 **VERIFY/PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in **REMOTE**.
- Test Engineer ZAH Date 11/11/96
- 2.1.4 **PRESS RESET** button at the VSD local control cabinet.
- 2.1.5 **VERIFY/PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet in **AUTO** position.
- Test Engineer ZAH Date 11/11/96
- 2.1.6 **VERIFY/PLACE** dampers MK-AZK105-1A1/1A2 in the **OPEN** position.
- Test Engineer ZAH Date 11/11/96
- 2.1.7 **SELECT** HS-AZK105-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.
- 2.1.8 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

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ATTACHMENT 9 -AY101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

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2.1.9 After a stabilization period of 15 minutes **RECORD** the following data:

2.1.9.1 for exhaust fan AZ-K1-5-1A:

Motor Current	<u>22</u>	<u>% Load D.G.</u>	Amps. (II-AZK105-1A)
Motor Speed	<u>2674</u>	<u>% Load D.G.</u>	% (% Speed Meter) RPM AC
Train A Header Press.	<u>-11.1</u>		Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-10.7</u>		Ins w.c. (PIC-AZK1-1B)
Airflow	<u>670</u>		cfm (FIC-AY101K1-2)

2.1.9.2 for inlet filter train:

Inlet Air Temperature	<u>42.8</u>	°F (TIC-AY101K102-1)
Pre-filter Diff. Press.	<u>0.02</u>	Ins w.c. (PIC-AY101K103-1)
HEPA Filter Diff. Press.	<u>0.2</u>	Ins w.c. (PIC-AY101K104-1)
Airflow	<u>77</u>	cfm (FI-AY101K1-1)
Simulated Tank Press.	<u>-2.5</u>	Ins. w.c. (PIC-AY101K1-1)

2.1.10 **SIMULATE** a tank pressure more negative than setpoint at PIC-AY101K1-1.

2.1.11 **VERIFY** that valve MK-AY101K1-1 modulates toward the **OPEN** position.

Test Engineer ZAH Date 11/12/96

2.1.12 **SIMULATE** a tank pressure more positive than setpoint at PIC-AY101K1-1.

2.1.13 **VERIFY** that valve MK-AY101K1-1 modulates toward the **CLOSED** position.

Test Engineer ZAH Date 11/12/96

2.1.14 **RETURN** tank pressure simulation to PIC-AY101K1-1 setpoint value.

2.2 Heater AY101-K1-2-1 Control Test

2.2.1 **SIMULATE** a temperature <40 °F at TIC-AY101K102-1.

2.2.2 **VERIFY** that heater AY101-K1-2-1 **ENERGIZES**.

Test Engineer D.H. Date 11/13/96

2.2.3 **SIMULATE** a temperature >40 °F at TIC-AY101K102-1.

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ATTACHMENT 9 -AY101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 D.H.
2.2.4 **VERIFY** that heater AY101-K1-2-1 **DE-ENERGIZES**. *3/31/97*

Test Engineer *D.H.* Date *11/13/96*

2.3 Filter Differential Pressure Monitoring Test

2.3.1 **DISCONNECT** 1/4" tubing from high side connection to PDI-AY101K103-1.

2.3.2 **VERIFY** that PDAH-AY101K1-1 annunciates on MCS graphic 15PriIn.v.

Test Engineer *ZAH* Date *11/12/96*

2.3.3 **ACKNOWLEDGE** PDAH-AY101K1-1 on MCS graphic 15PriIn.v.

2.3.4 **RE-CONNECT** 1/4" tubing at high side connection to PDI-AY101K103-1.

2.3.5 **VERIFY** that PDAH-AY101K1-1 clears on MCS graphic 15PriIn.v.

Test Engineer *ZAH* Date *ZAH 11/12/96*

2.4 Flow Control Valve MK-AY101K1-2 Test

2.4.1 **CONNECT** Variable Test Pressure Source (VTPS) to FT-AY101K1-2 and simulate a flow of less than setpoint (<400 cfm).

Test Engineer *ZAH* Date *11/12/96*

2.4.2 **VERIFY** that control valve MK-AY101K1-2 modulates toward the **OPEN** position.

Test Engineer *ZAH* Date *11/12/96*

2.4.3 **INCREASE** simulated flow at FT-AY101K1-2 to above setpoint (~500 cfm).

2.4.4 **VERIFY** that control valve MK-AY101K1-2 modulates toward the **CLOSED** position.

Test Engineer *ZAH* Date *11/12/96*

2.4.5 **REMOVE** simulation from FT-AY101K1-2.

Test Engineer *ZAH* Date *11/12/96*

ATTACHMENT 10

1 INITIAL CONDITIONS

NOTE: Any tests required by this section need not be repeated if previously completed and documented.

- 1.1 **VERIFY** installation of system filtes, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer D.J. Date 11/8/96

- 1.2 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.J.
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	D.J.
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	D.J.
Breaker #2B	AY102 Recirc. Vent. Building Breaker in Distribution Panelboard PP-1.	CLOSED	MTS	D.J.
100A Main Disconnect	AY102 Recirc. Vent. Buiding Main Disconnect.	CLOSED	MTS	D.J.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATIONHNF-SD-W030-TD-002,
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- 1.3 **VERIFY/PERFORM** valve line-up as left after testing completed in Attachment 2, except as follows:

Damper	Location	Position
MK-AY102K1-2A1	402 AY Recirc Module	OPEN
MK-AY102K1-2A2	402 AY Recirc Module	OPEN
MK-AY102K1-2A3	402 AY Recirc Module	CLOSED

Test Engineer D.J. Date 11/8/96

- 1.4 **POSITION** Recirc. Vent System dampers in Bypass Mode configuration as indicated in the following table:

Damper	Location	Position
MK-AY102K4-1	402 AY Recirc Module	OPEN
MK-AY102K4-2	402 AY Recirc Module	CLOSED
MK-AY102K4-3	402 AY Recirc Module	OPEN
MK-AY102K4-4	402 AY Recirc Module	OPEN

Test Engineer D.J. Date 11/8/96

- 1.5 **SELECT** Bypass mode on MCS graphic 10RecAY1.v.
- 1.6 **OPEN** damper MK-AZK1-1A by placing handswitch HS-AZK1-1AA in **MANUAL** position and handswitch HS-AZK1-1A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer D.J. Date 11/8/96

- 1.7 **OPEN** damper MK-AZK1-2A by placing handswitch HS-AZK1-2AA in **MANUAL** position and handswitch HS-AZK1-2A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer D.J. Date 11/8/96

- 1.8 On MCS graphic 15PriIn.v, **SELECT** valves MK-AY102K1-1 and MK-AY102K1-2 IN **AUTO** mode.

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ATTACHMENT 10 -AY102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

2 PROCEDURE

DATA TRANSFERRED FROM REVISION 0 D.J.

2.1 Tank Pressure Control Valve MK-AY102K1-1 Test

3/31/96

2.1.1 **STATION** a field observer at the AY102 plenum box to advise the test engineer of field conditions during test.2.1.2 **CONNECT** Variable Test Pressure Source (VTPS) to PIT-AY102K1-1 and simulate a tank pressure of -2.5 to -3.0 "w.c.Test Engineer D.J. Date 11/8/962.1.3 **VERIFY/PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in **REMOTE**.Test Engineer D.J. Date 11/8/962.1.4 **PRESS RESET** button at the VSD local control cabinet.2.1.5 **VERIFY/PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet in **AUTO** position.Test Engineer D.J. Date 11/8/962.1.6 **VERIFY/PLACE** dampers MK-AZK105-1A1/1A2 in the **OPEN** position.Test Engineer D.J. Date 11/8/962.1.7 **SELECT** HS-AZK105-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.2.1.8 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

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ATTACHMENT 10 -AY102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERED FROM REVISION 0 *D.J.*

2.1.9 After a stabilization period of 15 minutes **RECORD** the following data: *3/31/96*

2.1.9.1 for exhaust fan AZ-K1-5-1A:

Motor Current <i>LOAD</i>	<u>17</u>	% <i>LOAD</i>
Motor Speed	<u>2349</u>	Amps. (II-AZK105-1A)
Train A Header Press.	<u>-8.8</u>	% (% Speed Meter) <i>RPM etc</i>
Train B Header Press.	<u>-8.5</u>	Ins w.c. (PIC-AZK1-1A)
Airflow	<u>430</u>	Ins w.c. (PIC-AZK1-1B)
		cfm (FIC-AY102K1-2)

2.1.9.2 for inlet filter train:

Inlet Air Temperature	<u>51</u>	°F (TIC-AY102K102-1)
Pre-filter Diff. Press.	<u>.02</u>	Ins w.c. (PIC-AY102K103-1)
HEPA Filter Diff. Press.	<u>.3</u>	Ins w.c. (PIC-AY102K104-1)
Airflow	<u>122</u>	cfm (FI-AY102K1-1)
Simulated Tank Press.	<u>.7</u>	Ins. w.c. (PIC-AY102K1-1)

2.1.10 **SIMULATE** a tank pressure more negative than setpoint at PIC-AY102K1-1:

2.1.11 **VERIFY** that valve MK-AY102K1-1 modulates toward the **OPEN** position.

Test Engineer *D.J.* Date *11/8/96*

2.1.12 **SIMULATE** a tank pressure more positive than setpoint at PIC-AY102K1-1.

2.1.13 **VERIFY** that valve MK-AY102K1-1 modulates toward the **CLOSED** position.

Test Engineer *D.J.* Date *11/8/96*

2.1.14 **RETURN** tank pressure simulation to PIC-AY102K1-1 setpoint value.

2.2 Heater AY102-K1-2-1 Control Test

2.2.1 **SIMULATE** a temperature <40 °F at TIC-AY102K102-1.

2.2.2 **VERIFY** that heater AY102-K1-2-1 **ENERGIZES**.

Test Engineer *D.J.* Date *11/8/96*

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ATTACHMENT 10 -AY102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 *D.J.*
2.2.3 **SIMULATE** a temperature $>40^{\circ}\text{F}$ at TIC-AY102K102-1. *3/31/97*

2.2.4 **VERIFY** that heater AY102-K1-2-1 **DE-ENERGIZES**.

Test Engineer *D.J.* Date *11/13/96*

2.3 Filter Differential Pressure Monitoring Test

2.3.1 **DISCONNECT** 1/4" tubing from high side connection to PDI-AY102K103-1.

2.3.2 **VERIFY** that PDAH-AY102K1-1 annunciates on MCS graphic 15PriIn.v.

Test Engineer *D.J.* Date *11/8/96*

2.3.3 **ACKNOWLEDGE** PDAH-AY102K1-1 on MCS graphic 15PriIn.v.

2.3.4 **RE-CONNECT** 1/4" tubing at high side connection to PDI-AY102K103-1.

2.3.5 **VERIFY** that PDAH-AY102K1-1 clears on MCS graphic 15PriIn.v.

Test Engineer *D.J.* Date *11/8/96*

2.4 Flow Control Valve MK-AY102K1-2 Test

2.4.1 **CONNECT** Variable Test Pressure Source (VTPS) to FT-AY102K1-2 and simulate a flow of less than setpoint ($<400\text{ cfm}$).

Test Engineer *D.J.* Date *11/8/96*

2.4.2 **VERIFY** that control valve MK-AY102K1-2 modulates toward the **OPEN** position.

Test Engineer *D.J.* Date *11/8/96*

2.4.3 **INCREASE** simulated flow at FT-AY102K1-2 to above setpoint ($\sim 500\text{ cfm}$).

2.4.4 **VERIFY** that control valve MK-AY102K1-2 modulates toward the **CLOSED** position.

Test Engineer *D.J.* Date *11/8/96*

2.4.5 **REMOVE** simulation from FT-AY102K1-2.

Test Engineer *D.J.* Date *11/8/96*

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 11 - AZ101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 D.S.
ATTACHMENT 11 3/31/97

1 INITIAL CONDITIONS

NOTE: Any tests required by this section need not be repeated if previously completed and documented.

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer D.S. Date 11/13/96

- 1.2 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.S.
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	MTS	D.S.
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	MTS	D.S.
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	MTS	D.S.
Breaker #2A	AZ101 Recirc. Vent. Building Breaker in Distribution Panelboard PP-2.	CLOSED	MTS	D.S.
100A Main Disconnect	AZ101 Recirc. Vent. Building Main Disconnect.	CLOSED	MTS	D.S.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 11 -AZ101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 *D.H.*
3/31/97

- 1.3 **VERIFY/PERFORM** valve line-up as left after testing completed in Attachment 2, except as follows:

Damper	Location	Position
MK-AZ101K1-2A1	401AZ Recirc Module	OPEN
MK-AZ101K1-2A2	401AZ Recirc Module	OPEN
MK-AZ101K1-2A3	401AZ Recirc Module	CLOSED

Test Engineer *D.H.* Date 11/13/96

- 1.4 **POSITION** Recirc. Vent System dampers in Bypass Mode configuration as indicated in the following table:

Damper	Location	Position
MK-AZ101K4-1	401AZ Recirc Module	OPEN
MK-AZ101K4-2	401AZ Recirc Module	CLOSED
MK-AZ101K4-3	401AZ Recirc Module	OPEN
MK-AZ101K4-4	401AZ Recirc Module	OPEN

Test Engineer *D.H.* Date 11/13/96

- 1.5 **SELECT** Bypass mode on MCS graphic 10RecAY1.v.
- 1.6 **OPEN** damper MK-AZK1-1A by placing handswitch HS-AZK1-1AA in **MANUAL** position and handswitch HS-AZK1-1A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer *D.H.* Date 11/13/96

- 1.7 **OPEN** damper MK-AZK1-2A by placing handswitch HS-AZK1-2AA in **MANUAL** position and handswitch HS-AZK1-2A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer *D.H.* Date 11/13/96

- 1.8 On MCS graphic 15PriIn.v, **SELECT** valves MK-AZ101K1-1 and MK-AZ101K1-2 IN AUTO mode.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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Revision 1 HNFSDW030POTP002

ATTACHMENT 11 -AZ101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0

D. J.
3/31/97

2 PROCEDURE

2.1 Tank Pressure Control Valve MK-AZ101K1-1 Test

2.1.1 **STATION** a field observer at the AZ101 plenum box to advise the test engineer of field conditions during test.

2.1.2 **CONNECT** Variable Test Pressure Source (VTPS) to PIT-AZ101K1-1 and simulate a tank pressure of - 2.5 to -3.0 "w.c.

Test Engineer D. J. Date 11/13/96

2.1.3 **VERIFY/PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in **REMOTE**.

Test Engineer D. J. Date 11/13/96

2.1.4 **PRESS RESET** button at the VSD local control cabinet.

2.1.5 **VERIFY/PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet in **AUTO** position.

Test Engineer D. J. Date 11/13/96

2.1.6 **VERIFY/PLACE** dampers MK-AZK105-1A1/1A2 in the **OPEN** position.

Test Engineer D. J. Date 11/13/96

2.1.7 **SELECT** HS-AZK105-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

2.1.8 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 11 - AZ101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 *D.S.*
3/31/97

2.1.9 After a stabilization period of 15 minutes **RECORD** the following data:

2.1.9.1 for exhaust fan AZ-K1-5-1A:

Motor Current	<u>19</u>	<u>% LOAD</u> Amps. (II-AZK105-1A)
Motor Speed	<u>2230</u>	<u>% (% Speed Meter)</u> RPM <i>etc</i>
Train A Header Press.	<u>-2.8</u>	Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-2.5</u>	Ins w.c. (PIC-AZK1-1B)
Airflow	<u>561</u>	cfm (FIC-AZ101K1-2)

2.1.9.2 for inlet filter train:

Inlet Air Temperature	<u>42</u>	°F (TIC-AZ101K102-1)
Pre-filter Diff. Press.	<u>.01</u>	Ins w.c. (PIC-AZ101K103-1)
HEPA Filter Diff. Press.	<u>.35</u>	Ins w.c. (PIC-AZ101K104-1)
Airflow	<u>142</u>	cfm (FI-AZ101K1-1)
Simulated Tank Press.	<u>-2.5</u>	Ins. w.c. (PIC-AZ101K1-1)

2.1.10 **SIMULATE** a tank pressure more negative than setpoint at PIC-AZ101K1-1.

2.1.11 **VERIFY** that valve MK-AZ101K1-1 modulates toward the **OPEN** position.

Test Engineer *D.S.* Date 11/13/96

2.1.12 **SIMULATE** a tank pressure more positive than setpoint at PIC-AZ101K1-1.

2.1.13 **VERIFY** that valve MK-AZ101K1-1 modulates toward the **CLOSED** position.

Test Engineer *D.S.* Date 11/13/96

2.1.14 RETURN tank pressure simulation to PIC-AZ101K1-1 setpoint value.

2.2 Heater AZ101-K1-2-1 Control Test

2.2.1 **SIMULATE** a temperature <40 °F at TIC-AZ101K102-1.

2.2.2 **VERIFY** that heater AZ101-K1-2-1 **ENERGIZES**.

Test Engineer *D.S.* Date 11/13/96

2.2.3 **SIMULATE** a temperature >40 °F at TIC-AZ101K102-1.

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ATTACHMENT 11 -AZ101 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 D.S. 3/31/97
2.2.4 **VERIFY** that heater AZ101-K1-2-1 DE-ENERGIZES.

Test Engineer D.S. Date 11/13/96

2.3 Filter Differential Pressure Monitoring Test

2.3.1 **DISCONNECT** ¼" tubing from high side connection to PDI-AZ101K103-1.

2.3.2 **VERIFY** that PDAH-AZ101K1-1 annunciates on MCS graphic 15PriIn.v.

Test Engineer D.S. Date 11/13/96

2.3.3 **ACKNOWLEDGE** PDAH-AZ101K1-1 on MCS graphic 15PriIn.v.

2.3.4 **RE-CONNECT** ¼" tubing at high side connection to PDI-AZ101K103-1.

2.3.5 **VERIFY** that PDAH-AZ101K1-1 clears on MCS graphic 15PriIn.v.

Test Engineer D.S. Date 11/13/96

2.4 Flow Control Valve MK-AZ101K1-2 Test

2.4.1 **CONNECT** Variable Test Pressure Source (VTPS) to FT-AZ101K1-2 and simulate a flow of less than setpoint (<400 cfm).

Test Engineer D.S. Date 4/9/97

2.4.2 **VERIFY** that control valve MK-AZ101K1-2 modulates toward the **OPEN** position.

Test Engineer D.S. Date 4/9/97

2.4.3 **INCREASE** simulated flow at FT-AZ101K1-2 to above setpoint (~500 cfm).

2.4.4 **VERIFY** that control valve MK-AZ101K1-2 modulates toward the **CLOSED** position.

Test Engineer D.S. Date 4/9/97

2.4.5 **REMOVE** simulation from FT-AZ101K1-2.

Test Engineer D.S. Date 4/9/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 12 -AZ102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE*DATA TRANSFERRED FROM REVISION 0 D-G.*

ATTACHMENT 12

*3/31/97***1 INITIAL CONDITIONS**

NOTE: Any tests required by this section need not be repeated if previously completed and documented.

- 1.1 **VERIFY** installation of system filters, temporary plenum boxes and flex hoses in accordance with Attachment 19.

Test Engineer *D-G* Date *11/8/96*

- 1.2 **VERIFY/PERFORM** the following electrical line-up:

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION	INITIALS	IV
Breaker #3	Primary Vent. Fan Breaker in Standby Panelboard No.1.	CLOSED	<i>MTS</i>	<i>D-G</i>
Breaker #7	UPS No.1. Breaker in Standby Panelboard No.1.	CLOSED	<i>MTS</i>	<i>D-G</i>
Breaker #2	UPS No.2. Breaker in Standby Panelboard No.2.	CLOSED	<i>MTS</i>	<i>D-G</i>
Circuit #4	TB-LCU1-2C Circuit in UPS-PP-13 (for dampers MK-AZK1-1A/2A)	CLOSED	<i>MTS</i>	<i>D-G</i>
Breaker #2B	AZ102 Recirc. Vent. Building Breaker in Distribution Panelboard PP-2.	CLOSED	<i>MTS</i>	<i>D-G</i>
100A Main Disconnect	AZ102 Recirc. Vent. Building Main Disconnect.	CLOSED	<i>MTS</i>	<i>D-G</i>

Revision 1

HNF-SD-W030-POTP-002

ATTACHMENT 12 -AZ102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE*DATA TRANSFERRED FROM REVISION 0 3/31/96*

- 1.3 **VERIFY/PERFORM** valve line-up as left after testing completed in Attachment 2, except as follows:

Damper	Location	Position
MK-AZ102K1-2A1	402 AZ Recirc Module	OPEN
MK-AZ102K1-2A2	402 AZ Recirc Module	OPEN
MK-AZ102K1-2A3	402 AZ Recirc Module	CLOSED

Test Engineer

D. J.

Date

11/8/96

- 1.4 **POSITION** Recirc. Vent System dampers in Bypass Mode configuration as indicated in the following table:

Damper	Location	Position
MK-AZ102K4-1	402 AZ Recirc Module	OPEN
MK-AZ102K4-2	402 AZ Recirc Module	CLOSED
MK-AZ102K4-3	402 AZ Recirc Module	OPEN
MK-AZ102K4-4	402 AZ Recirc Module	OPEN

Test Engineer

D. J.

Date

11/8/96

- 1.5 **SELECT** Bypass mode on MCS graphic 10RecAY1.v.
- 1.6 **OPEN** damper MK-AZK1-1A by placing handswitch HS-AZK1-1AA in **MANUAL** position and handswitch HS-AZK1-1A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer

D. J.

Date

11/8/96

- 1.7 **OPEN** damper MK-AZK1-2A by placing handswitch HS-AZK1-2AA in **MANUAL** position and handswitch HS-AZK1-2A in **OPEN** position on MCS graphic 17PriExh.v.

Test Engineer

D. J.

Date

11/8/96

- 1.8 On MCS graphic 15PriIn.v, **SELECT** valves MK-AZ102K1-1 and MK-AZ102K1-2 IN AUTO mode.

2 PROCEDURE

DATA TRANSFERRED FROM REVISION 0 3/31/97
D.J.

2.1 Tank Pressure Control Valve MK-AZ102K1-1 Test

- 2.1.1 **STATION** a field observer at the AZ102 plenum box to advise the test engineer of field conditions during test
- 2.1.2 **CONNECT** Variable Test Pressure Source (VTPS) to PIT-AZ102K1-1 and simulate a tank pressure of - 2.5 to - 3.0 "w.c.

Test Engineer D.J. Date 11/8/96

- 2.1.3 **VERIFY/PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in **REMOTE**.

Test Engineer D.J. Date 11/8/96

- 2.1.4 **PRESS RESET** button at the VSD local control cabinet.

- 2.1.5 **VERIFY/PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet in **AUTO** position.

Test Engineer D.J. Date 11/8/96

- 2.1.6 **VERIFY/PLACE** dampers MK-AZK105-1A1/1A2 in the **OPEN** position.

Test Engineer D.J. Date 11/8/96

- 2.1.7 **SELECT** HS-AZK105-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

- 2.1.8 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v

ATTACHMENT 12 -AZ102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 *D.J.*
3/8/96

2.1.9 After a stabilization period of 15 minutes **RECORD** the following data:

2.1.9.1 for exhaust fan AZ-K1-5-1A:

Motor Current	<u>14</u>	<i>% LOAD</i> Amps. (II-AZK105-1A)
Motor Speed	<u>1841</u>	% (% Speed Meter) <i>RPM</i>
Train A Header Press.	<u>-5.5</u>	Ins w.c. (PIC-AZK1-1A)
Train B Header Press.	<u>-5.4</u>	Ins w.c. (PIC-AZK1-1B)
Airflow	<u>327</u>	cfm (FIC-AZ102K1-2)

2.1.9.2 for inlet filter train:

Inlet Air Temperature	<u>76</u>	°F (TIC-AZ102K102-1)
Pre-filter Diff. Press.	<u>0</u>	Ins w.c. (PIC-AZ102K103-1)
HEPA Filter Diff. Press.	<u>0</u>	Ins w.c. (PIC-AZ102K104-1)
Airflow	<u>95</u>	cfm (FI-AZ102K1-1)
Simulated Tank Press.	<u>-2.5"</u>	Ins. w.c. (PIC-AZ102K1-1)

2.1.10 **SIMULATE** a tank pressure more negative than setpoint at PIC-AZ102K1-1.

2.1.11 **VERIFY** that valve MK-AZ102K1-1 modulates toward the **OPEN** position.

Test Engineer *D.J.* Date 11/8/96

2.1.12 **SIMULATE** a tank pressure more positive than setpoint at PIC-AZ102K1-1.

2.1.13 **VERIFY** that valve MK-AZ102K1-1 modulates toward the **CLOSED** position.

Test Engineer *D.J.* Date 11/8/96

2.1.14 **RETURN** tank pressure simulation to PIC-AZ102K1-1 setpoint value.

2.2 Heater AZ102-K1-2-1 Control Test

2.2.1 **SIMULATE** a temperature <40 °F at TIC-AZ102K102-1.

2.2.2 **VERIFY** that heater AZ102-K1-2-1 **ENERGIZES**.

Test Engineer *D.J.* Date 11/13/96

2.2.3 **SIMULATE** a temperature >40 °F at TIC-AZ102K102-1.

Revision 1 HNF-SD-W030-POTP-002**ATTACHMENT 12 -AZ102 PRIMARY VENT INLET FILTER TRAIN TEST PROCEDURE**

DATA TRANSFERRED FROM REVISION 0 D.S.
2.2.4 **VERIFY** that heater AZ102-K1-2-1 **DE-ENERGIZES**. 3/31/97

Test Engineer D.S. Date 11/13/94

2.3 Filter Differential Pressure Monitoring Test

2.3.1 **DISCONNECT** 1/4" tubing from high side connection to PDI-AZ102K103-1.

2.3.2 **VERIFY** that PDAH-AZ102K1-1 annunciates on MCS graphic 15PriIn.v.

Test Engineer D.S. Date 11/8/96

2.3.3 **ACKNOWLEDGE** PDAH-AZ102K1-1 on MCS graphic 15PriIn.v.

2.3.4 **RE-CONNECT** 1/4" tubing at high side connection to PDI-AZ102K103-1.

2.3.5 **VERIFY** that PDAH-AZ102K1-1 clears on MCS graphic 15PriIn.v.

Test Engineer D.S. Date 11/8/96

2.4 Flow Control Valve MK-AZ102K1-2 Test

2.4.1 **CONNECT** Variable Test Pressure Source (VTPS) to FT-AZ102K1-2 and simulate a flow of less than setpoint (<400 cfm).

Test Engineer D.S. Date 11/8/96

2.4.2 **VERIFY** that control valve MK-AZ102K1-2 modulates toward the **OPEN** position.

Test Engineer D.S. Date 11/8/96

2.4.3 **INCREASE** simulated flow at FT-AZ102K1-2 to above setpoint (~500 cfm).

2.4.4 **VERIFY** that control valve MK-AZ102K1-2 modulates toward the **CLOSED** position.

Test Engineer D.S. Date 11/8/96

2.4.5 **REMOVE** simulation from FT-AZ102K1-2.

Test Engineer D.S. Date 11/8/96

ATTACHMENT 13 - MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS BY MCS COGNIZANT ENGINEER**ATTACHMENT 13****1 Primary Exhaust System MCS MACRO Test**

- 1.1 For all tests in this attachment, **VERIFY** the damper line-up as left after testing completed in attachment 12.

Test Engineer ZAH Date 4/17/99

Note: Not all MACRO features will be verified in this test; other features will be tested in a separate procedure.

- 1.2 **PLACE** system in automatic mode as follows: At MCS graphic 15PriIn.v and 17PriExh.v, **SELECT** all controls to AUTO mode.

- 1.3 At MCS graphic 25mExhst.v, ^{see TE-22 rec 10/2/97} **SELECT** Pumps OFF, Chiller OFF, Heater 1A ON and Fan 1A ON. **RUN** MACRO, verify system **STARTS** with Fan 1A ON.

Test Engineer ZAH Date 4/17/99

- 1.4 At MCS graphic 25mExhst.v, **SELECT** Heater 1B and Fan 1B ON. **RUN** MACRO and **VERIFY** 1B and Fan 1B are ON, Heater 1B and Fan 1A OFF.

Test Engineer ZAH Date 4/17/99

2 Final Tuning of System PID Controls by MCS Cognizant Engineer

- 2.1 Train A; **VERIFY** Building Vent System OFF; both vestibule doors for Filter Room-A open to ensure stable pressure reference.

LBA Test Engineer ZAH Date 4/16/99

- 2.2 At MCS graphic 25mExhst.v, **SELECT** Pumps OFF, Chiller OFF, Heater 1A ON and Fan 1A ON. **RUN** MACRO, verify system **STARTS** with Fan 1A and Heater 1A ON, and Fan 1B, Heater OFF, damper MK-AZK1-1B closed. Run system for 10 minutes to stabilize. *

LBA Test Engineer ZAH Date 4/16/99

* Heater was not stabilized as it takes considerably longer to stabilize (> 30 min)

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATIONRevision 1 HNF-SD-W030-POTP-002**ATTACHMENT 13 - MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS
BY MCS COGNIZANT ENGINEER**2.3 At MCS graphic 15PriIn.v and 17PriExh.v, **RECORD** the following data for Train-A:

Inlet manifold pr. PIC-AZK1-1A = 15.0 ins. wc
 Inlet man. temp TI-AZK12-1A 58 degrees F
 Heater exit temp. TI-AZK12-2A _____ degrees F
 Heater diff. temp. TDIC-AZK12-1A 16 degrees F
 Filter exit temp. TI-AZK12-3A 74 degrees F
 AY101 Tank pr. PIC-AY1K1-1 - 2.0 ins. wc
 AY101 Tank exit flow FIC-AY1K1-2 143 scfm
 AY102 Tank pr. PIC-AY2K1-1 - 2.0 ins. wc
 AY102 Tank exit flow FIC-AY2K1-2 153 scfm
 AZ101 Tank pr. PIC-AZ1K1-1 - 2.0 ins. wc
 AZ101 Tank exit flow FIC-AZ1K1-2 150 scfm
 AZ102 Tank pr. PIC-AZ2K1-1 - 1.9 ins. wc
 AZ102 Tank exit flow FIC-AZ2K1-2 135 scfm
 Stack flow FI-AZK1-3 565 scfm

X Sensor has been
deleted.

TE-027

PIC
10/24/972.4 At MCS Engineering station, **TUNE** PID loops as follows. **RECORD** initial PID rate settings for above controllers in the table below.

ADJUST the Proportional, Integral and Derivative control gains for stable control of each loop. This will first be performed on each individual loop, and may have to be repeated when the loops operate interactively. Use an empirical technique and include the following steps:

- Increase the loop gain, forcing the system to oscillate, and determine the maximum gain and oscillation frequency.
- Adjust the P, I, D rates for desired system performance and test various transients for stability and desired operation.

PARAMETER	INITIAL PID RATES
Inlet man. press., PIC-AZK1-1A	PID = 0.80 ^{0.70} , 8.00, 0.02 ; Deadband = 0.1, 0.35 wc
Heater diff. temp., TDIC-AZK12-1A	PID = 0.10, 1.00, 1.00 ; Limit ΔSP to 15°F
AY101 Tank press., PIC-AY1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.05, 0.01 0.01-0.05
AY101 Tank exit flow, FIC-AY1K1-2	PID = 0.24, 7.00, 0.04 ; Deadband = 1.5, 5.0 1-4 scfm
AY102 Tank press., PIC-AY1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.05, 0.01 0.01-0.05

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION:

Revision 1 HNF-SD-W030-POTP-002ATTACHMENT 13 - MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS
BY MCS COGNIZANT ENGINEER

PARAMETER	INITIAL PID RATES	
AY102 Tank exit flow, FIC-AY1K1-2	PID = $\frac{0.24}{0.25}, \frac{7.00}{8.00}, 0.04$; Deadband = $0.5, 2.0$ scfm	1-4
AZ101 Tank press., PIC-AZ1K1-1	PID = $0.90, 10.00, 0.02$; Deadband = $0.05, 0.1$ "wc	0.01-0.0
AZ101 Tank exit flow, FIC-AZ1K1-2	PID = $\frac{0.24}{0.25}, \frac{7.00}{8.00}, 0.04$; Deadband = $0.5, 2.0$ scfm	1-4
AZ102 Tank pr., PIC-AZ1K1-1	PID = $0.90, 10.00, 0.02$; Deadband = $0.05, 0.1$ "wc	0.01-0.0
AZ102 Tank exit flow, FIC-AZ1K1-2	PID = $\frac{0.24}{0.25}, \frac{7.00}{8.00}, 0.04$; Deadband = $0.5, 2.0$ scfm	1-4

- 2.5 Train B; **VERIFY** Building Vent System OFF; both vestibule doors for Filter Room-B open to ensure stable pressure reference.

SLH Test Engineer _____

2014 Date *4/13/17*

- 2.6 At MCS graphic 25mExhst.v, **SELECT** Pumps OFF, Chiller OFF, Heater 1B ON and Fan 1B ON. **RUN** MACRO, verify system **STARTS** with Fan 1B and Heater 1B ON, Fan 1A, Heater 1A OFF, damper MK-AZK1-1A closed. Run system for 10 minutes to stabilize.

2A

SLH Test Engineer _____

2014 Date *4/13/17*

- 2.7 At MCS graphic 15PriIn.v and 17PriExh.v, **RECORD** the following data for Train-B:

Inlet manifold pr.	PIC-AZK1-1B	-15.2 ins. wc
Inlet man. temp	TI-AZK12-1B	58 °F
Heater exit temp.	TI-AZK12-2B	°F
Heater diff. temp.	TDIC-AZK12-1B	13 °F
Filter exit temp.	TI-AZK12-3B	72 °F

Does not exist

TE-027

ECN-250

HC 10/1/17

- 2.8 **REPEAT** PID tuning for Train-B. Record rate settings in the table below.

PARAMETER	INITIAL PID RATES
Inlet man. press., PIC-AZK1-1B	PID = 0.80, 7.00 , 0.02; Deadband = 0.5, 0.1 "wc 0.70, 8.00 0.1, 0.35 "wc
Heater diff. temp., TDIC-AZK12-1B	PID = 0.10, 1.00, 1.00; Limit ΔSP to 15 °F

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ATTACHMENT 13 - MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS BY MCS COGNIZANT ENGINEER

- 2.9 RECORD data for Upset-1; Switch filter trains:

$PIC-AZ-CL-1B = 14.8$, $TDEC \text{ diff} = 17$, $TI_{out} = 3A = 75$, $Stack = 585$
 $AY1:PI = -2.0$ $AY2:PI = -2.1$ $AZ1:PI = -2.1$ $AZ2:PI = -2.1$
 $PI = 147$ $PI = 155$ $PI = 155$ $PI = 157$

- 2.10 RECORD data for Upset-2; switch exhaust fans:

$FanPIC = -15.1$, $TDEC \text{ diff} = 13$, $TI_{out} = 71$, $Stack = 585$
 $AY1:PI = -2.1$ $AY2:PI = -2.0$ $AZ1:PI = -2.1$ $AZ2:PI = -2.1$
 $PI = 153$ $PI = 153$ $PI = 155$ $PI = 159$

- 2.11 RECORD data for Upset-3; Bypass HEME:

$FanPIC = 16.0 \pm 1$, $TDEC \text{ diff} = 13$, $TI_{out} = 73$, $Stack = 570$
 $AY1:PI = -2.1$ $AY2:PI = -2.0$ $AZ1:PI = -2.0$ $AZ2:PI = -2.2$
 $PI = 152$ $PI = 147$ $PI = 150$ $PI = 163$

- 2.12 RECORD data for Upset-4; Bypass HEME and Condenser:

$FanPIC = 16 \pm 1$, $TDEC \text{ diff} = 14$, $TI_{out} = 73$, $Stack = 560$
 $AY1:PI = -2.0$ $AY2:PI = -2.0$ $AZ1:PI = -2.1$ $AZ2:PI = -2.2$
 $PI = 155$ $PI = 148$ $PI = 150$ $PI = 165$

- 2.13 RECORD data for Upset-5; Restore flow thru HEME and Condenser:

$FanPIC = 16 \pm 1$, $TDEC \text{ diff} = 12$, $TI_{out} = 71$, $Stack = 540$
 $AY1:PI = -2.0$ $AY2:PI = -2.2$ $AZ1:PI = -2.0$ $AZ2:PI = -1.9$
 $PI = 147$ $PI = 148$ $PI = 150$ $PI = 130$

- 2.14 RECORD data for Upset-6; Increase AY101 tank exit flow to 400 scfm by resetting FIC-AZK1-2:

$FanPIC = -14.9$, $TDEC \text{ diff} = 12$, $TI_{out} = 70$, $Stack = 815$
 $AY1:PI = -2.1$ $AY2:PI = -2.1$ $AZ1:PI = -1.9$ $AZ2:PI = -2.0$
 $PI = 400$ $PI = 153$ $PI = 153$ $PI = 160$

- 2.15 RECORD data for Upset-7; Increase AY101 Tank in-leak by fully opening the 6-inch test damper at the AY101 plenum box:

$FanPIC = -15.0$, $TDEC \text{ diff} = 12$, $TI_{out} = 69$, $Stack = 800$
 $AY1:PI = -2.0$ $AY2:PI = -2.0$ $AZ1:PI = -2.0$ $AZ2:PI = -2.0$
 $PI = 395$ $PI = 154$ $PI = 149$ $PI = 156$

- 2.16 VERIFY that all PID control adjustments are complete.

MCS Cog. Engineer

Test Engineer

[Signature]

see final settings below

Date

5/7/97

Date

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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**ATTACHMENT 13 - MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS
BY MCS COGNIZANT ENGINEER**

PARAMETER	FINAL PID RATES
Inlet man. press., PIC-AZK1-1A	PID = 0.70, 8.00, 0.02 ; Deadband = 0.1 to 0.35" Filter = 2 sec
Heater diff. temp., TDIC-AZK12-1A	PID = 0.10, 1.00, 1.00 ; Limit SP deviation to 15°F
AY101 Tank press., PIC-AY1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.01 to 0.05" Filter = 1 sec
AY101 Tank exit flow, FIC-AY1K1-2	PID = 0.24, 7.00, 0.04 ; Deadband = 1 to 4 scfm Filter = 3 sec
AY102 Tank press., PIC-AY1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.01 to 0.05" Filter = 1 sec
AY102 Tank exit flow, FIC-AY1K1-2	PID = 0.24, 7.00, 0.04 ; Deadband = 1-4 scfm Filter = 3 sec
AZ101 Tank press., PIC-AZ1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.01 to 0.05" Filter = 1 sec
AZ101 Tank exit flow, FIC-AZ1K1-2	PID = 0.24, 7.00, 0.04 ; Deadband = 1 to 4 scfm Filter = 3 sec
AZ102 Tank pr., PIC-AZ1K1-1	PID = 0.90, 10.00, 0.02 ; Deadband = 0.01 to 0.05" Filter = 1 sec
AZ102 Tank exit flow, FIC-AZ1K1-2	PID = 0.24, 7.00, 0.04 ; Deadband = 1 to 4 scfm Filter = 3 sec
Inlet man. press., PIC-AZK1-1B	PID = 0.70, 8.00, 0.02 ; Deadband = 0.1 to 0.35" Filter = 2 sec
Heater diff. temp., TDIC-AZK12-1B	PID = 0.10, 1.00, 1.00 ; Deadband = 0.1 to 0.35" Filter = 2 sec

Revision 1 HNF-SD-W030-POTP-002**ATTACHMENT 13 -MCS INITIAL MACRO TEST AND FINAL TUNING OF PID CONTROLS
BY MCS COGNIZANT ENGINEER****3 Alarm Logic Timing Checks by MCS Cognizant Engineer**

- 3.1 Train A; **VERIFY** Building Vent System OFF; both vestibule doors for Filter Room-A open to ensure stable pressure reference.

Test Engineer 7044 Date 4/15/97

- 3.2 At MCS graphic 15PriIn.v and 17PriExh.v, **SELECT** all PID controls in AUTO mode. At MCS graphic 25mExhst.v, **SELECT** Pumps OFF, Chiller OFF, Heater 1A ON and Fan 1A ON. **RUN** MACRO, verify system **STARTS** with Fan 1A and Heater 1A ON, and Fan1B, Heater OFF, damper MK-AZK1-1B closed. Run system for 10 minutes to stabilize. PREPARE MCS alarm printer to print alarms as noted below.

Test Engineer 7044 Date 4/15/97

- 3.3 At MCS graphic 20BldExh.v, **SELECT** Fan 1B to STOP. **RECORD** alarm level and time required (in seconds) for each of the following alarms to occur after fan STOP command.

Inlet manifold pr.	PIC-AZK1-1A	-10" ins. wc	10 sec.
Inlet man. temp	TI-AZK12-1A	° F	* sec. did not alarm
* Does not exist Heater exit temp.	TI-AZK12-2A	° F	* sec. did not alarm
Heater diff. temp.	TDIC-AZK12-1A	5 ° F	* sec. > 16 min. ok
Filter exit temp.	TI-AZK12-3A	N/A ° F	* sec. No Low alarm
AY101 Tank pr.	PIC-AY1K1-1	0.5 ins. wc	6 sec.
AY101 Tank exit flow	FIC-AY1K1-2	50 scfm	11 sec.
AY102 Tank pr.	PIC-AY2K1-1	0.5 ins. wc	4 sec.
AY102 Tank exit flow	FIC-AY2K1-2	50 scfm	16 sec.
AZ101 Tank pr.	PIC-AZ1K1-1	0.5 ins. wc	4 sec.
AZ101 Tank exit flow	FIC-AZ1K1-2	50 scfm	10 sec.
AZ102 Tank pr.	PIC-AZ2K1-1	0.5 ins. wc	6 sec.
AZ102 Tank exit flow	FIC-AZ2K1-2	50 scfm	10 sec.
Stack flow	FI-AZK1-3	200 scfm	12 sec.

- 3.4 **VERIFY** that all alarm logic timing is satisfactory.

MCS Cog. Engineer LT Lie Date 4/15/97
Test Engineer 7044 Date 4/15/97

* TE-027 ac 4/17/97

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ATTACHMENT 14-PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE*Data Transfer From Revision 0C 7041*
ATTACHMENT 14*3/3/97***1 INITIAL CONDITIONS**

- 1.1 **VERIFY** all system instrumentation in Appendix A is calibrated and has a current calibration tag affixed to each instrument and that all system loop calibrations are complete.

Test Engineer: 7041

- 1.2 **VERIFY** the SYSTEM IS ALIGNED for preoperational testing in accordance with Appendix B.

Test Engineer: 7041

- 1.3 **CYCLE** all MANUAL VALVES, listed in Appendix C, full travel and verify proper operation.

Test Engineer: 7041

- 1.4 **RECORD** ALL Valve Deficiencies in Attachment 16, Test Log.

Test Engineer: 7041**2 Primary Tank Ventilation Automatic Isokinetic Sampling**

NOTE: The primary tank vent exhaust may be started or stopped as directed by the Test Engineer to support testing.

- 2.1 **VERIFY** that system has been energized for a minimum of one hour prior to recording data in step 4.

Test Engineer: D. G.

- 2.2 **VERIFY** flow and sample probe assembly is correctly oriented and securely mounted in place.

Test Engineer: 7041

- 2.3 **VERIFY** instrumentation/pump cabinet is securely mounted to floor/pad.

Test Engineer: 7041

ATTACHMENT 14 - PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE*Data Transfer From Revision OC 2014 5/21/99*

- 2.4 **VERIFY** all signal connections between flow and sample probe and instrumentation/control cabinet are correct. These include Record sample transport line, Beta sample transport line, total and static pressure signal lines, stack temperature signal, power wiring, and signal wiring.

Test Engineer: ZAH

- 2.5 **VERIFY** sample exhaust from cabinet is routed back to the stack.

Test Engineer: ZAH

- 2.6 **VERIFY** air flow measurement ports are installed as per Attachment H, Figure 1.

Test Engineer: ZAH

- 2.7 **VERIFY** incoming electrical power is connected to the terminal blocks TB-1 and TB-2.

Test Engineer: ZAH

- 2.8 **VERIFY** all wiring for remote signals is properly connected to terminal block TB-6.

Test Engineer: ZAH

- 2.9 **VERIFY** stack exhaust fan status wiring is connected to terminal block TB-4.

Test Engineer: ZAH

- 2.10 **VERIFY** PUMP AUTO/OFF selector switch HS-AZK111-1A is in the OFF position.

Test Engineer: ZAH

- 2.11 **PLACE** Power Switch SW-P6 in the ON position.

- 2.12 **VERIFY** the following:

- Pump cabinet cooling fan starts.
- "Power On" light L-1 is ON.

Test Engineer: ZAH

- 2.13 **PLACE** Power Switch SW-1 in the ON position.

- 2.14 **VERIFY** displays in FT-1 (FIT-AZK1-3), FT-2 (FIT-AZK1-2), FT-3 (FIT-AZK1-1) and PT-5 (PIT-AZK1) are ON.

Test Engineer: ZAH

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ATTACHMENT 14-PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

Data Transfer From Revision 0C
JAH 3/3/97

2.15 **PLACE** Power Switch SW-3 in ON.

2.16 **VERIFY** "Run" LED's on Control Modules #1 and #2 are flashing.

Test Engineer: JAH

2.17 **PLACE** Power Switch SW-4 in the ON position.

2.18 **VERIFY** display in Beta monitor is ON.

Test Engineer: JAH

2.19 **DEPRESS** alarm acknowledge buttons HS-AZK1-1A1 and HS-AZK1-1B1 **AND VERIFY** the lights in the buttons come ON.

Test Engineer: JAH

2.20 **DEPRESS** "Pump Swap" Pushbutton, HS-AZK111-1B, as necessary until "Pump #1 in Lead" light comes on.

Test Engineer: JAH

2.21 **PLACE** "Auto/Off" Switch, HS-AZK111-1A, in AUTO.

2.22 **VERIFY** that isolation valves MV-AZK1-4 and MV-AZK1-5 position to Pump #1.

Test Engineer: N.F.

2.23 **VERIFY/PERFORM** the following damper line-up:

Damper	Location	Position
MK-AY101K1-1	AY101 Inlet	OPEN
MK-AY101K1-2A1	401-AY Recirc. Module	CLOSED
MK-AY101K1-2A2	401-AY Recirc. Module	CLOSED
MK-AY101K1-2A3	401-AY Recirc. Module	OPEN
MK-AY102K1-1	AY102 Inlet	OPEN
MK-AY102K1-2A1	402-AY Recirc. Module	CLOSED
MK-AY102K1-2A2	402-AY Recirc. Module	CLOSED
MK-AY102K1-2A3	402-AY Recirc. Module	OPEN
MK-AZ101K1-1	AZ101 Inlet	OPEN
MK-AZ101K1-2A1	401-AZ Recirc. Module	CLOSED

ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

Damper	Location	Position
MK-AZ101K1-2A2	401-AZ Recirc. Module	CLOSED
MK-AZ101K1-2A3	401-AZ Recirc. Module	OPEN
MK-AZ102K1-1	AZ102 Inlet	OPEN
MK-AZ102K1-2A1	402-AZ Recirc. Module	CLOSED
MK-AZ102K1-2A2	402-AZ Recirc. Module	CLOSED
MK-AZ102K1-2A3	402-AZ Recirc. Module	OPEN
MK-AZK108-1A	Vent Cell	OPEN
MK-AZK108-1B	Vent Cell	OPEN
MK-AZK108-1C	Vent Cell	CLOSED
MK-AZK109-1A	Vent Cell	OPEN
MK-AZK109-1B	Vent Cell	OPEN
MK-AZK109-1C	Vent Cell	CLOSED
MK-AZK1-1A	Filter train	OPEN
MK-AZK1-2A	Filter train	OPEN
MK-AY101K4-1	401-AY Recirc. Module	CLOSED
MK-AY101K4-2	401-AY Recirc. Module	CLOSED
MK-AY101K4-3	401-AY Recirc. Module	OPEN
MK-AY101K4-4	401-AY Recirc. Module	OPEN
MK-AY101K4-5	401-AY Recirc. Module	OPEN
MK-AY101K4-6	401-AY Recirc. Module	OPEN
MK-AY102K4-1	402-AY Recirc. Module	CLOSED
MK-AY102K4-2	402-AY Recirc. Module	CLOSED
MK-AY102K4-3	402-AY Recirc. Module	OPEN
MK-AY102K4-4	402-AY Recirc. Module	OPEN

ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE*Data Transfer From OC 704 3/11/97*

Damper	Location	Position
MK-AY102K4-5	402-AY Recirc. Module	OPEN
MK-AY102K4-6	402-AY Recirc. Module	OPEN
MK-AZ101K4-1	401-AZ Recirc. Module	CLOSED
MK-AZ101K4-2	401-AZ Recirc. Module	CLOSED
MK-AZ101K4-3	401-AZ Recirc. Module	OPEN
MK-AZ101K4-4	401-AZ Recirc. Module	OPEN
MK-AZ101K4-5	401-AZ Recirc. Module	OPEN
MK-AZ101K4-6	401-AZ Recirc. Module	OPEN
MK-AZ102K4-1	402-AZ Recirc. Module	CLOSED
MK-AZ102K4-2	402-AZ Recirc. Module	CLOSED
MK-AZ102K4-3	402-AZ Recirc. Module	OPEN
MK-AZ102K4-4	402-AZ Recirc. Module	OPEN
MK-AZ102K4-5	402-AZ Recirc. Module	OPEN
MK-AZ102K4-6	402-AZ Recirc. Module	OPEN
MK-AZK105-1A1	Filter Room	OPEN
MK-AZK105-1A2	Filter Room	OPEN
MK-AZK105-1B1	Filter Room	OPEN
MK-AZK105-1B2	Filter Room	OPEN

Test Engineer D. G. Date 3/11/97

- 2.24 **VERIFY/PLACE** the **LOCAL/REMOTE** handswitch at the VSD local control cabinet in **REMOTE**.

Test Engineer D. G. Date 3/11/97

- 2.25 **PRESS RESET** button at the VSD local control cabinet.

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ATTACHMENT 14 - PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE*Data Transfer From Revision 0.C. 2/1/97*

- 2.26 **VERIFY/PLACE** the **HAND/OFF/AUTO** handswitch at the VSD local control cabinet in **AUTO** position.

Test Engineer D.G. Date 3/1/97

- 2.27 **SELECT** HS-AZK105-1AA **MANUAL** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

- 2.28 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.

- 2.29 **VERIFY** Pump #1 starts after approximately 90 seconds and "Pump #1 ON" light comes on.

Test Engineer: D.G.

- 2.30 **DEPRESS** "Pump Swap" HS-AZK111-1B..

- 2.31 **VERIFY** the following:

- Pump #1 stops.
- "Pump #1 On" light goes OFF.
- Isolation valves MV-AZK1-4 and MV-AZK1-5 reposition to Pump #2.
- Pump #2 starts after approximately 90 seconds.
- "Pump #2 On" light comes ON.

Test Engineer: D.G.

- 2.32 **PLACE** the "Auto/Off" switch HS-AZK111-1A in OFF.

- 2.33 **VERIFY** Pump #2 STOPS and "Pump #2 On" light goes OFF.

Test Engineer: D.G.**3 Tritium Sampler Control Loop**

- 3.1 **VERIFY** Tritium Sampler control switch, HS-AZK1-2A1, is in the **AUTO** position.

Test Engineer: ZAH

- 3.2 **DEPRESS** the **MAIN** power pushbutton and the **PUMP** power pushbutton.

- 3.3 **VERIFY** the power on lights under each pushbutton illuminate.

Test Engineer: ZAH

- 3.4 **VERIFY** a Primary Tank Ventilation exhaust fan is in service.

Test Engineer: ZAH

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- 3.5 **PLACE** Tritium Sampler control switch, HS-AZK1-2A1, is in the AUTO position.
- 3.6 **VERIFY** the following occurs:
- Tritium Sample Pump starts
 - Tritium Sampler Low Flow alarm clears on graphics screen 18PriMon.v.
- Test Engineer: *ZAH*
- 3.7 **SELECT** HS-AZK105-1A **STOP** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.
- 3.8 **VERIFY** the following occurs:
- Tritium Sample Pump stops
 - Tritium Sampler Low Flow alarm initiates on graphics screen 18PriMon.v.
- Test Engineer: *ZAH*
- 3.9 **PLACE** Tritium Sampler control switch, HS-AZK1-2A1, is in the STOP position.

4 Sample Flow Control Loop

NOTE - Record required data for this section on Appendix D.

- 4.1 **SELECT** HS-AZK105-1A **START** command for exhaust fan AZ-K1-5-1A on MCS graphic 17PriExh.v.
- 4.2 **PLACE** "Auto/Off" Switch, HS-AZK111-1A, in AUTO.
- 4.3 **VERIFY** that stack sample pump #1 or #2 starts.
- Test Engineer: *A. G.*
- 4.4 **ADJUST** Primary Tank Ventilation Stack Flow to approximately 400 SCFM.
- 4.5 **CALCULATE** percent of full scale (%FS) stack flow using stack flow (SCFM) displayed on FIT-AZK1-3 and the following formula:

NOTE - 1100 SCFM represents full scale stack flow.

$$\%FS \text{ Stack Flow} = (\text{Displayed SCFM} \div 1100 \text{ SCFM}) \times 100$$

- 4.6 **RECORD** the value for displayed stack flow and the %FS Stack Flow calculated in step 4.5.
- Test Engineer: *D. G.*

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ATTACHMENT 14 - PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE*Data Transfer From Revision 0C*
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- 4.7 **CALCULATE** Ideal Output of FY-1 (FY-AZK1-3) using %FS calculated above and the following formula:

$$\text{Ideal Output} = (\%FS \text{ Stack Flow} \div 100) \times 16.00 \text{ mA} + 4 \text{ mA}$$

- 4.8 **RECORD** the Ideal Output calculated in step 4.7

Test Engineer: D.G.

- 4.9 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-1 (FY-AZK1-3) at TB-6.

Test Engineer: D.G.

- 4.10 **CALCULATE** the percent deviation from the ideal output, calculated above. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.11 **RECORD** the %Deviation calculated in step 4.10.

Test Engineer: D.G.

- 4.12 **CALCULATE** Ideal Sample Flow for Record and Beta Samples using %FS Stack Flow calculated above and the following formula:

NOTE - 2 SCFM represents full scale sample flow.

$$\text{Ideal Sample Flow} = \%FS \text{ Stack Flow} \div 100 \times 2.0 \text{ SCFM}$$

- 4.13 **RECORD** the Ideal Sample Flow calculated in step 4.12.

Test Engineer: D.G.

- 4.14 **RECORD** sample flows as indicated on FI-2 (FI-AZK1-2) and FI-3 (FI-AZK1-1).

Test Engineer: D.G.

- 4.15 **CALCULATE** the % Deviation, for the Record sample flow, from the Ideal Sample flow calculated above. This deviation should be $\leq 5\%$.

$$\text{Record Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

- 4.16 **RECORD** the Record Sample Flow % Deviation calculated in step 4.15.

Test Engineer: D.G.

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ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR I

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- 4.17 **CALCULATE** the % Deviation, for the Beta sample flow, from the Ideal Sample flow calculated above. This deviation should be $\leq 5\%$.

$$\text{Beta Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM} \times 100}{\text{Ideal SCFM}}$$

- 4.18 **RECORD** Beta Sample Flow % Deviations calculated 4.17.

Test Engineer: D. G.

- 4.19 **CALCULATE** the ideal output for FY-2 (FY-AZK1-2) using the displayed sample flow recorded in step 4.14.

$$\text{FY-2 (FY-AZK1-2) Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.20 **RECORD** the FY-2 (FY-AZK1-2) Ideal Output calculated in step 4.19.

Test Engineer: D. G.

- 4.21 **CALCULATE** the ideal output for FY-3 (FY-AZK1-1) using the displayed sample flow recorded in step 4.14.

$$\text{FY-3 (FY-AZK1-1) Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.22 **RECORD** the FY-3 (FY-AZK1-1) Ideal Output calculated in step 4.21.

Test Engineer: D. G.

- 4.23 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-2 (FY-AZK1-2) and FY-3 (FY-AZK1-1) at TB-6.

Test Engineer: D. G.

- 4.24 **CALCULATE** the % Deviation from the ideal output for the Record sample flow. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4\text{mA}] - [\text{Ideal Output (mA)} - 4\text{mA}]}{\text{Ideal Output (mA)} - 4\text{mA}} \times 100$$

- 4.25 **RECORD** % Deviation, for the Record sample flow, from ideal output calculated in step 4.24.

Test Engineer: D. G.

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- 4.26 **CALCULATE** the % Deviation from the ideal output for the Beta sample flow. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4 mA} \times 100$$

- 4.27 **RECORD** % Deviation, for the Beta sample flow, from ideal output calculated in step 4.26.

Test Engineer: D. G.

- 4.28 **RECORD** sample manifold vacuum as displayed on PI-5 (PIT-AZK1).

Test Engineer: D. G.

- 4.29 **VERIFY** the value recorded in step 4.28 is within $\pm 5\%$ of the setpoint pressure of 7"-10" Hg.

Test Engineer: D. G.

- 4.30 **CALCULATE** the percent full scale (%FS) stack temperature using stack temperature indicated on TI-1 (TI-AZK1-3) on graphics screen 18PriMon.v.

NOTE - 200°F represents full scale stack temperature.

$$\% FS Stack Temperature = \frac{Displayed ^\circ F \times 100}{200 ^\circ F}$$

- 4.31 **RECORD** Full stack temperature and %FS Stack Temperature calculated 4.30.

Test Engineer: D. G.

- 4.32 **CALCULATE** the ideal output of TY-1 (TY-AZK1-3) using the %FS Stack Temperature calculated in step 4.30.

$$Ideal Output (mA) = \frac{\%FS Stack Temperature \times 16.00mA + 4mA}{100}$$

- 4.33 **RECORD** V/I channel 2 Ideal Output calculated in step 4.32.

Test Engineer: D. G.

- 4.34 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of TY-1 (TY-AZK1-3) at TB-6.

Test Engineer: D. G.

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- 4.35 **CALCULATE** the % Deviation, for TY-1 (TY-AZK1-3), from the Ideal output calculated in step 4.32. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4mA} \times 100$$

- 4.36 **RECORD** the % Deviation for TY-1 (TY-AZK1-3) calculated 4.35.

Test Engineer: D. G.

- 4.37 **ADJUST** Primary Tank Ventilation Stack Flow to approximately 600 SCFM.

- 4.38 **CALCULATE** percent of full scale (%FS) stack flow using stack flow (SCFM) displayed on FI-1 (FI-AZK1-3) and the following formula:

NOTE - 1100 SCFM represents full scale stack flow.

$$\%FS \text{ Stack Flow} = (Displayed \text{ SCFM} \div 1100 \text{ SCFM}) \times 100$$

- 4.39 **RECORD** the value for displayed stack flow and the %FS Stack Flow calculated in step 4.38.

Test Engineer: D. G.

- 4.40 **CALCULATE** Ideal Output of FY-1 (FY-AZK1-3) using %FS calculated above and the following formula:

$$Ideal \text{ Output} = (\%FS \text{ Stack Flow} \div 100) \times 16.00 \text{ mA} + 4 \text{ mA}$$

- 4.41 **RECORD** the Ideal Output calculated in step 4.40.

Test Engineer: D. G.

- 4.42 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-1 (FY-AZK1-3) TB-6.

Test Engineer: D. G.

- 4.43 **CALCULATE** the percent deviation from the ideal output, calculated in step 4.40. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4mA} \times 100$$

- 4.44 **RECORD** %Deviation calculated in step 4.43.

Test Engineer: D. G.

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- 4.45 **CALCULATE** Ideal Sample Flow for Record and Beta Samples using %FS Stack Flow calculated in step 4.38 and the following formula:

NOTE - 2 SCFM represents full scale sample flow.

$$\text{Ideal Sample Flow} = \%FS \text{ Stack Flow} \div 100 \times 2.0 \text{ SCFM}$$

- 4.46 **RECORD** the Ideal Sample Flow calculated in step 4.45.

Test Engineer: D. G.

- 4.47 **RECORD** sample flows as indicated on FI-2 (FI-AZK1-2) and FI-3 (FY-AZK1-1).

Test Engineer: D. G.

- 4.48 **CALCULATE** the % Deviation, for the Record sample flow, from the Ideal Sample flow calculated in step 4.45. This deviation should be $\leq 5\%$.

$$\text{Record Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

- 4.49 **RECORD** the Record Sample Flow % Deviation calculated in step 4.48.

Test Engineer: D. G.

- 4.50 **CALCULATE** the % Deviation, for the Beta sample flow, from the Ideal Sample flow calculated in step 4.45. This deviation should be $\leq 5\%$.

$$\text{Beta Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

- 4.51 **RECORD** Beta Sample Flow % Deviations calculated in step 4.50.

Test Engineer: D. G.

- 4.52 **CALCULATE** the ideal output for FY-2 (FY-AZK1-2) using the displayed sample flow recorded in step 4.47.

$$\text{FY-2 (FY-AZK1-2) Ideal Output} = \frac{\text{Displayed SCFM}}{2.0 \text{ SCFM}} \times 16.00 \text{ mA} + 4.00 \text{ mA}$$

- 4.53 **RECORD** the FY-2 (FY-AZK1-2) Ideal Output calculated in step 4.52.

Test Engineer: D. G.

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- 4.54 **CALCULATE** the ideal output for FY-3 (FY-AZK1-1) using the displayed sample flow recorded in step 4.47.

$$\text{FY-3 (FY-AZK1-1) Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00 \text{ mA} + 4.00 \text{ mA}}{2.0 \text{ SCFM}}$$

- 4.55 **RECORD** the FY-3 (FY-AZK1-1) Ideal Output calculated 4.54.

Test Engineer: D. G.

- 4.56 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-2 (FY-AZK1-2) and FY-3 (FY-AZK1-1) at TB-6.

Test Engineer: D. G.

- 4.57 **CALCULATE** the % Deviation from the ideal output for the Record sample flow. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.58 **RECORD** % Deviation, for the Record sample flow, from ideal output calculated 4.57.

Test Engineer: D. G.

- 4.59 **CALCULATE** the % Deviation from the ideal output for the Beta sample flow. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.60 **RECORD** % Deviation, for the Beta sample flow, from ideal output calculated 4.59.

Test Engineer: D. G.

- 4.61 **RECORD** sample manifold vacuum as displayed on PI-5 (PIT-AZK1).

Test Engineer: D. G.

- 4.62 **VERIFY** the value recorded in step 4.61 is within $\pm 5\%$ of the setpoint pressure of 7"-10" Hg.

Test Engineer: D. G.

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- 4.63 **CALCULATE** the percent full scale (%FS) stack temperature using stack temperature indicated on TI-1 (TI-AZK1-3).

NOTE - 200°F represents full scale stack temperature.

$$\% \text{ FS Stack Temperature} = \frac{\text{Displayed } ^\circ\text{F} \times 100}{200^\circ\text{F}}$$

- 4.64 **RECORD** Full stack temperature and %FS Stack Temperature calculated in step 4.63.

Test Engineer: D. G.

- 4.65 **CALCULATE** the ideal output of TY-1 (TY-AZK1-3) using the %FS Stack Temperature calculated in step 4.63.

$$\text{Ideal Output (mA)} = \frac{\% \text{FS Stack Temperature} \times 16.00 \text{mA} + 4 \text{mA}}{100}$$

- 4.66 **RECORD** TY-1 (TY-AZK1-3) Ideal Output calculated in step 4.65.

Test Engineer: D. G.

- 4.67 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of TY-1 (TY-AZK1-3) at TB-6.

Test Engineer: D. G.

- 4.68 **CALCULATE** the % Deviation, for TY-1 (TY-AZK1-3), from the Ideal output calculated in step 4.65. This deviation should be $\leq 2\%$.

$$\% \text{ Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{mA}] - [\text{Ideal Output (mA)} - 4 \text{mA}]}{\text{Ideal Output (mA)} - 4 \text{mA}} \times 100$$

- 4.69 **RECORD** the % Deviation for TY-1 (TY-AZK1-3) calculated in step 4.68.

Test Engineer: D. G.

- 4.70 **ADJUST** Ventilation Stack Flow to approximately 800 SCFM.

- 4.71 **CALCULATE** percent of full scale (%FS) stack flow using stack flow (SCFM) displayed on FI-1 (FI-AZK1-3) and the following formula:

NOTE - 1100 SCFM represents full scale stack flow.

$$\% \text{FS Stack Flow} = (\text{Displayed SCFM} \div 1100 \text{ SCFM}) \times 100$$

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- 4.72 **RECORD** the value for displayed stack flow and the %FS Stack Flow calculated in step 4.71.

Test Engineer: D.G.

- 4.73 **CALCULATE** Ideal Output of FY-1 (FY-AZK1-3) using %FS calculated in step 4.71 and the following formula:

$$\text{Ideal Output} = (\%FS \text{ Stack Flow} \div 100) \times 16.00 \text{ mA} + 4\text{mA}$$

- 4.74 **RECORD** the Ideal Output calculated in step 4.73.

Test Engineer: D.G.

- 4.75 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-1 (FY-AZK1-3) at TB-6.

Test Engineer: D.G.

- 4.76 **CALCULATE** the percent deviation from the ideal output, calculated in step 4.73. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual \text{ Output (mA)} - 4\text{mA}] - [Ideal \text{ Output (mA)} - 4\text{mA}]}{Ideal \text{ Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.77 **RECORD** %Deviation calculated in step 4.76.

Test Engineer: D.G.

- 4.78 **CALCULATE** Ideal Sample Flow for Record and Beta Samples using %FS Stack Flow calculated in step 4.71 and the following formula:

NOTE - 2 SCFM represents full scale sample flow.

$$\text{Ideal Sample Flow} = \%FS \text{ Stack Flow} \div 100 \times 2.0 \text{ SCFM}$$

- 4.79 **RECORD** the Ideal Sample Flow calculated in step 4.78.

Test Engineer: D.G.

- 4.80 **RECORD** sample flows as indicated on FI-2 (FI-AZK1-2) and FI-3 (FI-AZK1-1).

Test Engineer: D.G.

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- 4.81 **CALCULATE** the % Deviation, for the Record sample flow, from the Ideal Sample flow calculated in step 4.78. This deviation should be $\leq 5\%$.

$$\text{Record Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM} \times 100}{\text{Ideal SCFM}}$$

- 4.82 **RECORD** the Record Sample Flow % Deviation calculated in step 4.81.

Test Engineer: DF

- 4.83 **CALCULATE** the % Deviation, for the Beta sample flow, from the Ideal Sample flow calculated in step 4.78. This deviation should be $\leq 5\%$.

$$\text{Beta Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM} \times 100}{\text{Ideal SCFM}}$$

- 4.84 **RECORD** Beta Sample Flow % Deviations calculated in step 4.83.

Test Engineer: DF

- 4.85 **CALCULATE** the ideal output for FY-2 (FY-AZK1-2) using the displayed sample flow recorded in step 4.80.

$$\text{Channel 2 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.86 **RECORD** the FY-2 (FY-AZK1-2) Ideal Output calculated 4.85.

Test Engineer: DF

- 4.87 **CALCULATE** the ideal output for FY-3 (FY-AZK1-1) using the displayed sample flow recorded in step 4.80.

$$\text{Channel 3 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.88 **RECORD** the FY-3 (FY-AZK1-1) Ideal Output calculated 4.87.

Test Engineer: DF

- 4.89 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-2 (FY-AZK1-2) and FY-3 (FY-AZK1-1) at TB-6.

Test Engineer: DF

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- 4.90 **CALCULATE** the % Deviation from the ideal output for the Record sample flow. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4mA} \times 100$$

- 4.91 **RECORD** % Deviation, for the Record sample flow, from ideal output calculated 4.90.

Test Engineer: D. G.

- 4.92 **CALCULATE** the % Deviation from the ideal output for the Beta sample flow. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4mA} \times 100$$

- 4.93 **RECORD** % Deviation, for the Beta sample flow, from ideal output calculated in step 4.92.

Test Engineer: D. G.

- 4.94 **RECORD** sample manifold vacuum as displayed on PI-5 (PIT-AZK1).

Test Engineer: D. G.

- 4.95 **VERIFY** the value recorded in step 4.94 is within $\pm 5\%$ of the setpoint pressure of 7"-10" Hg.

Test Engineer: D. G.

- 4.96 **CALCULATE** the percent full scale (%FS) stack temperature using stack temperature indicated on TI-1 (TI-AZK1-3).

NOTE - 200°F represents full scale stack temperature.

$$\% FS Stack Temperature = \frac{Displayed ^\circ F \times 100}{200^\circ F}$$

- 4.97 **RECORD** Full stack temperature and %FS Stack Temperature calculated in step 4.96.

Test Engineer: D. G.

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- 4.98 **CALCULATE** the ideal output of TY-1 (TY-AZK1-3) using the %FS Stack Temperature calculated in step 4.96.

$$\text{Ideal Output (mA)} = \frac{\%FS \text{ Stack Temperature} \times 16.00 \text{ mA} + 4 \text{ mA}}{100}$$

- 4.99 **RECORD** TY-1 (TY-AZK1-3) Ideal Output calculated in step 4.98.

Test Engineer: DG

- 4.100 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of TY-1 (TY-AZK1-3) at TB-6.

Test Engineer: DG

- 4.101 **CALCULATE** the % Deviation, for TY-1 (TY-AZK1-3), from the Ideal output calculated in step 4.98. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.102 **RECORD** the % Deviation for TY-1 (TY-AZK1-3) calculated in step 4.101.

Test Engineer: DG

- 4.103 **ADJUST** Ventilation Stack Flow to approximately 1000 SCFM.

- 4.104 **CALCULATE** percent of full scale (%FS) stack flow using stack flow (SCFM) displayed on FI-1 (FI-AZK1-3) and the following formula:

NOTE - 1100 SCFM represents full scale stack flow.

$$\%FS \text{ Stack Flow} = (\text{Displayed SCFM} \div 1100 \text{ SCFM}) \times 100$$

- 4.105 **RECORD** the value for full scale stack flow and the %FS Stack Flow calculated in step 4.104.

Test Engineer: DG

- 4.106 **CALCULATE** Ideal Output of FY-1 (FY-AZK1-3) using %FS calculated in step 4.104 and the following formula:

$$\text{Ideal Output} = (\%FS \text{ Stack Flow} \div 100) \times 16.00 \text{ mA} + 4 \text{ mA}$$

- 4.107 **RECORD** the Ideal Output calculated in step 4.106.

Test Engineer: DG

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- 4.108 USING a Digital Multimeter, MEASURE AND RECORD the output of FY-1 (FY-AZK1-3) at TB-6.

Test Engineer: D.G.

- 4.109 CALCULATE the percent deviation from the ideal output, calculated in step 4.106. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.110 RECORD %Deviation calculated in step 4.109.

Test Engineer: D.G.

- 4.111 CALCULATE Ideal Sample Flow for Record and Beta Samples using %FS Stack Flow calculated in step 4.104 and the following formula:

NOTE - 2 SCFM represents full scale sample flow.

$$\text{Ideal Sample Flow} = \% \text{FS Stack Flow} \div 100 \times 2.0 \text{ SCFM}$$

- 4.112 RECORD the Ideal Sample Flow calculated in step 4.111.

Test Engineer: D.G.

- 4.113 RECORD sample flows as indicated on FI-2 (FI-AZK1-2) and FI-3 (FI-AZK1-1).

Test Engineer: D.G.

- 4.114 CALCULATE the % Deviation, for the Record sample flow, from the Ideal Sample flow calculated in step 4.111. This deviation should be $\leq 5\%$.

$$\text{Record Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

- 4.115 RECORD the Record Sample Flow % Deviation calculated in step 4.114.

Test Engineer: D.G.

- 4.116 CALCULATE the % Deviation, for the Beta sample flow, from the Ideal Sample flow calculated in step 4.111. This deviation should be $\leq 5\%$.

$$\text{Beta Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

- 4.117 RECORD Beta Sample Flow % Deviations calculated in step 4.116.

Test Engineer: D.G.

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- 4.118 **CALCULATE** the ideal output for FY-2 (FY-AZK1-2) using the displayed sample flow recorded in step 4.113.

$$\text{Channel 2 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.119 **RECORD** the FY-2 (FY-AZK1-2) Ideal Output calculated 4.118.

Test Engineer: DF

- 4.120 **CALCULATE** the ideal output for FY-3 (FY-AZK1-1) using the displayed sample flow recorded in step 4.113.

$$\text{Channel 3 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.0 \text{ SCFM}}$$

- 4.121 **RECORD** the FY-3 (FY-AZK1-1) Ideal Output calculated 4.120.

Test Engineer: DF

- 4.122 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of FY-2 (FY-AZK1-2) and FY-3 (FY-AZK1-1).

Test Engineer: DF

- 4.123 **CALCULATE** the % Deviation from the ideal output for the Record sample flow. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4\text{mA}] - [\text{Ideal Output (mA)} - 4\text{mA}]}{\text{Ideal Output (mA)} - 4\text{mA}} \times 100$$

- 4.124 **RECORD** % Deviation, for the Record sample flow, from ideal output calculated 4.123.

Test Engineer: DF

- 4.125 **CALCULATE** the % Deviation from the ideal output for the Beta sample flow. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4\text{mA}] - [\text{Ideal Output (mA)} - 4\text{mA}]}{\text{Ideal Output (mA)} - 4\text{mA}} \times 100$$

- 4.126 **RECORD** % Deviation, for the Beta sample flow, from ideal output calculated in step 4.125.

Test Engineer: DF

- 4.127 **RECORD** sample manifold vacuum as displayed on PI-5 (PIT-AZK1).

Test Engineer: DF

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- 4.128 **VERIFY** the value recorded in step 4.127 is within $\pm 5\%$ of the setpoint pressure of 7"-10" $\frac{3}{4}$ Hg. *3/3/97*

Test Engineer: OG

- 4.129 **CALCULATE** the percent full scale (%FS) stack temperature using stack temperature indicated on TI-1 (TI-AZK1-3).

NOTE - 200°F represents full scale stack temperature.

$$\% \text{ FS Stack Temperature} = \frac{\text{Displayed } ^\circ\text{F} \times 100}{200^\circ\text{F}}$$

- 4.130 **RECORD** Full stack temperature and %FS Stack Temperature calculated in step 4.129.

Test Engineer: OG

- 4.131 **CALCULATE** the ideal output of TY-1 (TY-AZK1-3) using the %FS Stack Temperature calculated in step 4.129.

$$\text{Ideal Output (mA)} = \frac{\% \text{ FS Stack Temperature} \times 16.00 \text{ mA} + 4 \text{ mA}}{100}$$

- 4.132 **RECORD** TY-1 (TY-AZK1-3) Ideal Output calculated in step 4.131.

Test Engineer: OG

- 4.133 **USING** a Digital Multimeter, **MEASURE AND RECORD** the output of TY-1 (TY-AZK1-3) at TB-6.

Test Engineer: OG

- 4.134 **CALCULATE** the % Deviation, for TY-1 (TY-AZK1-3), from the Ideal output calculated in step 4.131. This deviation should be $\leq 2\%$.

$$\% \text{ Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

- 4.135 **RECORD** the % Deviation for TY-1 (TY-AZK1-3) calculated in step 4.134.

Test Engineer: OG

- 4.136 **REMOVE** all Digital Multimeters and reconnect all wiring.

Test Engineer: OG

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5 Beta Monitor

NOTE - Record all data from this section on Appendix E.

5.1 **INSTALL** a known check source into detector head and allow sufficient time for monitor to perform count.

5.2 **CALCULATE** the ideal output for RE-AZK1-1 using the displayed value. 100,000 DPM/Ft³ represents full scale value.

$$\text{Ideal Output (mA)} = \frac{\log \text{Displayed Value} \times 16.00 \text{mA} + 4 \text{mA}}{\log 100,000 \text{ DPM/Ft}^3 \text{ (Full Scale)}}$$

5.3 **RECORD** the ideal output calculated in step 5.2.

Test Engineer: ZAHL

5.4 **USING** a Digital Multimeter, **MEASURE** and **RECORD** the current output of RE-AZK1-1.

Test Engineer: ZAHL

5.5 **CALCULATE** the percent deviation from the ideal output calculated in step 5.2. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{mA}] - [\text{Ideal Output (mA)} - 4 \text{mA}]}{\text{Ideal Output (mA)} - 4 \text{mA}} \times 100$$

5.6 **RECORD** the actual output and the percent deviation calculated in step 5.5.

Test Engineer: ZAHL

5.7 **REPEAT** steps 5.1 through 5.6 for all check sources to be used.

5.8 **REMOVE** Digital Multimeter and reconnect all wiring.

5.9 **CREATE** a failure of the Beta Monitor by installing a jumper from terminal 24 BK to 21 BK on the back of the Beta Monitor.

5.10 **VERIFY** the following events occur:

- The local horn sounds.
- The local amber beacon flashes (both are on top of the instrumentation cabinet).

Test Engineer: ZAHL

5.11 **DEPRESS** the horn acknowledge button HS-AZK1-1B1.

5.12 **VERIFY** the following events occur:

- The horn stops sounding.
- The amber beacon continues to flash.
- The light in HS-AZK1-1B1 is ON.

Test Engineer: ZJA

5.13 **REMOVE** the jumper installed in step 5.9.

5.14 **VERIFY** the amber beacon stops flashing.

Test Engineer: ZJA

5.15 **DEPRESS** acknowledge button HS-AZK1-1B1.

5.16 **VERIFY** horn does not sound and light in HS-AZK1-1B1 is OFF.

Test Engineer: ZJA

5.17 **CREATE** a high radiation condition of the Beta Monitor by installing a jumper between terminal 22 BK and 21 BK on the back of the Beta Monitor.

5.18 **VERIFY** the local bell rings and the local red beacon flashes.

Test Engineer: ZJA

5.19 **DEPRESS** the bell acknowledge button HS-AZK1-1A1.

5.20 **VERIFY** the following events occur:

- The bell stops sounding.
- The red beacon continues to flash.
- The light in HS-AZK1-1A1 is ON.

Test Engineer: ZJA

5.21 **REMOVE** the jumper installed in step 5.17.

5.22 **VERIFY** the red beacon stops flashing.

Test Engineer: ZJA

5.23 **DEPRESS** bell acknowledge button HS-AZK1-1A1.

5.24 **VERIFY** bell does not sound and light in HS-AZK1-1A1 is OFF.

Test Engineer: JOH

5.25 **CREATE** a high stack temperature condition as follows:

5.25.1 **CONNECT** a thermocouple simulator to terminals 9B and 10B on FT-1 (FIT-AZK1-3).

5.25.2 **INPUT** a signal of 119 ohms to simulate a stack temperature of 120°F.

5.26 **VERIFY** that Primary Tank Ventilation System Monitor Sample Flow Control Valve, MV-AZK1-1, closes due to high stack temperature.

Test Engineer: JOH

5.27 **DISCONNECT** the thermocouple simulator from terminals 9B and 10B on FT-1 (FIT-AZK1-3).

5.28 **VERIFY** that Primary Tank Ventilation System Monitor Sample Flow Control Valve, MV-AZK1-1, opens when stack temperature decreases below 110°F.

Test Engineer: JOH

6 Auto Pump Control

6.1 **START** system with Pump #1 in LEAD.

6.2 **VERIFY** Pump #1 is running.

Test Engineer: JOH

6.3 **SIMULATE** a failure of Pump #1 by jumpering terminal TB-3 wire 55YW and terminal PS-2 wire 56YW.

6.4 **REMOVE** jumper after Pump #1 stops.

6.5 **VERIFY** the following events occur:

- "Pump #1 On" light is OFF.
- "Pump Failure" light is ON.
- "Pump #1 in Lead" light is OFF.
- Isolation valves MV-AZK1-4 and MV-AZK1-5 begin to reposition to Pump #2.
- Pump #2 starts, after a time delay of approximately 90 seconds.
- "Pump #2 On" light is ON.

Test Engineer: JOH

6.6 **DEPRESS** the "Pump Swap" pushbutton, HS-AZK111-1B, momentarily.

6.7 **VERIFY** that pump status DOES NOT change.

Test Engineer: D. J.

6.8 **DEPRESS** the Pump "Reset" pushbutton, HS-AZK111-1C, momentarily.

6.9 **VERIFY** the following:

- "Pump Failure" light turns OFF.
- "Pump #1 in Lead" light remains OFF.

Test Engineer: D. J.

6.10 **SIMULATE** a failure of Pump #2 by jumpering terminals PS-2 wires 56YW and 57YW.

6.11 **REMOVE** jumper after Pump #2 stops.

6.12 **VERIFY** the following:

- "Pump #2 On" light is OFF.
- "Pump Failure" light is ON.
- "Pump #1 in Lead" light is ON.
- Isolation valves MV-AZK1-4 and MV-AZK1-5 begin to reposition to Pump #1.
- Pump #1 starts, after a time delay of approximately 90 seconds.
- "Pump #1 On" light is ON.

Test Engineer: D. J.

6.13 **DEPRESS** the "Pump Swap" pushbutton, HS-AZK111-1B, momentarily.

6.14 **VERIFY** that pump status DOES NOT change.

Test Engineer: D. J.

6.15 **DEPRESS** the Pump "Reset" pushbutton, HS-AZK111-1C, momentarily.

6.16 **VERIFY** the following:

- "Pump Failure" light turns OFF.
- "Pump #1 in Lead" light remains ON.

Test Engineer: D. J.

7 **Test for Accuracy, Zero Drift and Calibration Drift.**

7.1 **INSTALL** the Reference Method Apparatus.

NOTE - The Stack monitoring system will be operated for a 168 hour conditioning period, during which it shall be continuously measuring stack flow.

ATTACHMENT 14-PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

- 7.2 **RECORD** the start date and time for the conditioning portion of the test.

Start Date 3/29/97Time 9:05 amTest Engineer: D. J.

- 7.3 **RECORD** the start date and time for the data collection portion of the test.

Start Date 9:05 am D:4
3/31/97Time 9:05 amTest Engineer: D. J.

- 7.4 **DURING** the 168 hour test, take fourteen sets of flow measurements over the seven days, at least one hour apart and at least one set on the last day, using the reference method and the monitoring system.

- 7.5 **DURING** the 168 hour test, stack flow will be varied over the full range of the system. The test will start with stack flow at approximately 400 scfm. 48 hours into the test stack flow will be increased to 800 scfm and 120 hours into the test stack flow will be adjusted to 1000 scfm.

NOTE: Additional data sheets will be provided for this portion of the test.

- 7.6 **COLLECT** Reference Method data using 6-TF-155, Air Flow Test For Tank Farm Stacks and Ducts.

- 7.7 **RECORD** reference method data taken in step 7.6 on Appendix H.

Test Engineer: 7014

- 7.8 **RECORD** monitoring system data taken in step 7.4, 7.5 on Appendix F.

Test Engineer: 7014

- 7.9 **DURING** the 168 hour test, subject the monitoring system to the manufacturers' specified zero and calibration procedures at 24 hour intervals to test for calibration drift and zero drift.

- 7.10 **RECORD** the monitoring system output reading (Volts DC) on Appendix G before and after the adjustments in step 7.9.

Test Engineer: 7014

- 7.11 UPON completion of steps 7.1 through 7.10 THEN PERFORM the following calculations on Appendix F:

- 7.11.1 CALCULATE the mean (average) value of the 14 reference method values (volumetric) using the following equation:

$$\overline{RM} \text{ (mean reference method value)} = \sum RM \div 14$$

where, $\sum RM$ = sum of the individual reference method values.

- 7.11.2 CALCULATE the individual differences between the 14 pairs of reference method values (RM) and the measurement system values (MS) using the following equation:

$$d_i = RM - MS$$

- 7.11.3 CALCULATE the sum of the differences of the 14 pairs calculated in step 7.11.2.

$$\sum_{i=1}^{14} d_i$$

- 7.11.4 CALCULATE the mean value of the differences of the 14 pairs calculated above, using the following equation:

$$\overline{d_i} \text{ (mean difference)} = \sum_{i=1}^{14} d_i \div 14$$

- 7.11.5 CALCULATE the square of each of the 14 values of d_i calculated in step 7.11.2.

- 7.11.6 CALCULATE the sum of the squares of the differences calculated in step 7.11.5.

$$\sum d_i^2$$

- 7.11.7 PERFORM the following calculations for both Zero and Calibration on Appendix G:

- 7.11.8 CALCULATE the individual differences between the 7 pairs of successive readings.

ATTACHMENT 14-PRIMARY VENT TRIN STACK MONITOR TEST PROCEDURE

7.11.9 **CALCULATE** the sum of the differences of the 7 pairs calculated in step 7.11.8.

$$\sum_1^7 d_i^2$$

7.11.10 **CALCULATE** the mean value of the differences for the 7 pairs, using the following equation:

$$\bar{d}_i = \sum d_i \div 7$$

7.11.11 **CALCULATE** the square of each of the 7 values of d_i calculated in step 7.11.8.

7.11.12 **CALCULATE** the sum of the squares of the differences calculated in step 7.11.11.

$$\sum d_i^2$$

- 7.11.13 **CALCULATE** the Relative Accuracy of the measurement system versus the reference method used in the following equation:

$$RA = \frac{|\bar{d}_i| + cc}{\overline{RM}} \times 100$$

$\overline{RM}$ = arithmetic mean of the reference method.

$|\bar{d}_i|$ = the absolute value of the mean difference between the reference method values (volumetric) and the corresponding measurement system values (volumetric)

cc = confidence coefficient.

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{14}}$$

$T_{0.025}$ for 14 = 2.160

$$Sd = \sqrt{\frac{\sum_1^{14} d_i^2 - \frac{\left(\sum_1^{14} d_i\right)^2}{14}}{13}}$$

NOTE - The values of $\overline{RM}$, $\bar{d}_i$, $\sum_1^{14} d_i^2$, and $\sum_1^{14} d_i$ can be found on Appendix F.

- 7.11.14 **RECORD** the values calculated for Sd, cc, and RA in Appendix F.

Test Engineer: ZAN 4/8/97

- 7.11.15 **CALCULATE** the Zero Drift of the measurement system using the following equation:

$$\text{Zero Drift} = \left[\frac{|\bar{d}_i| + cc}{5V} \right] \times 100$$

where,

$|\bar{d}_i|$ =

the absolute value of the mean difference between the 7 pairs of successive readings.

cc =

confidence coefficient

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{7}}$$

$T_{0.025}$ for 7= 2.447

$$Sd = \sqrt{\frac{\sum_1^7 d_i^2 - \frac{\left(\sum_1^7 d_i \right)^2}{7}}{6}}$$

NOTE - The values of $\bar{d}_i$, $\sum_1^7 d_i^2$, and $\sum_1^7 d_i$ can be found on Appendix G.

- 7.11.16 **RECORD** the values calculated for Sd, cc, and Zero Drift on Appendix G.

Test Engineer: ZBA 4/8/95

- 7.11.17 **CALCULATE** the Calibration Drift of the measurement system using the following equation:

$$\text{Calibration Drift} = \left[\frac{|\bar{d}_i| + cc}{5V} \right] \times 100$$

where,
 $|\bar{d}_i|$ = the absolute value of the mean difference between the 7 pairs of successive readings.
 cc = confidence coefficient

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{7}}$$

$T_{0.025}$ for 7= 2.447

$$Sd = \sqrt{\frac{\sum_1^7 d_i^2 - \frac{\left(\sum_1^7 d_i\right)^2}{7}}{6}}$$

NOTE - The values of $\bar{d}_i$, $\sum_1^7 d_i^2$, and $\sum_1^7 d_i$ can be found on Appendix G.

- 7.11.18 **RECORD** the values calculated for Sd, cc, and Calibration Drift on Appendix G.

Test Engineer: 2011 4/8/97

- 7.11.19 **ACCEPTANCE CRITERIA** for Relative Accuracy, Zero Drift, and Calibration Drift are as follows;

- Relative Accuracy <10% of $\overline{RM}$
- Zero Drift <3% of Span
- Calibration Drift <3% of Span

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 14 - PRIMARY VENT TRAIN STACK MONITOR

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8.0 SECURE FROM POTP

- 8.1 **VERIFY** that all temporary test equipment has been removed from the Primary Tank Ventilation System.

Test Engineer: 7A9K

- 8.2 **VERIFY** that all temporary test equipment has been removed from the Primary Tank Ventilation Stack Monitor.

Test Engineer: 7A9K

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

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ATTACHMENT 14-PRIMARY VENT TRIN STACK MONITOR

DATA TRANSFERED From REVISION OC *D.G.*
9/1/97

APPENDIX A - List of Instrumentation Requiring Calibration Verification

Equipment Number	Functional Description	Signature	Date/Time
FIT-AZK1-1	Beta Monitor Sampler Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>T.G. Howell</i>	2/7/97
FIT-AZK1-2	Record Monitor Sampler Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>T.G. Howell</i>	2/7/97
FIT-AZK1-3	Stack Discharge Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>T.G. Howell</i>	2/7/97
PI-AZK1	Sampler Pressure Gauge in Monitor Panel in Stack Monitor Room.	<i>T.G. Howell</i>	2/7/97
RIAS-AZK1-1	Beta Monitor Sampler Radiation Indicator in Stack Monitor Room.	<i>T.G. Howell</i>	2/7/97
			<i>2/2/97 D.G.</i>
			<i>2/5/97 D.G.</i>

ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

DATA TRANSFERRED FROM REVISION OC D.D. 4/11/97

Page 1, Appendix B - Manual Valves Alignment

[illegible]

Performed

By

Verified

Performed By Thomas G. Howell Verified BY G P Hoptons
 PRINT NAME INITIALS DATE PRINT NAME INITIALS DATE
TGH 2/2/97 GH 2/2/97

PRINT NAME _____

INITIALS

DATE _____

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DATE _____

Page 2, Appendix B - Primary Ventilation System Controller Lineup

Inlet Stations Pressure Control Valves

PIC-AZ1K1-1 Controller in Manual with 100% output deviation.
PIC-AZ2K1-1 Controller in Manual with 100% output deviation.
PIC-AY1K1-1 Controller in Manual with 100% output deviation.
PIC-AY2K1-1 Controller in Manual with 100% output deviation.

Flow control Valves

FIC-AZ1K1-2 Controller in Manual with valve bypassed.
FIC-AZ2K1-2 Controller in Manual with valve bypassed.
FIC-AY1K1-2 Controller in Manual with valve bypassed.
FIC-AY2K1-2 Controller in Manual with valve bypassed.

Filter Train Inlet Valves Interlock Setup

MK-AZK1-1A will be in Auto.
MK-AZK1-1B will be in Auto.

Primary Heater Controller set point

TDIC-AZK12-1A 10°F.
TDIC-AZK12-1B 10°F.

Filter Train Setup

Train A will be on line with Train B in Standby.

Primary Exhaust Train Header Pressure Controller

PDIC-AZK1-1A and PDIC-AZK1-1B In Auto with various setpoint to maintain desired flow rate (-4"-30").

Filter Train Outlet Valves Interlock Setup

MK-AZK1-2A and MK-AZK1-2B will be in Auto. The interlock controllers will be in Normal or Override as directed by Test Director.

Primary Exhauster Fan Controller (AZ-K1-5-1A and AZ-K1-5-1B)

Fan "A" will be the lead fan with "B" fan in Standby. The interlock controllers will be in Normal or Override as directed by Test Director.

Primary Sampling System

AZ-K1-11-1 Pump will be in lead with AZ-K1-11-2 in Standby.

Shutdown System:

Take Standby fan and heater out of Standby.
Stop running fan.

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ATTACHMENT 14-PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

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APPENDIX C - MANUAL VALVE CYCLE LIST

[illegible]

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATIC

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ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

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APPENDIX D

STEP	PARAMETER	STACK FLOW			
		400 SCFM	600 SCFM	800 SCFM	1000 SCFM
4.6, 4.39, 4.72, 4.105	FI-1 (FI-AZK1-3) Display (SCFM)	400	600	800	1000
	%Full Scale Stack Flow	36.4	54.5	72.7	90.9
4.8, 4.41, 4.74, 4.107	FY-1 (FI-AZK1-3) Channel 1 Ideal Output (mA)	9.82	12.72	15.63	18.54
4.9, 4.42, 4.75, 4.108	FY-1 (FI-AZK1-3) Channel 1 Actual Output (mA)	9.81	12.72	15.62	18.53
4.11, 4.44, 4.77, 4.110	FYI-1 (FI-AZK1-3) Channel 1 % Deviation ($\leq 2\%$)	0.17	0	0.08	0.07
4.13, 4.46, 4.79, 4.112	Ideal Record and Beta Sample Flow (SCFM)	0.73	1.09	1.45	1.82
4.14, 4.47, 4.80, 4.113	FI-2 (FI-AZK1-2) Display (SCFM)	0.73	1.08	1.48	1.82
	FI-3 (FI-AZK1-1) Display (SCFM)	0.72	1.09	1.48	1.80
4.16, 4.49, 4.82, 4.115	% Deviation Record Sample ($\leq 5\%$)	0	0.92	2.0	0
4.18, 4.51, 4.84, 4.117	% Deviation Beta Sample ($\leq 5\%$)	1.36	0	2.0	1.1
4.20, 4.53, 4.86, 4.119	FY-2 (FY-AZK1-2) Channel 2 Ideal Output (mA)	9.84	12.64	15.84	18.56
4.22, 4.55, 4.88, 4.121	FY-3 (FY-AZK1-1) Channel 3 Ideal Output (mA)	9.84	12.72	15.84	18.40
4.23, 4.56, 4.89, 4.122	FY-2 (FY-AZK1-2) Channel 2 Actual Output (mA)	9.90	12.61	15.87	18.52
	FY-3 (FY-AZK1-1) Channel 3 Actual Output (mA)	9.77	12.76	15.85	18.45
4.25, 4.58, 4.91, 4.124	FY-2 (FY-AZK1-2) Channel 2 % Deviation ($\leq 2\%$)	1.0	0.34	0.25	0.27
4.27, 4.60, 4.93, 4.126	FY-3 (FY-AZK1-1) Channel 3 % Deviation ($\leq 2\%$)	1.2	0.46	0.08	0.35

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APPENDIX D

STEP	PARAMETER	STACK FLOW			
		400 SCFM	600 SCFM	800 SCFM	1000 SCFM
4.28, 4.61, 4.94, 4.127	PI-5 (PIT-AZK1) Sample Manifold Vacuum "Hg	8.5	8.6	8.75	8.51
4.31, 4.64, 4.97, 4.130	TI-1 (TI-AZK1-3) Display (°F)	65	67	66	72
	% Full Scale Stack Temperature	32.5	33.5	33	36
4.33, 4.66, 4.99, 4.132	TY-1 (TY-AZK1-3) Channel 2 Ideal Output (mA)	9.20	9.36	9.28	9.76
4.34, 4.67, 4.100, 4.133	TY-1 (TY-AZK1-3) Channel 2 Actual Output (mA)	9.19	9.30	9.25	9.70
4.36, 4.69, 4.102, 4.135	TY-1 (TY-AZK1-3) Channel 2 % Deviation ($\leq 2\%$)	0.19	1.12	0.57	1.04

APPENDIX E

STEP	PARAMETER	1 ST CHECK SOURCE	2 nd CHECK SOURCE	3 rd CHECK SOURCE	4 th CHECK SOURCE
5.2	Displayed Activity	5/4.79 am	OK		
5.3	V/I-2 Channel 1 Ideal Output (mA)	15.87		14.56	
5.4	RE-AZK1-1 output (mA)	16.06			ONE
5.6	V/I-2 Channel 1 Actual Output (mA)	16.06			
5.6	V/I-2 Channel 1 % Deviation ($\leq 2\%$)	1.575%			SOURCE

Revision No. 1

ATTACHMENT 14

APPENDIX F

TEST FOR ACCURACY

RUN NO.	DATE	TIME	REFERENCE METHOD (SCFM)	MEASUREMENT SYSTEM (SCFM)	DIFFERENCE $d_i = RM - MS$	d_i^2
1	3/31/97	1130	400	407	7	49
2	3/31/97	1240	409	412	3	9
3	4/1/97	0842	377	417	40	1600
4	4/1/97	1113	401	415	14	196
5	4/1/97	1319	405	415	10	100
6	4/3/97	7040500920	711765 774	801	27	729
7	4/3/97	1050	765	800	35	1225
8	4/3/97	1338	760	800	40	1600
9	4/3/97	1450	763	800	37	1369
10	4/4/97	0808	970	1018	48	2304
11	4/4/97	0935	953	1000	47	2209
12	4/4/97	1045	968	1005	37	1369
13	4/4/97	1300	956	1000	44	1936
14	4/7/97	0920	955	1000	45	2025
			$\overline{RM} = 704$			$\sum_{i=1}^{14} d_i = 434$
					$\overline{d_i} = 31$	$\sum_{i=1}^{14} d_i^2 = 16,120$

Sd = _____
 cc = _____
 RA = _____

Revision No. 1A

ATTACHMENT 14

Data Transfer from Rev. 1
7/24/97 4/8/97

APPENDIX G

TEST FOR CALIBRATION DRIFT AND ZERO DRIFT

Run No.	Date	Time	Zero Reading Volts		Difference		Calibration Reading Volts		Difference	
			Before	After	d_i	d_i^2	Before	After	d_i	d_i^2
0	4/1/97			0.000				5.000		
1	4/1/97	0930	0.000	0.000	0	0	4.984	5.000	16	256
2	4/2/97	0830	0.000	0.000	0	0	5.000	5.000	0	0
3	4/3/97	0830	0.000	0.000	0	0	5.016	5.000	16	256
4	4/4/97	1030	0.000	0.000	0	0	5.008	6.000	8	64
5	4/5/97	1340	0.000	0.000	0	0	5.000	5.000	0	0
6	4/6/97	1400	0.000	0.000	0	0	4.960	5.000	40	1600
7	4/7/97	0830	0.000		0	0	5.008		8	64
					$\sum_1^7 d_i = 0$	$\sum_1^7 d_i^2 = 0$			$\sum_1^7 d_i = 88$	$\sum_1^7 d_i^2 = 2240$
					$\bar{d}_i = 0$				$\bar{d}_i = 12.5\%$	

Sd: 0cc: 0Zero Drift: 0Sd: 13cc: 12.65Calibration Drift: 0.5%HNF-SD-W030-TD-002,
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APPENDIX H

241-AZ-702 BLDG EXHAUST STACK SITE-SPECIFIC DATA

GENERAL INFORMATION

Exhaust Duct:	10" dia. exhaust duct leading to 55' stack.
Flow Test Ports:	FTPs F & G; 3/4" cplng w/plug approx. 8'-0" (above floor).
Scaffolding:	None required.
Exhaust Fans:	AZ-K1-5-1A and AZ-K1-5-1B; 1000 CFM @ 50 °F (each)
HEPA Filter:	Two trains, 2 filters each (in series): AZ-K1-4-1A & AZ-K1-4-2A and AZ-K1-4-1B & AZ-K1-4-2B; see H-2-131271 & H-2-131076.

REFERENCES

Include the following references if requested by Air Balance (AB), Operations (NPO), or Tank Farm Power Operator (OP) personnel:

H-2-131076, P & ID Primary Tank Vent.

TO-060-350, Start, Stop and Operate AY/AZ Primary Exhaust System.

PRECAUTIONS & LIMITATIONS

No additional precautions & limitations. See 6-TF-155, Section 4.0.

PREREQUISITES

Effluent Engineer will complete calculations on Data Sheet 5 for each air flow measurement.

Note: Data shown in this appendix is that collected for flow-test #14 as required by par. 7.4 - 7.7, and includes the summary results for all 14 tests. Test data for #1-13 is located in the field work package, #2E-96-287.

J Clifton 8/22/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION SY
Revision 1 HNF-SD-W030-POTP-002
ATTACHMENT 14-PRIMARY VENT TRAIN STACK MONITOR TES

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APPENDIX H, DATA SHEET 1

STEP 7.1	INSTRUMENT CALIBRATION DATA	
7.1.1	AIR FLOW INSTRUMENT	HYGROMETER
	Flow Instrument Type <i>MICRO</i>	Equipment Number <i>#5</i>
	WHS� Code Number <i>702-28-09-018</i>	WHS� Code Number <i>799-32-03-003</i>
	WHS� Cal Due Date <i>8-2-97</i>	WHS� Cal Due Date <i>8-13-97</i>
		WHC Cal Due Date <i>N/A</i>
7.1.2	ADDITIONAL INSTRUMENT CALIBRATION DATA	
	COMMENTS:	

Any supporting Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

Initials/Date *R 3-31-97*

APPENDIX H, DATA SHEET 1

STEP 7.1	INSTRUMENT CALIBRATION DATA	
7.1.1	AIR FLOW INSTRUMENT	HYGROMETER
	Flow Instrument Type <u>MICRO</u>	Equipment Number <u>#3</u>
	WHS� Code Number <u>702-28-09-018</u>	WHS� Code Number <u>779-32-01-002</u>
	WHS� Cal Due Date <u>8-2-97</u>	WHS� Cal Due Date <u>12-6-97</u>
		WHC Cal Due Date <u>N/A</u>
7.1.2	ADDITIONAL INSTRUMENT CALIBRATION DATA	
	COMMENTS: _____	
	_____ _____ _____ _____ _____	

Any supporting Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

Initials/Date R 5/3/97

PREOPERATIONAL TESTING, PRIMARY TANK VENTILATION

Revision 1

HNF-SD-W030-POTP-002

ATTACHMENT 14 - PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE
APPENDIX H, DATA SHEET 2

STEP 7.2	BAROMETRIC PRESSURE READING				
7.2.1	Hanford Weather Forecaster (373-2716)				
7.2.2 7.2.3	Location	Station Number	Elevation (ft)	Time of Reading	Barometric Pressure (in. Hg)
	200 East	6	680	0830	29.34 (P)
COMMENTS:					
STEP 7.3	INSTALLED INSTRUMENT READINGS				
7.3.1	Operating exh fan:		AZ-K1-5-1A	AZ-K1-5-1B	
7.3.2	Instrument		Location		Reading
	Stack Flow Indicator FI-AZ-K1-3		241-AZ-271 Graphics Screen 18PriMon.v		1000 (FI-1) (SCPM)
7.3.3	Instrument calibration sticker current?			☒ YES	NO
	Instrument in proper working condition?			☒ YES	NO
	COMMENTS:				
STEP 7.4	PRE-TEST PRESSURE LEAK CHECK				
7.4.3 7.4.6	[Reading $\geq$ 3.0 in. wg and stable ($\pm$ 0.2 in. wg) for 15 sec.]			☒ PASS	FAIL
	Impact Pressure ☒ Static Pressure ☒			COMMENTS:	

Any supporting Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

Initials/Date
4-7-97

ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR TEST PROCEDURE

241-AZ-702 BLDG VENT	
MEASUREMENT	TEST PORT
Humidity	F.
Static Pressure	F.
Temperature	F, G
Velocity Pressure	F, G
Stack Diameter:	10 in.
Stack Area:	0.5454 sq ft
Port Elevation	670'-10"

Figure 1. 241-AY/AZ Tank Exhaust Stack Air Flow Test Ports.

APPENDIX H, DATA SHEET 3 (Sheet 1 of 2)

STEP 7.5	STACK AIR FLOW MEASUREMENTS					
	TEST PORT F					
	Relative Humidity:		16.5 (RH)		RETEST (IF REQUIRED)	
	Static Pressure:		.32" w.g. (P _s)		(P _s)	
	Traverse Points* (in.)	Temp.	Velocity		Velocity	
		ts (°F)	VP (in. wg)	FPM** (ft/min)	VP (in. wg)	FPM** (ft/min)
7.5.2	1/2	77	.19	1746		
	1/2	77	.19	1746		
	7/8	77	.20	1791		
7.5.3	1 1/4	77	.21	1835		
	1 3/4	77	.21	1835		
7.5.4	2 1/4	77	.22	1879		
	2 7/8	77	.22	1879		
7.5.5	3 3/4	77	.22	1879		
	6 1/4	77	.23	1921		
7.5.6	7 1/8	77	.22	1879		
	7 3/4	77	.22	1879		
	8 1/4	77	.21	1835		
	8 3/4	77	.20	1791		
	9 1/8	77	.19	1746		
	9 1/2	77	.17	1651		
	9 1/2	77	.17	1651		
	TOTAL ts	1232	TOTAL FPM	28943	TOTAL FPM	

* Traverse points are measured relative to internal diameter (i.d.); none may be located within 0.5 in. of stack walls.

** $FPM = 4005 \sqrt{VP}$

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

Time test completed: 0915

Initials/Date 2/4

4-7-97

APPENDIX H, DATA SHEET 3 (Sheet 2 of 2)

STEP 7.5	STACK AIR FLOW MEASUREMENTS					
7.5.2	TEST PORT G					
	AIR FLOW MEASUREMENTS (CONTINUED)			RETEST (IF REQUIRED)		
	Traverse Points* (in.)	Temp.	Velocity		Velocity	
		ts (°F)	VP (in. wg)	FPM** (ft/min)	VP (in. wg)	FPM** (ft/min)
	1/2	77	.20	1791		
	1/2	77	.20	1791		
	7/8	77	.21	1835		
	1 1/4	77	.22	1879		
	1 3/4	77	.22	1879		
	2 1/4	77	.22	1879		
	2 7/8	77	.22	1879		
	3 3/4	77	.22	1879		
	6 1/4	77	.22	1879		
	7 1/8	77	.22	1879		
	7 3/4	77	.21	1835		
	8 1/4	77	.20	1791		
	8 3/4	77	.19	1746		
	9 1/8	77	.16	1602		
	9 1/2	77	.18	1699		
	9 1/2	77	.18 (VP1)	1699	(VP1)	
	TOTAL ts	1232	TOTAL FPM	28942	TOTAL FPM	

* Traverse points are measured relative to internal diameter (i.d.); none may be located within 0.5 in. of stack walls.

** $FPM = 4005 \sqrt{VP}$

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

Time test completed: 0920

Initials/Date me

4-7-97

APPENDIX H, DATA SHEET 4

STEP 7.6		PITOT TUBE PERFORMANCE CHECK	
		(PASS = $P \leq \pm 5\%$; FAIL = $P > \pm 5\%$)	PASS/FAIL
7.6.1	$P = \left[\left(\frac{.18}{VP1} - \frac{.16}{VP2} \right) \div \frac{.18}{VP1} \right] \times 100 = \underline{0} \%$		
7.6.3	IF $P > \pm 5\%$ AND $VP1 < 0.04$ in. wg, air flow retest is NOT required;		
7.6.4	COG Engineer will determine acceptability of pitot tube performance.		
		COMMENTS: _____	

STEP 7.7		POST-TEST PRESSURE LEAK CHECK	
		[Reading ≥ 3.0 in. wg and stable (± 0.2 in. wg) for 15 sec.]	PASS/FAIL
		Impact Pressure ☒ Static Pressure ☒	
7.7.1	COMMENTS: _____		
7.7.2	_____		

STEP 7.9		STACK AIR FLOW CALCULATIONS	
7.9.1	Total ts = ts1 + ts2 + ts3 + ...	Total Port F	1232 (Sht 3)
		Total Port G	1232 (Sht 3)
		ts(total) (F + G)	2464
7.9.2	Average ts = Total ts $\div$ 32	ts(avg)	77
7.9.3	Velocity (FPM) = $4005 \sqrt{VP}$	Data Sheet 3	
7.9.4	Total FPM = FPM1 + FPM2 + FPM3 + ...	Total Port F	28943 (Sht 3)
		Total Port G	28942 (Sht 3)
		FPM(total) (F + G)	57885
7.9.5	Average FPM = Total FPM $\div$ 32	fpm(avg)	1809
7.9.6	Total CFM = Average FPM $\times$ 0.5454 sq ft	cfm(total)	987

Any supporting Data sheets are to be appended to this data sheet.
Step numbers correspond to 6-TF-155.

Initials/Date sc
4-7-97

DATA SHEET 5 (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW CALCULATION WORKSHEET

AVERAGE ACTUAL STACK GAS VELOCITY (v_s)

$$v_s = K_p C_p (\sqrt{VP})_{avg} \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

AVERAGE STACK GAS DRY VOLUMETRIC FLOW RATE (Q_{sd})

$$Q_{sd} = 60 (1 - B_{ws}) v_s A \left(\frac{T_{std}}{T_{s(avg)}} \right) \left(\frac{P_s}{P_{std}} \right)$$

$$= 60 (1 - B_{ws}) K_p C_p (\sqrt{VP})_{avg} A \left(\frac{T_{std}}{P_{std}} \right) \sqrt{\frac{P_s}{T_{s(avg)} M_s}}$$

Eq. Input	Description	Value
B_{ws}	Stack gas water vapor: $B_{ws} = \left(\frac{RH}{100} \right) \left(\frac{P_{ws}}{P_s} \right)$	4.005
RH	Stack relative humidity, percent	16.5% (Sht 3)
P_{ws}	Vapor pressure of H ₂ O at temperature $t_{s(avg)}$	4.93587
K_p	Pitot tube constant: $85.49 \frac{ft}{sec} \left[\frac{(lb) (in. Hg)}{(lb-mole) ^\circ R (in. H_2O)} \right]^{\frac{1}{2}}$	85.49
C_p	Pitot tube coefficient, standard	0.99
$(\sqrt{VP})_{avg}$	Average of velocity pressure sqrt, in. wg: $(\sqrt{VP})_{avg} = fpm_{(avg)} \div 4005$	4.4517
$fpm_{(avg)}$	Average stack gas velocity, ft/min	1809 (Sht 4)
A	Cross-sectional stack area, ft ²	0.5454
T_{std}	Standard absolute temperature, °R	528

PREOPERATIONAL TEST 3, PRIMARY TANK VENTILATION
 Revision 1 HNF-SD-W030-POTP-002
 ATTACHMENT 14 -PRIMARY VENT TRIN STACK MONITOR

HNF-SD-W030-TD-002,
 REV. 0, PAGE 173

DATA SHEET 5 (Sheet 2 of 2)

COGNIZANT ENGINEER AIR FLOW CALCULATION WORKSHEET

P_{std}	Standard absolute pressure, in. Hg	29.92
P_s	Absolute stack gas pressure, in. Hg: $P_s = P_b + (P_g \div 13.6)$	29.36
P_b	Barometric pressure at test port, in. Hg	29.34 (Shr 2)
P_g	Stack static pressure, in. wg	4.32 (Shr 3)
$T_{s(avg)}$	Average absolute stack temperature, °R $T_{s(avg)} = 460 + t_{s(avg)}$	537
$t_{s(avg)}$	Average stack gas temperature, °F	77 (Shr 4)
M_s	Molecular weight stack gas, wet, lb/lb-mole: $M_s = 29(1 - B_{ws}) + 18B_{ws}$	28.94

CALCULATION (Q_{std})

$$60(1 - 0.005) \frac{85.49(444)}{4005} \frac{1809(45454)}{4005} \left[\frac{528}{29.92} \right] \sqrt{\frac{29.36}{537(28.94)}}$$

$$= 954.5$$

$Q_{std} = 955 \text{ dscfm}$

FI = 1000

937 CFM

COG Engr Initials/Date: One

4-7-97

APPENDIX H, DATA SHEET 6

STEP	DISPOSITION
10.1 10.2	Vent & Balance Reviewer shall ensure Data Sheets are accurate, complete, and legible. <u>Steven V. Carroll</u> <u>[Signature]</u> <u>4-7-97</u> V&B Review (print name) Signature Date
10.3	Facility Person-In-Charge (PIC) shall ensure all caps, plugs, and instrumentation have been restored to original configuration and record Work Request Number of items requiring additional maintenance: System configuration restored: <u>[Signature]</u> <u>4/7/97</u> Facility PIC Date <u>N/A</u> <u>N/A</u> <u>N/A</u> Work Request Number Work Request Number Date
10.5 10.6	Facility PIC forward work package to Environmental for effluent and emissions calculations (Env. Engr. sign when complete & return work package to Planner): <u>Gary Carroll</u> <u>[Signature]</u> <u>4-7-97</u> Env. Engr. (print name) Signature Date
COMMENTS:	

Any supporting Data sheets are to be appended to this data sheet.

Step numbers correspond to 6-TF-155.

PREOPERATIONAL TEST G, PRIMARY TANK VENTILATION

Revision 1

HNF-SD-W030-POTP-002

ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR

HNF-SD-W030-TD-002,
REV. 0, PAGE 175

Effluent Engineering Worksheet (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS

RUN	DATE	TIME	Q_{ad}	D_i	$(D_i)^2$
1	3-31-97	1139	400	7	49
2	3-31-97	1305	409	3	9
3	4-1-97	0842	377	40	1600
4	4-1-97	1113	401	14	196
5	4-1-97	1319	405	10	100
6	4-3-97	0920	774	27	729
7	4-3-97	1050	765	35	1225
8	4-3-97	1328	760	40	1600
9	4-3-97	1450	763	37	1369
10	4-4-97	0808	970	48	2304
11	4-4-97	0935	953	47	2209
12	4-4-97	1045	968	37	1369
13	4-4-97	1300	956	44	1936
14	4-7-97	0920	955	45	2025
SUM = RUN1 + RUN2 + ...			9856 (ΣQ_{ad})	434 (ΣD_i)	16,720 ($\Sigma (D_i)^2$)
AVG = SUM ÷ 14			704 ($\bar{Q}_{ad}$)	31 ($\bar{D}_i$)	

COG Engr Initials/Date: Gene

4-7-97

PREOPERATIONAL TEST 3, PRIMARY TANK VENTILATION
Revision 1 HNF-SD-W030-POTP-002
ATTACHMENT 14 -PRIMARY VENT TRAIN STACK MONITOR

HNF-SD-W030-TD-002,
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Effluent Engineering Worksheet (Sheet 2 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS

95% CONFIDENCE COEFFICIENT (CC)

$$CC = 2.160 \sqrt{\frac{\sum(D_i)^2 - \frac{(\sum D_i)^2}{14}}{13 \times 14}}$$

Eq. Input	Description	Value
$\sum(D_i)^2$	Sum of 14 squared flow rate differences	16720
$\sum D_i$	Sum of 14 flow rate differences	434

CALCULATION(CC)

$$CC = 2.160 \sqrt{\frac{16,720 - (434)^2/14}{13 \times 14}} = 9.15$$

CC = 9.15

PERCENT RELATIVE ACCURACY (RA)

$$RA = \left[\frac{|D_i| + CC}{\overline{Q}_{sd}} \right] \times 100$$

$ D_i $	Absolute average flow rate difference	31
$\overline{Q}_{sd}$	Average reference flow rate	704

CALCULATION (RA)

$$RA = \left(\frac{31 + 9.15}{704} \right) 100 = 5.7$$

RA = 5.7 %

168-HOUR AIR FLOW TEST RESULTS

PASS = RA ≤ 10% FAIL = RA > 10%

PASS/FAIL

ATTACHMENT 16

TEST LOG

TEST NUMBER:

TEST LOG

PAGE NUMBER:

of

TEST TITLE:

TIME/DATE

EVENT DESCRIPTION/SIGNATURE

4/17/97 1330

Performing Macro Testing in Attachment 13,
Steps 1.1 thru 1.4. There is no "Pumps off"
selection on screen ^{0044/1/97} ~~is present~~ ^{at 17:25} ~~exists~~.
The heaters also come on with the Fan on startup
and turn off on shutdown.

ATTACHMENT 17

TEST EXCEPTION REPORT			
TEST PROCEDURE NO. & SECTION:		TEST NAME:	T.E. NUMBER:
DESCRIPTION OF PROBLEM:			
ORIGINATOR:		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☐ CONTINUE	
ORG:	DATE:	TE:	DATE
DISPOSITION:			
DISPOSITION AND RETEST REQUIREMENTS BY:		DISPOSITION ACTIONS COMPLETE:	
DATE		Verified By: DATE	
QAE CONCURRENCE WITH DISPOSITION (if required):		RETEST COMPLETE:	
DATE		TE DATE	

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-002, Section 5.0,
NOTE

TEST NAME: Preoperational
Testing, Primary Tank
Ventilation Systems

T.E. NUMBER: W030-TE-012

DESCRIPTION OF PROBLEM: The Note at the beginning of Section 5.0 states that Steps 5.1 and 5.2 must be performed prior to performance of any other steps. This note contains a typo due to rearrangement of the sequence of attachments prior to issuance of the procedure. The note should state that steps. 5.1 and 5.5 be performed prior to any other steps to insure protective interlocks and damper operation are tested before operating any other components in the system.

ORIGINATOR:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

Thomas G Howell 9/12/96
ORG: DATE:

D. P. J. 9/16/96
PIC DATE

DISPOSITION:

Change the note at the beginning of Section 5.0 to read as follows: Steps 5.1 and 5.5 must be performed before any other sections of this procedure.

DISPOSITION AND RETEST REQUIREMENTS BY:

DISPOSITION ACTIONS COMPLETE:

none
Thomas G Howell 9/12/96
DATE

Verified Dennis B Cole 9/12/96
By: DATE

QAE CONCURRENCE WITH DISPOSITION (if required):

RETEST COMPLETE:

Hank M. Chapin 9/12/96
DATE

PIC DATE

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-002, Attachment 1
and 5.

TEST NAME: Preoperational
Testing, Primary Tank
Ventilation Systems

T.E. NUMBER: W030-TE-013

DESCRIPTION OF PROBLEM: An additional signal must be simulated to satisfy the logics to allow testing of damper response to high differential signals from the HEPA and HEGA differential pressure instruments. The logic must receive a feedback signal from the opposite train heater before it will allow the dampers to respond (train switchover).

ORIGINATOR:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

ORG: Thomas B Howell DATE: 9/12/96

PIC: [Signature] DATE: 9/16/96

DISPOSITION:

Add the following steps to Attachments 1 and 5:

Attachment 1:

2.2.17.1 Simulate a feedback signal from ACT Train B heater AZ-K1-2-1B to indicate the Train B heater in service.

2.2.52 Remove simulated signal from ACT Train B heater AZ-K1-2-1B.

Attachment 5:

2.2.17.1 Simulate a feedback signal from ACT Train A heater AZ-K1-2-1A to indicate the Train B heater in service.

2.2.52 Remove simulated signal from ACT Train A heater AZ-K1-2-1A.

DISPOSITION AND RETEST REQUIREMENTS BY:

DISPOSITION ACTIONS COMPLETE:

None

Thomas B Howell DATE: 9/12/96

Verified By: Dennis B Cole DATE: 9/12/96

QA CONCURRENCE WITH DISPOSITION (if required):

RETEST COMPLETE:

Hank M. Chapin DATE: 9/12/96

PIC: _____ DATE: _____

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-002, attachment 14

TEST NAME: Preoperational
testing, Primary Tank
Ventilation System

T.E. NUMBER: W030-TE-015

DESCRIPTION OF PROBLEM: Expected value in POTP-002, attachment 14, steps 4.29, 4.62, 4.95 and 4.128 is incorrect. This value is the value the vendor set the system to operate at during the factory acceptance test. The vendor states that any value between 7" Hg and 10" Hg is acceptable as the value varies based upon actual field conditions.

ORIGINATOR:

Doug Loh 3/17/97
ORG: DATE:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

D.B. Cole 3/25/97
PIC DATE

DISPOSITION: Change expected value to read 7" - 10" Hg $\pm$ 5%.

DISPOSITION AND RETEST REQUIREMENTS BY:

NONE

Doug Loh 3/17/97
DATE

DISPOSITION ACTIONS COMPLETE:

Verified D.B. Cole 3/18/97
By: DATE

QAE CONCURRENCE WITH DISPOSITION (if required):

Hank M. Chafin 3/18/97
DATE

RETEST COMPLETE: N/A

PIC DATE

**AIR MONITOR
CORPORATION****FAX TRANSMISSION**

Date: March 24, 1997

No. of Pages: 1

(includes this page)

TO: Mr. Paul Zylinski Hanford Site	FROM: Scott Minaker Mechanical Engineer Air Monitor Corporation P.O. Box 6358 Santa Rosa, CA 95406
Fax: (509) 373-3404 Phone:	Fax: 707-526-2825 Phone: 707-544-2706

REMARKS: ☐ URGENT ☒ FOR YOUR REVIEW ☐ PLEASE COMMENTRE: System manifold Vacuum Parameters
AMC W.O. 25255

Dear Mr. Zylinski, the design operating range of the manifold Vacuum for the above referenced project is 5 IN-HG to 10 IN-HG. Between these ranges the pump will pull the required sample and still be operating on the pump curve.

If you have any questions, do not hesitate to give me a call.

Best Regards,

Air Monitor Corp.

Scott Minaker

Project Coordinator/Mechanical Engineer

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-002, Rev.0C.

TEST NAME: Preoperational
Testing, Primary Tank
Ventilation Systems

T.E. NUMBER: W030-TE-017

DESCRIPTION OF PROBLEM: Wording needs to be added to provide flexibility for performance of sections or subsections in other than the written sequence.

ORIGINATOR:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☐ CONTINUE

Doug Clark 3/25/97
ORG: DATE:

D.P. J. 3/25/97
PIC DATE

DISPOSITION: Add the following wording to section 5.0 of the test procedure. " Once Step 5.1 and 5.5 are complete, then sections or steps within sections of the procedure (except for initial conditions) may be performed out of sequence under direction and authority of the Test Engineer with concurrence of the Test Director."

DISPOSITION AND RETEST REQUIREMENTS BY:

NONE

DISPOSITION ACTIONS COMPLETE:

Doug Clark 3/25/97
DATE

Verified D.B. Cole 3/25/97
By: DATE

QA CONCURRENCE WITH DISPOSITION (if required):

RETEST COMPLETE: N/A

Frank M. Chafin 3/25/97
DATE

PIC DATE

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-002, Rev.1A

TEST NAME: Preoperational
Testing, Primary Tank
Ventilation Systems

T.E. NUMBER: W030-TE-018

DESCRIPTION OF PROBLEM: During testing on POTP-002 micron module RCMDR-10 failed and a commercial module had to be qualified to safety class 2 to replace the failed module. The attached procedure documents the dedication of the replacement module.

ORIGINATOR:

Doug Stork 5/9/97
ORG: DATE:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

W. L. G. 5/12/97
PIC DATE

DISPOSITION: Replace module per attached procedure and continue testing.

DISPOSITION AND RETEST REQUIREMENTS BY:

NONE

Doug Stork 5/9/97
DATE

DISPOSITION ACTIONS COMPLETE:

Verified Dennis B. Cole 5/12/97
By: DATE

QAE CONCURRENCE WITH DISPOSITION (if required):

Frank M. Chapin 5-12-97
DATE

RETEST COMPLETE:

W. L. G. 5/12/97
PIC DATE

Commercial Dedication for DR10 Module

1.0 Install Module

1.1 Install the module in the RCM. Clear the memory during installation by pressing the "push-to-activate" switch for 5 sec during and immediately following insertion.

1.2 Perform a device definition on the module to register it with the control system.

1.3 Download the operating program.

1.4 Test individual channels per the following sections, which may be performed in any order.

2.0 Verify Input Channel 31.

2.1 Examine graphic display i030001a.v. Verify that both XS_RCM_D7_1 and XS_RCM_D7_2 are "High", indicating that controller 7 has not failed.

2.2 From screen 28KeepAl.v, switch controller RCMD 7 keep-alive to OFF. On graphic y001a.v, verify that both the above tags change to "Low", indicating that controller 7 has failed.

2.3 Turn RCMD 7 keep-alive back ON.

Signoff

Date

3.0 Test AZ-K1-2A Keep Alive Circuit

3.1 Pull fuse TB01-4.

3.2 In TB-LCU1-2C, install a temporary jumper between TB01-89 & 90.

3.3 In TB-LCU1-2C, lift lead at TB01-86 on the side going to the MICON.

3.4 Re-Install fuse TB01-4.

3.5 From the OCS, verify valve AZ-K1-2A can be both OPEN'ed and CLOSE'ed. Leave valve in OPEN position.

3.6 From OCS screen 29KeepAl.v, turn OFF the Keep Alive for module RCMDR 9. Verify valve K1-2A closes automatically.

3.7 Try to OPEN K1-2A from the OCS, and verify it will not open.

3.8 Turn the Keep Alive for RCMDR_9 back to ON.

Signoff

Date

3.9 Pull fuse TB01-4.

3.10 In TB-LCU1-2C, remove the temporary jumper between TB01-89 & 90.

3.11 In TB-LCU1-2C, re-land the lifted lead at TB01-86.

3.12 Re-install fuse TB01-4.

Signoff

Date

4.0 Test remaining Output Channels

4.1 Channels 10-11: From the OCS, START Fan AZ-K15-1A. After it has run for about 30 sec, STOP the fan. Verify fan start/stops as commanded.

L F Hill
Signoff

5/6/97
Date

4.2 Channels 20-23: From the OCS, OPEN Dampers MK-702-K2-6A and -6B. After they have been open for about 30 sec, CLOSE them. Verify dampers open/close as commanded.

L F Hill
Signoff

5/6/97
Date

4.3 Channels 24-27: From the OCS, OPEN Dampers MK-702-K2-7A and -7B. After they have been open for about 30 sec, CLOSE them. Verify dampers open/close as commanded.

L F Hill
Signoff

5/7/97
Date

4.4 Channel 32: From OCS screen 28KeepAl.v, switch the Fieldbus for RCMDR 10 to OFF. Verify Fieldbus alarm for RCMDR-10 trips after about 16 sec. Turn the Fieldbus monitoring back to ON and verify the alarm clears.

L F Hill
Signoff

5/6/97
Date

5.0 Module dedication complete

L F Hill
Signoff

5/7/97
Date

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-W030-POTP-002, Rev.1A

TEST NAME: Preoperational Testing, Primary Tank Ventilation Systems

T.E. NUMBER: W030-TE-019

DESCRIPTION OF PROBLEM: During testing micon module RCMD-28 failed and another module had to be qualified to safety class 3 to replace the failed module. The attached procedure documents the dedication of the replacement module.

ORIGINATOR:

Doug Larkin 7/8/97
ORG: DATE:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

L. Matting 7/8/97
PIC DATE:

DISPOSITION: Replace module per attached procedure and continue testing.

DISPOSITION AND RETEST REQUIREMENTS BY: N/A

Doug Larkin 7/8/97
DATE

DISPOSITION ACTIONS COMPLETE:

Verified D.B. Cole 7/8/97
By: DATE

QAE CONCURRENCE WITH DISPOSITION (if required): N/A ^{HMAC} 7/8/97

Hank M. Chupin 7-8-97
DATE

RETEST COMPLETE:

L. Matting 7/8/97
PIC DATE

Commercial Dedication for D28 Module

1.0 Install Module

1.1 Install the module in the RCM. Clear the memory during installation by pressing the "push-to-activate" switch for 5 sec during and immediately following insertion.

1.2 Perform a device definition on the module to register it with the control system.

1.3 Download the operating program.

2.0 Verify Input Channels (may be performed in any order)

2.1 In cabinet TB-LCU3-3C, for each pair of input terminals identified below, open (by lifting one of the wires) and short the input and verify the indicated status for each state on the OCS screen. Re-land wires.

Terminals	Tag	Open	Closed	Signoff
TB01-1,2	RAH AZ K19 1	HIGH	NORMAL	<i>L. Hill</i>
TB01-4,5	RAX AZ K19 1	FAILURE	NORMAL	<i>L. Hill</i>
TB01-13,14	LDA AY 1102 1	LEAK	NORMAL	<i>L. Hill</i>
TB01-16,17	LDA AZ2102 1	LEAK	NORMAL	<i>L. Hill</i>
TB01-19,20	LDA V0608 1	LEAK	NORMAL	<i>L. Hill</i>
TB01-22,23	LDA AZ 503 1	LEAK	NORMAL	<i>L. Hill</i>
TB01-25,26	LDA AZ 702 1	LEAK	NORMAL	<i>L. Hill</i>
TB01-28,29	LDA 702 2A	LEAK	NORMAL	<i>L. Hill</i>
TB01-31,32	LDA 702 2B	LEAK	NORMAL	<i>L. Hill</i>
TB01-34,35	FAL AZ R1 4	LOW	NORMAL	<i>L. Hill</i>
TB01-46,47	YS AZ CWR 1	OFF	ON	<i>L. Hill</i>
TB01-49,50	XA AZ CWR 1	NORMAL	FAULT	<i>L. Hill</i>
TB01-58,59	LAL AZ CWTk 1	LOW	NORMAL	<i>L. Hill</i>
TB01-73,74	LAH AZ PCSP 1	HIGH	NORMAL	<i>L. Hill</i>
TB01-76,77	LAL AZ PCSP 1	LOW	NORMAL	<i>L. Hill</i>

2.2 Turn off Power Supply for JAX3 and verify FAULT alarm. *L. Hill*

2.3 Operate HS AZ CWP-1A1 between LOCAL and REMOTE and verify proper indication on screen 14Chillr.v.

L. Hill
Signoff

7/8/97
Date

2.4 Operate HS AZ CWP-1B1 between LOCAL and REMOTE and verify proper indication on screen 14Chillr.v.

L. Hill
Signoff

7/8/97
Date

3.0 Module dedication complete

L. Hill
Signoff

7/8/97
Date

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION:

HNF-SD-W030-POTP-002,
Revision 1A; section 2, and
Attachment 13.

TEST NAME:

W030 Pre-
Operational Test Procedure
Primary Vent System Test

T.E. NUMBER:

TE-022

DESCRIPTION OF PROBLEM:

Procedure errors:

(a) Par. 2.1.1, last bullet calls for test of encasement leak detection, but such a test is not found.

(b) Test Log (Att. 16) describes error in Attachment 13 (page 108), par. 1.3; procedure states "SELECT pumps off" but such an option is not available.

TEST ENGINEER:

Doug Hahn 10/2/97
ORG: DATE:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION X CONTINUE

[Signature] 10/2/97
PIC DATE

DISPOSITION (Completed by Test Engineer):

- Par. 2.1.1; delete last bullet (encasement leak detection). This is a typo error, the procedure was not intended to test leak detection.
- Attachment 13, page 108, par. 1.3; delete phrase "SELECT pumps OFF". Procedure writer misinterpreted graphic screen. (Note: errors noted in testing and described in Test Log, attachment 16).

DISPOSITION AND RETEST REQUIREMENTS BY:

NO RE TEST

Doug Hahn 10/2/97
TEST ENGINEER DATE

DISPOSITION ACTIONS COMPLETE:

[Signature] 10/2/97
TEST DIRECTOR DATE

OAE CONCURRENCE WITH DISPOSITION (if required):

Frank M. Chafin 10-2-97
QA ENGINEER DATE

RETEST COMPLETE:

N/A
TEST DIRECTOR DATE

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: HNF-SD-W030-POTP-002, Rev. 1A; Attachments 2 & 6, par. 2.1.17 and Exhibit A.		TEST NAME: W030 Pre- Operational Test Procedure Primary Vent System Test.	T.E. NUMBER: TE-023
DESCRIPTION OF PROBLEM: Fan-B vibration results unacceptable. See Mark Jennings memo of June 3, 1997, attached.			
TEST ENGINEER: MD GERKEN 10/2/97 <i>Doug Gerken</i>		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION X CONTINUE <i>R. Muthing</i> 10/9/97 PIC DATE	
DISPOSITION (Completed by Test Engineer): Place on long-term punchlist - Implement vibration consultant recommendations, i.e. repair anchor bolts at fan-support-structure as determined by Engineering. Retest not required for closure.			
DISPOSITION AND RETEST REQUIREMENTS BY: <i>Doug Gerken</i> 10/9/97 TEST ENGINEER DATE No RETEST		DISPOSITION ACTIONS COMPLETE: <i>R. Muthing</i> 10/9/97 TEST DIRECTOR DATE	
QAE CONCURRENCE WITH DISPOSITION (if required): <i>Mark M. Chapin</i> 10-9-97 QA ENGINEER DATE		RETEST COMPLETE: N/A TEST DIRECTOR DATE	

FROM: M.JENNINGS
TO: G.HOWEL
DATE: 3 JUNE 97

cc; S.PIERCE, H.FOX, E.STAPLES, G.HOPKINS, D.COLE

SUBJ: W030 PRIMARY VENTILATION FAN VIBRATION DATA

ALL DATA WAS COLLECTED USING AN SKF, MODEL CMVA10 VIBRATION ANALYZER/DATA COLLECTOR, HANFORD CALIBRATION NUMBER 752-84-02-001, CALIBRATION DUE DATE 5 DEC 97.

THE VALUES ASSOCIATED WITH THE 702-AZ PRIMARY EXHAUST FANS ARE RECORDED AS A "PEAK VELOCITY" IN INCHES PER SECOND (IPS) THE OVERALL (OA) VALUE SHOWS THE MEAN OF THE ENTIRE VIBRATION SPECTRUM FROM 0 TO 12000 CYCLES PER MINUT (CPM). THE X1 VALUES INDICATE THE SPECTRAL PEAK AT 1 TIMES THE EQUIPMENTS RUN SPEED. X1 IS ALSO REFERRED TO AS THE EQUIPMENTS FUNDAMENTAL FREQUENCY.

AZ702-K1-5-1A

15 APR 97 DATA AT 100% SPEED (3630 CPM FAN SHAFT, 1770 CPM MOTOR SHAFT)

	VERTICAL	HORIZONTAL
#1	.260 OA, .228 X1	.169 OA, .113 X1
#2	.274 OA, .255 X1	.231 OA, .132 X1
#3	.240 OA, .115 X1	N/A
#4	.143 OA, .039 X1	N/A

24 APR 97 DATA AT VARIABLE SPEEDS (ALL READINGS AT #3 VERTICAL, FOR COMPARISON ONLY)

% SPEED, CPM	VERTICAL READING
15%, 510	.018 OA, .007 X1
20%, 720	.014 OA, .005 X1
25%, 930	.041 OA, .032 X1
30%, 1110	.072 OA, .063 X1
35%, 1290	.136 OA, .118 X1
40%, 1500	.119 OA, .113 X1
45%, 1680	.102 OA, .043 X1
50%, 1860	.092 OA, .075 X1
55%, 2040	.056 OA, .023 X1
60%, 2220	.183 OA, .177 X1
65%, 2430	.077 OA, .059 X1
70%, 2610	.150 OA, .090 X1
75%, 2790	.291 OA, .265 X1
80%, 2970	.185 OA, .168 X1

85%, 3150	.205 OA, .164 X1
90%, 3360	.210 OA, .145 X1
95%, 3540	.260 OA, .206 X1
100%, 3630	.257 OA, .104 X1

AZ702-K1-5-1B

15 APR 97 DATA AT 100% SPEED (3630 CPM FAN SHAFT, 1770 CPM MOTOR SHAFT)

	VERTICAL	HORIZONTAL
#1	.152 OA, .027 X1	.130 OA, .046 X1
#2	.139 OA, .020 X1	.149 OA, .036 X1
#3	.267 OA, .259 X1	N/A
#4	.117 OA, .105 X1	N/A

24 APR 97 DATA AT VARIABLE SPEEDS (ALL READINGS AT #3 VERTICAL, FOR COMPARISON ONLY)

% SPEED, CPM	VERTICAL READING
15%, 510	.020 OA, .006 X1
20%, 720	.019 OA, .007 X1
25%, 930	.061 OA, .055 X1
30%, 1110	.039 OA, .031 X1
35%, 1290	.043 OA, .017 X1
40%, 1500	.078 OA, .051 X1
45%, 1680	.072 OA, .051 X1
50%, 1860	.125 OA, .120 X1
55%, 2040	.441 OA, .403 X1
60%, 2220	.350 OA, .309 X1
65%, 2430	.166 OA, .155 X1
70%, 2610	.312 OA, .302 X1
75%, 2790	.228 OA, .210 X1
80%, 2970	.257 OA, .240 X1
85%, 3150	.187 OA, .163 X1
90%, 3360	.191 OA, .183 X1
95%, 3540	.287 OA, .274 X1
100%, 3630	.271 OA, .161 X1

1. ALL DATA, PEAK VELOCITY IPS.

2. BEARING DESIGNATOR;

- 1 MOTOR SHAFT, OPEN END
- 2 MOTOR SHAFT, SHEAVE END
- 3 FAN SHAFT, SHEAVE END
- 4 FAN SHAFT, FAN END

3. CONVERSION FROM PEAK VELOCITY TO PEAK TO PEAK DISPLACEMENT;

VELOCITY (IPS) = .00005236 * DISPLACEMENT (MILS) * RPM

4. N509 ACCEPTANCE DISPLACEMENT/VELOCITY CONVERSIONS;

600 RPM, 3.2 MILS = .1005 IPS
720 RPM, 2.7 MILS = .1017 IPS
900 RPM, 2.1 MILS = .0989 IPS
1200 RPM, 1.6 MILS = .1005 IPS
1800 RPM, 1.1 MILS = .1036 IPS
3600 RPM, 0.5 MILS = .0942 IPS

FOR THE PURPOSE OF N509 ACCEPTANCE, A MAXIMUM VALUE OF .1
IPS PEAK AT X1 THROUGHOUT THE RPM RANGE IS USED.

THE ABOVE 100% VALUES WERE OBTAINED ON 15 APR 97 AND THE VARIABLE
SPEED VALUES ON 24 APR 97.

THE ABOVE VALUES FOR THESE FANS AT 100% SPEED DO NOT MEET THE
CRITERIA OF ASME N509 NOR DOES IT MATCH THE DATA PROVIDED BY THE
FAN MANUFACTURER, AMERICAN FAN COMPANY (AFC).

AFC PROVIDED DOCUMENTATION THAT SHOWS THE FAN SHAFT BEARING
VIBRATION (MOTOR DATA WAS NOT PROVIDED) AT >.5 MILS DISPLACEMENT
(PEAK TO PEAK) AT 3600 RPM AFTER FABRICATION AND PRIOR TO
SHIPMENT TO EXHAUST TRAIN MANUFACTURER, ELLIS AND WATTS. THE
HIGHEST VALUES DOCUMENTED BY AFC WERE .48 AND .49 MILS. THERE IS
NO INDICATION THAT THE DATA WAS FILTERED (X1), UNFILTERED (OA) OR
THAT THE FANS WERE RUN AT SPEEDS OTHER THAN 3600 RPM.

BOTH OF THESE FANS SHOW A RESONANCE CONDITION WITH RESONANCE
PEAKS OCCURRING AT;

TRAIN A 35, 60 AND 75% MAXIMUM SPEED

TRAIN B 25, 55 AND 70% MAXIMUM SPEED

LEVELS RECORDED ON TRAIN "A" INDICATE THE FAN SHAFT/WHEEL
ASSEMBLY MAY HAVE A BETTER BALANCE THEN "B". THE TRAIN "A" MOTOR
SHOWS A SERIOUS BALANCE PROBLEM OR A PROBLEM CENTERED AROUND THE
EFFECTS OF THE VARIABLE FREQUENCY DRIVE ON THE MOTOR.

THE 35 AND 60% PEAKS ASSOCIATED WITH TRAIN "A" ARE INTERESTING
BUT NOT A SERIOUS SAFETY OR RELIABILITY CONCERN. THE 75% PEAK IS
SIGNIFICANT TO THE FUTURE RELIABILITY OF THE UNIT.

THE 25% PEAK ASSOCIATED WITH TRAIN "B", AGAIN, IS INTERESTING BUT NOT A SERIOUS CONCERN. THE 55% PEAK SHOULD BE CONSIDERED A SAFETY ISSUE. THE 70% PEAK IS SIGNIFICANT TO FUTURE RELIABILITY.

THE SOURCE OF THE RESONANCE HAS NOT BEEN DETERMINED. PROBABLE SOURCES INCLUDE THE ENTIRE EXHAUST TRAIN STRUCTURE (FAN, FILTER HOUSING, SUPPORTING STRUCTURE, ECT...), THE FAN HOUSING/MOUNTING STRUCTURE AND/OR THE FAN SHAFT/WHEEL ASSEMBLY.

TO DETERMINE THE SOURCE, I NEED TO PERFORM WHAT IS COMMONLY REFERRED TO AS A BUMP TEST. THIS IS A VERY SIMPLE TEST THAT CAN DETERMINE THE NATURAL FREQUENCY OF THE STRUCTURES. ONCE THIS IS COMPLETED, SPECIFIC RECOMMENDATIONS CAN BE PROVIDED.

IF YOU HAVE ANY QUESTIONS, PLEASE GIVE A CALL, 373-9035.

MARK M. JENNINGS
MAINTENANCE CONCEPTS

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: HNH-SD-W030-POTP-002, Rev. 2A; Att. 3, par. 2.1.29, Att. 7, par. 2.1.20, 2.1.22, 2.2.22, 2.2.24.		TEST NAME: W030 Pre- Operational Test Procedure Primary Vent System Test	T.E. NUMBER: TE-026
DESCRIPTION OF PROBLEM: Noted procedure sections describe expected temperatures (degrees F) at which high-temperature alarms occur downstream of filter-train duct heater. Actual recorded alarm levels were less than expected, as follows:			
ATT.	Par.	Expected temp.	Actual recorded temp.
3	2.1.29	>175	175
7	2.1.20	>220	220
7	2.1.22	>230	230
7	2.2.22	>220	220
7	2.2.24	>230	230
TEST ENGINEER: MD GERKEN <i>Doug L. Gerken</i> 10/21/97 ORG: DATE:		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION X CONTINUE <i>R. Gutierrez</i> 10/21/97 PIC DATE	
DISPOSITION (Completed by Test Engineer): Accept as-is. MCS is currently set to trip the alarm at the lower temperature limit, which is acceptable. The trip point can be easily changed if needed.			
DISPOSITION AND RETEST REQUIREMENTS BY: <i>Doug L. Gerken</i> 10/21/97 TEST ENGINEER DATE		DISPOSITION ACTIONS COMPLETE: <i>R. Gutierrez</i> 10/21/97 TEST DIRECTOR DATE	
QA CONCURRENCE WITH DISPOSITION (if required): * PER 10-21-97 N/A <i>Hank M. Chapin</i> 10-21-97 QA ENGINEER DATE		RETEST COMPLETE: N/A TEST DIRECTOR DATE	

TEST EXCEPTION REPORT			
TEST PROCEDURE NO. & SECTION: HNF-SD-W030-POTP-002, Rev. 2A; Att. 13, par. 2.3, 3.3.		TEST NAME: W030 Pre- Operational Test Procedure Primary Vent System Test	
		T.E. NUMBER: TE-027	
DESCRIPTION OF PROBLEM: Noted procedure sections require recording of operating data and alarm levels (with time delay) for a list of selected parameters. One item did not exist and three of these alarms did not occur as follows:			
Item	Paragraph	Parameter	
1.	3.3	Inlet manifold temperature	TI-AZK12-1A
2.	2.3, 3.3	Heater exit temperature	TI-AZK12-2A, 2B (does not exist)
3.	3.3	Filter exit temperature	TI-AZK12-3A
TEST ENGINEER: MD GERKEN 10/23/97 <i>Doug Loh</i>		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION X CONTINUE <i>R. Muttoning</i> 10/27/97 PIC DATE	
DISPOSITION (Completed by Test Engineer):			
Accept as-is.			
Item #1 : No alarm would be expected since this parameter is not affected by loss of system air flow.			
Item #2 : Delete from list; instrument was deleted from design by ECN-W030-250; copy is attached (page 1 only).			
Item #3 : Procedure error. The parameter would not be expected to alarm in this condition; it only alarms for over-temperature condition which does not occur with loss of system air flow and heater.			
DISPOSITION AND RETEST REQUIREMENTS BY:		DISPOSITION ACTIONS COMPLETE:	
TEST ENGINEER <i>Doug Loh</i> 10/27/97 DATE		TEST DIRECTOR <i>R. Muttoning</i> 10/27/97 DATE	
QA CONCURRENCE WITH DISPOSITION (if required):		RETEST COMPLETE: N/A	
QA ENGINEER <i>Hank M. Chafin</i> 10/27/97 DATE		TEST DIRECTOR DATE	

ENGINEERING CHANGE NOTICE				1. ECN <u>636496</u>
2. ECN Category (mark one) ☐ Supplemental ☐ Direct Revision ☐ Change ECN ☐ Temporary ☐ Standby ☐ Supersede ☐ Cancel/Void		3. Originator's Name, Organization, MSIN, and Telephone No. MA Friedrich, TWRS, G3-14 376-7408		4. USQ Required? ☐ Yes ☒ No <i>444 9/16/96</i>
		5. Date 9-5-96		
		6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W-030/CR1132		
		7. Bldg./Sys./Fac. No. 241-AV/AZ		
		8. Approval Designator /SC-2		
		9. Document Numbers Changed by this ECN (includes sheet no. and rev.) See Block 13a		
		10. Related ECN No(s). W-030-113		
		11. Related PO No. NA		
12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)		12b. Work Package No. NA		
		12c. Modification Work Complete NA		
		12d. Restored to Original Condition (Temp. or Standby ECN only) NA		
		Design Authority/Cog. Engineer Signature & Date		
		Design Authority/Cog. Engineer Signature & Date		
13a. Description of Change <u>H-2-131076 SH 1, Rev 1</u> 1. Revise as shown on page 3 <u>H-2-131309 SH 1, Rev 0</u> 1. Revise as shown on page 4 <u>H-2-131309 SH 2, Rev 0</u> 1. Revise as shown on page 5 <u>H-2-131309 SH 3, Rev 0</u> 1. Revise as shown on page 6 <u>H-2-131309 SH 4, Rev 0</u> 1. Revise as shown on page 7		13b. Design Baseline Document? ☒ Yes ☐ No <div style="text-align: right;">SC-2</div>		
14a. Justification (mark one) Criteria Change ☐ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const ☒ Const. Error/Omission ☐ Design Error/Omission ☐				
14b. Justification Details Inaccurate temperature readings are due to element placement. Functions and alarms that were dependent upon TI-AZK12-2A and TI-AZK12-2B readings can be accommodated by other temperature indicators.				
15. Distribution (include name, MSIN, and no. of copies)				
<u>ICF KH DISTRIBUTION</u> Const Doc Cntl S2-53		H. M. Chafin R3-25 F. T. Clifton R3-25 D. B. Cole R3-25 K. A. Colosi R3-25 S. R. Pierce S5-05 DOE/C. Pacheco S7-54		
<u>WHC DISTRIBUTION</u> S. R. Briggs R3-25		<div style="border: 1px solid black; padding: 5px;"> <div style="text-align: center;">RELEASE STAMP</div> <div style="display: flex; justify-content: space-between;"> <div> 9/16/96 DATE: STA: 33 </div> <div style="text-align: center;"> <div>HANFORD RELEASE</div> </div> <div> ID: 79 </div> </div> </div>		

ATTACHMENT 18

TEST EXCEPTION LOG				
TE#	DATE	DESCRIPTION	DISPOSITIONED	DATE CLOSED
	SEE	TEST REPORT, ATTACHMENT-3.		
			JTC	

ATTACHMENT 19 - FILTERS AND TEMPORARY CONNECTIONS

ATTACHMENT 19

- 1.1 At each of the four Inlet stations, HEPA filters and pre-filters installed. Aerosol testing is required.
- 1.2 In Primary Vent Trains A/B, second-stage HEPA filter installed; In first stage HEPA positions, suitable temporary plywood blanks as needed to simulate a partly-loaded HEPA, and these blanks may be modified during testing. Aerosol testing not required.
- 1.3 Temporary plenum box (dimensions 4'X 4'X 8') installed to simulate the volume of each tank, with suitable flexible hoses connected to each Recirc Vent system and inlet station according to instructions previously established. Each box shall have an open-ended 6-inch isolation damper for simulation of tank in-leakage; each shall be initially closed.
- 1.4 Only HEPA-filtered air may be induced into the system from inside the farm. Thus, a portable HEPA filter is to be connected to the plenum box at tank AY-101 at its 6-inch open-ended damper; others are to be closed and sealed for this test. Initial testing assumes in-leakage is zero.
- 1.5 VERIFY that all components involved in the test are "blue-tagged" to prevent disturbance by non-test personnel.

ATTACHMENT 3

MISCELLANEOUS SUPPORTING DATA

CERTIFIED VENDOR INFORMATION (CVI)

Major equipment CVI is filed as follows:

EQUIPMENT	CVI FILE NO. (22525-)	VENDOR NAME
Air Cleanup Trains	113	Ellis & Watts
Air Inlet Stations	90,91,92,98	Ionex
HEME	24,50,99	CECO
Condenser	26	Oregon Iron
Stack Monitor/Sampler	27,28,63	Air Monitor Corp.
Flow inst. (Mastron)	27,101	Air Monitor Corp.
Flow-Control Valves	21	Valtek/Limitorque

MASTER TEST EXCEPTION NUMBER LIST

HNF-SD-W030-TD-002,
REV. 0, PAGE 203

TEST EXCEPTION NO.	TEST EXCEPTION DESCRIPTION	TEST DOCUMENT AFFECTED	DATE ISSUED	DATE CLOSED
W030-001	Temperature transmitters	CGA-5	4-1-96	7/1/96
W030-002	Temperature sensors	CGA-6	4-1-96	7/1/96
W030-003	Level Elements not per ECN120	CGA-2	4-3-96	7/1/96
W030-004	Leak Detector TMACS I/F	CGA-8	4-3-96	7/30/96
W030-005	Current transmitter ranges	CGA-3,4,5,7	4-17-96	8/12/96
W030-006	Verification of calibration appendices for att A,B,C&D	POTP-003	5-14-96	5-16-96
W030-007	Verification of calibration appendices for att A	POTP-004	5-31-96	6-6-96
W030-008	Instruments that do not require loop testing	CGA-3	6-6-96	6-6-96
W030-009	Seal Pot low level alarm test method	POTP-005	7/12/96	7-16-96
W030-010	Add steps to Section 3.0 in Attachments 1,2,3&4 of POTP-001 to test damper position alarms	POTP-001	8/22/96	8/22/96
W030-011	Section 6.0 of Attachment 1,2,3&4 will not work as written. Delete Section 6.0	POTP-001	8/26/96	8/26/96
W030-012	Correct typo in note at beginning of Section 5.0.	POTP-002	9/5/96	9/16/96
W030-013	Add simulation of additional signal in Attachments 1&2 for damper testing	POTP-002	9/5/95	9/16/96
W030-014	Delete steps 2.2.6 through 2.2.8 in Attachment G.	POTP-007	11/26/96	11/26/96
W030-015	Change expected value in attachment 14, steps 4.29, 4.62, 4.95 and 4.128 to read 7" to 10" Hg.	POTP-002	3/13/97	3/25/97
W030-016	Change expected value in ECN 613163 attachment C and F step 2.9 and 2.11 should be 2.0" wc and 2.5" wc respectively. Attachment H step 2.3.1 expected value should be -1.5" wc.	POTP-007	3/25/97	3/25/97
W030-017	Revise procedure to provide testing flexibility.	POTP-002	3/25/97	3/25/97
W030-018	Modification to qualify non safety class module to safety class 2 to replace failed module.	POTP-002	5/09/97	5/12/97

MASTER TEST EXCEPTION NUMBER LIST

HNF-SD-W030-TD-002,
REV. 0, PAGE 204

TEST EXCEPTION NO.	TEST EXCEPTION DESCRIPTION	TEST DOCUMENT AFFECTED	DATE ISSUED	DATE CLOSED
W030-019	Modification to qualify module safety class 3 to replace failed module.	POTP-002	7/8/97	7/8/97
W030-020	Procedure change to switch from flow control to pressure control.	POTP-007	9/26/97	9/26/97
W030-021	With bldg AC off low flow alarm is received.	POTP-007	9/26/97	9/26/97
W030-022	Correct procedure errors.	POTP-002	10/02/97	10/02/97
W030-023	Primary Fans vibration results unacceptable.	POTP-002	10/02/97	10/09/97
W030-024	Delete procedure section in favor of temperature calculation.	POTP-007	10/21/97	10/21/97
W030-025	Changed requirement for purge air on fan shaft seals.	POTP-001	10/21/97	10/21/97
W030-026	Changed acceptance criteria for hi-temp alarms on filter train.	POTP-002	10/21/97	10/21/97
W030-027	Deleted filter train temperature transmitters from alarm table.	POTP-002	10/23/97	10/27/97
W030-028				
W030-029				
W030-030				
W030-031				
W030-032				
W030-033				
W030-034				
W030-035				
W030-036				
W030-037				
W030-038				
W030-039				
W030-040				

ENGINEERING CHANGE NOTICE

Page 1 of 24
am 10/18/96

1. ECN No 622257

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. T.G. HOWELL, NHC, R3-25, 372-2786	4. USQ Required? ☐ Yes ☒ No	5. Date 10-16-96	
	6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W030/CR112	7. Bldg./Sys./Fac. No. 241-AY/AZ	8. Approval Designator SQ	
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-W030-POTP-002, REV. 0	10. Related ECN No(s). W-030-250	11. Related PO No. NA	

12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. NA	12c. Modification Work Complete NA Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date
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13a. Description of Change
 Changed test method in procedure Attachments 3 and 7 to incorporate a design change to the system.

13b. Design Baseline Document? ☐ Yes ☒ No

14a. Justification (mark one)

Criteria Change ☐ Design Improvement ☒ Environmental ☐ Facility Deactivation ☐
 As-Found ☐ Facilitate Const ☐ Const. Error/Omission ☐ Design Error/Omission ☐

14b. Justification Details

A temperature element was removed from each Primary Vent filter train. Functions and alarms were transferred to other temperature elements. Procedure change was needed to reflect this change in instrumentation.

15. Distribution (include name, MSIN, and no. of copies)

D.B. Cole R3-25 one copy T.G. Howell R3-25 one copy
 H.M. Chafin R3-25 one copy S.R. Pierce S5-05 one copy
 K.A. Colosi R3-25 one copy

Central Files A3-88 (1)

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DATE:	STA: 4		
OCT 18 1996		ID:	

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 193218

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. T.G. HOWELL, NHC, R3-25, 372- 2786	4. USQ Required? ☐ Yes ☒ No	5. Date 10-30-96
	6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W030/CR112	7. Bldg./Sys./Fac. No. 241-AY/AZ	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-W030-POTP-002, REV. 0	10. Related ECN No(s). W-030-250	11. Related PO No. NA

12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. NA	12c. Modification Work Complete NA Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condi- tion (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date
---	---------------------------------------	---	--

13a. Description of Change
Correct test method in procedure Attachments 3 and 7 and insert steps for testing of additional functions. This ECN incorporates the changes made in ECN 622257.

13b. Design Baseline Document? ☐ Yes ☒ No

14a. Justification (mark one)

Criteria Change ☒	Design Improvement ☐	Environmental ☐	Facility Deactivation ☐
As-Found ☐	Facilitate Const. ☐	Const. Error/Omission ☐	Design Error/Omission ☐

14b. Justification Details
Original steps 2.2.35 - 2.2.43 in Attachments 3 & 7 were incorrect in method and redundant testing. These steps were removed and additional steps were added to test high temperature heater lockout functions and the normal start sequence for placing a filter train in service.

15. Distribution (include name, MSIN, and no. of copies) D.B. Cole R3-25 one copy T.G. Howell R3-25 one copy H.M. Chafin R3-25 one copy S.R. Pierce S5-05 one copy K.A. Colosi R3-25 one copy <i>Central Files A3-880</i>	<p>RELEASE STAMP</p> <p>DATE: <i>NOV 01 1996</i></p> <p>STA: <i>[Signature]</i></p> <p>RELEASE</p> <p>NOV 01 1996</p>
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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 613162

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary Standby ☐ Supersedure ☐ Cancel/Void ☐		3. Originator's Name, Organization, MSIN, and Telephone No. T.G. HOWELL, NHC, R3-25, 372-2786		4. USQ Required? ☐ Yes ☒ No		5. Date 2/6/97	
		6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W030/CR112		7. Bldg./Sys./Fac. No. 241-AY/AZ		8. Approval Designator SQ	
		9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-W030-POTP-002, REV. 03		10. Related ECN No(s). NA		11. Related PO No. NA	
12a. Modification Work ☐ Yes (fill) out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)		12b. Work Package No. NA		12c. Modification Work Complete NA Design Authority/Cog. Engineer Signature & Date		12d. Restored to Original Condition (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date	
13a. Description of Change Correct component labels used in text. Added step numbers to Appendix D of Attachment 14. Rearranged steps to start exhaust fan earlier in test sequence.				13b. Design Baseline Document? ☐ Yes ☒ No			
14a. Justification (mark one) Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const ☐ Const. Error/Omission ☐ Design Error/Omission ☐							
14b. Justification Details The procedure was developed prior to completion of component labeling in the field and on drawings. Labeling in text was changed to reflect current labeling on drawings and in the field. Step numbers were added to Appendix D and the valve alignment needed changing based on equipment currently out of service.							
15. Distribution (include name, MSIN, and no. of copies) D.B. Cole R3-25 one copy T.G. Howell R3-25 one copy H.M. Chafin R3-25 one copy S.R. Pierce S5-05 one copy K.A. Colosi R3-25 one copy G.P. Hopkins S5-03 STA 34 G3-11						RELEASE STAMP DATE 4 FEB 6 7 1997 3	

ENGINEERING CHANGE NOTICE

1. ECN 640742

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Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. T.G. HOWELL, NHC, R3-25, 372-2786	4. USQ Required? ☐ Yes ☒ No	5. Date 03/26/97
	6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W030/CR112	7. Bldg./Sys./Fac. No. 241-AY/AZ	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-W030-POTP-002, REV. 0	10. Related ECN No(s). NA	11. Related PO No. NA

12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. NA	12c. Modification Work Complete NA Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date
---	-----------------------------	--	--

13a. Description of Change
Changed Attachments 2&6 to incorporate test method for logic changes to fan switchover on low flow. Changed Attachment 14 to reflect setpoint changes from vendor, correct typographical errors, and change method of simulation of sample pump failure.

13b. Design Baseline Document? ☐ Yes ☒ No

14a. Justification (mark one)

Criteria Change ☒	Design Improvement ☐	Environmental ☐	Facility Deactivation ☐
As-Found ☐	Facilitate Const ☐	Const. Error/Omission ☐	Design Error/Omission ☐

14b. Justification Details
Logic changes were made to prevent both fans from being disabled on a single instrument failure. We received information from the stack sampler vendor that the vacuum range for acceptable operation was 5-10" Hg. These changes have been reflected in this revision along with corrections of typo's and notes to clarify testing methods.

15. Distribution (include name, MSIN, and no. of copies)

D.B. Cole R3-25 one copy T.G. Howell R3-25 one copy
H.M. Chafin R3-25 one copy S.R. Pierce S5-05 one copy
K.A. Colosi R3-25 one copy G.P. Hopkins S5-03

per files 63-11

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DATE *4* *27* *1997*

STA *4*

27

ENGINEERING CHANGE NOTICE

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1. ECN 840744

Proj. ECN NA

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. T.G. HOWELL, NHC, R3-25, 372-2786 6. Project Title/No./Work Order No. Tank Farm Ventilation Upgrade W030/CR112	4. USQ Required? ☐ Yes ☒ No 7. Bldg./Sys./Fac. No. 241-AY/AZ	5. Date 04-02-97 8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-W030-POTP-002, REV. 1	10. Related ECN No(s). W-030-250	11. Related PO No. NA

12a. Modification Work ☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. NA	12c. Modification Work Complete NA Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date
---	-----------------------------	--	--

13a. Description of Change..... 13b. Design Baseline Document? ☐ Yes ☒ No
 Revision OB changes were inadvertently dropped out of Revision 1. This ECN will restore those changes to the procedure and corrects typos in Attachment 14, pages 22, 29, 30 and 31.

14a. Justification (mark one)
 Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐
 As-Found ☐ Facilitate Const ☐ Const. Error/Omission ☐ Design Error/Omission ☐

14b. Justification Details
 Original steps 2.2.35 - 2.2.43 in Attachments 3 & 7 were incorrect in method and redundant testing. These steps were removed and additional steps were added to test high temperature heater lockout functions and the normal start sequence for placing a filter train in service.

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 H.M. Chafin R3-25 one copy S.R. Pierce S5-05 one copy
 K.A. Colosi R3-25 one copy

proj. files 63-11

RELEASE STAMP	
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2833 Symmes
Fairfield, Ohio 45014
Pho. (513) 874-2400
Fax: (513) 870-5577

HNF-SD-W030-TD-002,
REV. 0, PAGE 211

ELLIS & WATTS
BATAVIA, OH 45103

DOCUMENT NO. K0564VFD-TEST REVISION 0 (12/20/94)

ISSUE NO. _____

TITLE: TEST PROCEDURE FOR VARIABLE FREQUENCY DRIVE & MOTOR

PREPARED BY:

Bill T. Brungs
Bill T. Brungs

12/22/94

ENGINEERING
APPROVAL:

R.D. Porco
R.D. Porco

12/22/94

Q.A. APPROVAL:

R.R. Schertler
R.R. Schertler

12/28/94

DATE

CONTROLLED

DOCUMENT NO. K0564VFD-TEST

PAGE 1

REV.	PAGE	CHANGE RECORD	PREP. BY	ENG. APPVL	Q.A. APPVL
0	All	Original document released.	(See	cover	sheet)
<p style="text-align: right;">HNF-SD-W030-TD-002, REV. 0, PAGE 212</p>					
<p>ELLIS & WATTS BATAVIA, OHIO 45103</p>			<p>SIZE A</p>	<p>CAGE CODE 98437</p>	
<p>TEST PROCEDURE FOR VARIABLE FREQ. DRIVE & MOTOR</p>			<p>DOCUMENT NO. K0564VFD-TEST</p>		<p>PAGE 2</p>
					<p>REV. 0</p>

TABLE OF CONTENTS

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REV. 0, PAGE 213

TEST PROCEDURE FOR VARIABLE FREQUENCY DRIVE & MOTOR 4

TEST REPORT FOR VARIABLE FREQUENCY DRIVE & MOTOR:

K0564VFD.REP END OF DOCUMENT

ELLIS & WATTS BATAVIA, OHIO 45103	SIZE A	CAGE CODE 98437		
	DOCUMENT NO.		PAGE	REV.
TEST PROCEDURE FOR VARIABLE FREQ. DRIVE & MOTOR	K0564VFD-TEST		3	0

TEST PROCEDURE FOR VARIABLE FREQUENCY DRI

HNF-SD-W030-TD-002,
REV. 0, PAGE 214

1. Visually inspect the variable frequency drive for any damage. As always this includes the enclosure, panel mounted components, and printed circuit boards.
2. Confirm all input and output wiring to the drive. Check for proper wire terminations and screw/lug tightness. Certify that the drive and the motor have proper ground connections.
3. Before applying power to the drive, use a VOM to check for any potential short circuit conditions to ground on L1, L2, L3, as well as T1, T2, T3. Check all fuses for a non-blown condition.
4. Place the motor disconnect switch located on the ACT unit to the ON position, and the HAND-OFF-AUTO switch in the OFF position.
5. Turn the speed potentiometer to '0'.
6. Place the circuit breaker located on the drive to the ON position. The green POWER light on the drive door should illuminate. The red RUN light should also illuminate. If it does not, and the amber VFD FAIL light is illuminated, press the VFD RESET pushbutton. The VFD FAIL light should go out, and the RUN light should illuminate.
7. Place the LOCAL-REMOTE selector switch located on the drive door to the LOCAL position.
8. Place the HAND-OFF-AUTO switch in the HAND position.
9. With the drive in a "run" state, gradually turn the speed potentiometer to the 25 % of full speed position. Using a calibrated tachometer, measure the speed of the motor and fan shafts. Record these values on the test report.
10. Repeat Step 9 for speed potentiometer positions of 50, 75, and 100 percents of full speed.
11. While the motor is being driven at 50 % of full speed, depress the EMERGENCY OFF pushbutton and ensure that the motor comes to a complete stop.
12. The VFD FAIL light should illuminate, and the RUN light should go out.
13. Press the VFD RESET pushbutton. The VFD FAIL light should go out, the RUN light should illuminate, and the drive should reengage the motor.

ELLIS & WATTS BATAVIA, OHIO 45103	SIZE A	CAGE CODE 98437	
	DOCUMENT NO. K0564VFD-TEST	PAGE 4	REV. 0
TEST PROCEDURE FOR VARIABLE FREQ. DRIVE & MOTOR			

TEST REPORT FOR VARIABLE FREQUENCY DRIVE & MOTOR: K0564VFD.REP

1. Visual inspection of the variable frequency drive, per Step 1 of test procedure K0564VFD-TEST.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

2. Confirmation of input and output wiring to the drive, per Step 2 of test procedure K0564VFD-TEST.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

3. Check for any potential short circuit conditions to ground, per Step 3 of test procedure K0564VFD-TEST.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

4. Verification of initial power up of the drive, per Step 6 of test procedure K0564VFD-TEST.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

5. Record of measured speeds, per Step 9 of test procedure K0564VFD-TEST.

POTENTIOMETER SETTING

MOTOR SPEED

FAN SPEED

25%

522

1059

50%

972

1973

75%

1414

2865

100%

1945

3932

12-29-94

Note: These values are for information only. Actual speeds may vary depending on load conditions.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

6. Testing of the EMERGENCY STOP pushbutton, per Steps 11-13 of test procedure K0564VFD-TEST.

Comply YES

Witnessed By:

12-29-94

MEBY EW 017K

Sta 2 Cgo 12-29-94 7837 TECH

ELLIS & WATTS BATAVIA, OHIO 45103	SIZE A	CAGE CODE 98437	
	REPORT NO.		PAGE
TEST REPORT FOR VARIABLE FREQ. DRIVE & MOTOR	K0564VFD-TEST		REV.

ELECTRIC HEATING COIL
FUNCTIONAL TEST REPORT FORM

HNF-SD-W030-TD-002,
REV. 0, PAGE 218

E&W Heating Coil P/N 80P4-108

Mfg. Model No. TR-40429

Mfg Serial No. N/A

1. Visual Inspection: ☒ Accept (Check)
2. Circuit Continuity Test: Control Circuit ☒ Accept (Check)
Heater Circuit ☒ Accept (Check)
3. Step controller or SCR (if applicable):
Acceptance Criteria - proportional control of heater stages
☒ Accept ☐ Not Applicable (Check one)
4. Power Lead Voltage and Amperage:

Record:	Voltage	Amperage
L1	<u>407</u>	<u>27</u>
L2	<u>405</u>	<u>27</u>
L3	<u>404</u>	<u>27</u>

Acceptance Criteria -

Voltage High Limit = Nameplate Voltage x 1.07 = 513.6 VAC
Voltage Low Limit = Nameplate Voltage x 0.93 = 446.4 VAC

Amperage High Limit = (Nameplate Wattage x 1.05) / 1.73 x
Voltage High Limit = 24.8 23.6 Amps
Amperage Low Limit = (Nameplate Wattage x 0.95) / 1.73 x
Voltage Low Limit = 27.2 Amps

☒ Accept (Check)

List Test Equipment used including ID Numbers and Calibration date:

4343 VOM
4421 AMP PROBE

Inspection Performed By: Paul Correll E&W 12/29/94
E&W QA Witnessed By: MEL BOGARD E&W 12-29-94
QA Witnessed By: [Signature]

SIGNATURE

COMPANY

DATE

ELLIS & WATTS
BATAVIA, OHIO 45103

SIZE
A

CAGE CODE
98437

REPORT NO.

PAGE

REV.

ELECTRIC HEATING COIL FUNCTIONAL
TEST REPORT (SEE ENG-277)

FIGURE 2
HOUSING LEAK RATE TEST REPORT

HNF-SD-W030-TD-002,
REV. 0, PAGE 219

DATA AND CALCULATION - PRESSURE DECAY METHOD (ENG-204, Section 5.1)

E&W Job No. K0564 Customer Spec. or P.O. No. KL08080
Unit Serial No. 14294 Customer Name Kaiser
Part No. 80P Michael S. King Sta 2 Gne
Test Engineer (Sign/Date and Print Name) Mike King Steve Coyne 12-28-94
Inspector (Sign/Date and Print Name) Mer Bogard 12-28-94 MER BOGARD
Distribution:
☐ QA File ☐ Customer (if required) ☐ Other (specify) _____

Initial Test YES Retest No. _____

I. Test Equipment Used (List description and CID No.)

1. Monometer 2426
2. Stop Watch 7426
3. _____

II. Conversion Factors

1" w.g. = 5.204 lb/ft²
°R = °F + 460
P_{abs} = Gage Pressure and Barometric Pressure
1" Hg = 70.73 lb/ft²

III. Test Data

V = 71.3 ft³
Barometric Pressure (BP) = 30.04 " Hg
Design Pressure (P₀) = 32 " w.g.

Time, Temperature and Pressure Readings

t_i 0 min.
T_i 73 °F
P_i 40 " w.g.

Individual Pressure Readings @ 1 minute intervals

P ₁ <u>31.2</u> " w.g.	P ₆ _____ " w.g.	P ₁₁ _____ " w.g.
P ₂ <u>26.6</u> " w.g.	P ₇ _____ " w.g.	P ₁₂ _____ " w.g.
P ₃ <u>24.0</u> " w.g. 2 min. 40 sec	P ₈ _____ " w.g.	P ₁₃ _____ " w.g.
P ₄ _____ " w.g.	P ₉ _____ " w.g.	P ₁₄ _____ " w.g.
P ₅ _____ " w.g.	P ₁₀ _____ " w.g.	P ₁₅ _____ " w.g.

t_f = 15 min. or t @ 75% P₀ = 24' @ 2:40 min.

T_f = 73 °F

P_f = 24 P₁₅ or 75% P₀ = 24 " w.g.

FIGURE 2
HOUSING LEAK RATE TEST REPORT

HNF-SD-W030-TD-002,
REV. 0, PAGE 220

DATA AND CALCULATION - PRESSURE DECAY METHOD (ENG-204, Section 5.1)

E&W Job No. K0564 Customer Spec. or P.O. No. K68080
Unit Serial No. 14294 Customer Name KAISER
Part No. 80P

Test Engineer (Sign/Date and Print Name) STUE COYNE 12-28-94 STUE COYNE

Inspector (Sign/Date and Print Name) MEL BOGARD 12-28-94 MEL BOGARD

Distribution:

☐ QA File ☐ Customer (if required) ☐ Other (specify) _____

IV. Calculation of Leak Rate

A. Conversion of Readings

1. Convert °F to °R

$$T_i = \underline{73} \text{ } ^\circ\text{F} + 460 = \underline{533} \text{ } ^\circ\text{R}$$

$$T_f = \underline{73} \text{ } ^\circ\text{F} + 460 = \underline{533} \text{ } ^\circ\text{R}$$

2. Convert P ("w.g.) to P (lb/ft²)

$$P_i = \underline{40.0} \text{ "w.g.} \times 5.204 = \underline{208.2} \text{ lb/ft}^2$$

$$P_f = \underline{24.0} \text{ "w.g.} \times 5.204 = \underline{124.9} \text{ lb/ft}^2$$

3. Convert BP ("Hg) to BP (lb/ft²)

$$BP = \underline{30.04} \text{ "Hg} \times 70.73 = \underline{2124.7} \text{ lb/ft}^2$$

4. Convert P_{gage} to P_{abs}

$$P_{i(\text{abs})} \text{ (lb/ft}^2\text{)} = P_i \text{ (lb/ft}^2\text{)} + BP \text{ (lb/ft}^2\text{)}$$

$$P_{f(\text{abs})} \text{ (lb/ft}^2\text{)} = P_f \text{ (lb/ft}^2\text{)} + BP \text{ (lb/ft}^2\text{)}$$

B. Leak Rate

$$\bar{Q} = \left(\frac{P_i}{T_i} - \frac{P_f}{T_f} \right) \left(\frac{V}{R_x \Delta t (0.075 \text{ lb/ft}^2)} \right)$$

$$\bar{Q} = \left(\frac{\text{lb/ft}^2}{^\circ\text{R}} - \frac{\text{lb/ft}^2}{^\circ\text{R}} \right) \left(\frac{\text{ft}^3}{(53.35 \frac{\text{ft-lb}}{\text{lb } ^\circ\text{R}}) (\text{min.}) (0.075 \text{ lb/ft}^2)} \right)$$

$\frac{208.2 + 2124.7}{533} - \frac{124.9 + 2124.7}{533}$ $\frac{71.3}{2.67}$

$$\bar{Q} = \underline{1.1} \text{ SCFM}$$

$$0.16 \times 6.7 = 1.1$$

EW
0178

FIGURE 2

HNF-SD-W030-TD-002,
REV. 0, PAGE 221

HOUSING LEAK RATE TEST REPORT

DATA AND CALCULATION - PRESSURE DECAY METHOD (ENG-204, SECTION 5.1)

E&W Job No. K0504 Customer Spec. or P.O. No. K68080
 Unit Serial No. 14294 Customer Name KAISER
 Part No. 80P
 Test Engineer(Sign/Date and Print Name) Paul E. Carroll 12-29-94 PAUL E. Carroll
 Inspector(Sign/Date and Print Name) Mel Bobard 12-29-94 MEL BOBARD
 Distribution: QA File Customer (if required) Other (specify)

EW
0176

IV. Calculation of Leak Rate

A. Conversion of Readings

1. Convert degrees F to degrees R

$$T_i = 72 \text{ F} + 460 = 532.0 \text{ R}$$

$$T_f = 72 \text{ F} + 460 = 532.0 \text{ R}$$

2. Convert P ("w.g.) to P (lb/ft
- ²
-)

$$P_i = 40 \text{ "w.g.} \times 5.204 = 208.2 \text{ lb/ft}^2$$

$$P_f = 24 \text{ "w.g.} \times 5.204 = 124.9 \text{ lb/ft}^2$$

3. Convert BP ("Hg) to BP (lb/ft
- ²
-)

$$BP = 30.03 \text{ "Hg} \times 70.73 = 2124 \text{ lb/ft}^2$$

4. Convert P(gage) to P(absolute)

$$P_i(\text{abs}) (\text{lb/ft}^2) = P_i (\text{lb/ft}^2) + BP (\text{lb/ft}^2)$$

$$P_f(\text{abs}) (\text{lb/ft}^2) = P_f (\text{lb/ft}^2) + BP (\text{lb/ft}^2)$$

B. Leak Rate

$$Q = \frac{(P_i)}{(T_i)} - \frac{(P_f)}{(T_f)} \times \frac{V}{(R_a \times \Delta t \times 0.075 \text{ lb/ft}^2)}$$

$$Q = \frac{(\text{lb/ft}^2)}{(R)} - \frac{(\text{lb/ft}^2)}{(R)} \times \frac{(\text{ft}^3)}{(53.35 \text{ ft}^3 - \text{lb/ft}^3 - R) \times (\text{min.}) \times (0.075 \text{ lb/ft}^2)}$$

$$Q = 0.797 \text{ SCFM}$$

Sayer & Associates, Inc.
CONSULTING ENGINEERS

HNF-SD-W030-TD-002,
REV. 0, PAGE 222

3730 Clay Mountain Drive
Medina, Ohio 44256
(330) 725-4621

October 16, 1997

Fluor Daniel Northwest
P. O. Box 1050
1100 Jadwin Ave.
Richland, Washington 99352

Attention: Mr. D. P. DeVine

Subject: Engineering Report

Reference: Vibration Test of Exhaust Fan
SAI Reference #97055

Dear Mr. DeVine

Please find enclosed herewith two (2) copies of the Report which summarizes the testing and analysis provided by Sayer & Associates, Inc. relative to the above referenced project. I have not sent copies to anyone else. Please call me at (330)725-4621 if you have any questions.

Respectfully Submitted,

SAYER & ASSOCIATES, INC.

Robert J. Sayer, P.E.
Principal Engineer

Vibration & Modal Study
of an
Exhaust Fan
at the
Hanford Site

Prepared For: Fluor Daniel Northwest
Richland, Washington

Prepared By: Robert J. Sayer, P.E.
Principal Engineer

Date: October 17, 1997

SAYER & ASSOCIATES, INC.

3730 Clay Mountain Drive • Medina, OH 44256
(330)725-4621; FAX (330)725-4621

Vibration Study of Exhaust Fan
SAI Reference #97055
Page 1

Introduction:

A Vibration Study of two exhaust fans, including an Experimental Modal Analysis, was performed by Robert J. Sayer, P.E. on October 6 & 7, 1997 at the Hanford Site. The fans were belt driven, overhung centrifugal type with the bearings supported on a pedestal. Vibration isolation mounts were provided between the fan base and exhauster structure to minimize the transmissibility of dynamic loads from the fan, motor and belts.

Instrumentation and computer software used for the study included:

CSI Wavepak Dual Channel Analyzer
Custom Built ICP Power Supply & Multiplexor
PCB VO326 Industrial Piezo-Electric Velocity Sensors
PCB 086C20 Instrumented Force Hammer
SMS Starmodal Curve-fitting & Animation Software

This Report contains a summary of the data acquired during the field testing and the analysis of data performed afterward.

Objective:

The objective of the test was to identify the reason for excessive vibration of Fan B at certain operating speeds. An allowable vibration limit of .25 ips (peak) was established by the Client.

Fan B (As Found):

Vibration levels measured at the inboard (fan side) bearing are summarized below for different fan speeds. Both the synchronous and overall vibration levels are reported in peak velocity.

Fan Speed	Percent	Horizontal Vibration	Vertical Vibration
		(Synchronous/Overall)	(Synchronous/Overall)
1080 rpm	30%	.044/.062 ips	.106/.114 ips
1440 rpm	40%	.030/.085 ips	.085/.117 ips
1800 rpm	50%	.048/.062 ips	.065/.106 ips
2160 rpm	60%	.320/.346 ips	.388/.405 ips
2520 rpm	70%	.083/.133 ips	.070/.123 ips
2880 rpm	80%	.017/.051 ips	.092/.126 ips
3240 rpm	90%	.076/.106 ips	.110/.156 ips
3600 rpm	100%	.085/.102 ips	.180/.244 ips

Figure 1 contains transient vibration data acquired from the fan bearing during a gradual speed ramp-up. An apparent resonant condition was identified at approximately 36 Hz (2160 rpm) as evident from the magnified response as the fan speed passed through this frequency. This sensitivity is also evident in the summarized vibration data.

Vibration Study of Exhaust Fan
SAI Reference #97055
Page 2

Figure 2 contains a frequency spectrum of the vibration data at a fan speed of 36 Hz. The spectrum is dominated by response at the rotational frequency of the fan. Figure 3 contains the spectrum of vibration data at a fan speed of 60 Hz (3600 rpm). In addition to the response at the rotational frequency of the fan, this spectrum contains responses at many harmonic multiples of the fan, motor and belts.

Both the frequency spectra of Figures 1 & 2 and the summarized data indicate that the response synchronous to the rotational speed of the fan decreases in magnitude as the fan increases in speed beyond 2160 rpm. This supports a conclusion that the excessive vibration is not strictly a balancing problem, but is the most probably the result of the excitation of a resonance.

An impact test was performed to determine the natural frequencies of the system. Coherence and Transfer Functions obtained from this test are included in Figure 4. Three natural frequencies were identified within the normal operating frequency range of the fan. One of the natural frequencies matched the frequency at which the fan exhibited an increased vibration sensitivity.

A complete experimental modal analysis was performed to determine the modal parameters (natural frequency, mode shape and damping) of the system. Figure 5 contains a three dimensional view of the modal model developed for the test.

The impact data was curve-fitted and animated using SMS Starmodal. Figures 6 through 11 contain snapshots of the animated mode shapes shown to an exaggerated scale (solid line) and superimposed upon the undeformed model (dotted line). Both a three dimensional and end view is included for each mode shape.

The mode shape associated with the natural frequency at 17.8 Hz (damping = 9.03%) consists of the vertical translation of the fan base as a nearly rigid body on top of the isolators. Flexibility of the fan base is minimal. Vertical translation of the exhauster structure, including flexure of the cantilevered arm, also participates in the mode shape indicating a looseness between the exhauster base and the concrete foundation. The excitation of this natural frequency occurs at a very low fan speed (1140 rpm) at which dynamic forces produced by the fan are minimal and should not present a problem.

The mode shape associated with the natural frequency at 23.0 Hz (damping = 6.76%) consists of the fan base rocking as a nearly rigid body on top of the isolators. Flexibility of the fan base is minimal. A horizontal translation of the exhauster structure also participates in the mode shape. Once again, this indicates a looseness between the exhauster base and the concrete foundation. This natural frequency also occurs at a very low fan speed (1380 rpm) and should not present a problem.

Vibration Study of Exhaust Fan
SAI Reference #97055
Page 3

Flexural deformation of the fan base dominates the mode shape associated with the natural frequency at 35.6 Hz. Excitation of this natural frequency is the reason for the sensitivity which resulted in the excessive vibrations at a fan speed of 2160 rpm. The natural frequency is lightly damped (3.28%). Therefore, the response of the mechanical system will be significant even when subjected to small harmonic dynamic forces, such as fan rotor imbalance, at this frequency. It should be noted that the horizontal translation and flexure of the cantilevered arm of the exhauster base is also evident in this mode shape.

Fan A:

An impact test was performed to obtain a comparison of the modal characteristics of Fan A with Fan B. The Coherence and Transfer Functions obtained from the impact test of Fan A are included in Figure 12. Although the structural supporting system for both fans are identical, there was a significant difference in the results of the modal tests. The principle natural frequency was approximately 21 Hz, compared to 17.8 Hz for Fan B.

The magnitude of the natural frequency associated with the flexure of the fan base (36.5 Hz) was not much different than that of Fan B. This fan base will also be sensitive at fan speeds around 2190 rpm. Damping is greater for Fan A than for Fan B as evident by the rounded characteristic of the transfer function at the natural frequency. Therefore, dynamic magnification of vibrations due to excitation of resonance at 36.5 Hz will not be as severe.

Vibration levels measured at the inboard (fan side) bearing are summarized below for different fan speeds. Both the synchronous and overall vibration levels are reported in peak velocity.

<u>Fan Speed</u>	<u>Percent</u>	<u>Horizontal Vibration</u> <u>(Synchronous/Overall)</u>	<u>Vertical Vibration</u> <u>(Synchronous/Overall)</u>
1080 rpm	30%	.071/.081 ips	.056/.066 ips
1200 rpm	33%	.078/.088 ips	.297/.299 ips
1800 rpm	50%	.019/.040 ips	.113/.130 ips
2160 rpm	60%	.352/.376 ips	.239/.245 ips
2520 rpm	70%	.166/.199 ips	.090/.129 ips
2880 rpm	80%	.209/.234 ips	.117/.187 ips
3240 rpm	90%	.239/.245 ips	.055/.144 ips
3600 rpm	100%	.222/.263 ips	.044/.257 ips

Although the magnitude of vibrations measured at Fan A were less than that of Fan B (As Found), an amplified response due to excitation of a resonance was still evident as the fan speed approached 2160 rpm. Therefore, it is recommended that the variable speed controller should be modified such that speeds of 2000-2250 rpm be blocked out of the operating range of the fan.

It should be noted that the sensitivity in the horizontal direction exceeded the sensitivity in the vertical direction which is opposite to the response measured at Fan B.

Vibration Study of Exhaust Fan
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Page 4

Fan B (After Modification):

Based upon the results of the modal testing, it was determined to check the tightness of the anchor bolts (mechanical expansion anchor type) which connect the exhaust structure to the concrete foundation. There were two anchor bolts under the fan. The nut on one of the anchor bolts was found to be loose and was tightened. The other anchor bolt was not installed correctly. Anchorage of the bolt was inadequate and the nut could not be tightened.

Figure 13 contains the Coherence and Transfer Functions from an impact test performed after tightening the one anchor bolt. These results were very similar to the impact test of Fan A. The principal natural frequency increased to 20.5 Hz and the natural frequency around 36 Hz was not as pronounced.

Vibration levels measured at the inboard (fan side) bearing, after tightening a single anchor bolt, are summarized below for different fan speeds. Both the synchronous and overall vibration levels are reported in peak velocity.

<u>Fan Speed</u>	<u>Percent</u>	<u>Horizontal Vibration</u> <u>(Synchronous/Overall)</u>	<u>Vertical Vibration</u> <u>(Synchronous/Overall)</u>
1080 rpm	30%	.027/.036 ips	.047/.058 ips
1440 rpm	40%	.032/.095 ips	.064/.102 ips
1800 rpm	50%	.048/.110 ips	.055/.094 ips
2160 rpm	60%	.282/.306 ips	.286/.295 ips
2520 rpm	70%	.107/.124 ips	.109/.139 ips
2880 rpm	80%	.076/.109 ips	.086/.125 ips
3240 rpm	90%	.084/.101 ips	.091/.121 ips
3600 rpm	100%	.089/.113 ips	.112/.168 ips

The sensitivity at 2160 rpm still existed although the magnitude of vibration was reduced significantly at this frequency as well as the full operating speed of the fan. The vibration levels at 2160 rpm were still above the .25 ips acceptance limit. Therefore, it is recommended that the variable speed controller should be modified such that speeds of 2100-2250 rpm be blocked out of the operating range of the fan if the vibration levels are not reduced below these levels after replacing the anchor bolts.

Conclusions:

The excessive vibrations of Fan B were due to the excitation of a resonance associated with the flexural deformation of the fan base. The difference in the dynamic characteristics between Fan A and Fan B were the result of loose anchor bolts between the exhaust structure and the concrete foundation. Significant reduction in vibration was achieved after tightening one of the anchor bolts. It is recommended that additional anchor bolts be installed to provide a more positive connection between the exhaust structure and the concrete foundation.

Vibration Study of Exhaust Fan
SAI Reference #97055
Page 5

The natural frequency of the fan base will still exist around 36 Hz (2160 rpm) even after establishing a more positive connection between the exhaust structure and the foundation. Structural modification of the fan base to increase the flexural rigidity thereof is not recommended without an in depth qualitative analysis to support the design of the modification. It is possible that this natural frequency could be increased in value to another speed which falls within the operating range of the fan, resulting in larger rather than smaller vibrations.

FIGURE 1

Transient Vibration Data Acquisition
During Start-Up
(Fan B)

Top: Bearing Vibration versus Time (Vertical & Horizontal)
Bottom Left: Expanded Time Waveform Between Cursors
Bottom Left: Frequency Spectrum of Data Between Cursors

FIGURE 2

Frequency Spectra
Fan Bearing Vibration
(Fan B)

Approx. Fan Speed = 2160 rpm (36 Hz)

FIGURE 3

Frequency Spectra
Fan Bearing Vibration
(Fan B)

Approx. Fan Speed = 3600 rpm (60 Hz)

FIGURE 4

Coherece & Transfer Functions
Impact Test
(Fan B)

Project : FLUORDAN
Trace A : Undeformed

FIGURE 5

Three Dimensional View
Experimental Modal Analysis Model

Project : FLUORDAN

Trace A : # 1:17.83 Hz ———

Mode # : 1

Frequency : 17.83 Hz

Damping : 9.03 %

Trace B : Undeformed -----

FIGURE 6

Three Dimensional View
Mode Shape @ 17.8 Hz

Project : FLUORDAN
Trace A : # 1:17.83 Hz ——— Trace B : Undeformed -----
Mode # : 1
Frequency : 17.83 Hz
Damping : 9.03 %

FIGURE 7

End View
Mode Shape @ 17.8 Hz

Project : FLUORDAN
Trace A : # 2:23.03 Hz ———
Mode # : 2
Frequency : 23.03 Hz
Damping : 6.76 %

Trace B : Undeformed -----

FIGURE 8

3D View
Mode Shape @ 23.0 Hz

Project : FLUORDAN

Trace A : # 2:23.03 Hz ———

Mode # : 2

Frequency : 23.03 Hz

Damping : 6.76 %

Trace B : Undeformed -----

FIGURE 9

End View
Mode Shape @ 23.0 Hz

Project : FLUORDAN
Trace A : # 3:35.58 Hz ———
Mode # : 3
Frequency : 35.58 Hz
Damping : 3.28 %

Trace B : Undeformed -----

FIGURE 10

3D View
Mode Shape @ 35.6 Hz

Project : FLUORDAN
Trace A : # 3:35.58 Hz ———
Mode # : 3
Frequency : 35.58 Hz
Damping : 3.28 %

Trace B : Undeformed -----

FIGURE 11

End View
Mode Shape @ 35.6 Hz

FIGURE 12

Coherence & Transfer Functions
Impact Test
(Fan A)

FIGURE 13

Coherence & Transfer Functions
Impact Test
(Fan B After Tightening Anchor Bolt)

ATTACHMENT 4

CALIBRATION, GROOMING, AND ALIGNMENT PLAN WITH CALIBRATION DATA

CONTENTS:

1. Calibration, Grooming, and Alignment Plan for Project W-030 (unreleased document).
2. Instrument Loop Signoff Sheets with list of applicable loop drawings (see note below).
3. Instrument loop calibration sheets, each followed by related field instrument cal. sheets.
4. Instrument cal. sheets for (non-loop) local instruments (if any).

IMPORTANT NOTES:

The attached data is presented as field-recorded by plant instrument technicians and initialed off by test engineers; it represents work done over many months according to current site work practices and best available information and techniques. Only necessary information was recorded for each calibration sheet, and thus many data fields are not applicable and are left blank. Some vendor-provided data is included and may be missing non-critical information. Test exception reports were created only where necessary.

Generally, "loops" refers to those instruments related to the central Monitor and Control System (MCS), although some non-MCS "local loops" are noted in the signoff sheets. Loop data sheets are attached in the order shown on the loop signoff sheets. Generally, each loop will include a loop-test data sheet, followed by its associated field-instrument calibration data sheet (with the most recent data presented first) and any other relevant calibration information. Additional supporting data may be found in the archived original test records.

CALIBRATION, GROOMING, AND ALIGNMENT PLAN

HNF-SD-W030-TD-002,
REV. 0, PAGE 243

FOR PROJECT W-030

TANK FARM VENTILATION UPGRADE

PLAN APPROVAL

<u>Frank Clifton</u>	<u>3/6/96</u>	<u>M.D. Harding</u>	<u>3-7-96</u>
Startup Manager	Date	TWRS Operations	Date

<u>David P. Pyle</u>	<u>3/6/96</u>	<u>W.H. Brule</u>	<u>3-7-96</u>
TWRS Engineering	Date	TWRS Maintenance	Date

<u>Thomas H. Powell</u>	<u>3-6-96</u>	<u>Hank M. Chapin</u>	<u>3-7-96</u>
Construction Projects Startup	Date	Quality Assurance	Date

<u>John A. Cole</u>	<u>3/7/96</u>	<u>L.H. Hill</u>	<u>3/6/96</u>
Project Management	Date	Lowell Hill	Date

The original signatures are on file.

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1.0 PURPOSE AND SCOPE

The purpose of this Calibration, Grooming, and Alignment (CGA) Plan is to provide a safe, uniform, and expeditious method for verifying calibration of instrumentation and associated instrument loops in the Project W-030, Tank Farm Ventilation Upgrade.

- 1.1 The instrument loops will be calibrated on a system basis and will be identified in a list as part of each system CGA package.

2.0 REFERENCES

- 2.1 Drawing H-2-131000, Shts. 1 thru 4 (W-030 Drawing List).
- 2.2 Drawing ES-W030-Y00, Shts. 1 thru 5 (W030 MCS Logic Diagram Drawing List).
- 2.3 Memorandum Of Understanding (MOU), Project W-030 Test Configuration Control, EDT No. 614741.

3.0 CHANGE CONTROL

Administrative or editorial changes required to this plan, during testing, may be accommodated as exceptions in the released test report, if the changes will not affect operating facility safety, function, or performance and will not compromise or influence test data. Addition or deletion of steps or major changes to this plan will be accomplished by revision and approval by the original signature authorities.

4.0 EXCEPTIONS

Exceptions to results or to the test procedure will be given a sequential number and recorded on Test Exception log sheet in the applicable CGA Package attachment. A test exception report will be filled out to record and disposition each test exception.

5.0 PERSONNEL REQUIREMENTS

- 5.1 Instrument Technician (2).
- 5.2 MCS Operator (1).
- 5.3 Electrician (as needed).
- 5.4 Test Engineer (1)

6.0 PRECAUTIONS AND LIMITATIONS

- 6.1 During the performance of this procedure, if any of the following conditions are found, immediately stop work, place equipment in a safe condition, and notify the Test Engineer and take appropriate action to resolve the problem quickly:
 - 6.1.1 Stop work if any condition could jeopardize personnel safety or jeopardize damage to equipment/components.
 - 6.1.2 Stop work if personnel error or procedural error/inadequacy could prevent fulfillment of this procedure.
 - 6.1.3 Stop work if any un-safe condition exists.
- 6.2 Review hazards in the work area (if any), prior to start of this test.
- 6.3 Sections or steps within sections of this procedure (except for prerequisites, Section 6.0) may be performed out of sequence under direction and authority of the Test Engineer.
- 6.4 Performance of this procedure requires stationing of an Operator in the Control Room.

7.0 Special Tools, Equipment, and Materials

- 7.1 The following is a general list of test equipment that may be required to perform the testing under this procedure:
 - 7.1.1 Digital Multimeter (DMM).
 - 7.1.2 Decade Box.
 - 7.1.3 Calibrated Pressure Source.
 - 7.1.4 Calibrated Pressure Gauge.
 - 7.1.5 Calibrated Power Supply.
 - 7.1.6 Two-Way Radios or Sound Powered Phones to communicate between field devices and Control Room.

- 7.2 The Measuring and Test Equipment (M&TE) used to collect test data during performance of this procedure shall meet the following requirements:

7.2.1 It shall be within its current calibration cycle as evidenced by an affixed calibration label.

7.2.2 It shall be capable of providing the desired range.

7.2.3 It shall have an accuracy consistent with state-of-the-art limitations. It shall be equal to or greater than the input tolerance specified on the Data Sheets or if device being calibrated is not recall related, at least 4 times greater than the specified device tolerance.

8.0 PREREQUISITES

- 8.1 Perform a pre-job meeting and walkdown prior to testing.
- 8.2 Identify safety concerns (if any) related to the testing and assure compliance with safety requirements.
- 8.3 Establish communications between field devices and Control Room.
- 8.4 Personnel radiological safety will be as specified by a Radiation Work Procedure for instrumentation/instrument loops requiring entry into the tank farm.
- 8.5 Equipment and materials entering a contamination control area shall be minimized.

9.0 PROCEDURE

9.1 Test Boundaries

This procedure provides boundaries within which the test personnel can work, allowing them flexibility to perform the testing and still work in a safe manner. These boundaries are as follows:

9.1.1 Test personnel must work within the site Lock and Tag procedures and identify those pieces of equipment that must be tagged out prior to the test.

9.1.2 Test personnel shall have the freedom to lift leads for diagnostic testing. The circuits being tested shall be restored to a normal configuration upon completion of testing or at the end of the shift, if testing of that loop does not continue on the next shift.

- 9.1.3 Test personnel shall have the freedom to change the order in which the testing is being performed.
- 9.1.4 Test personnel shall have the authority to change the system configuration to match the drawing configuration if wiring is found not to be in accordance with the construction drawings and applicable ECN's on systems that have been turned over to WHC. The change must be noted/logged in the daily test log located in the Control Room. The contractor should be notified in cases where the system has not been turned over to WHC.
- 9.1.5 If the system configuration does not work as designed and is installed according to the contract drawings, the problem shall be noted in the daily test log and the design engineer shall be notified immediately to begin processing an ECN to correct the problem.
- 9.1.6 Test personnel, when completing a loop test, shall document it in the daily test log and initial for completion on the package instrument list. Also items found that are not installed per construction drawings, and any other problems/fixes shall be documented in the daily test log.

9.2 Test Execution

The test should be performed in accordance with the following steps:

- 9.2.1 The Test Engineer shall identify and initiate any system alignments that may be required for the loops to be tested.
- 9.2.2 Identify on Loop Test Data Sheet, the sensor actuation method to be used. Record the test instrument type (i.e: pressure source, etc.), instrument number, model, and calibration due date at the bottom of the Data Sheet (M&TE Inst. No.).
- 9.2.3 Identify if instrument calibration has been performed or will be performed as part of the loop test. This information will be provided on the calibration data sheet attached to the Loop Test Data Sheet.
- 9.2.4 Connect the sensor actuation device to the loop to be tested.

- 9.2.5 Loop tolerances are determined using the "Square Root of the Sum of the Squares (SRSS)" method as noted in ANSI/ASME PTC 19.1-1985, Part 1, "Measurement Uncertainties," and ANSI/ISA-S67.04-1988, Section 4.4.1. Loop tolerances will be pre-calculated and shown on the Loop Calibration Data Sheet.
- 9.2.6 Initiate the process input as shown on the Loop Calibration Data Sheet and then record the results in the spaces provided (LOI and MCS Screens) as applicable.
- 9.2.7 Verify annunciator setpoints and record the actual setpoint in the space provided on the Loop Test Data Sheet.
- 9.2.8 Additional remarks or comments may be recorded in the space provided on the Loop Test Data Sheet.
- 9.2.9 If there are any problems with the test that cannot be resolved quickly, then initiate a Test Exception on the form provided as part of each test package.
- 9.2.10 When all loop tests for a system have been completed, then the Test Engineer shall review the test data and sign in the space titled "Loop Complete" on Loop Test Data Sheets.
- 9.2.11 The associated P&ID shall be highlighted as loops are completed as a method of tracking test completion.

9.3 DOCUMENT CONFIGURATION CONTROL

All personnel involved with this CGA Procedure and the actual testing shall handle all documentation in accordance with EDT No. 614741, Memorandum of Understanding, Project W-030 Test Configuration Control. The Test Engineer shall review this EDT with all personnel involved in the testing to ensure everyone understands the scope of this document.

10.0 RESTORATION

- 10.1 Upon completion of loop testing, restore the loop to it's design configuration.
- 10.2 Remove/disconnect all test equipment used to perform the loop test.
- 10.3 Verify loop restoration by observing that loop indications, alarms and/or computer points are consistent with expected conditions.

- 11.1 All data sheets, test exception logs and test exception forms will become part of the system preoperational test report that will be developed upon completion of each system Preoperational Test Procedure.

12.0 ATTACHMENTS

- 12.1 The attachments to this document will be laid out by system and will contain the following items for each instrument loop in that system:

- Instrument Loop Sign-Off Sheet
- Instrument Test Data Sheet
- Loop Calibration Data Sheet
- System P&ID
- Test Exception Log
- Test Exception Form

- 12.2 The following system test packages will be developed for testing and will become attachments to this document:

Attachment A-	Raw Water System Test Package
Attachment B-	Primary Ventilation Condensate System Test Package
Attachment C-	Recirculation Condenser Cooling System Test Package
Attachment D-	Recirculation Ventilation System Test Package
Attachment E-	Primary Ventilation Condensate Cooling System Test Package
Attachment F-	Primary Tank Ventilation System Test Package
Attachment G-	Vent Building Ventilation System Test Package

INSTRUMENT LOOP SIGN-OFF SHEETS

for the

PRIMARY TANK VENTILATION SYSTEM

LOOP DIAGRAMS

H-2-131309, sheets 1-23

H-2-131311, sheets 5-8

H-2-131343, sheets 1-8

H-2-131344, sheets 1-8

NOTE: Calibration sheets were deemed unnecessary (by test engineering personnel) for certain local handswitch items and were signed off by simply verifying that the switch was able to energize the related circuit. These were added to page 7 of the signoff list.

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: CGA-6	TEST NAME: Calibration Grooming and Alignment	T.E. NUMBER: 002
DESCRIPTION OF PROBLEM: Loops TI AZ K18 1A and TI AZ K18 1B. The transmitters actually installed are for a 4-wire sensor, whereas the actual sensors are 3-wire. The transmitter output is therefore in a failed high state. The drawings seem to specify a 4-wire system.		
ORIGINATOR: LF Hill <u><i>[Signature]</i></u> 4/1/96 ORG: _____ DATE: _____	IMPACT ON TESTING: ☒ HOLD FOR RESOLUTION ☐ CONTINUE <u><i>R. Stutunoy</i></u> 4/1/96 PIC _____ DATE _____	
DISPOSITION: Lifted leads at TB-LCU-3S, TB01-1 & 4 to allow testing to proceed. Wiring corrected and retested per ECN-120.		
DISPOSITION AND RETEST REQUIREMENTS BY: <u><i>Doug [Signature]</i></u> 7/1/96 _____ DATE	DISPOSITION ACTIONS COMPLETE: Verified <u><i>R. Stutunoy</i></u> 7/1/96 By: _____ DATE	
OAE CONCURRENCE WITH DISPOSITION (if required): <u><i>Hubert M. Chafin</i></u> 7/1/96 _____ DATE	RETEST COMPLETE: <u><i>R. Stutunoy</i></u> 7/1/96 PIC _____ DATE	

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
AZ_K12_1AA	D. J.	6/24/96
AZ_K12_1AB	D. J.	6/24/96
AZ_K12_1BA	D. J.	6/25/96
AZ_K12_1BB	D. J.	6/25/96
AZ_K15_1AA	D. J.	6/24/96
AZ_K15_1AB	D. J.	6/24/96
AZ_K15_1BA	D. J.	6/25/96
AZ_K15_1BB	D. J.	7/16/96
FAL_AZK1_1A	D. J.	SEE FI-AZK1-1
FAL_AZK1_2A	D. J.	SEE FI-AZK1-2
FAL_AZK1_4	D. J.	8/31/96
FC_AY1_K1_2	- See FIC_AY1K1-2	
FC_AY2_K1_2	- See FIC_AY2K1-2	
FC_AZ1_K1_2	- See FIC_AZ1K1-2	
FI_AY101K1_1	D. J.	6/16/96
FI_AY1K1_2	D. J.	6/28/96
FI_AY102K1_1	D. J.	6/16/96
FI_AY2K1_2	D. J.	8/13/96
FI_AZK1-3	D. J.	7/24/96
FI_AZ101K1_1	D. J.	6/16/96
FI_AZ102K1-1	D. J.	6/16/96
FIC_AY1K1_2	* D. J.	7/17/96
FIC_AY2K1_2	* D. J.	6/13/96
FIC_AZ1K1_2	* D. J.	6/28/96
FIC_AZ2K1_2	D. J.	7/2/96
II_AZK15_1A	D. J.	7/18/96
II_AZK15_1B	D. J.	7/18/96
FI_AZ1-K1-2	D. J. Page 1	6/28/96
FI_AZ2-K1-2	D. J.	8/28/96

LOCAL
LOOP
LOCAL
LOOP

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
LDA_AY_1102_1	*	
LDA_AZ_2102_1	*	
LDA_V0608_1	*	
MK_AZ-K1_1AA	L.H.	6/5/96
MK_AZ-K1_1AB	L.H.	6/5/96
MK_AZ-K1_2AA	D.J.	6/10/96
MK_AZ-K1_2AB	D.J.	6/10/96
MK_AZ-K1_1BA	L.H.	6/5/96
MK_AZ-K1_1BB	L.H.	6/5/96
MK_AZ-K1_2BA	D.J. D.J.	6/10/96 6/10/96
MK_AZ-K1_2BB	D.J. D.J.	6/10/96 6/10/96
PC_AY1_K1_1	D.J.	5/7/96
PC_AY2_K1_1	D.J.	5/9/96
PC_AZ1_K1_1	D.J.	5/10/96
PC_AZ2_K1_1	D.J.	5/22/96
PC_AZ_K1_1A	L.F.H.	8/28/96
PC_AZ_K1_1B	D.J.	7/18/96
PDAH_AY101K1_1	L.H.	5/6/96
PDAH_AY102K1_1	L.H.	5/6/96
PDAH_AZ101K1_1	M.E. D.J.	5-1-96
PDAH_AZ102K1_1	M.E. D.J.	5-1-96
PDI_AZK14_1A	D.J.	8/30/96
PDI_AZK14_2A	D.J.	8/30/96
PDI_AZK14_1B	D.J.	8/30/96
PDI_AZK14_2B	D.J.	8/30/96
PDI_AZK18_1	L.H.	6/5/96
PDI_AZK19_1	L.H.	6/5/96

Not
Installed

CGA PACKAGE #6 INSTRUMENT LIST PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
PDI_AZ101K104_1	See page 7 following JTC	
PDI_AZ102K104_1	See page 7 following JTC	
PDI_AZK110_1A	D.J.	9/3/96
PDI_AZK110_1B	D.J. D.J.	8/30/96 9/3/96
PI_AY101K1_2	L.H.	4/30/96
PI_AY102K1_2	L.H.	5/4/96
PI_AZ101K1_2	L.H.	5/3/96
PI_AZ102K1_2	L.H.	5/1/96
PI_AY101K1_1	L.H.	5/6/96
PI_AY102K1_1	L.H.	5/6/96
PI_AY102K1_1 Dup.	L.H.	5/5/96
PI_AZ101K1_1	L.H.	5/3/96
PIC_AZ102K1-1	L.H.	5/3/96
PIC_AZK1_1A	TCB	8/2/96
PIC_AZK1_1B	D.J.	7/15/96
PIT_AZK1	D.J.	7/24/96
PS_AZK111_1	*	
PS_AZK111_2	*	
RA_AZK1_1	L.H. (See RAH-AE ICI-1)	2/7/97
RAH_AZK1_1	L.H.	2/7/97
RAH_AZK1_1A	L.H. (See RAH... K1-1)	2/7/97
RAH_AZK19_1	D.J.	10/14/97
RAX_AZK1_1	L.H.	2/7/97
RAX_AZK1_1A	L.H. (See RAX... K1-1)	2/7/97
RAX_AZK19_1	D.J.	10/14/97

LOCAL
LOOP HANG
LOCAL
HANG

LOCAL
LOOP
LOCAL
LOOP
LOCAL
LOOP

LOCAL

LOCAL

* NOT READY. ON PROJECT
ACTION LIST FOR
ENGINEERING EVALUATION.

JTC

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
RI_AZK1 K1-1	<i>[Signature]</i>	3/19/97
RI_AZK1 K19-1	<i>[Signature]</i>	10/13/97
RI_AZK1 2-1	(does not exist)	
RIAS_AZK109_1	<i>[Signature]</i>	10/13/97
SI_AZK15_1A	<i>[Signature]</i>	7/16/96
SI_AZK15_1B	<i>[Signature]</i>	7/15/96
TAL_AY1K102_1	<i>[Signature]</i>	5/16/96
TAL_AY2K102_1	<i>[Signature]</i>	5/16/96
TAL_AZ1K102_1	<i>[Signature]</i>	5/20/96
TAL_AZ2K102_1	<i>[Signature]</i>	5/12/96
TDIC_AZK12_1A	<i>[Signature]</i>	12/9/96
TDIC_AZK12_1B	<i>[Signature]</i>	12/9/96
TI_AZK108_1A-1	Error - Does not exist	10-22-97
TI_AZK1_3	<i>[Signature]</i>	10/5/96
TI_AZK12_1A	<i>[Signature]</i>	5/21/96
TI_AZK12_1B	<i>[Signature]</i>	5/21/96
TI_AZK12_2A *	<i>[Signature]</i>	5/21/96
TI_AZK12_2B *	<i>[Signature]</i>	5/21/96
TI_AZK12_3A	<i>[Signature]</i>	5/21/96
TI_AZK12_3B	<i>[Signature]</i>	5/21/96
TI_AZK18_1A	<i>[Signature]</i>	5/14/96
TI_AZK18_1B	<i>[Signature]</i>	5/14/96
UC_AZK1_1	<i>[Signature]</i> POTR2, ATT-14	3/31/97
UC_AZK1_2	<i>[Signature]</i> POTR2, ATT-14	3/31/97
UE_AZK1_1	<i>[Signature]</i> - see FIT_K1-3	7/24/96

LOCAL
SEE

~~TI_AZK108_1A-1~~

* TT-K1-3

25

* Deleted, ECN-250 Page 4

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
YS_AZK12_1A	D.S.	6/24/96
YS_AZK12_1A1	D.S.	6/24/96
YS_AZK12_1B	D.S.	6/25/96
YS_AZK12_1B1	D.S.	6/25/96
YS_AZK15_1A1	D.S.	6/19/96
YS_AZK15_1B1	L.H.	7/16/96
YS_AZ_K1WD_1A1	L.H.	7/30/96
YS_AZK1WD_1A2	L.H.	7/30/96
YS_AZ_K1WD_2A1	L.H.	7/30/96
YS_AZ_K1WD_2A2	L.H.	7/30/96
YS_AZ_K1WD_1B1	L.H.	7/30/96
YS_AZ_K1WD_1B2	L.H.	7/30/96
YS_AZ_K1WD_2B1	L.H.	7/30/96
YS_AZ_K1WD_2B2	L.H.	7/30/96
YS_RCM_A2_1	L.H.	7/2/96
YS_RCM_A3_1	L.H.	7/2/96
YS_RCM_A13_1	L.H.	7/2/96
YS_RCM_A14_1	L.H.	7/2/96
YS_RCM_D6_1	L.H.	7/2/96
YS_RCM_D7_1	L.H.	7/2/96
YS_RCM_D17_1	L.H.	7/2/96
YS_RCM_D18_1	L.H.	7/2/96
YS_RCM_DR9_1	L.H.	7/2/96
YS_RCM_DR10_1	L.H.	7/2/96
YS_RCM_DR20_1	L.H.	7/2/96

YS-RCM-DR21-1

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date
ZI_AY101K1_1	D.S.	5/7/96
ZI_AY101K1_2	L.H.	6/28/96
ZI_AY102K1_1	D.S.	5/9/96
ZI_AY102K1_2	L.H.	8/13/96
ZI_AZ101K1_1	D.S.	5/10/96
ZI_AZ101K1_2	L.H.	6/28/96
ZI_AZ102K1_1	D.S.	5/7/96
ZS_AZK1_1AA	L.H.	6/5/96
ZS_AZK1_1AB	L.H.	6/5/96
ZS_AZK1_1BA	L.H.	6/5/96
ZS_AZK1_1BB	L.H.	6/5/96
ZS_AZK1_2AA	D.S.	6/10/96
ZS_AZK1_2AB	D.S.	6/18/96
ZS_AZK1_2BA	L.H.	6/10/96
ZS_AZK1_2BB	L.H.	6/10/96
ZS_AZK1_3A	D.S.	6/10/96
ZS_AZK1_3B	D.S.	6/10/96
ZS_AZK15_1A1	D.S.	6/7/96
ZS_AZK15_1A2	D.S.	6/7/96
ZS_AZK15_1A3	D.S.	6/28/96
ZS_AZK15_1B1	D.S. L.H.	8/1/96
ZS_AZK15_1B2	D.S.	6/7/96
ZS_AZK15_1B3	D.S.	8/30/96
ZS_AZK18_1AA	D.S.	7/23/96
ZS_AZK18_1BAB	D.S.	7/23/96
ZS_AZ102_K1_2	L.H.	8/28/96
ZS_AZ102_K1_2	D.S. Page 6	7/23/96
1BB	D.S.	7/23/96
1CA	D.S.	7/23/96
1CB	D.S.	7/23/96

CGA PACKAGE #6 INSTRUMENT LIST
PRIMARY TANK VENTILATION SYSTEM

Tag	Complete	Date	
ZS_AZK18 ⁹ 1A	D.J.	7/23/96	
ZS_AZK19_1AB	D.J.	7/23/96	
ZS_AZK19_1BA	D.J.	7/23/96	
ZS_AZK19_1BB	D.J.	7/23/96	
ZS_AZK19KA	D.J.	7/23/96	
ZS_AZK19KB	D.J.	7/23/96	
FI-AZK1-1	FCB D.J.	7/24/96	
FI-AZK1-2	FCB D.J.	7/24/96	
HS-AZK1-1A1	FCB (see RAX-AZ K1-1)	2/7/97	LOCAL
HS-AZK1-1AS	D.J.	8/2/96	
HS-AZK1-1B1	FCB (see RAX-AZ K1-1)	2/7/97	LOCAL
HS-AZK1-1BS	D.J.	6/5/96 7/18/96	
HS-AZK1-2A1	D.J.	3/11/97	LOCAL (station)
HS-AZK104-1	D.J.	6/5/96	
HS-AZK104-1	D.J.	6/5/96	
HS-AZK111-1A	D.J.	3/11/97	LOCAL
HS-AZK111-1B	D.J.	3/11/97	LOCAL
HS-AZK111-1C	D.J.	3/11/97	LOCAL
PDI-A4101K103-1	D.J.	2/16/96	LOCAL
PDI-A4101K104-1	D.J.	2/16/96	
PDI-A4102K103-1	D.J.	2/16/96	
PDI-A4102K104-1	D.J.	2/16/96	
PDI-A4101K103-1	D.J.	2/16/96	
PDI-A4101K104-1	D.J.	2/16/96	
PDI-A4102K103-1	D.J.	2/16/96	
PDI-A4102K104-1	D.J.	2/16/96	

W-030 LOOP TEST DATA SHEETS

and

W-030 CALIBRATION DATA SHEETS

for the

PRIMARY TANK VENTILATION SYSTEM

NOTES ON LOOP CAL DATA SHEETS:

A. Loop Cal Sheets -

Data fields left blank are not applicable, i.e.:
Location field was not generally used and is left blank because the information was not helpful or needed;
"Screen" (applicable "screen" fields have a screen name given); "Trip point" (applicable fields have annunciator priority greater than zero); M&TE is noted only where required, eg, "M&TE" is generally not required for these loops- Analog Output (AO), Digital Output (DO) or Input (DI); also, very little calibration data is needed for DO/DI loops.

B. Instrument Cal Sheets -

Sheets marked "VOID" have been superseded by more recent calibration and are included only to show that the instrument had been calibrated at time of POTP test.
If the term "broken" is noted, then the instrument was later found defective and was replaced at time of later calibration.

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 261

Tag: AZ _____ K12_1AA I/O Type: DO Description: Pvhtr1A On

Cntlr: 9 Chan No: 10 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Star Tuned Heater on from DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Derry LarkDate: 6/24/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 262

Tag: AZ K12_1AB I/O Type: DO Description: PvhHtr1A Off

Cntlr: 9 Chan No: 11 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method: TURNED HEATER OFF FROM DCS

Sensor Calibration:

☐ per procedure (data attached) (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4				
Hi (1):	TRUE	7				

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 0

Other:

MTE Instr. No: Due Date:

(signoff)

Loop Complete:

Gary Ink

Date:

6/24/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 263

Tag: AZ K12_1BA I/O Type: DO Description: PvHtr1B Status
Cntlr: 20 Chan No: 10 P&ID: H-2-131076 (START)
Logic: ON

Remarks: _____

Location: _____

Actuation Method: TURN HEATER ON FROM DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Lind Date: 6/25/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 264

Tag: AZ _____ K12_1BB I/O Type: DO Description: PvhTr1B Status

Cntlr: 20 Chan No: 11 P&ID: H-2-131076

(STOP)
Logic:

Remarks: _____

Location: _____

Actuation Method: TURNED HEATER OFF From PCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Perry InkDate: 6/25/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 265

Tag: AZ _____ K15_1AA I/O Type: DO Description: PvFan1A Start

Cntlr: 10 Chan No: 10 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: STARTED FAN FROM DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: D. SubDate: 6/24/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 266

Tag: AZ K15_1AB I/O Type: DO Description: PvFan1A Stop

Cntlr: 10 Chan No: 11 PID: 4-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: STOPPED FAN FROM PCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Loh Date: 6/29/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 267

Tag: AZ _____ K15_1BA I/O Type: DO Description: PvFan1B Start

Cntlr: 21 Chan No: 10 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Start/stop fanSensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. J. LielDate: 7/16/96

6/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 268

Tag: AZ _____ K15_1BB I/O Type: DO Description: PvFan1B Stop

Cntlr: 21 Chan No: 11 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Start/stop fanSensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: LT Hill Date: 7/16/96

12/9/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 269

FSL-AZK102-1A

Tag: FS-AZK102-1A
PS-AZK112-1A
P₁ 12-04

P&ID: H-2-131676

LOOP:

Manufacturer: Dwyer Model No.: 1640-0 Serial No: 2E-000711

MTE Instr. No: 817.45-08.040
817.88-09.004 Due Date: 2.5.97
7.15.97

Input Range 0 - 0.20

Tolerance $\pm .02$ w.g. (10%)

Units: in. w.g.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
.13	Switch	.11	.15	N/A ^①	N/A ^①	.132

(signoff) Calibrated By:

Date: 12.9.96

Location: Vent RM 'A'

Comments ① INITIAL CALIBRATION / LIMITED CAL. (single point check)
TRIP (contact shut) on pressure ↑ (connect to H.P. port)

12/9/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 270

FSL-AZK102-1B

~~FS-AZK102-1B~~Tag: ~~FS-AZK112-1B~~
P₂ 12-10-96

P&ID: H-2-131076

LOOP:

Manufacturer: Dwyer Model No.: 1640-0 Serial No.: 2E-000712MTE Instr. No.: 817.45.08.040
817.28.09.004 Due Date: 2.5.97
7.15.97

Input Range 0-0.20

Tolerance $\pm .02$ w.g. (10%)

Units: in w.g.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
.13	switch	.11	.15	N/A ①	N/A ①	.133

(signoff) Calibrated By: Paul M. ZylinskiDate: 12.9.94Location: Vent Rm 'B'Comments ① INITIAL CALIBRATION / limited cal (single pt. ck.)
TRIP (contact shut) on pressure $\uparrow$ (connect to H.P. port)

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 271

Tag: FAL_AZ_K1_4 I/O Type: DI Description: PvStac TritFlow

Cntlr: 28 Chan No: 2 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: TURN FLOW ON AND OFF

Sensor Calibration:

☒ ~~SEE ATTACHED~~ per procedure VI (data attached) D.g.
(signoff)Setpoint: 2 LPM

Loop Tolerance:

Process State	Color	LOI LCU3-13	Screen1 18PriMon	Screen2 02Main	Screen3 gmp 142
Lo (0): LOW	<u>13</u>	<u>ON</u>	<u>YELLOW</u>		<u>YELLOW (LOW)</u>
Hi (1): NORMAL	<u>2</u>	<u>OFF</u>	<u>GREEN</u>	<u>ORANGE</u>	<u>GREEN (Normal)</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 3 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug DebenDate: 8/30/46

Tag: FAL-AZK1-4

P&ID: H-2-131078, SH 1

LOOP: H-2-131309, SH 21

FR70-4/75/2.5/5/6/

Manufacturer: FCIModel No.: H/5181-Y/TSerial No: 145R09MTE Instr. No: N/ADue Date: N/A

Input Range	0-10 LPM	Tolerance	N/A			
Units:	LPM					
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
2.0	SWITCH					
N/A						

(signoff) Calibrated By: Paul M. Zylinski / P. HuxsonDate: 8-29-96Location: Stack monitor room.

- ① (a) Does alarm FSL FAL AZK1-4 energize at MICON when sample pump on tritium monitor is secured (Y)N
(b) Does alarm clear if pump is re-energized (Y)N
Comments: (c) If (a) or (b) are No, proceed to step 2. Amf
- ② ① Adjust tritium monitor sample flow rate to 2 LPM as indicated on rotometer.
② Apply power to instrument and allow 15 min. warmup time.
③ Locate potentiometer (R5) and the red LED on the control circuit board.
④ If the LED is off: turn pot R5 CW until LED turns on.
If the LED is on: turn pot R5 CCW until LED turns off, then turn pot R5 CW until the LED just turns on.
⑤ With the LED on, turn pot R5 slowly CCW until the LED just turns off.
⑥ Turn pot R-5 one half turn (1/2) past the point at which the LED just turns off. (Note: R-5 may have up to 1/4 turn of hysteresis)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 273

Tag: FI_AY1_K1_1 I/O Type: AI Description: TkAirIn Flow

Cntlr: 46 Chan No: 1 P&ID: H-2-131075 Sht. 1 Logic:

Remarks: _____

Location: _____

Actuation Method: dp simulator; see 4-20mA simulator
for low drums.

Sensor Calibration:

☒ 5 pt cal per procedure UI (data attached) LJA
~~1 pt cal~~ (signoff)Loop Tolerance: $0.5\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + 0.5\%^2 + 0.2\%^2}$

Units: CFM

Process Input	Readout Tolerance	LOI LCU4-27	Screen1 15PriIn.	Screen2 gmp101	Screen3 02Main
Lo: 0.00	-3.23 - 3.23	<u>0.02</u>	<u>0</u>	<u>0.02</u>	<u>yellow</u>
Hi: 600.00	596.77 - 603.23	<u>600.14</u>	<u>600</u>	<u>599.6</u>	<u>yellow</u>

Annunciator(s)	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2 <u>(set)</u>	<u>50</u> 50.00	<u>50</u> 46.77 - 53.23	<u>551</u> yellow
Lo:	2	50.00	46.77 - 53.23	<u>50</u> yellow
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: Did 5 pt linearity check - OKMTE Instr. No: 817-13-55-023 Due Date: 3/26/97~~817-20-69-003~~ 1/12/97(signoff) Loop Complete: LJA Date: 7/12/96

Tag: FT-A101-K1-1

P&ID:

LOO1

HNF-SD-W030-TD-002,
REV. 0, PAGE 274Manufacturer: AMC Model No.: MASSTRON Serial No.: 6494DMTE Instr. No.: 817-63-02-016 Due Date: 6-19-97
817-45-08-062 12-30-97
817-35-40-046 1-15-98

Input Range		0-200°F (93.04-135.97°C)		Tolerance		.5%	
		0-600 SCFM (0-0.7458 in. w.c.)				2% - DISPLAY	
Units:		of (°F)					
		SCFM (in. w.c.)					
Input (in. w.c.)	Output %	ma	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0000	(4.000)	-12 (3.920)	12 (4.080)	* N/A	* N/A	-000 (4.000)
0.0466	0150	(8.000)	138 (7.920)	162 (8.080)			0151 (8.024)
0.1864	0300	(12.000)	288 (11.920)	312 (12.080)			0302 (12.049)
0.4195	0450	(16.000)	438 (15.920)	462 (16.080)			0453 (16.066)
0.7458	0600	(20.000)	588 (19.920)	612 (20.080)			0600 (19.999)

(signoff) Calibrated By: Paul M ZylinskiDate: 3-7-97Location: 101 AY AIR INLET STATION

Comments * New range., changed resistor R-11 to change (increase) span range. (value new = 55K Ω) Changed R-15 to 390K Ω to filtering.

Input (in)	Output (°F) (ma)	Lo:	Hi:	As found	Input	As left
93.04	0000 (4.000)	-4 (3.920)	4 (4.080)	N/A	N/A	-000 (4.000)
103.90	0050 (8.000)	46 (7.920)	54 (8.080)			0050 (7.965)
114.68	0100 (12.000)	96 (11.920)	104 (12.080)			0100 (12.000)
125.38	0150 (16.000)	146 (15.920)	154 (16.080)			0150 (15.972)
135.97	0200 (20.000)	196 (19.920)	204 (20.080)			0200 (20.000)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 275

Tag: FT AY10IK1-21

P&ID:

LOOP:

Manufacturer: AMC Model No.: MASSTRON Serial No: 6494DMTE Instr. No: 817-63-02-002 Due Date: 6-14-97
817-28-09-003 1-12-97
817-45-08-040 2-5-97Input Range 0-200°F (93.04-135.97°C)
0-600 scfm (0-0.7367 in. w.c.)Tolerance .5%

Units:

Input (in. w.c.)	Output (% flow)	(ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00	(4.00)	-3 (3.92)	+3 (4.08)	* N/A	* N/A	0000 (4.00)
0.0663	180	(8.80)	177 (8.72)	183 (8.88)	()	()	181 (8.83)
0.1841	300	(12.00)	297 (11.92)	303 (12.08)	()	()	302 (12.05)
0.4715	480	(16.80)	477 (16.72)	483 (16.88)	()	()	481 (16.84)
0.7367	600	(20.00)	597 (19.92)	603 (20.08)	↓	↓	600 (20.00)

(signoff) Calibrated By:

Paul M. Zylinski / P.J. HansonDate: 7-8-96Location: 101AY AIR INLET STATION.Comments * Resanged; changed R11 span resistor to 55K Ω .

W.O. No.: 21874

Job Name: W0-30

Location: FT-AY101-K1-1

Model: MASSTRON

Diameter: 6.000

Effective Area: 0.196350 sq/ft

K: 0.00000

Differential Pressure: 0.7458 in/wc

Date: 03/06/97 11:33:53

-----Conditions-----

Actual Bar. Press: 29.270 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: -2.000 in/wc

Actual Den.: .05846 lb/cuft

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0018	4.80	38.45	30.00	134.89
10	0.0074	5.60	76.91	60.00	269.78
15	0.0167	6.40	115.37	90.00	404.68
20	0.0298	7.20	153.83	120.00	539.57
25	0.0466	8.00	192.28	150.00	674.47
30	0.0671	8.80	230.74	180.00	809.36
35	0.0913	9.60	269.20	210.00	944.25
40	0.1193	10.40	307.66	240.00	1079.15
45	0.1510	11.20	346.11	270.00	1214.04
50	0.1864	12.00	384.57	300.00	1348.94
55	0.2256	12.80	423.03	330.00	1483.83
60	0.2685	13.60	461.49	360.00	1618.72
65	0.3151	14.40	499.94	390.00	1753.62
70	0.3654	15.20	538.40	420.00	1888.51
75	0.4195	16.00	576.86	450.00	2023.41
80	0.4773	16.80	615.32	480.00	2158.30
85	0.5388	17.60	653.77	510.00	2293.19
90	0.6041	18.40	692.23	540.00	2428.09
95	0.6731	19.20	730.69	570.00	2562.98
100	0.7458	20.00	769.15	600.00	2697.88

Full scale lbs/hr = (SPAN FLOW) x (STD DENSITY) x (60)
 Data generated for average barometric pressure
 at Hanford site = 29.270 in. Hg.

STEP DESCRIPTION		INPUT	AS FOUND	TOLERANCE	AS LEFT
DIFFERENTIAL PRESSURE -at TP1(+) and TP0(com)	zero	zero inches w.c. diff. pressure	↑	0Vdc, +/- 6.25 mVDC	0.00003 VDC
	span	full scale span pressure .7458 in. w.c.		1.25Vdc, +/- 6.25 mVDC	1.2502 VDC
TEMPERATURE TRANSMITTER BOARD -at yellow TP4(+) and ground (green)	zero	93.04Ω	↑ Initial Setup	0Vdc, +/- 1.07 mVdc	-0.00004 VDC
	span	135.97Ω (200°F)		214.3mV, +/- 1.07 mVdc	214.30 mVDC
-at 9A(+) and 10A(com)	zero	93.04Ω		4.00 maDC +/- .01 maDC	4.000 ma
	span	135.97Ω (200°F)		20.00 maDC +/- .01 maDC	20.000 ma
COMPENSATED TRANSMITTER OUTPUT -at 1A(+) and 2A(com)	zero	135.97Ω & zero IN w.c. diff. pressure	↓	4.00 maDC +/- .01 maDC	4.000 maDC
	span	135.97Ω and calculated value .7458 in. w.c.		20.00 maDC +/- .01 maDC	19.999 maDC
DISPLAY -at 1A(+) and 2A(com)	zero/ ch-1	93.04Ω & zero IN w.c. diff. pressure	↑	0000 SCFM ± 12 SCFM	- 000 SCFM
	zero/ ch-2	93.04Ω & zero IN w.c. diff. pressure	N/A	N/A	N/A
	zero/ ch-3	93.04Ω & zero IN w.c. diff. pressure	↑	0°F ± 4°F	- 000 °F
	span/ ch-1	135.97Ω & .7458 w.c. diff. pressure	↓	0600 SCFM ± 12 SCFM	0600 SCFM
	span/ ch-2	135.97Ω & N/A w.c. diff. pressure	N/A	N/A	N/A
	span/ ch-3	135.97Ω & .7458 w.c. diff. pressure	↓	200°F ± 4°F	0200 °F

4/8/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 278

Tag: FI_AY1_K1_2 I/O Type: AI Description: TankVent Flow

Cntlr: 13 Chan No: 1 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: pressure source zc01055 sensor,

Sensor Calibration:

☐ 5 pt cal☒ Zptedper procedure VI

(data attached)

L J Hill
(signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: SCFM

LCU2-32

Process Input Readout Tolerance

LOI

Screen1

Screen2

Screen3

~~LCU2-32~~

10RecAY1

15PriIn.

gmp101

Lo: 0.00 -3.77 -3.77

-0.1900-0.19

Hi: 700.00 696.23 - 703.77

702.44702702702.24350.49350350350.53

Annunciator(s): Priority Setpoint

Tolerance

Trip Point

Max: 0 99999.99

-

HiHi: 0 99999.99

-

Hi: 2 650.00

646.23 - 653.77

651 yellow

Lo: 2 50.00

46.23 - 53.77

50 yellow

LoLo: 0 -9999.99

-

Min: 0 -9999.99

-

Other:

revised per Scott Pierce.
L J Hill5 pt lineariti, check was within 0.5% toleranceL J HillMTE Instr. No: 817-13-55-023 Due Date: 3/26/97

(signoff)

Loop Complete:

L J HillDate: 6/28/96

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 280

Tag: FT-AV101KI-2

P&ID:

LOOP:

Manufacturer: AMC Model No.: Masstron Serial No.: 6831DMTE Instr. No.: 817.28.09.003 Due Date: 1.12.97
817.63.02.016 6.14.97
817.45.08.055 11.8.96

Input Range 0-200°F

Tolerance .5%

Units: 0-700 scfm (0-.3179 in.w.c.)

Input	Output (scfm) (ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0 (4.00)	-3 (3.92)	3 (4.08)	N/A (N/A)	N/A	-000 (4.00)
0.0286	210 (8.80)	207 (8.72)	213 (8.88)	()	()	210 (8.82)
0.0794	350 (12.00)	347 (11.92)	353 (12.08)	()	()	350 (12.01)
0.2034	560 (16.80)	557 (16.72)	563 (16.88)	()	()	562 (16.86)
0.3179	700 (20.00)	697 (19.92)	703 (20.08)	()	()	700 (20.00)

(signoff) Calibrated By:

PM Zylinski/PT HursonDate: 7.2.96Location: OUTLET FLOW (101AY RECIRC. BLDG.)

Comments

Initial SetupMicro: (Hi) - 650 scfm(LO) - 50 scfm - Achieved only w/ maximation

W.O. No.: 23284

Job Name: W0-30-27

Station: FT-AY101-K1-2

Model: VOLU-PROBE/4SS, MASSTRON/D

Diameter: 7.981

Effective Area: 0.347411 sq/ft

K: 0.00000

Differential Pressure: 0.3228 in/wc

Date: 03/03/97 13:19:10

-----Conditions-----

Actual Bar. Press: 29.258 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 0.000 in/wc

Actual Den.: .05873 lb/cuft

Std. Den.: .07494 lb/cuft

XFLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0008	4.80	44.66	35.00	157.37
10	0.0032	5.60	89.32	70.00	314.74
15	0.0072	6.40	133.98	105.00	472.12
20	0.0129	7.20	178.64	140.00	629.49
25	0.0201	8.00	223.30	175.00	786.87
30	0.0290	8.80	267.96	210.00	944.24
35	0.0395	9.60	312.62	245.00	1101.61
40	0.0516	10.40	357.28	280.00	1258.99
45	0.0653	11.20	401.94	315.00	1416.36
50	0.0806	12.00	446.60	350.00	1573.74
55	0.0976	12.80	491.26	385.00	1731.11
60	0.1161	13.60	535.92	420.00	1888.48
65	0.1363	14.40	580.58	455.00	2045.86
70	0.1581	15.20	625.24	490.00	2203.23
75	0.1815	16.00	669.90	525.00	2360.61
80	0.2065	16.80	714.56	560.00	2517.98
85	0.2332	17.60	759.22	595.00	2675.35
90	0.2614	18.40	803.88	630.00	2832.73
95	0.2913	19.20	848.54	665.00	2990.10
100	0.3227	20.00	893.20	700.00	3147.48

Full scale lbs./hr = (SPAN FLOW) x (STD DENSITY) x (60)

Data generated for today's barometric pressure at ETF (3-3-97)

Note: Use full scale lbs/hr to obtain SCFM(700) when generating this form.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 282

Tag: FI_AY2_K1_1 I/O Type: AI Description: TkAirIn Flow

Cntlr: 46 Chan No: 15 P&ID: H-2-131075 Skt. 1 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source; mA Simulator for low limit.

Sensor Calibration:

☒ 5 pt cal☐per procedure VI (data attached) [Signature]
(signoff)Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ \text{(DCS)} \end{matrix}}$

Units: CFM

Process Input Readout Tolerance

LOI
LCU4-28Screen1
15PriIn.Screen2
group102Screen3
02M2in

Lo: 0.00 -3.23 - 3.23

0.1900.09yellow empty

Hi: 600.00 596.77 - 603.23

600.0600599.60yellow filled

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2	550.00	546.77 - 553.23	<u>550 yellow</u>
Lo:	2	50.00	46.77 - 53.23	<u>50 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

MTE Instr. No: 817-13-55-023 Due Date: 3/20/97817-28-09-0031/12/97(signoff) Loop Complete: [Signature] Date: 7/16/96

Tag: FIT-AY102-K1-1

P&ID:

LOOP

HNF-SD-W030-TD-002,
REV. 0, PAGE 283

Manufacturer: AMC Model No.: MASSTRON Serial No.: 6497D
 817.63.02.014 6.14.97
 817.45.08.012 12.30.97
 MTE Instr. No.: 817.35.40.046 Due Date: 1.15.98

Input Range		0-200°F (93.04-135.97°C) 0-600 scfm (0-0.7458 in.w.c)		Tolerance		.5% 2% - DISPLAY	
Units:		°F (°F) scfm (in.w.c)					
Input (in.w.c)	Output %	ma	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0000	(4.000)	12 (3.920)	12 (4.080)	* N/A	* N/A	0000 (4.000)
0.0466	0150	(8.000)	138 (7.920)	162 (8.080)			0150 (8.002)
0.1864	0300	(12.000)	288 (11.920)	312 (12.080)			0300 (12.011)
0.4195	0450	(16.000)	438 (15.920)	462 (16.080)			0451 (16.035)
0.7458	0600	(20.000)	588 (19.920)	612 (20.080)			0600 (20.000)

(signoff) Calibrated By:

Paul M. JylinskiDate: 3.10.97Location: 102-AY AIR INLET STATION

Comments * New range, changed resistor R-11 to change (increase) span range. (value new = 55K Ω) Changed R-15 to 390K Ω to 1 filtering.

Input (in.)	Output (°F) (ma)	Lo:	Hi:	As found	in/out	As left
93.04	0000 (4.000)	-4 (3.920)	4 (4.080)	* N/A	* N/A	-000 (3.999)
103.90	0050 (8.000)	46 (7.920)	54 (8.080)			0050 (7.984)
114.68	0100 (12.000)	96 (11.920)	104 (12.080)			0100 (12.007)
125.38	0150 (16.000)	146 (15.920)	154 (16.080)			0149 (15.960)
135.97	0200 (20.000)	196 (19.920)	204 (20.080)			0200 (20.000)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 284

Tag: FT AY102KI-1

P&ID:

LOOP:

Manufacturer: AMC Model No.: MASSTRON Serial No.: 6497DMTE Instr. No.: See below Due Date: See below

Input Range			Tolerance				
0-200 °F (93.04-135.47 °C)			.5%				
Units:							
0-100 °C (32-212 °F)							
Input (in.w.c)	Output %	(ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00	(4.00)	-3 (3.92)	+3 (4.08)	*N/A (N/A)	N/A	0.000 (0.000)
0.0663	180	(8.80)	177 (8.72)	183 (8.88)	()	()	0.179 (17.9)
0.1841	300	(12.00)	297 (11.92)	303 (12.08)	()	()	0.299 (29.9)
0.4715	480	(16.80)	477 (16.72)	483 (16.88)	()	()	0.480 (48.0)
0.7363	600	(20.00)	597 (19.92)	603 (20.08)	()	()	599.0 ()

S.F.
7-10-96

(signoff) Calibrated By:	07-11-96	817-28-09-003
		Date: 1-12-97
		817-45-08-062
		9-23-96
Location: 102AY AIR INLET STATION		817-63-02-002
		6-14-97

Comments * Changed resistor R-11
to change span range.
Initial setup

0	-001	3.98
0.066	180	8.80
0.1841	300	12.00
0.4715	480	16.80
0.736	600	19.99

7-11-96

PJH
cpc

W.O. No.: 21874

-----Conditions-----

Job Name: W0-30

Actual Bar. Press: 29.270 in/hg

Station: FT-AY102-K1-1

Actual Temp.F.: 200

Model: MASSTRON

Std. Temp.F.: 69

Diameter: 6.000

H2O: 0.00 %

Effective Area: 0.196350 sq/ft

Process Fluid: AIR

K: 0.00000

Duct Static: -2.000 in/wc

Differential Pressure: 0.7458 in/wc

Actual Den.: .05846 lb/cuft

Date: 03/06/97 11:32:44

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0018	4.80	38.45	30.00	134.89
10	0.0074	5.60	76.91	60.00	269.78
15	0.0167	6.40	115.37	90.00	404.68
20	0.0298	7.20	153.83	120.00	539.57
25	0.0466	8.00	192.28	150.00	674.47
30	0.0671	8.80	230.74	180.00	809.36
35	0.0913	9.60	269.20	210.00	944.25
40	0.1193	10.40	307.66	240.00	1079.15
45	0.1510	11.20	346.11	270.00	1214.04
50	0.1864	12.00	384.57	300.00	1348.94
55	0.2256	12.80	423.03	330.00	1483.83
60	0.2685	13.60	461.49	360.00	1618.72
65	0.3151	14.40	499.94	390.00	1753.62
70	0.3654	15.20	538.40	420.00	1888.51
75	0.4195	16.00	576.86	450.00	2023.41
80	0.4773	16.80	615.32	480.00	2158.30
85	0.5388	17.60	653.77	510.00	2293.19
90	0.6041	18.40	692.23	540.00	2428.09
95	0.6731	19.20	730.69	570.00	2562.98
100	0.7458	20.00	769.15	600.00	2697.88

Full scale lbs/hr = (SPAN FLOW) x (STD. DENSITY) x (60)
Data generated for average barometric pressure
at Hanford site = 29.270" Hg.

4/8/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 286

Tag: FI_AY2_K1_2 I/O Type: AI Description: TankVent Flow

Cntlr: 13 Chan No: 6 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: DP Source ; 4-20mA source for limits

Sensor Calibration:

☒ 5 pt cal per procedure UI (data attached) L J Hill
☐ _____ (signoff)

 Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} 2 & 2 & 0.5\% & 0.2\% \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$

Units: SCFM

Process Input	Readout Tolerance	LOI LCU 2-33	Screen1 11RecAY2	Screen2 15PriIn.	Screen3 group 102
Lo: 0.00	-3.77 - 3.77	<u>0.46</u>	<u>0</u>	<u>0</u>	<u>0.33</u>
Hi: 700.00	696.23 - 703.77	<u>702.16</u>	<u>703</u>	<u>703</u>	<u>702.90</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2	<u>650.00</u>	<u>646.23 - 653.77</u>	<u>650.50 yellow</u>
Lo:	2	50.00	46.23 - 53.77	<u>50 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

SP change per Scott Pierce817-28-09-0031/12/97MTE Instr. No: 817-13-55-023 Due Date: 3/26/97

(signoff)

Loop Complete: L J HillDate: 8/13/96

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 288

Tag: FT-AV102KI-2

F&ID:

LOOP:

Manufacturer: AMC Model No.: Masstron Serial No: 68310D
817.13.55.023 3.2L.97
817.28.09.003 11.2.97 8.15.94
 MTE Instr. No: 817.63.02.016 Due Date: 6.14.97
817.28.09.004 817.45.08.055 11.8.97 8.15.94 7.15.97

Input Range 0-200°F			Tolerance .5%		
Units: 0-700 SCFM (0-3179 in. w.c.)					
Input (in. w.c.)	Output (SCFM)	(ma)	Lo:	Hi:	As Found In/Out As Left
0.000	0	(4.00)	-3 (3.92)	3 (4.08)	N/A (N/A) N/A -0.01 (4.0)
0.0286	210	(8.80)	207 (8.72)	213 (8.88)	N/A () 211 (8.85)
0.0794	350	(12.00)	347 (11.92)	353 (12.08)	() 350 (12.00)
0.2034	560	(16.80)	557 (16.72)	563 (16.88)	() 559 (16.80)
0.3179	700	(20.00)	697 (19.92)	703 (20.08)	() 699 (20.00)

(signoff) Calibrated By: Am ZylinskiDate: 8.15.96Location: OUTLET FLOW (102AY RECIRC. BLDG.)

Comments

Initial setupMicon(Hi) - 650 SCFM(Lo) - 50 SCFM (Achieved only w/ ma Xmotion)

W.O. No.: 23284

Job Name: W-030-27

Station: FT-AY102-K1-2

Model: VOLU-PROBE/4SS. , MASSTRON/D

Diameter: 7.981

Effective Area: 0.347411 sq/ft

K: 0.00000

Differential Pressure: 0.3205 in/wc

Date: 03/05/97 08:27:19

-----Conditions-----

Actual Bar. Press: 29.466 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 0.000 in/wc

Actual Den.: .05915 lb/cuft

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0008	4.80	44.34	35.00	157.37
10	0.0032	5.60	88.68	70.00	314.74
15	0.0072	6.40	133.02	105.00	472.12
20	0.0128	7.20	177.37	140.00	629.49
25	0.0200	8.00	221.71	175.00	786.87
30	0.0288	8.80	266.05	210.00	944.24
35	0.0392	9.60	310.40	245.00	1101.61
40	0.0512	10.40	354.74	280.00	1258.99
45	0.0648	11.20	399.08	315.00	1416.36
50	0.0801	12.00	443.43	350.00	1573.74
55	0.0969	12.80	487.77	385.00	1731.11
60	0.1153	13.60	532.11	420.00	1888.48
65	0.1354	14.40	576.46	455.00	2045.86
70	0.1570	15.20	620.80	490.00	2203.23
75	0.1802	16.00	665.14	525.00	2360.61
80	0.2051	16.80	709.49	560.00	2517.98
85	0.2315	17.60	753.83	595.00	2675.35
90	0.2595	18.40	798.17	630.00	2832.73
95	0.2892	19.20	842.52	665.00	2990.10
100	0.3204	20.00	886.86	700.00	3147.48

Full scale lbs/hr = (SPAN FLOW) x (STD DENSITY) x (60)

Data generated for today's barometric pressure at ETF (35.97)

Note: Use full scale lbs/hr to obtain SCFM when generating this form.

6/11/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 290

Tag: FI_AZ_K1_3 I/O Type: AI Description: PVSzac Flow

Cntlr: 14 Chan No: 7 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source is from A source for 75 limit

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) PCR
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (\text{other})^2 + (\text{DCS})^2}$

Units: SCFM

Process Input	Readout Tolerance	LOI LCU2-12	Screen1 18PriMon	Screen2 02Main	Screen3 group 14
Lo: 0.00	-22.11 / 22.11	<u>-0.36</u>	<u>0</u>	<u>empty</u>	<u>-0.30</u>
Hi: 1100.00	1077.89 / 1122.11	<u>1097.0</u>	<u>1097</u>	<u>slam</u> "fuel"	<u>1097.64</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	2	1050.00	1027.89 / 1072.11	<u>1050 yellow</u>
Lo:	2	200.00	177.89 / 222.11	<u>202 yellow</u>
LoLo:	0	99999.99	/	_____
Min	3	-75.00	-97.11 / -52.89	<u>-75 white</u>

Other:

Also checked indications on 03 Hz kDt & 04 Totals817-63-02-0026/14/97817-45-08-4411/8/96

MTE Instr. No:

817-28-09-003

Due Date:

1/12/97

(signoff)

Loop Complete:

L. J. Hill

Date:

7/24/96

Tag: FIT-AZKI-3

P&ID:

LOOP

Manufacturer: AMC Model No.: HASSTRON Serial No: 6757DMTE Instr. No: 817-35-40-046
817-63-02-046
817-45-08-062 Due Date: 1/15/98
6/9/97
12/30/97

0-200°F (93.04-135.97°F)			OUTPUT = .5%				
Input Range 0-1100 SCFM (0 - 0.3223 in. w.c.)			Tolerance DISPLAY = 2%				
Units: of SCFM							
Input (in. w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0000	0.000	-22 (-0.25)	22 (.025)	* N/A (N/A)	* N/A	-000 (0.000)
0.0290	0330	1.500	303 (1.475)	352 (1.525)	()	()	0330 (1.506)
0.0805	0550	2.500	528 (2.475)	572 (2.525)	()	()	0550 (2.500)
0.2063	0880	4.000	858 (3.975)	902 (4.025)	()	()	0880 (4.000)
0.3223	1100	5.000	1078 (4.975)	1122 (5.025)	↓ (↓)	↓ (↓)	1100 (5.000)

(signoff) Calibrated By: Paul M. ZylinskiDate: 2-3-97Location: Main Stack (ENCLOSURE AZKI-1)Comments * Initial Setup. Changed R15 to 390K Ω to reduce noise (filter).

Input (in)	Output (°F) (V)	Lo:	Hi:	As found	Input	As left
93.04	0 (0.000)	-4 (-0.25)	4 (.025)	* N/A (N/A)	* N/A	0 (0.0005)
103.90	50 (1.250)	46 (1.225)	54 (1.275)	()	()	50 (1.237)
114.68	100 (2.500)	96 (2.475)	104 (2.525)	()	()	100 (2.495)
125.38	150 (3.750)	146 (3.725)	154 (3.775)	()	()	150 (3.737)
135.97	200 (5.000)	196 (4.975)	204 (5.025)	()	()	200 (5.001)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 292

Tag: FIT-AZK1-1-3

P&ID: H-2-131078, SH 1

LOOP: H-2-131309, SH 19

Manufacturer: AMC Model No.: MASTRON Serial No.: 6757DMTE Instr. No.: 817-28-09-003
817-63-02-002
817-45-08-044 Due Date: 1-12-97
6-14-97
11-8-96

Input Range			0-200°F (93.03 - 135.97 A)		Tolerance		DISPLAY = 2%	
			0-1100 SCFM (0.0000 - 0.2922 in.w.c.)				OUTPUT = .5%	
Units:			°F					
			SCFM					
Input (in.w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left	
0.0000	0.00	(0.00)	-5 (0.025)	5 (0.025)	*N/A (N/A)	*N/A	0.000 (0.00)	
0.0263	330.0	(1.50)	325 (1.475)	335 (1.525)	()	()	0.330 (1.50)	
0.0730	550.0	(2.50)	545 (2.475)	555 (2.525)	()	()	0.550 (2.50)	
0.1870	880.0	(4.00)	875 (3.975)	885 (4.025)	()	()	0.883 (4.020)	
0.2922	1100.0	(5.00)	1095 (4.975)	1105 (5.025)	()	()	1.100 (5.00)	

(signoff) Calibrated By: Date: 07-24-96Location: Main Stack Flow (ENCL AZK1-1)Comments * initial setup.

input (in)	output (°F)	(V)	Lo	Hi	As found	In/Out	As left
93.04	0	(0.000)	-4 (0.025)	4 (0.025)	*N/A (N/A)	*N/A	0 (0.00)
103.90	50	(1.25)	46 (1.225)	54 (1.275)	()	()	50 (1.240)
114.68	100	(2.50)	96 (2.475)	104 (2.525)	()	()	100 (2.500)
125.38	150	(3.75)	146 (3.725)	154 (3.775)	()	()	150 (3.740)
135.97	200	(5.00)	196 (4.975)	204 (5.025)	()	()	200 (5.000)

re-called later - see attached

Tag: FIT-AZKI-3

P&ID:

L:

HNF-SD-W030-TD-002,
REV. 0, PAGE 293Manufacturer: AMC Model No.: MASSTRON Serial No: 6757DMTE Instr. No: 817-35-40-046
817-63-02-016
817-45-08-062 Due Date: 115.98
6-19-97
12-30-97

0-200°F (93.04-135.97°F)			Output = .5%			Tolerance			DISPLAY = 2%		
Input Range 0-1100 SCFM (0 - 0.3223 in. w.c.)											
Units: of SCFM											
Input (in. w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left				
0.0000	0000	0.000	-22 (-0.25)	22 (.025)	* N/A (N/A)	* N/A	-000 (-0.000)	1.499	1.499	1.499	1.499
0.0290	0330	1.500	303 (1.475)	352 (1.525)	()	()	0329 (1.499)	2.499	2.499	2.499	2.499
0.0805	0550	2.500	528 (2.475)	572 (2.525)	()	()	0549 (2.475)	3.999	3.999	3.999	3.999
0.2063	0880	4.000	858 (3.975)	902 (4.025)	()	()	0880 (3.975)	4.999	4.999	4.999	4.999
0.3223	1100	5.000	1078 (4.975)	1122 (5.025)	()	()	1100 (5.000)	5.000	5.000	5.000	5.000

(signoff) Calibrated By: Paul M. Zylinski Date: 1-28-97Location: Main Stack (ENCLOSURE AZKI-1)Comments * Initial Setup, changed R15 to 39K Ω to reduce noise (filter).

input (in)	output (°F) (V)	Lo:	Hi:	As found	Input	As left
93.04	0 (0.000)	-4 (-0.25)	4 (.025)	* N/A (N/A)	* N/A	0 (0.000)
103.90	50 (1.250)	46 (1.225)	54 (1.275)	()	()	50 (1.240)
114.68	100 (2.500)	96 (2.475)	104 (2.525)	()	()	100 (2.500)
125.38	150 (3.750)	146 (3.725)	154 (3.775)	()	()	150 (3.742)
135.97	200 (5.000)	196 (4.975)	204 (5.025)	()	()	200 (5.001)

VOID
PCB 12/197

Main Stack

----- Air Monitor Corp. Transmitter Span Calculation Data Sheet

HNF-SD-W030-TD-002,
REV. 0, PAGE 294

W.O. No.: 23283

Name: W-030

Location: FT-AZ-K1-3

Model: MASSTRON

Diameter: 10.000

Effective Area: 0.545417 sq/ft

K: 0.00000

Differential Pressure: 0.3224 in/wc

Date: 01/09/97 10:21:35

-----Conditions-----

Actual Bar. Press: 29.270 in/Hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 1.000 in/wc

Actual Den.: .05891 lb/cuft

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
10	0.0032	5.60	139.93	110.00	494.60
20	0.0128	7.20	279.86	220.00	989.20
30	0.0290	8.80	419.79	330.00	1483.81
40	0.0515	10.40	559.72	440.00	1978.41
50	0.0805	12.00	699.66	550.00	2473.02
60	0.1160	13.60	839.59	660.00	2967.62
70	0.1579	15.20	979.52	770.00	3462.22
80	0.2063	16.80	1119.45	880.00	3956.83
90	0.2611	18.40	1259.38	990.00	4451.43
100	0.3223	20.00	1399.32	1100.00	4946.04

Full SCALE $\frac{lb}{hr} = (\text{SPAN FLOW}) \times (\text{STD. DENSITY}) \times (60)$ Data generated for Average Barometric pressure at
Hanford site = 29.270 in/Hg

Computer Type: PC

FoxPro Version: 2.6 Runtime

Source File: MFC.APP Rev 1.0b 06/01/95

Prepared by: _____ Date: _____

Reviewed by: _____ Date: _____

VOID
RCS 2/3/97

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 295

Tag: FI_AZ1_K1_1 I/O Type: AI Description: TkAirIn Flow

Cntlr: 51 Chan No: 1 P&ID: H-2-131075 Sh. 2 Logic:

Remarks: _____

Location: _____

Actuation Method: DP Source

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) attached
☐ _____ (signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: CFM

Process Input	Readout Tolerance	LOI LCU3-34	Screen1 15PriIn.	Screen2 gray 103	Screen3 02Min
Lo: 0.00	-3.23 - 3.23	<u>0.42</u>	<u>0</u>	<u>0.33</u>	<u>yellow empty</u>
Hi: 600.00	596.77 - 603.23	<u>601.15</u>	<u>601.68</u>	<u>601.50</u>	<u>YELLOW FL</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2	550.00	546.77 - 553.23	<u>550 YELLOW</u>
Lo:	2	50.00	46.77 - 53.23	<u>50.1 YELLOW</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

ALSO TEST FAL-A2K1-1AMTE Instr. No: 817-13-55-023 Due Date: 3/20/97817-28-09-002 1/12/97(signoff) Loop Complete: Doug Loh Date: 7/16/96

Tag: FIT-AZ101-K1-1

P&ID:

LOO1

HNF-SD-W030-TD-002,
REV. 0, PAGE 296

Manufacturer: AMC Model No.: MASSTRON Serial No.: 6496D
 817.63.02.016 6.14.97
 817.45.08.062
 MTE Instr. No.: 817.35.40.046 Due Date: 12.30.97
 1.15.98

Input Range	0-200°F (93.04-135.97°C)	Tolerance	5%				
	0-600 SCFM (0-0.7458 in. w.c.)		2% - DISPLAY				
Units:	°F (°C)						
	SCFM (in. w.c.)						
Input (in. w.c.)	Output %	ma	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0000	(4.000)	-12 (3.920)	12 (4.080)	* N/A	* N/A	-000 (4.000)
0.0466	0150	(8.000)	138 (7.920)	162 (8.080)			0151 (8.025)
0.1864	0300	(12.000)	288 (11.920)	312 (12.080)			0301 (12.043)
0.4195	0450	(16.000)	438 (15.920)	462 (16.080)			0452 (16.069)
0.7458	0600	(20.000)	588 (19.920)	612 (20.080)			0600 (20.001)

(signoff) Calibrated By:

Paul M. ZylinskiDate: 3.11.97

Location:

101AZ AIR INLET STATION

Comments * New range., changed resistor R-11 to change (increase) span range. (value was = 55K Ω) Changed R-15 to 390K Ω to filtering.

Input (in)	Output (°F) (ma)	Lo:	Hi:	As Found	In/Out	As Left
93.04	0000 (4.000)	-4 (3.920)	4 (4.080)	* N/A	N/A	-000 (4.008)
103.90	0050 (8.000)	46 (7.920)	54 (8.080)			0051 (8.003)
114.68	0100 (12.000)	96 (11.920)	104 (12.080)			0101 (12.023)
125.38	0150 (16.000)	146 (15.920)	154 (16.080)			0150 (16.004)
135.97	0200 (20.000)	196 (19.920)	204 (20.080)			0200 (20.000)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 297Tag: FT-AZ101KI-~~21~~⁷³

P&ID:

LOOP:

Manufacturer: AMC Model No.: MASTRO-1 Serial No.: 6496DMTE Instr. No.: See below Due Date: See below

Input Range	0-200°F (93.04-135.97°)		Tolerance		.5%		
Units:	0.600 SCFM (0-0.7367 in wc.)						
Input (in wc.)	Output %	(ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00	(4.00)	-3 (3.92)	+3 (4.08)	* N/A (N/A)	N/A	0.000 (
0.0663	180	(8.80)	177 (8.72)	183 (8.88)	()	()	181.0 (
0.1841	300	(12.00)	297 (11.92)	303 (12.08)	()	()	302.0 (
0.4715	480	(16.80)	477 (16.72)	483 (16.88)	()	()	482.0 (
0.7367	600	(20.00)	597 (19.92)	603 (20.08)	()	()	600.0 (

(signoff) Calibrated By: <u>[Signature]</u>	01-11-96	817-28-09-003
Date:	1-12-97	817-45-08-062
Location: <u>101 AZ AIR INLET STATION</u>	9-22-96	817-63-02-002
	6-14-97	

Comments * Changed resistor
R-11 to change span range.
Initial setup.

0.0 0 4.0
0.0663 182 8.86
0.1841 302 12.06
0.4715 482 16.86
0.7367 600 20.00

7-11-96
RTK
CPE

----- Air Monitor Corp. Transmitter Span Calculation Data Sheet -----

W.O. No.: 21874

Job Name: W0-30

Station: FT-AZ101-K1-1

Model: MASSTRON

Orifice Diameter: 6.000

Effective Area: 0.196350 sq/ft

K: 0.00000

Differential Pressure: 0.7458 in/wc

Date: 03/06/97 11:29:58

-----Conditions-----

Actual Bar. Press: 29.270 in/Hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: -2.000 in/wc

Actual Den.: .05846 lb/cuft

Std. Den.: .07494 lb/cuft

HNF-SD-W030-TD-002,
REV. 0, PAGE 298

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0018	4.80	38.45	30.00	134.89
10	0.0074	5.60	76.91	60.00	269.78
15	0.0167	6.40	115.37	90.00	404.68
20	0.0298	7.20	153.83	120.00	539.57
25	0.0466	8.00	192.28	150.00	674.47
30	0.0671	8.80	230.74	180.00	809.36
35	0.0913	9.60	269.20	210.00	944.25
40	0.1193	10.40	307.66	240.00	1079.15
45	0.1510	11.20	346.11	270.00	1214.04
50	0.1864	12.00	384.57	300.00	1348.94
55	0.2256	12.80	423.03	330.00	1483.83
60	0.2685	13.60	461.49	360.00	1618.72
65	0.3151	14.40	499.94	390.00	1753.62
70	0.3654	15.20	538.40	420.00	1888.51
75	0.4195	16.00	576.86	450.00	2023.41
80	0.4773	16.80	615.32	480.00	2158.30
85	0.5388	17.60	653.77	510.00	2293.19
90	0.6041	18.40	692.23	540.00	2428.09
95	0.6731	19.20	730.69	570.00	2562.98
100	0.7458	20.00	769.15	600.00	2697.88

Full scale lbs/hr = (SPAN FLOW) x (STD DENSITY) x (60)
 Data generated for average barometric pressure
 at Hanford site = 29.270" Hg.

4/8/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 299

Tag: FI_AZ1_K1_2 I/O Type: AI Description: TankVent Flow
 Cntlr: 2 Chan No: 1 P&ID: H-2-131075 Logic: Y150

Remarks: _____

Location: _____

Actuation Method: DP source across sensor → DP's set
per manufacturer's datasheet.

Sensor Calibration:

☐ 5 pt cal☒ 2 pt calper procedure UI

(data attached)

LJH
(signoff)

Loop Tolerance: $0.5\% = \sqrt{(\text{sensor})^2 + (\text{transmitter})^2 + (0.5\%)^2 + (0.2\%)^2}$
 (sensor) (transmitter) (other) (DCS)

Units: SCFM

LCU1-42

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

Lo: 0.00

-3.77 - 3.77

0.000-0.14

Hi: 700.00

696.23 - 703.77

702.00702702701.97

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2	650.00	646.23 - 653.77	<u>650 yellow</u>
Lo:	2	50.00	46.23 - 53.77	<u>50 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

SP change per Scott Pierce. LJH

Other:

5 pt linearity check was within 0.5% toleranceALSO TEST FAL-AZK1-2AMTE Instr. No: 817-13-55-023Due Date: 3/26/97

(signoff)

Loop Complete: LJHDate: 6/28/96

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 300

Tag: FT-AZ101K1-2

P&ID:

LOOP:

Manufacturer: AMC Model No.: Masstron Serial No.: 68331MTE Instr. No: 817-28-09-003
817-63-02-016Due Date: 1-12-97
4-14-97817-45-08-05511-8-96Input Range 0-200°F
0-700 SCFM (0.3179 in wa)Tolerance .5%

Units:

Input	Output (SCFM) (MA)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0 (4.00)	-3 (3.92)	3 (4.08)	N/A	(N/A)	N/A -000 (3.99)
0.0286	210 (8.80)	207 (8.72)	213 (8.88)		()	212 (8.85)
0.0794	350 (12.00)	347 (11.92)	353 (12.08)		()	349 (12.03)
0.2034	560 (16.80)	557 (16.72)	563 (16.88)		()	560 (16.83)
0.3179	700 (20.00)	697 (19.92)	703 (20.08)		()	701 (20.02)

(signoff) Calibrated By: P. J. Lusk / P. HussonDate: 7-2-96Location: OUTLET FLOW (101AZ RECIRC BLDG)

Comments

Initial setupMicon: (Hi) 650 SCFM(Lo) 50 SCFM (Achieved only w/ma. X-mation)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 301

Tag: FT-AZ101K1-2

P&ID:

LOOP:

Manufacturer: AMC Model No.: Masstron Serial No.: 68331MTE Instr. No: 817-45-08-062
817-35-40-046
817-62-02-01612.30.97
1.15.98
6.14.97

Due Date:

93.04 - 135.97 F
0 - 300 °F

Input Range 0 - 700 SCFM (0-0 in. w.c.) Tolerance * 0.5% - output
* 2% - display

Units: °F/SCFM/IN

Input (in. w.c.)	Output (SCFM) (ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0 (4.00)	-14 (3.920)	14 (4.08)	① N/A (N/A)	① N/A	-000 (4.00)
0.0200	175 (8.00)	161 (7.920)	189 (8.08)	()	()	0176 (8.024)
0.0800	350 (12.00)	336 (11.920)	364 (12.08)	()	()	0350 (12.04)
0.1801	525 (16.00)	511 (15.92)	539 (16.08)	()	()	0526 (16.020)
0.3203	700 (20.00)	686 (19.92)	714 (20.08)	()	()	0700 (20.000)

(signoff) Calibrated By:

Paul M. ZylinskiDate: 2.25.97

Location:

OUTLET FLOW (101AZ RECIRC PLDGE)

Comments

① Initial setup. Density comp. board added at factory.
Changed R15 to 390K to 1 filtering

Micon Hi = 650 SCFM

Lo = 50 SCFM (Achieved w/Xmation only).

input (in.)	output (°F) (ma)	Lo:	Hi:	As found	In/Out	As left
93.04	0 (4.00)	-4 (3.920)	4 (4.08)	① N/A (N/A)	① N/A	-000 (4.00)
103.90	50 (8.00)	46 (7.920)	54 (8.08)	()	()	0050 (7.968)
114.68	100 (12.00)	96 (11.920)	104 (12.08)	()	()	0100 (12.005)
125.38	150 (16.00)	146 (15.920)	154 (16.08)	()	()	0150 (15.986)
135.97	200 (20.00)	196 (19.920)	204 (20.08)	()	()	0200 (20.003)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 302

Tag: FI_AZ2_K1_1 I/O Type: AI Description: TkAirIn Flow

Cntlr: 51 Chan No: 15 P&ID: H-2-131075 skt.2 Logic:

Remarks:

Location:

Actuation Method:

DP Source

Sensor Calibration:

☒ 5 pt cal☐

per procedure

VI

(data attached)

H. H. Hill
(signoff)
$$\text{Loop Tolerance: } 0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\%^2 & + & 0.2\%^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$$

Units: CFM

Process Input

Readout Tolerance

LOI

LCU3-35

Screen1

15PriIn.

Screen2

group 104

Screen3

02Main

Lo: 0.00

-3.23 - 3.23

0.1400.16

yellow empty

Hi: 600.00

596.77 - 603.23

600.03600600.02

yellow filled

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

-

HiHi:

0

99999.99

-

Hi:

2

550.00

546.77 - 553.23

550 yellow

Lo:

2

50.00

46.77 - 53.23

50 yellow

LoLo:

0

-9999.99

-

Min:

0

-9999.99

-

Other:

MTE Instr. No: 817-13-55-023Due Date: 3/20/97817-28-09-0021/12/97

(signoff)

Loop Complete:

L. H. HillDate: 7/16/96

Tag: FIT-AZ102-K1-1

P&ID:

HNF-SD-W030-TD-002,
REV. 0, PAGE 303Manufacturer: AMC Model No.: MASSTRON Serial No: 6495DMTE Instr. No: 817-63-02-01C
817-45-08-012
817-55-40-04CDue Date: 6-14-97
12-30-97
1-15-98

Input Range	0-200°F (93.04-135.97°C)		Tolerance		.5 %	
	0-600 SCFM (0-0.7458 in.w.c)				2% - DISPLAY	
Units:	°F (°C)					
	SCFM (in.w.c)					
Input (in.w.c)	Output %	ma	Lo:	Hi:	As Found	In/Out As Left
0.0000	0000	(4.000)	-12 (3.920)	12 (4.080)	* N/A	* N/A - 000 (4.001)
0.0466	0150	(8.000)	138 (7.920)	162 (8.080)		0151 (8.033)
0.1864	0300	(12.000)	288 (11.920)	312 (12.080)		0300 (12.028)
0.4195	0450	(16.000)	438 (15.920)	462 (16.080)		0451 (16.044)
0.7458	0600	(20.000)	588 (19.920)	612 (20.080)		0600 (20.000)

(signoff) Calibrated By: Paul M. ZylinskiDate: 3-24-97Location: 102AZ AIR INLET STATION

Comments * New range., changed resistor R-11 to change (increase) span range. (value new = 55K Ω)

Input (°F)	Output (°F) (ma)	Lo:	Hi:	As Found	In/Out	As left
93.04	0000 (4.000)	-4 (3.920)	4 (4.080)	* N/A	* N/A	- 000 (4.001)
103.90	0050 (8.000)	46 (7.920)	54 (8.080)			0050 (7.992)
114.68	0100 (12.000)	96 (11.920)	104 (12.080)			0100 (12.015)
125.38	0150 (16.000)	146 (15.920)	154 (16.080)			0150 (15.999)
136.97	0200 (20.000)	196 (19.920)	204 (20.080)			0200 (20.000)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 304

Tag: FT-AZ102KI-4

P&ID:

LOOP:

Manufacturer: AMCModel No.: MASTRONSerial No: 64951MTE Instr. No: See BelowDue Date: See BelowInput Range 0-200°F (43.04-135.97A)
0-600 SCFM (0-.7363 in w.c.)

Tolerance .5%

Units: (

Input (in w.c.)	Output % (ma)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00 (4.00)	-3 (3.92)	+3 (4.08)	* N/A (N/A)	N/A	-001 / (4.00)
0.0663	180 (8.80)	177 (8.72)	183 (8.88)	()		180 / 8.79 19.98
0.1841	300 (12.00)	297 (11.92)	303 (12.08)	()		300 / (11.99)
0.4715	480 (16.80)	477 (16.72)	483 (16.88)	()		480 / (16.89)
0.7363	600 (20.00)	597 (19.92)	603 (20.08)	↓ (↓)	↓	599 / (19.98)

(signoff) Calibrated By:

07-11-96

Date:

Location: 102AZ AIR INLET STATION

817-28-09-003

1-12-97

817-45-08-062

9-22-90

817-63-02-002

6-14-97

Comments * Changed resistor R-1
to change span range
Initial setup

W.O. No.: 23284

Job Name: W-030-27

Location: FT-AZ101-K1-2

Model: VOLU-PROBE/4SS, MASSTRON/D

Diameter: 7.981

Effective Area: 0.347411 sq/ft

K: 0.00000

Differential Pressure: 0.3203 in/wc

Date: 02/25/97 15:13:21

-----Conditions-----

Actual Bar. Press: 29.480 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 0.000 in/wc

Actual Den.: .05918 lb/cuft

Std. Den.: .07494 lb/cuft

ZFLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0008	4.80	44.32	35.00	157.37
10	0.0032	5.60	88.64	70.00	314.74
15	0.0072	6.40	132.96	105.00	472.12
20	0.0128	7.20	177.28	140.00	629.49
25	0.0200	8.00	221.60	175.00	786.87
30	0.0288	8.80	265.92	210.00	944.24
35	0.0392	9.60	310.24	245.00	1101.61
40	0.0512	10.40	354.56	280.00	1258.99
45	0.0648	11.20	398.88	315.00	1416.36
50	0.0800	12.00	443.20	350.00	1573.74
55	0.0968	12.80	487.52	385.00	1731.11
60	0.1153	13.60	531.84	420.00	1888.48
65	0.1353	14.40	576.16	455.00	2045.86
70	0.1569	15.20	620.49	490.00	2203.23
75	0.1801	16.00	664.81	525.00	2360.61
80	0.2050	16.80	709.13	560.00	2517.98
85	0.2314	17.60	753.45	595.00	2675.35
90	0.2594	18.40	797.77	630.00	2832.73
95	0.2890	19.20	842.09	665.00	2990.10
100	0.3203	20.00	886.41	700.00	3147.48

Full scale lbs/hr = (SPAN FLOW) × (STD DENSITY) × 60

Data generated for today's barometric pressure at ETF (2-25-97)

Note: Use full scale lbs/hr to obtain SCFM when generating
this form

4/8/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 306

Tag: FI_AZ2_K1_2 I/O Type: AI Description: TankVent Flow
 Cntl: 2 Chan No: 6 P&ID: H-2-131075 Logic: Y150

Remarks: _____

Location: _____

Actuation Method: DP source per vendor V.I.
for low limit, used 4-20mA source.

Sensor Calibration:

☐ 5 pt cal☒ 2ptper procedure V.I.

(data attached)

LSH
(signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{sensor}^2 & + & \text{transmitter}^2 & + & 0.5\%^2 & + & 0.2\%^2 \\ \text{(sensor)} & & \text{(transmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: SCFM

Process Input

Readout Tolerance

LCV

~~1-43 LOI~~

Screen1

Screen2

Screen3

15PriIn.

13RecAZ2

group 104

Lo: 0.00

-3.77 - 3.77

0.03000.01

Hi: 700.00

696.23 - 703.77

700.90700700700.90

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

-

HiHi:

0

99999.99

-

Hi:

2

650.00

646.23 - 653.77

yellow 649.09

Lo:

2

50.00

46.23 - 53.77

yellow 49.5

LoLo:

0

-9999.99

-

Min:

0

-9999.99

-

SP change per Scott Pinyan
LSH

Other: _____

Spt & Inseth check is within 0.5% LSHMTE Instr. No: 817-13-55-023Due Date: 3/26/97817-28-09-0031/12/97817-45-08-04411/8/96

(signoff)

Loop Complete: LSHDate: 7/2/96

Tag: FT-AZ102KI-2

P&ID:

Loop:

Manufacturer: AMC Model No.: MASSTRON Serial No.: 6834DMTE Instr. No.: 817.45.08.062
817.35.40.046
817.63.02.016Due Date: 12.30.97
1.15.98
6.14.97

93.04-135.97°F						
Input Range 0-200°F						
0-700 SCFM (0-0.3214 in. w.c.)						
Units: °F/SCFM/A						
Input (in. w.c.)	Output (SCFM) (mA)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0	(4.00)	-14 (3.92)	14 (4.08)	N/A (N/A)	-000 (3.999)
0.0200	175	(8.00)	161 (7.92)	189 (8.08)	()	0175 (8.016)
0.0803	350	(12.00)	336 (11.92)	364 (12.08)	()	0349 (11.995)
0.1807	525	(16.00)	511 (15.92)	539 (16.08)	()	0525 (15.998)
0.3214	700	(20.00)	686 (19.92)	714 (20.08)	()	0700 (20.001)

(signoff) Calibrated By: Paul M. Zyland Date: 2.25.97

Location: OUTLET FLOW (102 AZ RECIRC. Bldg)

Comments: ① Initial setup. Density Comp. brand added at factory
changed R15 to 390K to 1 fitting
Micron Hi = 650 SCFM
Lo = 50 SCFM (Achieved w/Xmation only)

Input (in.)	Output (°F) (mA)	Lo:	Hi:	As found	Input	As left
93.04	0 (4.000)	-4 (3.920)	4 (4.080)	① N/A (N/A)	① N/A	-000 (4.000)
103.90	50 (8.000)	46 (7.920)	54 (8.080)	()	()	0050 (7.976)
114.68	100 (12.000)	96 (11.920)	104 (12.080)	()	()	0100 (12.005)
125.38	150 (16.000)	146 (15.920)	154 (16.080)	()	()	0150 (16.004)
135.97	200 (20.000)	196 (19.920)	204 (20.080)	()	()	0200 (20.003)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 308

Tag: FT-AZ102KI-2

P&ID:

LOOP:

Manufacturer: AMC Model No.: Masstron Serial No.: 6834DMTE Instr. No.: 817-2809-003
817-63-02-016 Due Date: 1-12-97
817-45-08-055 6-14-97
11-8-96Input Range 0-200°FTolerance .5%Units: 0-700 SCFM (0.3179 in. w.c.)

Input (in. w.c.)	Output (SCFM) (mo)	Lo:	Hi:	As Found	In/Out	As Left
0.000	0 (4.00)	-3.0 (3.92)	3 (4.08)	N/A (N/A)	N/A	0001 (4.00)
0.0286	210 (8.80)	207 (8.72)	213 (8.88)	()	()	209 (8.78)
0.0794	350 (12.00)	347 (11.92)	353 (12.08)	()	()	351 (12.03)
0.2034	560 (16.80)	557 (16.72)	563 (16.88)	()	()	561 (16.83)
0.3179	700 (20.00)	697 (19.92)	703 (20.08)	↓ (↓)	↓	700 (20.02)

(signoff) Calibrated By:

Paul M. Zylinski / P. HuronDate: 7.2.96

Location:

OUTLET FLOW (102AZ RECIRC BLDG)

Comments

Initial Setups:Hi: (Hi) 650 SCFM(Lo) 50 SCFM (Achieved only w/ma. X-mation)

----- Air Monitor Corp. Transmitter Span Calculation Data Sheet -----

W.O. No.: 21874

Job Name: W0-30

Station: FT-AZ102-K1-1

Model: MASSTRON

Diameter: 6.000

Effective Area: 0.196350 sq/ft

K: 0.00000

Differential Pressure: 0.7458 in/wc

Date: 03/06/97 11:31:44

-----Conditions-----

Actual Bar. Press: 29.270 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: -2.000 in/wc

Actual Den.: .05846 lb/cuft

Std. Den.: .07494 lb/cuft

HNF-SD-W030-TD-002,
REV. 0, PAGE 309

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0018	4.80	38.45	30.00	134.89
10	0.0074	5.60	76.91	60.00	269.78
15	0.0167	6.40	115.37	90.00	404.68
20	0.0298	7.20	153.83	120.00	539.57
25	0.0466	8.00	192.28	150.00	674.47
30	0.0671	8.80	230.74	180.00	809.36
35	0.0913	9.60	269.20	210.00	944.25
40	0.1193	10.40	307.66	240.00	1079.15
45	0.1510	11.20	346.11	270.00	1214.04
50	0.1864	12.00	384.57	300.00	1348.94
55	0.2256	12.80	423.03	330.00	1483.83
60	0.2685	13.60	461.49	360.00	1618.72
65	0.3151	14.40	499.94	390.00	1753.62
70	0.3654	15.20	538.40	420.00	1888.51
75	0.4195	16.00	576.86	450.00	2023.41
80	0.4773	16.80	615.32	480.00	2158.30
85	0.5388	17.60	653.77	510.00	2293.19
90	0.6041	18.40	692.23	540.00	2428.09
95	0.6731	19.20	730.69	570.00	2562.98
100	0.7458	20.00	769.15	600.00	2697.88

Full scale lb/hr = (SPAN FLOW) x (STD. DENSITY) x (60)
Data generated for average barometric pressure
at Hanford site = 29.270 "Hg.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 310

Tag: FC_AY1_K1_2 I/O Type: AO Description: TankVent Flow
 Cntrlr: 13 Chan No: 1 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: operate valve from neg controller

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) JFH
☐ _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units:	LOI	Screen1	Screen2	Screen3
Process Input	LCU2-27	15PriIn.	10RecAY1	
Lo: <u>14.00</u> 6.00	<u>12.01 - 16.01</u> 2.01 - 2.01	<u>13.87</u>	<u>14</u>	
Hi: 100.00	<u>100.07</u>	<u>100</u>	<u>100</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other:

Below setpoint → opens valve
Hardstop @ 10% ; controller shuts off @ 14%

MTE Instr. No: value observation Due Date: _____

(signoff) Loop Complete: JFH Date: 7/17/96

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-W030-TD-002

Section 2 of 2

Title: Preoperational Test Report, Primary Ventilation System

Date: 11/04/97 Revision: 0

Originator: Clifton FT

Co: NHC

Recipient: _____

Co: _____

References: EDT-622918

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 311

Tag: FC_AY2_K1_2 I/O Type: AO Description: TankVent Flow

Cntlr: 13 Chan No: 2 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 5 pt cal per procedure UI (data attached) S. F. Hill
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 \\ \text{(sensor)} \end{matrix}^2 + \begin{matrix} 2 \\ \text{(xmitter)} \end{matrix}^2 + \begin{matrix} 2.0\% \\ \text{(other)} \end{matrix}^2 + \begin{matrix} 0.2\% \\ \text{(DCS)} \end{matrix}^2}$

Units:

 Process Input Readout Tolerance
 Lo: 14.6 * +2.01 - 16.01
 0.00 12.6 - 16.6
 Hi: 100.00 97.99 - 102.01

LCU2-33

LO1

LSU1-28

14.6

100

Screen1

15PriIn.

15

100

Screen2

11RecAY2

15

100

Screen3

9 loop 102

14.6

100

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: _____

HiHi: _____

Hi: _____

Lo: _____

LoLo: _____

Min: _____

 Other: * hndstop @ 14.6

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: S. F. HillDate: 8/13/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 312

Tag: FC_AZ1_K1_2 I/O Type: AO Description: TankVent Flow
 Cntrlr: 2 Chan No: ~~2~~ ^{0.4} 2 P&ID: H-2-131075 Logic: Y150

Remarks: _____

Location: _____

Actuation Method: Generate Valve from DCS

Sensor Calibration:

~~5~~ 5 pt cal per procedure See ZI-AZ1-K1-2 (data attached) L. J. Hill
 (signoff)

Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: PERCENT

Process Input Readout Tolerance

	LOI	Screen1	Screen2	Screen3
Lo: <u>14.5</u> <u>-0.00</u>	LCU1-28 <u>14.39</u>	15PriIn. <u>14</u>	12RecAZ1 <u>14</u>	grop 103 <u>14.45</u>
Hi: 100.00	<u>101.35</u>	<u>101</u>	<u>101</u>	<u>101.35</u>

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: _____

HiHi: _____

Hi: _____

Lo: _____

LoLo: _____

Min: _____

Other:

Below setpoint opens valve.MTE Instr. No: Value observation

Due Date: _____

(signoff)

Loop Complete: L. J. HillDate: 6/28/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 313

Tag: FC_AZ2_K1_2 I/O Type: AO Description: TankVent Flow
 Cntrlr: 2 Chan No: 2 P&ID: H-2-131075 Logic: Y150

Remarks: _____

Location: Actuation Method: operate valve from MCS

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) (signoff)

Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0\%)^2 + (0.2\%)^2}$

Units:	Process Input	Readout Tolerance	LOI LCU2-27	Screen1 15PriIn.	Screen2 13RecAZ2	Screen3 gmp104
Lo:	0.00	-2.01 - 2.01	<u>13.87</u>	<u>14</u>	<u>14</u>	<u>13.93</u>
Hi:	100.00	97.99 - 102.01	<u>101.57</u>	<u>102</u>	<u>102</u>	<u>101.54</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other:

verified FIC operates properly

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Date: 8/28/96

W.O. No.: 23284

Job Name: W-030-27

ation: FT-AZ102-K1-2

Model: VOLU-PROBE/4SS. ,MASSTRON/D

Diameter: 7.981

Effective Area: 0.347411 sq/ft

K: 0.00000

Differential Pressure: 0.3214 in/wc

Date: 02/25/97 13:44:25

-----Conditions-----

Actual Bar. Press: 29.380 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 0.000 in/wc

Actual Den.: .05898 lb/cuft

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0008	4.80	44.47	35.00	157.37
10	0.0032	5.60	88.94	70.00	314.74
15	0.0072	6.40	133.41	105.00	472.12
20	0.0128	7.20	177.88	140.00	629.49
25	0.0200	8.00	222.35	175.00	786.87
30	0.0289	8.80	266.82	210.00	944.24
35	0.0393	9.60	311.29	245.00	1101.61
40	0.0514	10.40	355.76	280.00	1258.99
45	0.0650	11.20	400.23	315.00	1416.36
50	0.0803	12.00	444.71	350.00	1573.74
55	0.0972	12.80	489.18	385.00	1731.11
60	0.1157	13.60	533.65	420.00	1888.48
65	0.1357	14.40	578.12	455.00	2045.86
70	0.1574	15.20	622.59	490.00	2203.23
75	0.1807	16.00	667.06	525.00	2360.61
80	0.2057	16.80	711.53	560.00	2517.98
85	0.2322	17.60	756.00	595.00	2675.35
90	0.2603	18.40	800.47	630.00	2832.73
95	0.2900	19.20	844.94	665.00	2990.10
100	0.3214	20.00	889.42	700.00	3147.48

Full scale lbs./hr. = (SPAN FLOW) x (STD DENSITY) x (60)
 Data generated for today's barometric pressure at ETF (2.25.97)
 Note: Use full scale lbs./hr. to obtain SCFM when generating
 this form.

7/18/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 315

Tag: II_AZ_K15_1A I/O Type: AI Description: PvFan1A Current

Cntlr: 3 Chan No: 15 P&ID: H-2-131076 Logic: Y110

Remarks: _____

Location: _____

Actuation Method: 4-20mA SOURCE ON INPUT

Sensor Calibration:

☒ 5 pt cal☐ _____per procedure VENDOR DATA (data attached)D.J.
(signoff)

Loop Tolerance:

$$2.0 \% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0 \%^2 & + & 0.2 \%^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$$

Units: % LOAD

Process Input Readout Tolerance

LOI

LCU1-9

Screen1

17PriExh

Screen2

03LeakDt

Screen3

04Totalz

Lo: 0.00 -3.01 / 3.01

-0.100

Hi: 150.00 146.99 / 153.01

150.01150

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 99999.99

/

HiHi: 0 99999.99

/

Hi: 2 100.00

96.99 / 103.01

99.9

Lo: 0 -9999.99

/

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other: _____

MTE Instr. No: 817-13-55-073Due Date: 3/26/97

(signoff)

Loop Complete: D.J.Date: 7/18/96

6/25/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 316

Tag: IT-AZK105-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 5

Manufacturer: Love/Buyer Model No.: 4380 Serial No: MTE Instr. No: 817-13-55-023 Due Date: 3-26-97
817-45-08-055 4-08-96

Input Range 0 to 10

Tolerance 2%

Units: volts

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.0			NGW	NEW	4.0
2.5	8.0					8.0
5.0	12.0					12.0
7.5	16.0					16.0
10.0	20.0					20.0

(signoff) Calibrated By: E. McJannet Date: 7-18-96Location: 702 filter building

Comments

calibrate per vendor data so that 0 to 10 volts on input equals 4 to 20mA on output

7/18/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 317

Tag: II_AZ_K15_1B I/O Type: AI Description: P/Fan1B Current

Cntlr: 14 Chan No: 15 P&ID: H-2-131076 Logic: Y121

Remarks: _____

Location: _____

Actuation Method: 4-20mA simulator in output

Sensor Calibration:

☒ 5 pt calper procedure VENDOR DATA (data attached) D.G.
(signoff)Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 \\ \text{(sensor)} \end{matrix}^2 + \begin{matrix} 2 \\ \text{(transmitter)} \end{matrix}^2 + \begin{matrix} 2.0\% \\ \text{(other)} \end{matrix}^2 + \begin{matrix} 0.2\% \\ \text{(DCS)} \end{matrix}^2}$

Units: % LOAD

Process Input	Readout Tolerance	LOI LCU2-9	Screen1 17PriExh	Screen2 03Leak	Screen3 04Totaliz
Lo: 0.00	-3.01 / 3.01	<u>-0.03</u>	<u>0</u>	_____	_____
Hi: 150.00	146.99 / 153.01	<u>149.98</u>	<u>150</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	2	100.00	96.99 / 103.01	<u>99.88</u>
Lo:	0	-9999.99	/	_____
LoLo:	0	-9999.99	/	_____
Min:	0	-9999.99	/	_____

Other: _____

MTE Instr. No: 817-13-55-023 Due Date: 3/26/97(signoff) Loop Complete: D.G. Date: 7/18/96

6/25/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 318

Tag: IT-AZK105-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 5

Manufacturer: LOVE/Dwyer Model No.: 4380 Serial No: MTE Instr. No: 817-13-55-022 Due Date: 3-26-97
817-45-08-055 11-08-96

Input Range 0 to 10		Tolerance 2%				
Units: volts						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.0			NEW	NEW	4.0
2.5	8.0					8.0
5.0	12.0					12.0
7.5	16.0					16.0
10.0	20.0					20.0

(signoff)Calibrated By: <u>S. M. Green</u>	Date: <u>3-18-96</u>
Location: <u>702 filter building</u>	

Comments

calibrate per vendor data so that 0 to 10 volts on input equals 4 to 20mA on output

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 319

Tag: MK_AZ_Ki_1AA I/O Type: DO Description: PVDmpriA Open

Cntlr: 9 Chan No: 1 P&ID: H-2-131076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: Set open shutoff switch☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: 2/2/96Date: 6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 320

Tag: MK_AZ_K1_1AB I/O Type: DO Description: Pvdmp1A Clse

Cntlr: 9 Chan No: 2 P&ID: H-2-131076, 6H.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: set closed cutoff switch☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L. Hill Date: 6/5/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 321

Tag: MK-AZ-K1-1A

P&ID: H-2-131076

LOOP:

Manufacturer: EL-O-MATICModel No.: EL-350Serial No: 906039MTE Instr. No: N/ADue Date: N/A

Input Range Functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: Rylandi FitzsimmonsDate: 5-23-97Location: Vent Room 'A' (DAMPER 1A) - INLET

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/N

Do open and closed limit switches actuate (indicated on MICON OP. SCREEN) when valve reaches full stroke position (open and closed respectively)?

open - Y/Nclosed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 322

Tag: MK_AZ_K1_2AA I/O Type: DO Description: PvDmpr2A Open

Cntlr: 9 Chan No: 3 P&ID: H-2-131076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN + CLOSE VALVE From PCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug LinkDate: 6/10/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 323

Tag: MK_AZ_K1_2AB I/O Type: DO Description: PvDmpr2A Clse

Cntlrl: 9 Chan No: 4 P&ID: H-2-(31076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE VALVE FROM DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: _____

Loop Tolerance: _____

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug J. [Signature]Date: 6/10/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 324

Tag: MK.AZ.KI.ZA

P&ID: H-2-131076

LOOP:

Manufacturer: EL-O-MATICModel No.: EL-350Serial No: 906033MTE Instr. No: N/ADue Date: N/A

Input Range Functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By:

Rylynn / S. FitzgibbonDate: 5-23-97Location: Vent Room 'A' (DAMPER 2A) - OUTLET

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? YIN

Do open and closed limit switches actuate (indicated on MICON OP. SCREEN) when valve reaches full stroke position (open and closed respectively)?

open - YIN
closed - YIN

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 325

Tag: MK_AZ_K1_1BA I/O Type: DO Description: PvdmpriB Status

Cntrlr: 20 Chan No: 1 P&ID: H-2-131076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCS

Sensor Calibration: set open cutoff switch

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: J. J. Liel

Date: 6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

!HNF-SD-W030-TD-002,
REV. 0, PAGE 326

Tag: MK_AZ_K1_1BB I/O Type: DO Description: PvdmpriB Status

Cntlr: 20 Chan No: 2 P&ID: H-2-131076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: set closed cutoff = wite☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: PHillDate: 6/9/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 327

Tag: MK-AZ-K1-1B

P&ID: H-2-131076

LOOP:

Manufacturer: EL-O-MATICModel No.: EL 350Serial No.: 9060310MTE Instr. No.: N/ADue Date: N/A

Input Range Functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By:

P. J. Smith / S. FitzsimmonsDate: 5.23.97Location: Vent Room 'B' (DAMPER 1B) - INLET

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/N

Do open and closed limit switches actuate (indicated on MICON OP. SCREEN) when valve reaches full stroke position (open and closed respectively)?

open - Y/N
closed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 328

Tag: MK_AZ_K1_2BA I/O Type: DO Description: PvDmpr2B Status

Cntlr: 20 Chan No: 3 P&ID: H-2-131076, SM.1 Logic:

Remarks: _____

Location: _____

Actuation Method: Operate From DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Dany DikDate: 6/10/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 329

Tag: MK_AZ_K1_2BB I/O Type: DO Description: PvDmpr2B Status

Cntlr: 20 Chan No: 4 P&ID: H-2-131076, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPERATE FROM DCS

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: _____

Date: _____

6/10/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 330

Tag: MK-AZ-KI-ZB

P&ID: H-2-131076

LOOP:

Manufacturer: EL-O-MATICModel No.: EL 350Serial No.: 906036MTE Instr. No.: N/ADue Date: N/A

Input Range Functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. Zylinski / S. StitzingerDate: 5-23-97Location: Vent Room 'B' (DAMPERS) - OUTLET

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/N

Do open and closed limit switches actuate (indicated on MICON OP. SCREEN) when valve reaches full stroke position (open and closed respectively)?

open - Y/N
closed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 331

Tag: PC_AY1_K1_1 I/O Type: AO Description: TkAirIn Press

Cntlr: 46 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate loop & valve

Sensor Calibration:

☒ 5 pt cal

per procedure

~~10/11~~

(data attached)

L. Hill
(signoff)

part of ZI-AY1-K1-1 Datasheet

$$\text{Loop Tolerance: } 2.0 \% = \sqrt{\begin{matrix} 2 & 2 & 2.0 \% & 0.2 \% \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$$

Units:

Process Input Readout Tolerance

LOI

Screen1

Screen2

Screen3

15PriIn.

Lo: 0.00 -2.01 - 2.01

Hi: 100.00 97.99 - 102.01

1% (4mA)101% (-20mA)

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max:

-

HiHi:

-

Hi:

-

Lo:

-

LoLo:

-

Min:

-

Other:

PI-AY1-K1-1 properly modulates
the valve.

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

L. Hill

Date:

3/6/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 332

Tag: PC_AY2_K1_1 I/O Type: AO Description: TkAirIn Press

Cntlr: 46 Chan No: 3 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

Sheep
2/2/96
(signoff)

date part of ZI-AY2-K1-1 date

$$\text{Loop Tolerance: } 2.0 \% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 2.0 \%^2 & + & 0.2 \%^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$$

Units:

Process Input	Readout Tolerance	LOI	Screen1 15PriIn.	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	_____	<u>0%</u>	_____	_____
Hi: 100.00	97.99 - 102.01	_____	<u>100%</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other:

PI-AY2-K1-1 modulates valve in AUTOMTE Instr. No: observation Due Date: _____

(signoff)

Loop Complete:

JF Hill

Date:

5/9/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 333

Tag: PC_AZ1_K1_1 I/O Type: AO Description: TkAirIn Press

Cntlr: 51 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor Calibration: n/a
☐ 5 pt cal per procedure _____ (data attached) _____
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 \\ \text{(sensor)} \end{matrix}^2 + \begin{matrix} 2 \\ \text{(xmitter)} \end{matrix}^2 + \begin{matrix} 2.0\% \\ \text{(other)} \end{matrix}^2 + \begin{matrix} 0.2\% \\ \text{(DCS)} \end{matrix}^2}$

Units:	LOI	Screen1	Screen2	Screen3
Process Input	Readout Tolerance	15PriIn..	output current	
Lo: 0.00	-2.01 - 2.01	<u>-1%</u>	3.976 mA	
Hi: 100.00	97.99 - 102.01	<u>99%</u>	4.80 mA	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other:

PI-AZ1-K1-1

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: DD Date: 5/10/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 334

Tag: PC_AZ2_K1_1 I/O Type: AO Description: TkAirIn Press

Cntlr: 51 Chan No: 3 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 3 pt calper procedure PIAData part of ~~PI~~ AZ2-K1-1
Data Sheet
LGZ
(signoff)

(data attached)

$$\text{Loop Tolerance: } 2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + 2.0\%^2 + 0.2\%^2}$$

Units:

Process Input Readout Tolerance

LOI

Screen1

Screen2

Screen3

15PriIn.

~~output current~~

Lo: 0.00 -2.01 - 2.01

1%

Hi: 100.00 97.99 - 102.01

100%

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max:

-

HiHi:

-

Hi:

-

Lo:

-

LoLo:

-

Min:

-

Other:

PI-AZ2-K1-1 modulates the damper

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LGZDate: 5/7/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 335

Tag: PC_AZ_K1_1A I/O Type: AO Description: Pvhdr1A Press

Cntlr: 3 Chan No: 4 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Measured speed using (calibrated) SI-AZ-KIS-1ASensor Calibration: N/A☐ 5 pt cal

per procedure _____ (data attached) _____ (signoff)

$$\text{Loop Tolerance: } 2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + \text{(other)}^2 + \text{(DCS)}^2}$$

Units:

Process Input	Readout Tolerance	LOI LCU1-9	Screen1 17PriExh	Screen2 group124	Screen3
Lo: 10.00%	2.01 - 12.01%	10%	377rpm	377rpm	
Hi: 100.00%	97.99 - 102.01%	100%	-	-	
tech 3600 rpm	3528 - 3672	100%	3638rpm	3638rpm	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other:

Pressure control loop works properly

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LSHDate: 8/28/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 336

Tag: PC_AZ_K1_1B I/O Type: AO Description: PvHdrlB Press

Cntlr: 14 Chan No: 4 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: PLACE CONTROLLER IN AUTO AND VERIFY
FAR RESPONDS TO PROCESS INPUT CHANGESSensor Calibration: N/A☐ 5 pt cal per procedure _____ (data attached) _____ (signoff)Loop Tolerance: $2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + 2.0\%^2 + 0.2\%^2}$

Units:

Process Input Readout Tolerance

LOI
LOW 2-9Screen1
17PriExhScreen2
GROUP 129

Screen3

Lo: 10.00% -2.01 - 2.01

10%3752RPM376RPM

Hi: 100.00% 97.99 - 102.01

100%3627RPM3628RPM

TACK 3600RPM 3529 - 3672

3627RPM3628RPM

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: _____

HiHi: _____

Hi: _____

Lo: _____

LoLo: _____

Min: _____

Other: _____

PRESSURE CONTROL LOOP WORKS PROPERLY

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: D. L. L.Date: 7/19/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 337

Tag: PDAH_AY1K1_1 I/O Type: DI Description: AY1InFtrDpHi

Cntlr: 47 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: 3 in-H2O

Loop Tolerance:

Process State	Color	LOI	Screen1 15PriIn.	Screen2	Screen3
Lo (0): NORMAL	2	OFF NORMAL	NORMAL	_____	_____
Hi (1): HIGH	3	ON	HIGH	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 2 ~~YELLOW~~Lo: 0 ~~WHITE~~

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Lusk Date: 5/6/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 338Tag: ^{PDS} PDIS-AY101K1-1

P&ID: H-2-131075. SH 1

LOOP: H-2-131343, SH 6

Manufacturer: Dwyer Model No.: 1950 Serial No: ZE 000 705MTE Instr. No: 817-35-40-026 Due Date: 8-9-97
817-45-08-044 2-12-98

Input Range <u>0-5"</u>		Tolerance <u>1.5%</u>				
Units: IN WC						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
<u>3.0</u>	<u>SWITCH</u>	<u>2.97</u>	<u>3.07</u>	<u>3.06</u>	<u>IN</u>	<u>3.00</u>

(signoff) Calibrated By:

Date:

3/19/97 ^{68.97}
4-8-97 ^uLocation: AY101K1 AIR INLET STATION

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

4/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 339PDS
Tag: PDES-AY101K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 6

Manufacturer: DWYER Model No.: 1950 Serial No: 2E DDD 705MTE Instr. No: 817-35-40-020 Due Date: 7-21-96
817-45-08-040 2-5-97

Input Range 0-5

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/out	As Left
3.0	SWITCH	2.93	3.07	N/A	N/A	2.99

(signoff) Calibrated By: Pzyliński / PJ HunsonDate: 4-12-96Location: AY101K1 air inlet station

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

Superseded
PDS
4-8-97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 340

Tag: PDAH_AY2K1_1 I/O Type: DI Description: AY2InFtrDphi

Cntlr: 48 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration: *N/A*☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: 3 in-H2O

Loop Tolerance:

Process State	Color	LOI LCU4-28	Screen1 15PriIn.	Screen2	Screen3
Lo (0): NORMAL	2	<u>OFF</u>	<u>LOW</u>	_____	_____
Hi (1): HIGH	3	<u>ON</u>	<u>HIGH</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 2 YELLOW

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: *Doney*Date: *5/6/96*

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 341Tag: ^{PDS}
~~PDS~~-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 6

Manufacturer: Dwyer Model No.: 1950 Serial No: ZE 000 706MTE Instr. No: 817-35-40-026 Due Date: 8-9-97
817-45-08-044 2-12-98

Input Range 0-5"

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
3.0	SWITCH	2.97	3.07	2.91	OUT	3.00

(signoff) Calibrated By:

Date:

3/19/97 SF
4-8-97 4-9-97Location: AY102K1 AIR INLET STATION

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

4/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 342PDS
Tag: PDIS-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 6

Manufacturer: DOYER Model No.: 1950 Serial No: 2E 000 706MTE Instr. No: 817-35-40-020 Due Date: 7-21-96
817-45-08-040 2-5-97

Input Range 0-5

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
3.0	2.4 SWIRELL 1.7 4.2, 6	2.97	3.07	2.05 N/A 4-12-96	2.4 N/A	2.99

(signoff) Calibrated By: Bjorklund / PJ HansonDate: 4-12-96Location: AY102K1 air inlet station

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

Superseded
RCS
4-8-97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 343

Tag: PDAH_AZ1K1_1 I/O Type: DI Description: AZ1InFtrDpHi
Cntlr: 52 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: Jumpers field contacts

Sensor Calibration:

X per procedure vendor data to C (data attached) MZ Elms
(signoff)

Setpoint: 3 in-H2O

Loop Tolerance:

Process State	Color	LOI LCU3-34	Screen1 15PriIn. (Process color)	Screen2 group 104	Screen3
Lo (0): NORMAL	2	<u>OFF</u>	<u>green</u>	<u>green</u>	_____
Hi (1): HIGH	3	<u>ON</u>	<u>yellow</u>	<u>yellow</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 2 yellow
Lo: 0 _____

Other: _____

MTE Instr. No: N/A Due Date: _____(signoff) Loop Complete: MZ Elms Day 2nd Date: 5/1/96
Day 2nd

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 344Tag: ^{PAS} PDI3-AZ101K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 6

Manufacturer: DWYER Model No.: 1950 Serial No: 2E-000-707MTE Instr. No: 877-15-08-090
877-35-40-026 Due Date: 2-28-98
8-9-97

Input Range 0-5"

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
3.0	SWITCH	2.96	3.04	^A 4.07 3.14	3.13 OUT	^B 4.07 2.99 3.00

(signoff) Calibrated By:

Paul M. ZylinskiDate: 4-8-97

Location:

AZ101K1 AIR INLET STATION

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

3/28/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 345Tag: ⁴²⁵PD15-AZ101K1-1
_{Py 9.5.96}

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 6

Manufacturer: DWYERModel No.: 1950Serial No: 2E-000-707MTE Instr. No: 817-35-40-018
817-45-08-040Due Date: 7.21.96
2.5.97

Input Range 0-5

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
2.0		1.925	2.075	N/A	N/A	2.04
V.25						
2.50						
3.75	Py					
5.00	4.5.96					

~~0.00~~(signoff) Calibrated By: Azizulahi / J. FitzgibbonDate: 4-8-96Location: AZK101K1 Air inlet filter

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 2" WC

Micon wiring incorrect!

VOID
4.8.97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SF-W030-TD-002,
REV. 0, PAGE 346

Tag: PDAH_A22K1_1 I/O Type: DI Description: A22InFtrDpHi
Cntlr: 53 Chan No: 1 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: 3 jumper field contact

Sensor Calibration:

☒ per procedure PGC-6-011 (data attached) LJ Hill
(signoff)

Setpoint: 3 in-H2O

Loop Tolerance:

Process State	Color	LOI LCU3-35	Screen1 15PriIn.	Screen2	Screen3
Lo (0): NORMAL	2	<u>OFF</u>	(process color)	<u>green</u>	
Hi (1): HIGH	3	<u>ON</u>	<u>yellow</u>	<u>yellow</u>	

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	2	<u>yellow</u>
Lo:	0	

Other: _____

MTE Instr. No: N/A Due Date: _____(signoff) Loop Complete: LJ Hill Date: 5/1/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 347PDS
Tag: ~~POIS~~-AZ102K1-1

PID: H-2-131075, SH 2

LOOP: H-2-131344, SH 6

Manufacturer: Dwyer Model No.: 1950 Serial No: ZE-000-708MTE Instr. No: 817-45-08-090
817-35-40-026 Due Date: 2-28-98
8-9-97

Input Range	0-5"	Tolerance	1.5%			
Units:	IN WC					
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
3.0	SWITCH	2.96	3.04	3.14	IN	2.99

(signoff) Calibrated By:

Paul M. ZyliniskiDate: 4-8-98

Location:

AZ102K2 AIR INLET STATION

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

4/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 348Tag: ^{PDS} PDIS-AZ102K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 6

Manufacturer: DWYER Model No.: 1950 Serial No: 2E 000 708MTE Instr. No: 817-35-40-020 Due Date: 7-21-96
817-45-08-040 2-5-97

Input Range 0-5

Tolerance 1.5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
3.0	0.0724	2.93	3.07	N/A	N/A	3.00

(signoff)Calibrated By: P. J. HensonDate: 4-12-96Location: AZ102K1 air inlet station

Comments

CALIBRATE PER VENDOR DATA AND PSCP-6-011 SET HI ALARM TO 3" WC

VOID
4-8-97
fmg

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 349

Tag: PDI_AZ_K14_1A I/O Type: AI Description: PvHepala Dp
 Cntrlr: 3 Chan No: 10 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO ZERO AND
SPAN TRANSMITTER AND CHECK ALARM POINTS

Sensor Calibration:

☒ 5 pt cal☐ _____per procedure 6-TF-302

(data attached)

D. El

(signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ \text{(sensor)} & \text{(xmmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input Readout Tolerance

LOI
LCU1-10Screen1
17PriExhScreen2
group 125

Screen3

Lo: 0.00 -0.03 - .03

00.00.00

Hi: 6.00 5.97 - 6.03

6.026.05.99

Annunciator(s): Priority Setpoint

Tolerance

Trip Point

Max: 0 99999.99

-

HiHi: 1 5.00

4.97 - 5.03

5.0 (RED)

Hi: 2 3.00

2.97 - 3.03

3.0 (YELLOW)Lo: 02 -0.75 -9999.99-0.72 / -0.78-0.75 yellow

LoLo: 0 -9999.99

-

Min: 0 -9999.99

-

Other:

VERIFIED PROGRAM OPERATE

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug JuhnDate: 8/30/96Add & retest LO Alarm L&Skel10/15/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 350

Tag: PDT-AZK104-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 6

Manufacturer: ITT Barton Model No.: FKGG Serial No: B662950MTE Instr. No: 817-35-40-029
817-45-08-044 Due Date: 8-8-97
2-12-98

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.0	3.90	4.10	4.01	IN	4.01
1.5	8.0	7.90	8.10	8.01	IN	8.01
3.0	12.0	11.90	12.10	11.97	IN	11.99
4.5	16.0	15.90	16.10	15.93	IN	16.00
6.0	20.0	19.90	20.10	19.90	IN	20.00

(signoff) Calibrated By: Fitzsimmons Date: 3-4-97

Location: _____

Comments Functionally test 0+100% to Micron
CALIBRATE PER PROCEDURE 6-TF-302

3/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 351

Tag: PDT/PDE-AZK104-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 6

Manufacturer: ITT BARTONModel No.: FKCG

Serial No:

BC62950MTE Instr. No: 017-35-40-020
817-45-08-040Due Date: 7-21-96
2-5-97

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	3.90	4.10	N/A	N/A	4.00
1.5	8.00	7.90	8.10			8.02
3	12.00	11.90	12.10			12.00
4.5	16.00	15.90	16.10			16.00
6	20.00	19.90	20.10	↓	↓	20.00

(signoff) Calibrated By:

Pzylnski / P. HuxsonDate: 3-6-96

Location:

Vent Bldg. 'A'Comments AZ-KI-4-1A HEPA FILTER (PRIMARY)

CALIBRATE PER PROCEDURE 6-TF-302

3/25/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 352

Tag: PDI_AZ_K14_2A I/O Type: AI Description: PVHepa2A Dp
 Cntrlr: 3 Chan No: 11 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO ZERO AND
SPAN TRANSMITTER AND CHECK ALARM POINTS

Sensor Calibration:

☒ 5 pt cal

per procedure

6-TF-302

(data attached)

DJ.
(signoff)

Loop Tolerance:

$$0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 0.5\% \text{ (other)}^2 & + & 0.2\% \text{ (DCS)}^2 \end{matrix}}$$

Units: IN WC

Process Input	Readout Tolerance	LOI LCUI-10	Screen1 17PriExh.	Screen2 6200P 125	Screen3
Lo: 0.00	-.03 - .03	<u>0</u>	<u>0.0</u>	<u>0.01</u>	
Hi: 6.00	5.97 - 6.03	<u>6.01</u>	<u>6.0</u>	<u>6.00</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	9999.99	.	
HiHi:	1	5.00	4.97 - 5.03	<u>5.0 (Red)</u>
Hi:	2	3.00	2.97 - 3.03	<u>2.98 (Yellow)</u>
Lo:	<u>2</u>	<u>-0.75</u> 9999.99	<u>-0.72 / -0.78</u>	<u>-0.75 yellow</u>
LoLo:	0	-9999.99	.	
Min:	0	-9999.99	.	

Other:

MTE Instr. No:

817-35-40-06

Due Date:

8/9/97

(signoff)

Loop Complete:

Dany Del

Date:

8/30/96Add & retest LO Alarm 2/2/9710/15/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 353

Tag: PDT-AZK104-2A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 8

Manufacturer: ITT Barton Model No.: FKCG Serial No: BCG2955MTE Instr. No: 817-35-40-029
877-45-08-044 Due Date: 8-8-97
2-12-98

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.00	3.90	4.10	4.00	IN	4.00
1.5	8.00	7.90	8.10	7.97	IN	7.97
3.0	12.00	11.90	12.10	11.97	IN	11.97
4.5	16.00	15.90	16.10	15.96	IN	15.96
6.0	20.00	19.90	20.10	19.92	IN	19.92

(signoff) Calibrated By: FitzsimmonsDate: 3-4-97Location: Vent Bldg. 'A' (AZK14-2A HEPA FILTER secondary)

Comments Functionally tested 0 to 100% to Micon

CALIBRATE PER PROCEDURE 6-TF-302

5/24/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 354

Tag: PDT/PDE-AZK104-2A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 8

Manufacturer: ITT BARTON Model No.: FKCG Serial No.: BC62955MTE Instr. No: 817-35-40-019 Due Date: 11-9-96
817-45-08-040 2-5-97

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.0	3.9	4.1	N/A 7.00	N/A	4.00
1.5	8.0	7.9	8.1	8.00		8.00
3.0	12.0	11.9	12.1	12.00		12.00
4.5	16.0	15.9	16.1	16.00		16.00
6.0	20.0	19.9	20.1	20.00		20.00

5-29-96

(signoff) Calibrated By:

P. Zylinski / P. HensonDate: 5-29-96

Location:

Vent Bldg. 'A'Comments AZ-K1-4.2A HEPA FILTER SECONDARY

CALIBRATE PER PROCEDURE 6-TF-302

1047

Tag: PDI_AZ_K14_1B I/O Type: AI Description: PvhEpalB Dp

Cntlr: 14 Chan No: 10 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO ZERO AND
SPAN TRANSMITTER AND CHECK ALARM POINTS

Sensor Calibration:

☒ 5 pt cal☐per procedure 6-TF302

(data attached)

D. J. L.
(signoff)Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout	Tolerance	LOI LCU2-4	Screen1 17PriExh	Screen2 GROUP 125	Screen3
Lo: 0.00	-.03 /	.03	<u>5.99</u>	<u>6.0</u>	<u>6.01</u>	
Hi: 6.00	5.97 /	6.03	<u>-0.01</u>	<u>0.0</u>	<u>0.00</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	9999.99	/	
HiHi:	1	5.00	4.97 / 5.03	<u>5.00 (RED)</u>
Hi:	2	3.00	2.97 / 3.03	<u>2.99 (YELLOW)</u>
Lo:	<u>2</u>	<u>-0.75</u> -9999.99	<u>-0.78 / -0.72</u>	<u>-0.73 yellow</u>
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Other: _____

MTE Instr. No: 811-35-40-018 Due Date: 8/9/97

(signoff)

Loop Complete: Doug LakerDate: 8/30/96Add & test LO alarm Laker10/15/96

2, 25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 356

Tag: PDT-AZK104-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 9

Manufacturer: ITT Barton Model No.: FKCG Serial No: BC62952MTE Instr. No: 817-35-40-024 Due Date: 8-9-97
817-45-08-043 5-16-97

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.0	3.90	4.10	3.99	IN	3.99
1.5	8.0	7.90	8.10	7.99	IN	7.99
3.0	12.0	11.90	12.10	11.97	IN	11.97
4.5	16.0	15.90	16.10	15.97	IN	15.97
6.0	20.0	19.90	20.10	19.97	IN	19.97

(signoff) Calibrated By: Fitzsimmons Date: 2-24-97

Location: _____

Comments Check 0% and 100% to Micon

CALIBRATE PER PROCEDURE 6-TF-302

8. 0/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 357

Tag: PDT-AZK104-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 9

Manufacturer: ITT BARTON Model No.: FKCG Serial No: BC62952MTE Instr. No: 817.35.40.018
817.45.08.010 Due Date: 8.9.97
2.5.97

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output (wg)	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	3.90	4.10	N/A	N/A	4.00
1.5	8.00	7.90	8.10			8.02
3.0	12.00	11.90	12.10			12.04
4.5	16.00	15.90	16.10			16.05
6.0	20.00	19.90	20.10			20.05

(signoff) Calibrated By: Paul M. ZylinskiDate: 8.30.96Location: Vent Bldg. 'B'Comments AZ-K1-4-1B HEPA Filter (Primary)

, CALIBRATE PER PROCEDURE 6-TF-302

5/24/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 358

Tag: PDI_AZ_K14_2B I/O Type: AI Description: PvHepa2B Dp

Cntlr: 14 Chan No: 11 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO 0 AND
SPAN TRANSMITTER AND TEST ALARM PLINTS

Sensor Calibration:

☒ 5 pt cal☐per procedure 6-TF-302 (data attached) D.J.
(signoff)Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(transmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout	Tolerance	LOI LCU4-2 2-4	Screen1 17PriExh	Screen2 400V125	Screen3
Lo: 0.00	- .03 /	.03	<u>-0.01</u>	<u>0.00</u>	<u>-0.01</u>	
Hi: 6.00	5.97 /	6.03	<u>6.0</u> <u>5.98</u>	<u>5.98</u> <u>6.00</u>	<u>5.99</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	
HiHi:	1	5.00	4.97 / 5.03	<u>5.00 (RED)</u>
Hi:	2	3.00	2.97 / 3.03	<u>3.00 (YELLOW)</u>
Lo:	<u>2</u>	<u>-0.75</u> 99999.99	<u>-0.78 / -0.72</u>	<u>-0.75 yellow</u>
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Other:

MTE Instr. No: 6019Due Date: 7/7/96

(signoff)

Loop Complete: D.J.Date: 5/28/968/30/96Add 8.17-35-40-018

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 359

Tag: PDT-AZK104-2B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 11

Manufacturer: ITT Barton Model No.: EKCG Serial No: BC62951MTE Instr. No: 817-35-40-026 Due Date: 8-9-97
817-45-08-044 2-12-98

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.00	<u>3.90</u>	<u>4.10</u>	<u>3.94</u>	<u>IN</u>	<u>4.00</u>
1.5	8.00	<u>7.90</u>	<u>8.10</u>	<u>7.91</u>	<u>IN</u>	<u>7.99</u>
3.0	12.00	<u>11.90</u>	<u>12.10</u>	<u>11.89</u>	<u>OUT</u>	<u>11.94</u>
4.5	16.00	<u>15.90</u>	<u>16.10</u>	<u>15.87</u>	<u>OUT</u>	<u>15.95</u>
6.0	20.00	<u>19.90</u>	<u>20.10</u>	<u>19.87</u>	<u>OUT</u>	<u>19.92</u>

(signoff) Calibrated By: Fitzsimmons Date: 2-25-97Location: Vent Bldg 'B' (AZK14-2B HEPA Filter secondary)Comments checked 0 to 100% to Micron

5/24/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 360

Tag: PDT/PDE-AZK104-2B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 11

Manufacturer: ITT BARTON Model No.: FKCG Serial No: EC62951MTE Instr. No: 817-35-40-019 Due Date: 11.9.96

Input Range 0-6"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.0	3.9	4.1	N/A	N/A	4.00
1.5	8.0	7.9	8.1			8.02
3.0	12.0	11.9	12.1			12.00
4.5	16.0	15.9	16.1			16.00
6.0	20.0	19.9	20.1			20.00

(signoff) Calibrated By: Pm Zyglinski / JPHurson Date: 5.28.96Location: VENT BLDG 'B'Comments AZ-K1-4-2B HEPA Filter (secondary)Positioner not coupled to shaft (for isolation) - Repaired OK
CALIBRATE PER PROCEDURE 6-TF-302

VOID

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 361

Tag: PDI_AZ_K18_1 I/O Type: AI Description: PvCdsr Dp
 Cntrlr: 2 Chan No: 10 P&ID: H-2-131075 Sht. 3 Logic:

Remarks:

Location:

Actuation Method: pressure Source

Sensor Calibration:

☒ 5 pt calper procedure 6-TF-302

(data attached)

LJA
(signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU1-1

16PriCoo

02Main v

09LeakB

Lo: 0.00

-.11 - .11

- 0.03

0

- 0.02

Hi: 20.00

19.89 - 20.11

19.952019.95

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

-

HiHi:

0

99999.99

-

Hi:

2

11.00

10.89 - 11.11

11.00 (yellow)

Lo:

82-9999.99 -2.5"-2.4" - -2.6"2.49 (YELLOW)

LoLo:

0

-9999.99

-

Min:

0

-9999.99

-

Other:

Also on screen 02 Main vVERIFIED PROPER OPERATION OF ELECTRICAL ACTUATOR
BY PLACING HAND SWITCHES IN OFF-RUN-SPIN POSITIONS

MTE Instr. No:

817-35-40-018

Due Date:

7/21/96

(signoff)

Loop Complete:

LJA

Date:

6/5/96OPDED AND RETESTED LO ALARM D. LJA 10/9/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 362

Tag: PDT-AZK108-1

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 17

Manufacturer: ITT Barton Model No.: FHCG Serial No: 21129BSMTE Instr. No: 817-35-40-026 Due Date: 8-9-97
817-46-08-043 5-16-97

Input Range 0-20"

Tolerance .5%

Units: IN WC

Input	Output	Meter output (%)	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	0	3.90(52)	4.10(2)	3.98(0)	IN	3.98(0)
5	8.00	25	7.90(23)	8.10(27)	7.95(24)	IN	7.97(25)
10	12.00	50	11.90(48)	12.10(52)	11.91(49)	IN	11.98(50)
15	16.00	75	15.90(73)	16.10(77)	15.89(73)	OUT	15.98(75)
20	20.00	100	19.90(98)	20.10(102)	19.88(97)	OUT	20.00(100)

(signoff) Calibrated By: Fitzsimmons Date: 2-24-97

Location: _____

Comments Functionally checked 0 and 100% to Micron.

CALIBRATE PER PROCEDURE 6-TF-302

2/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 363

Tag: PDT/PDE-AZK108-1

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 17

Manufacturer: ITT BARTON Model No.: FHCG Serial No: 2112985MTE Instr. No: 817-35-40-018
817-45-08-040 Due Date: 7-21-96
2-5-97

Input Range 0-20"

Tolerance .5%

Units: IN WC

Input (in. wc)	Output (in. wc)	Output 2(%)	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	(0)	3.90(2)	4.10 (+2)	4.02 (0)	N/A	(0) (4.00)
5	8.00	(25)	7.90(23)	8.10 (27)	N/A (N/A)		(25.0) (8.00)
10	12.00	(50)	11.90(48)	12.10 (52)	()		(49.5) (12.00)
15	16.00	(75)	15.90(73)	16.10 (77)	()		(75.0) (16.00)
20	20.00	(100)	19.90(98)	20.10 (102)	()		(100.0) (20.00)

(signoff) Calibrated By:

P. J. HensonDate: 3-4-96

Location:

VENT. ALDG. 'B'Comments AZ-K1-8-1 CONDENSER DIFFERENTIAL PRESSUREper procedure 6-TF-302

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 364

Tag: PDI_AZ_K19_1 I/O Type: AI Description: Heme Dp
 Cntrlr: 13 Chan No: 10 P&ID: H-2-131075 skt.3 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt cal
☐ _____

 per procedure 6 TE - 302 (data attached) LJA
 (signoff)

Loop Tolerance: $0.5\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (0.5\%)^2 + (0.2\%)^2}$
 (sensor) (xmitter) (other) (DCS)

Units: IN WC

Process Input	Readout Tolerance	LOI LCU2-1	Screen1 16PriCoo	Screen2 group 114	Screen3
Lo: 0.00	-.05 - .05	<u>0.02</u>	<u>0</u>	<u>0.02</u>	
Hi: 10.00	9.95 - 10.05	<u>10.01</u>	<u>10</u>	<u>10.00</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	2	5.00	4.95 - 5.05	<u>5.01 yellow</u>
Lo:	<u>2</u>	<u>-1.35</u>	<u>-1.30 / -1.20</u>	<u>-1.23 yellow</u>
LoLo:	0	-99999.99	-	
Min:	0	-99999.99	-	

Other:

VERIFIED PROPER OPERATION OFF ELECTRIC ACTUATOR
BY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONS

 MTE Instr. No: 817-35-018 Due Date: 7/21/96
(signoff) Loop Complete: LJADate: 6/5/96
Add & Retest to Alarm
LJA
10/15/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 365

Tag: PDT-AZK109-1

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 18

Manufacturer: ITT BartonModel No.: FHCGSerial No: BC67889MTE Instr. No: 817-35-40-026Due Date: 8-9-97817-45-08-0435-16-97

Input Range 0-10"

Tolerance .5%

Units: IN WC

Input	Output	Meter Output (%)	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.00	0	3.90(2)	4.10(2)	3.99(0)	IN	3.99(0)
2.5	8.00	25	7.90(23)	8.10(27)	7.98(26)	IN	8.00(25)
5.0	12.00	50	11.90(48)	12.10(52)	11.96(50)	IN	11.99(49)
7.5	16.00	75	15.90(73)	16.10(77)	15.93(75)	IN	16.00(75)
10.0	20.00	100	19.90(98)	20.10(102)	19.92(101)	IN	20.00(101)

(signoff) Calibrated By: FitzsimmonsDate: 2-24-97Location: Vent Bldg 'B' (AZK19-1 Home Differential CG)Comments checked 0 to 100% to Micron

CALIBRATE PER PROCEDURE 6-TF-302

5/28/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 366

Tag: PDT/PDE-AZK109-1

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 18

Manufacturer: ITT BARTON Model No.: FHCG Serial No: BCL7889MTE Instr. No: 817-35-40-048 019 Due Date: 11-9-96
817-45-08-040

Input Range 0-10"

Tolerance .5%

Units: IN WC

Input (in wc)	Output (in)	Output (%)	Lo:	Hi:	As Found	In/Out	As Left
0.0	4.00	(0)	3.90 (-2)	4.10 (+2)	N/A	N/A	4.00 (0)
2.5	8.00	(25)	7.90 (23)	8.10 (27)	()	()	8.00 (24)
5.0	12.00	(50)	11.90 (48)	12.10 (52)	()	()	12.00 (49)
7.5	16.00	(75)	15.90 (73)	16.10 (77)	()	()	16.00 (76)
10.0	20.00	(100)	19.90 (98)	20.10 (102)	()	()	20.00 (101)

(signoff) Calibrated By:

Paul W. Zylinski / PHursonDate: 5-28-96

Location:

Vent Bldg. 'B'Comments AZK1-9-1 HEME DIFFERENTIAL PRESSURE

CALIBRATE PER PROCEDURE 6-TF-302

9/11/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 367

Tag: PDI_AZ_K110_1A I/O Type: AI Description: PvHegala Dp

Cntlr: 3 Chan No: 12 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO
ZERO + SPAN TRANSMITTER + TEST ALARM POINTS

Sensor Calibration:

☒ 5 pt cal per procedure LP-TF-302 (data attached) _____ (signoff) _____Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout	Tolerance	LOI	Screen1	Screen2	Screen3
			LCU1-10	17PriExh	02Main.v	Group125
Lo: 0.00	-.03 /	.03	<u>0.03</u>	<u>0.0</u>	<u>ORANGE</u>	<u>0.02</u>
Hi: 5.00	4.97 /	5.03	<u>4.98</u>	<u>5.0</u>	<u>RED</u>	<u>4.99</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	
HiHi:	1	2.25	2.22 / 2.28	<u>2.25 (RED)</u>
Hi:	2	2.00	1.97 / 2.03	<u>2.0 (YELLOW)</u>
Lo:	<u>2-8</u>	<u>-0.63</u> -9999.99	-0.66 / -0.60	<u>-0.62 yellow</u>
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Other: _____

MTE Instr. No: 817-35-40-026 ~~817-45-08-040~~ Due Date: 8-9-97

(signoff)

Loop Complete: Doug ParkerDate: 9/13/96Add & retest LO dam L. H. Lier10/15/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 368

Tag: PDT-AZK110-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 7

Manufacturer: ITT Barton Model No.: FKCG Serial No: BC62953MTE Instr. No: 817-35-40-029 Due Date: 8-8-97
817-45-08-044 2-12-98

Input Range 0-5"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	<u>3.90</u>	<u>4.10</u>	<u>4.09</u>	<u>IN</u>	<u>4.09</u>
1.25	8.00	<u>7.90</u>	<u>8.10</u>	<u>8.07</u>	<u>IN</u>	<u>8.07</u>
2.50	12.00	<u>11.90</u>	<u>12.10</u>	<u>12.01</u>	<u>IN</u>	<u>12.01</u>
3.75	16.00	<u>15.90</u>	<u>16.10</u>	<u>15.96</u>	<u>IN</u>	<u>15.96</u>
5.00	20.00	<u>19.90</u>	<u>20.10</u>	<u>19.91</u>	<u>IN</u>	<u>19.91</u>

(signoff) Calibrated By: Fitzsimmons Date: 3-4-97

Location: _____

Comments Functionally tested 0 to 100% to Micron
CALIBRATE PER PROCEDURE 6-TF-302

3/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 369

Tag: PDT/PDE-AZK110-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 7

Manufacturer: ITT BARTONModel No.: FKCG

Serial No:

6C62953MTE Instr. No: 817-35-40-020
817-45-08-040Due Date: 7-21-96
2-5-97

Input Range 0-5"

Tolerance .5%

Units: IN WC

Input	Output(ma)	Output Z (%)	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	(0)	3.90 (-2)	4.10 (+2)	N/A	N/A	4.00
Am 1.25	8.00	(25)	7.90 (-2)	8.10 (+2)	(C)	(C)	7.99
Pm 2.5	12.00	(50)	11.90 (-2)	12.10 (+2)	(C)	(C)	12.00
Am 3.75	16.00	(75)	15.90 (-2)	16.10 (+2)	(C)	(C)	15.99
Pm 5	20.00	(100)	19.90 (-2)	20.10 (+2)	(C)	(C)	20.00
Am 3-5-96							
			Am 3-5-96	Am 3-5-96	Am 3-5-96		

(signoff) Calibrated By: Pyzdinski / P. HursonDate: 3-6-96Location: Vent Bldg. 'A'Comments AZ-KI-10-1A HEGA FILTER

CALIBRATE PER PROCEDURE 6-TF-302

9/11/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 370

Tag: PDI_AZ_K110_1B I/O Type: AI Description: PvHegalB Dp

Cntlr: 14 Chan No: 12 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO
ZERO & SPAN TRANSMITTER & TEST ALARM POINTS

Sensor Calibration:

☒ 5 pt calper procedure 6-TF-302 (data attached) _____ (signoff)

Loop Tolerance:

$$0.5\% = \sqrt{\begin{matrix} 2 & 2 & 0.5\% & 0.2\% \\ \text{(sensor)} & \text{(xmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$$

Units: IN WC

Process Input Readout Tolerance

LOI
LCU2-4Screen1
17PriExhScreen2
02Main.vScreen3
Group125

Lo: 0.00 -.03 / .03

-0.000.0ORANGE-0.02

Hi: 5.00 4.97 / 5.03

4.975.0RED4.97

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 99999.99

/

HiHi: 1 2.25

2.22 / 2.28

2.23 (RED)

Hi: 2 2.00

1.97 / 2.03

2.0 (YELLOW)Lo: 2 -0.63-0.66 / -0.60-0.63 yellow

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other:

MTE Instr. No:

817-45-08-040
817-35-40-018-026

Due Date:

8-2-97
7-21-96 8-9-97

(signoff)

Loop Complete:

Day 1/13/96

Date:

9/13/96Add & retest LO drum 2 Police10/15/96

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 371

Tag: PDT-AZK110-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 10

Manufacturer: ITT Barton Model No.: FKCG Serial No: _____MTE Instr. No: 817-35-40-024 Due Date: 8-9-97
817-45-08-044 2-12-98

Input Range 0-5"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	3.90	4.10	3.95	IN	4.00
1.25	8.00	7.90	8.10	7.95	IN	8.01
2.50	12.00	11.90	12.10	11.90	IN	12.00
3.75	16.00	15.90	16.10	15.89	OUT	16.02
5.00	20.00	19.90	20.10	19.85	OUT	20.01

(signoff) Calibrated By: Fitzsimmons Date: 2-25-97

Location: _____

Comments checked 0 to 100% to Micron

CALIBRATE PER PROCEDURE 6-TF-302

3/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 372

Tag: PDT/PDE-AZK110-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 10

Manufacturer: ITT BARTONModel No.: FKCGSerial No: BC62954MTE Instr. No: 817-35-40-018
817-45-08-040Due Date: 7-21-96
2-5-97

Input Range 0-5"

Tolerance .5%

Units: IN WC

Input	Output (ma) ^{As Fd} offset ^{ATZ (70)}	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	3.90	4.10	N/A	N/A	4.00
1.25	8.00	7.90	8.10			8.03
2.50	12.00	11.90	12.10			12.02
3.75	16.00	15.90	16.10			16.01
5.00	20.00	19.90	20.10	↓	↓	20.00

(signoff) Calibrated By: P. J. HarrisonDate: 3-4-96Location: Vent Bldg. 'B'Comments AZ-K1-10-1B HEGA FILTER

CALIBRATE PER PROCEDURE 6-TF-302

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 373

Tag: PI_AY1_K1_2 I/O Type: AI Description: Tank Press

Cntlr: 46 Chan No: 4 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: PRESSURE SOURCE AT TRANSMITTER

Sensor Calibration:

☒ 5 pt cal☐ _____per procedure 6-TF-304 (data attached) D.S.
(signoff)Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input Readout Tolerance

LOI
LCU4-27Screen1
15PriIn.

Screen2

Screen3

Lo: -10.00 -11.81 / -8.19

-9.49-10.00

Hi: 80.00 78.19 / 81.81

79.8979.9

Annunciator(s): Priority Setpoint

Tolerance

Trip Point

Max: 0 99999.99

/

HiHi: 0 99999.99

/

Hi: 0 99999.99

/

Lo: 0 -9999.99

/

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other: _____

MTE Instr. No: 817-35-406009 Due Date: 8/11/96

(signoff)

Loop Complete: D.S.Date: 4/30/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 374

Tag: PIT-AV101K1-2

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 5

Manufacturer: FISHER PETER Model No.: 500PA100A Serial No: 94W008178
817.45.08.040 2.28.98
 MTE Instr. No: 817.35.40.014 Due Date: 8.6.97

Input Range		-10.00 TO 80.00		Tolerance		1.5% - OUTPUT	
Units:		IN WC				3.0% - LOCAL DISPLAY	
Input	(mid) Output1 / OUTPUT2	Lo:	Hi:	As Found	In/Out	As Left	
-10	4.00 / 0	3.76 (-3)	4.24 (3)	4.01 (-.5)	IN	4.01 (-.5)	
12.5	8.00 / 25	7.76 (22)	8.24 (28)	8.01 (26)	IN	8.01 (26)	
35.0	12.00 / 50	11.76 (47)	12.24 (53)	12.01 (51.5)	IN	12.01 (51.5)	
57.5	16.00 / 75	15.76 (72)	16.24 (78)	16.00 (76.5)	IN	16.00 (76.5)	
80	20.00 / 100	19.76 (97)	20.24 (103)	20.00 (100)	IN	20.00 (100)	

(signoff) Calibrated By:

Paul M Zylinski

Date:

4.14.97

Location:

101 AV ENCL.

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 375

Tag: PIT-AY102K1-2

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 5

Manufacturer: Fisher Porter Model No.: 50DP4100A Serial No: 94W008178MTE Instr. No: 817-35-40-009Due Date: 8-11-96817-45-08-0402-5-97

Input Range -10.00 TO 80.00

Tolerance 1.5%

Units: IN WC

Input	Output (ma) / Output (%)	Lo:	Hi:	As Found	In/Out	As Left
-10.0	4.00 / 0	3.76 / -3	4.24 / 3	N/A	N/A	4.00 / 0.0
12.5	8.00 / 25	7.76 / 22	8.24 / 28			8.00 / 25.5
35.0	12.00 / 50	11.76 / 47	12.24 / 53			12.00 / 49.0
57.5	16.00 / 75	15.76 / 72	16.24 / 78			16.00 / 76.0
80.0	20.00 / 100	19.76 / 97	20.24 / 103			20.00 / 100.0

(signoff) Calibrated By: PM Zyglinski / PS HansonDate: 4-26-96Location: ENCL-AY101

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

-VOID-
4-14-97
pmg

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 376

Tag: PI_AY2_K1_2 I/O Type: AI Description: Tank Press

Cntlr: 46 Chan No: 18 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt calper procedure 6 TF 304 (data attached) LZLilco

(signoff)

Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input

Readout Tolerance

LOI

LCU4-28

Screen1

15PriIn.

Screen2

Screen3

Lo: -10.00

-11.81 / -8.19

-9.99-10.0

Hi: 80.00

78.19 / 81.81

79.8679.7

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

/

HiHi:

0

99999.99

/

Hi:

0

99999.99

/

Lo:

0

-9999.99

/

LoLo:

0

-9999.99

/

Min:

0

-9999.99

/

Other: _____

MTE Instr. No:

817-35-40-027

Due Date:

3/19/97

(signoff)

Loop Complete:

LZLilco

Date:

9/6/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 377

Tag: PIT-AY102K1-2

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 5

Manufacturer: FISHER PORTER Model No.: 50DPA20A Serial No: 94W028177MTE Instr. No: 817-45-08-040
817-35-40-029 Due Date: 2-28-98
2-8-97

Input Range -10.00 TO 80.00		Tolerance 1.5% - OUTPUT 3.0% - LOCAL DISPLAY				
Units: IN WC	(ma)	(%)				
Input	Output	1/OUTPUT 2	Lo:	Hi:	As Found	In/Out As Left
-10.0	4.00	0	3.76(-3)	4.24(3)	4.00(.5)	IN 4.01(.5)
12.5	8.00	25	7.76(22)	8.24(28)	8.00(26)	IN 8.01(25.5)
35.0	12.00	50	11.76(47)	12.24(53)	12.00(51)	IN 12.01(51)
57.5	16.00	75	15.76(72)	16.24(78)	15.98(76.5)	IN 16.01(77)
80.0	20.00	100	19.76(97)	20.24(103)	19.97(102)	IN 20.00(102)

(signoff) Calibrated By:

Date: 4-11-97

Location:

ENCL 102AY

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 378

Tag: PIT-AV102K1-2

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH-5-2

Manufacturer: Fisher PorterModel No.: 50DP4100ASerial No: 99W008177MTE Instr. No: 817-35-40-009Due Date: 8-11-96817-45-08-0402-5-97

Input Range -10.00 TO 80.00

Tolerance 1.5%

Units: IN WC

Input	(m) Output: / OUTPUT2	Lo:	Hi:	As Found	In/Out	As Left
-10.0	4.00 / 0	3.76 / 3.0	4.24 / 3.0	N/A	N/A	4.00 / 0.5
12.5	8.00 / 25	7.76 / 8.0	8.24 / 8.0			8.00 / 25.0
35.0	12.00 / 50	11.76 / 12.0	12.24 / 12.0			12.00 / 50.5
57.5	16.00 / 75	15.76 / 16.0	16.24 / 16.0			16.00 / 76.5
80.0	20.00 / 100	19.76 / 20.0	20.24 / 20.0			20.00 / 102.0

(signoff) Calibrated By: P. J. H. / P. H. H.Date: 4-25-96Location: ENC - AV102

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID
4-11-97
fmg

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 379

Tag: PI_AZ1_K1_2 I/O Type: AI Description: Tank Press

Cntlr: 51 Chan No: 4 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt cal per procedure 6 TF304 (data attached) SAH
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
Lo: -10.00	-11.81 / -8.19	LCU3-34	15PriIn.		
Hi: 80.00	78.19 / 81.81	<u>-9.98</u>	<u>-10.0</u>		
		<u>79.75</u>	<u>79.8</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	
HiHi:	0	99999.99	/	
Hi:	0	99999.99	/	
Lo:	0	-9999.99	/	
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Other: _____

MTE Instr. No: 817-35-40-027 Date: 3/19/97(signoff) Loop Complete: SAH Date: 5/3/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 380

Tag: PIT-AZ101K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 5

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W006176MTE Instr. No: 817.45.08.040 Due Date: 2.2.98
817.35.40.014 8.6.97

Input Range -10.00 TO 80.00		Tolerance 1.5% ~ OUTPUT 3.0% ~ DISPLAY				
Units: IN WC						
	(ma) (%)					
Input	Output 1 / Output 2	Lo:	Hi:	As Found	In/Out	As Left
-10.0	4.00 / 0	<u>3.76 (-3)</u>	<u>4.24 (3)</u>	<u>3.99 (0)</u>	<u>IN</u>	<u>4.00 (0)</u>
12.5	8.00 / 25	<u>7.76 (22)</u>	<u>8.24 (28)</u>	<u>7.99 (25)</u>	<u>IN</u>	<u>8.00 (25.5)</u>
35.0	12.00 / 50	<u>11.76 (47)</u>	<u>12.24 (53)</u>	<u>11.98 (50.5)</u>	<u>IN</u>	<u>12.00 (50.5)</u>
57.5	16.00 / 75	<u>15.76 (72)</u>	<u>16.24 (78)</u>	<u>15.98 (75.5)</u>	<u>IN</u>	<u>16.00 (76.0)</u>
80.0	20.00 / 100	<u>19.76 (97)</u>	<u>20.24 (103)</u>	<u>19.97 (101)</u>	<u>IN</u>	<u>20.00 (101.5)</u>

(signoff) Calibrated By:

Paul M. ZykowskiDate: 4.14.97

Location:

101AZ ENCL

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 381

Tag: PIT-AZ101K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 5

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008176MTE Instr. No: 817-35-40-009 Due Date: 8-11-96
817-45-08-090 2-5-97

Input Range -10.00 TO 80.00		Tolerance 1.5%				
Units: IN WC						
Input	(ma) Output 1 / (o/a) Output 2	Lo:	Hi:	As Found	In/Out	As Left
-10.0	4.00 / 0	3.76 / -3	4.24 / +3	N/A	N/A	4.00 / 0.0
12.5	8.00 / 25	7.76 / -2.2	8.24 / 2.2			8.00 / 25.5
35.0	12.00 / 50	11.76 / -4.7	12.24 / 5.3			12.00 / 50.5
57.5	16.00 / 75	15.76 / -7.2	16.24 / 7.8			16.00 / 76.0
80.0	20.00 / 100	19.76 / -9.7	20.24 / 10.3			20.00 / 101.0

(signoff) Calibrated By: P. Zyglinski / P. HursonDate: 4-26-96Location: ENCL-AZ-101

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID
4-14-97
pmj

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 382

Tag: PI_A22_K1_2 I/O Type: AI Description: Tank Press

Cntlr: 51 Chan No: 18 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: PRESSURE SNAKE

Sensor Calibration:

☒ 5 pt cal☐per procedure 6-TF-304 (data attached) L. Hill
(signoff)

Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
		LCU3-35	15PriIn.		
Lo: -10.00	-11.81 / -8.19	<u>-10.00</u>	<u>-10.0</u>		
Hi: 80.00	78.19 / 81.81	<u>80.06</u>	<u>80.0</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	0	99999.99	/	_____
Lo:	0	-9999.99	/	_____
LoLo:	0	-9999.99	/	_____
Min:	0	-9999.99	/	_____

Other: _____

MTE Instr. No: 817-35-40-009 Due Date: 8/11/96

(signoff)

Loop Complete: L. HillDate: 5/1/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 383

Tag: PIT-AZ102K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 5

Manufacturer: FISHER PORTER Model No.: 500PA100A Serial No: 94W008175MTE Instr. No: 817-45-08-040 Due Date: 2-28-98
817-35-40-014 8-6-97

Input Range -10.00 TO 80.00		Tolerance 1.5% - OUTPUT 3.0% - DISPLAY				
Units: IN WC						
	(mA) (%)	Lo:	Hi:	As Found	In/Out	As Left
Input	Output 1 / Output 2					
-10.0	4.00 / 0	3.76 (-3)	4.24 (3)	4.00 (0)	IN	4.00 (0)
12.5	8.00 / 25	7.76 (22)	8.24 (28)	8.00 (25.5)	IN	8.00 (25.5)
35.0	12.00 / 50	11.76 (47)	12.24 (53)	12.00 (50.5)	IN	12.00 (50.5)
57.5	16.00 / 75	15.76 (72)	16.24 (78)	16.00 (75.5)	IN	16.00 (75.5)
80.0	20.00 / 100	19.76 (97)	20.24 (103)	20.00 (100)	IN	20.00 (100)

(signoff) Calibrated By:

Paul M. ZylinskiDate: 4-14-97

Location:

102AZ ENCL.

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 384

Tag: PIT-AZ102K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 5

Manufacturer: FISHER/PORTER Model No.: 51P4100A Serial No: 94W1008175MTE Instr. No: 817-35-40-009 Due Date: 8-11-96
817-45-08-040 2-5-97

Input Range -10.00 TO 80.00

Tolerance 1.5%

Units: IN WC

Input	(ma) (%) Output/OUTPUT Z	Lo:	Hi:	As Found	In/Out	As Left
-10.0	4.00 / 0	3.76 / -3	4.24 / +3	N/A	N/A	4.00 / 0
12.5	8.00 / 25	7.76 / 22	8.24 / 28	↓	↓	8.00 / 25
35.0	12.00 / 50	11.76 / 47	12.24 / 53	↓	↓	12.00 / 50.0
57.5	16.00 / 75	15.76 / 72	16.24 / 78	↓	↓	16.01 / 75.5
80.0	20.00 / 100	19.76 / 97	20.24 / 103	↓	↓	20.01 / 100.0

(signoff) Calibrated By: P. L. HensonDate: 4-26-96Location: ENCL-AZ102

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

Void
4-14-97
RNG

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 385

Tag: PI_AY1_K1_1 I/O Type: AI Description: Tank Press

Cntlr: 46 Chan No: 3 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt calper procedure 6 TF 309 (data attached) LTH
(signoff)Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU4-27	Screen1 15PriIn.	Screen2 02Main.v	Screen3 10RecAY1
Lo: -6.00	-6.05 / -5.95	<u>-5.96</u>	<u>-6.0</u>	<u>✓</u>	<u>✓</u>
Hi: 4.00	3.95 / 4.05	<u>+4.04</u>	<u>-4.01</u>	<u>✓</u>	<u>✓</u>

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: 0 99999.99 /

HiHi: 1 0.00 -0.05 / .05

Hi: 2 -.50 -.55 / -.45

Lo: 2 -3.50 -3.55 / -3.45

LoLo: 1 -4.00 -4.05 / -3.95

Min: 0 -99999.99 /

0.0 -0.05 LTH
 -0.51 -0.55
 -3.54 -3.54 -3.54 LTH
 -4.03 -4.04 -4.04

Other:

Also screens 03LeakDt.v & - alarms show properMTE Instr. No: 817-35-40-018Due Date: 7/21/96

(signoff)

Loop Complete: LTHDate: 5/6/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 386

Tag: PIT-AY101K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 1

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008179MTE Instr. No: 817-45-08-040 Due Date: 2-28-98
817-35-40-029 8-8-97

Input Range		-6.00 TO 4.00		Tolerance		.5% - OUTPUT 3% - LOCAL DISPLAY	
Units:		IN WC					
Input	Output 1 (mA) Output 2 (%)	Lo:	Hi:	As Found	In/Out	As Left	
-6.00	4.00 / 0	3.92 (-3)	4.08 (3)	4.16 (2)	OUT	4.00 (.5)	
-3.50	8.00 / 25	7.92 (22)	8.08 (28)	8.13 (25.5)	OUT	8.00 (26)	
-1.00	12.00 / 50	11.92 (47)	12.08 (53)	12.12 (53)	OUT	11.99 (52)	
1.50	16.00 / 75	15.92 (72)	16.08 (78)	16.11 (78)	OUT	16.00 (77)	
4.00	20.00 / 100	19.92 (97)	20.08 (103)	20.09 (102)	OUT	20.00 (102)	

(signoff) Calibrated By:

Paul M. Zylinski

Date:

4.11.97

Location:

ENCL 101AY

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 387

Tag: PIT-AY101K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 1

Manufacturer: FISHER PORTER Model No.: 502P4100A Serial No: 94WDD8179MTE Instr. No: 817-35-40-009Due Date: 8-11-96817-45-08-0402-5-97

Input Range -6.00 TO 4.00

Tolerance 4% .5%

Units: IN WC

Input	Output (ma) / OUTPUT 2 (%)	Lo:	Hi:	As Found	In/Out	As Left
-6.00	4.00 / 0	3.98 / -3.0	4.08 / +3.0	N/A	N/A	4.00 / 0.0
-3.500	8.00 / 25	7.98 / 22	8.02 / 28			8.00 / 25.0
-1.00	12.00 / 50	11.98 / 48	12.02 / 53			12.00 / 50.0
+1.50	16.00 / 75	15.98 / 72	16.02 / 78			16.00 / 76.0
+4.00	20.0 / 100	19.98 / 97	20.02 / 103			20.00 / 100.0

(signoff) Calibrated By: P. J. HarrisonDate: 4-26-96Location: ENCL - AY101

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID 4-11-97
By

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 388

Tag: PI_AY2_K1_1 I/O Type: AI Description: Tank Press

Cntlr: 46 Chan No: 17 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt calper procedure 6 TF 304 (data attached) L. Allen
(signoff)
$$\text{Loop Tolerance: } 0.5 \% = \sqrt{\begin{matrix} 2 & 2 & 0.5 \% & 0.2 \% \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$$

Units: IN WC

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
		LCU4-28	15PriIn.	02Main.v	11RecAY2
Lo: -6.00	-6.05 / -5.95	<u>-6.00</u>	<u>-6.0</u>		
Hi: 4.00	3.95 / 4.05	<u>3.98</u>	<u>4.0</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	
HiHi:	1	0.00	-.05 / .05	<u>0.0</u>
Hi:	2	-.50	-.55 / -.45	<u>-0.49</u>
Lo:	2	-3.50	-3.55 / -3.45	<u>-3.50</u>
LoLo:	1	-4.00	-4.05 / -3.45	<u>-4.02</u>
Min:	0	-99999.99	/	

Other:

Also screens 03LeakDt.v &

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Dan HuberDate: 5/6/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 389

Tag: PIT-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 2

Manufacturer: FISHER PORTER Model No.: 50DPA100A Serial No: 94W008181MTE Instr. No: 817.45-08.040
817.35.40.029 Due Date: 2.28.98
8.8.97

Input Range			-6.00 TO 4.00					Tolerance		4% . 5% - OUTPUT 3% - LOCAL DISPLAY	
Units:			IN WC								
Input	ma	(%)	Output	1/Output Z	Lo:	Hi:	As Found	In/Out	As Left		
-6.00	4.00	0			3.92 (-3)	4.08 (3)	4.06 (2)	IN	4.01 (1)		
-3.50	8.00	25			7.92 (22)	8.08 (28)	8.03 (27)	IN	8.02 (27)		
-1.00	12.00	50			11.92 (47)	12.08 (53)	12.00 (50) ^{4.11%}	IN	12.01 (52)		
1.50	16.00	75			15.92 (72)	16.08 (78)	16.00 (78)	IN	16.02 (78)		
4.00	20.00	100			19.92 (97)	20.08 (103)	19.95 (103)	IN	20.01 (103)		

(signoff) Calibrated By:

Paul M. ZylinskiDate: 4.11.97Location: ENCL 102AY

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 390

Tag: PIT-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 2 ^{4.25.96} 2Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No.: 94W008181MTE Instr. No: 817-35-40-009Due Date: 8-11-96817-45-08-0402-5-97

Input Range -6.00 TO 4.00

Tolerance 4% .5%

Units: IN WC

Input	(ma) Output	(%) OUT PUT 2	Lo:	Hi:	As Found	In/Out	As Left
-6.00	4.00	0	3.98/-3	4.02/3	N/A	N/A	4.00/0.0
-3.50	8.00	25	7.98/22	8.02/28			8.00/26.5
-1.00	12.00	50	11.98/47	12.02/53			12.00/52.0
+1.50	16.00	75	15.98/72	16.02/78			16.00/77.5
+4.00	20.00	100	19.98/97	20.02/103			20.00/103.0

(signoff) Calibrated By: R. J.inski / P. HansonDate: 4.25.96Location: ENCL - AY102

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID
4-11-97
Frog

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 391

Tag: PI_AZ1_K1_1 I/O Type: AI Description: Tank Press

Cntlr: 51 Chan No: 3 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt calper procedure 6 TF 304 (data attached) LEH
(signoff)Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} 2 & + & 2 & + & 0.5\% & + & 0.2\% \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU-34	Screen1 15PriIn.	Screen2 02Main.v	Screen3 12RecAZ1
Lo: -6.00	-6.05 / -5.95	<u>-6.02</u>	<u>-6.0</u>	<u>✓</u>	<u>✓</u>
Hi: 4.00	3.95 / 4.05	<u>3.99</u>	<u>4.0</u>	<u>✓</u>	<u>✓</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	<u>-0.02</u>
HiHi:	1	0.00	-0.05 / .05	<u>-0.47</u>
Hi:	2	-5.50	-5.55 / -4.45	<u>-3.48</u>
Lo:	2	-3.50	-3.55 / -3.45	<u>-3.97</u>
LoLo:	1	-4.00	-4.05 / -3.95	<u>-3.97</u>
Min:	0	-99999.99	/	<u></u>

Other:

Also screens 03LeakDt.v & ✓MTE Instr. No: 817-35-40-020 Due Date: 7/21/96

(signoff)

Loop Complete: LEHDate: 5/3/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 392

Tag: PIT-AZ101K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 1

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008182MTE Instr. No: 817-45-08-040
817-35-40-029 Due Date: 2-28-98
8-8-97

Input Range -6.00 TO 4.00			Tolerance <u>4%</u> <u>5%</u> <u>OUTPUT</u> <u>3%</u> <u>DISPLAY</u>				
Units:	IN	WC					
	(ma)	(%)	Lo:	Hi:	As Found	In/Out	As Left
-6.00	4.00	0	<u>3.92(-3)</u>	<u>4.08(3)</u>	<u>4.00(0)</u>	<u>IN</u>	<u>4.03(0)</u>
-3.50	8.00	25	<u>7.92(22)</u>	<u>8.08(28)</u>	<u>7.98(25)</u>	<u>IN</u>	<u>8.03(25.5)</u>
-1.00	12.00	50	<u>11.92(47)</u>	<u>12.08(53)</u>	<u>11.94(50.5)</u>	<u>IN</u>	<u>12.02(51)</u>
1.50	16.00	75	<u>15.92(72)</u>	<u>16.08(78)</u>	<u>15.92(75.5)</u>	<u>IN</u>	<u>16.04(76)</u>
4.00	20.00	100	<u>19.92(97)</u>	<u>20.08(103)</u>	<u>19.89(99)</u>	<u>OUT</u>	<u>20.04(100.5)</u>

(signoff) Calibrated By:

Pawel M. ZylinskiDate: 4-11-97Location: ENCL 101AZ

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 393

Tag: PIT-AZ101K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 1

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008182MTE Instr. No: 817-35-40-009 Due Date: 8-11-96
817-45-08-040 2-5-97

Input Range -6.00 TO 4.00

Tolerance 4% .5%

Units: IN WC

Input	(ma) Output	(%) Output 2	Lo:	Hi:	As Found	In/Out	As Left
-6.00	4.00	0	3.98/-3	4.02/3	N/A	N/A	4.00/0.0
-3.50	8.00	25	7.98/22	8.02/28			8.00/25.0
-1.00	12.00	50	11.98/47	12.02/53			12.00/50.5
+1.50	16.00	75	15.98/72	16.02/78			16.00/76.0
-4.00	20.00	100	19.98/97	20.02/103			20.00/100.5

(signoff) Calibrated By: P. ZylinskiDate: 4-26-96Location: ENCL A701

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID
4-11-97
PZ

4/26/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 394

Tag: PI_A22_K1_1 I/O Type: AI Description: Tank Press

Cntlr: 51 Chan No: 17 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 2.5 pt cal per procedure 6 TF304 (data attached) L4H
☐ _____ (signoff)

 Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU3-35	Screen1 15PriIn.	Screen2 02Main.v	Screen3 13RecAZ2
Lo: -6.00	-6.05 / -5.95	<u>-6.02</u>	<u>-6.0</u>	<u>✓</u>	<u>✓</u>
Hi: 4.00	3.95 / 4.05	<u>3.99</u>	<u>4.0</u>	<u>✓</u>	<u>✓</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	1	0.00	-.05 / .05	<u>0.0</u>
Hi:	2	-.50	-.55 / -.45	<u>-0.51</u>
Lo:	2	-3.50	-3.55 / -3.45	<u>-3.49</u>
LoLo:	1	-4.00	-4.05 / -3.45	<u>-3.99</u>
Min:	0	-9999.99	/	_____

Other:

Also screens 03LeakDt.v & ✓MTE Instr. No: 817-35-40-030 Due Date: 7/21/96

(signoff)

Loop Complete: L4HillDate: 5/3/96

2/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 395

Tag: PIT-AZ102K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 2

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008180
 MTE Instr. No: 817.45.08.040 Due Date: 2.28.98
817.35.40.029 8.8.97

Input Range -6.00 TO 4.00			Tolerance 4% .5% - OUTPUT 3% - LOCAL DISPLAY			
Units: IN WC						
Input	Output (ma)	(%)	Lo:	Hi:	As Found	In/Out As Left
-6.00	4.00	0	3.92 (-3)	4.08 (3)	4.07 (0)	N 4.07 (0)
-3.50	8.00	25	7.92 (22)	8.08 (28)	8.03 (25)	IN 8.03 (25)
-1.00	12.00	50	11.92 (47)	12.08 (53)	12.00 (50)	IN 12.00 (50)
1.50	16.00	75	15.92 (72)	16.08 (78)	16.00 (76)	IN 16.00 (76)
4.00	20.00	100	19.92 (97)	20.08 (103)	19.97 (101)	IN 19.97 (101)

(signoff) Calibrated By:

P. Przybylski

Date:

4.11.97

Location:

ENCL. 102A7

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

3/13/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 396

Tag: PIT-AZ102K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 2

Manufacturer: FISHER PORTER Model No.: 50DP4100A Serial No: 94W008180MTE Instr. No: 817-35-40-009 Due Date: 8-11-96817-45-08-0402-5-97Input Range ^{(mm) / (in)} -6.00 TO 4.00Tolerance ^{(mm) / (in)} A% 4.5%

Units: IN WC

Input	Output ^(mm) / ⁽ⁱⁿ⁾ Output 2	Lo:	Hi:	As Found	In/Out	As Left
-6.00	4.00 / 0	3.98 / -3.0	4.02 / +3.0	N/A	N/A	4.00 / -5
-3.50	8.00 / 25	7.98 / 22	8.02 / 28			8.00 / 25.0
-1.00	12.00 / 50	11.98 / 47	12.02 / 53			12.00 / 50.0
+1.50	16.00 / 75	15.98 / 72	16.02 / 78			16.00 / 75.0
+4.00	20.00 / 100	19.98 / 97	20.02 / 103			20.00 / 100.0

(signoff) Calibrated By: Ryzkowski / P. HensonDate: 4-26-96Location: ENCL-AZ-102

Comments

CALIBRATE PER 6-TF-304 (NEW PROCEDURE ATTACHED)

VOID
4-11-97
Pmg

4/29/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 397

Tag: PI_AZ_K1_1A I/O Type: AI Description: Pvhdr1A Press

Cntlr: 3 Chan No: 17 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED PRESSURE SOURCE AT TRANSMITTER
INPUT. Used PROMAC CALIBRATOR FOR LO-LO trip.

Sensor Calibration:

☒ 5 pt cal per procedure 6-TF-302 (data attached) D.J.
☐ _____ (signoff)Loop Tolerance: $0.5\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 0.5\%^2 + 0.2\%^2}$
(sensor) (xmitter) (other) (DCS)

Units: IN WC

Process Input	Readout Tolerance	LOI LCU1-9	Screen1 17PriExh	Screen2 gmp124	Screen3
Lo: -35.00	-35.19 / -34.81	<u>-34.99</u>	<u>-35.0</u>	<u>-34.99</u>	
Hi: 0.00	-.19 / .19	<u>-0.09</u>	<u>-0.1</u>	<u>-0.10</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	
HiHi:	0	99999.99	/	
Hi:	2	-10.00	-10.19 / -9.81	<u>-10.02 yellow</u>
Lo:	2	-32.00	-32.19 / -31.81	<u>-31.98 yellow</u>
Min LoLo:	3	-9999.99	/	
LoLo Min	3	-37.00	-37.19 / -36.81	<u>-37.00 white</u>

Other:

VERIFIED PROPER OPERATION OF ELECTRIC ACTUATORBY PLACING HAZOP SWITCH (HS) IN OFF-RUN-STOP POSITIONS817-13-55-0233-26-97MTE Instr. No: 817-45-08-033Due Date: 11-21-96817-35-40-00911-9-96(signoff) Loop Complete: JC BanowsDate: 8/2/96Doug Surber

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 398

Tag: PT-AZK1-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 12

Manufacturer: JTT Barton Model No.: FHCG Serial No: BC75555MTE Instr. No: 817-35-40-027 Due Date: 3-19-97
817-45-08-043 5-16-97

Input Range -35-0"

Tolerance .5%

Units: IN WC

Input	Output	Meter output %	Lo:	Hi:	As Found	In/Out	As Left
-35.00	4.00	(0)	3.90(2)	4.10(2)	4.11(1)	OUT	4.00(0)
-26.25	8.00	(25)	7.90(23)	8.10(27)	8.08(25)	IN	8.00(25)
-17.50	12.00	(50)	11.90(48)	12.10(52)	12.05(49)	IN	12.00(49)
-8.75	16.00	(75)	15.90(73)	16.10(77)	16.02(76)	IN	16.00(76)
0.00	20.00	(100)	19.90(98)	20.10(102)	20.01 19.98 3F	IN	20.00(100)

2-25-97

(signoff) Calibrated By: Fitzsimmons Date: 2-25-97

Location: _____

Comments Functionally checked 0% and 100% to Micron

CALIBRATE PER PROCEDURE 6-TF-302

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 399

Tag: PT/PE-AZK1-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 12

Manufacturer: ITT Barton Model No.: FHCG Serial No: BC75555MTE Instr. No: 817-45-08-033
817-35-40-020 Due Date: 11-21-96
7-21-96

Input Range -35-0"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
-35.00	4.00 mA	3.90	4.10 mA	NA	NA	4.00 mA
-26.25	8.00 mA	7.90	8.10	NA	NA	7.99 mA
-17.50	12.00 mA	11.90	12.10	NA	NA	11.99 mA
-8.75	16.00 mA	15.90	16.10	NA	NA	15.99 mA
0.00	20.00 mA	19.90	20.10	NA	NA	19.99 mA

(signoff) Calibrated By: A. Frazier S. Fitzsimmons Date: 5-1-96Location: A-side Filter Train

Comments

CALIBRATE PER PROCEDURE 6-TF-302

4/29/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 400

Tag: PI_AZ_K1_1B I/O Type: AI Description: Pvhdr1B Press

Cntlr: 14 Chan No: 17 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED
PRESSURE SOURCE AT TRANSMITTER MOUNT.
USED PRIMAL CALIBRATOR FOR LO-LO TRIP-

Sensor Calibration:

☒ 5 pt cal per procedure 6-TF-302 (data attached) D.G.
☐ _____ (signoff)

Loop Tolerance: $0.5\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmitter)}^2 & + & 0.5\% & + & 0.2\% \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU2-9	Screen1 17PriExh	Screen2	Screen3
Lo: -35.00	-35.19 / -34.81	<u>-35</u>	<u>-35</u>	_____	_____
Hi: 0.00	-.19 / .19	<u>0</u>	<u>0</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	2	-10.00	-10.19 / -9.81	<u>-10.01</u>
Lo:	2	-32.00	-32.19 / -31.81	<u>-32.00</u>
min LOLO	0	-9999.99	/	_____
LOLO	3	-37.00	-37.19 / -36.81	<u>-37.01</u> OPEN LOOP retest per

Other:

VERIFIED PROPER OPERATION OF ELECTRIC HAND SW ACTUATOR

BY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONS

MTE Instr. No: 817-13-55-023 Due Date: 8/11/96
817-35-40-009

(signoff) Loop Complete: D.G.Date: 8/18/96

Retested for -37.00 after software chk
flow control

2/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 401

Tag: PT-AZK1-1B

P&ID: H-2-131076, SH 1

LOOP: H-131309, SH 14

Manufacturer: ITT Barton Model No.: FHCG Serial No: BC67652MTE Instr. No: 817-35-40-027 Due Date: 3-19-97
817-45-08-044 2-12-98

Input Range -35-0"

Tolerance .5%

Units: IN WC

Input	Output	Meter output	Lo:	Hi:	As Found	In/Out	As Left
-35.00	4.00	0	3.90(2)	4.10(2)	4.00(0.5)	IN	4.00(0.5)
+26.25	8.00	25	7.90(23)	8.10(27)	8.01(25)	IN	8.01(25)
-17.50	12.00	50	11.90(48)	12.10(52)	12.01(51)	IN	12.01(51)
-8.75	16.00	75	15.90(73)	16.10(77)	16.01(76)	IN	16.01(76)
0.00	20.00	100	19.90(98)	20.10(102)	20.00(101)	IN	20.00(101)

(signoff) Calibrated By: Fitzsimmons Date: 2-24-97

Location: _____

Comments checked 0 to 100% to Micon

CALIBRATE PER PROCEDURE 6-TF-302

3/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 402

Tag: PT/PE-AZK1-1B

P&ID: H-2-131076, SH 1

LOOP: H-131309, SH 14

Manufacturer: ITT BARTONModel No.: FHCGSerial No: BC67652MTE Instr. No: 817-35-40-009
817-45-08-040

-4-96

Due Date: 8-11-96
2-5-97

Input Range -35-0"

Tolerance .5%

Units: IN WC

Input	Output(mg)	output z(%)	Lo:	Hi:	As Found	In/Out	As Left
-35.0	4.0	(0)	+3.90 (-2)	4.10 (2)	N/A (N/A)	()	4.00 (0)
-26.25	8.0	(25)	7.90 (23)	8.10 (27)	()	()	8.01 (27.5)
-17.50	12.0	(50)	11.90 (48)	12.10 (52)	()	()	12.02 (49.5)
-8.75	16.0	(75)	15.90 (73)	16.10 (77)	()	()	16.02 (76)
0	20.0	(100)	19.90 (98)	20.10 (102)	()	()	20.00 (100)

(signoff) Calibrated By: Przybylski/PJHussonDate: 3-7-96

Location: _____

Comments

Position indicator missing from isolation manifold
CALIBRATE PER PROCEDURE 6-TF-302 motor.Tagged incorrectly: Should
be PDT

Tag: PIT-AZ-KI

P&ID:

LO

HNF-SD-W030-TD-002,
REV. 0, PAGE 403Manufacturer: VELTRON Model No.: 5000AZ Serial No: 6756MTE Instr. No: 817-15-08-062 Due Date: 12-30-97
817-35-10-030 7-31-97

Input Range 0-12

Tolerance 2%

Units: in. Hg

Input	Output (VDC)	DISPLAY	Lo:	Hi:	As. Found	In/Out	As. Left (VDC)	DISPLAY
0.0	0.000	(00.00)	-0.10 (-2.4)	0.10 (2.4)	* N/A	* N/A	0.000	(-0.00)
3.0	1.250	(03.00)	1.15 (2.76)	1.35 (3.24)			1.256	(03.01)
6.0	2.500	(06.00)	2.40 (5.76)	2.60 (6.24)			2.510	(06.02)
9.0	3.750	(09.00)	3.65 (8.76)	3.85 (9.24)			3.760	(09.02)
12.0	5.000	(12.00)	4.90 (11.76)	5.10 (12.24)			5.000	(12.00)

(signoff) Calibrated By: Paul M. ZylinskiDate: 3-6-97Location: Main Stack Monitor Cabinet

Comments * New instrument; PT-5 Manifold Vacuum transmitter.
Input tolerance = $\pm .032$ in. Hg = .27% of field instrument span.

10/15/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 404PIT-A2-K1
Tag: TDIC-A2K12-1BH-2-131078
P&ID: H-2-131076, SH-1

LOOP: H-2-431300, SH-2

Manufacturer: VELTRON Model No.: 5000A2 Serial No: 6756MTE Instr. No: 217-35-40-032 Date: 08-08-97
017-45-08-042 Due Date: 02-12-97

Input Range 0-12			Tolerance 2%					
Units: ¹¹ hg			VDC					
Input	VDC output	DISPLAY	Lo:	Hi:	As Found	In/Out	VDC As Left	DISPLAY
0.0	0.0	0.0	-0.2	+0.2	N/A	N/A	0.01	+0.0
3.0	2.5	+3.0	2.3	2.7	?	?	2.50	+3.0
6.0	5.0	+6.0	4.8	5.2	?	?	4.99	+6.0
9.0	7.5	+9.0	7.3	7.7	?	?	7.52	+8.9
12.0	10.0	+12.0	9.8	10.2	?	?	10.01	+12.0

(signoff) Calibrated By: [Signature]Date: 10-21-96Location: STACK MONITOR CABINETComments PT-5 MANIFOLD VACUUM TRANSMITTER

VOID

2/11/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 405

Tag: PI-AZK1

P&ID: H-2-131078, SH 1

LOOP:

Manufacturer: US Gage Model No.: Vacuum Gage Serial No: 2E 000686

MTE Instr. No: 817-35-40-015 Due Date: 3-19-97

Input Range 0-20" 30"

Tolerance 5%

Units: Hg Vac.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-1.5	+1.5	0	IN	0
10	10	8.5	11.5	10	IN	10
20	20	18.5	21.5	19.91	IN	19.91

(signoff) Calibrated By: Fitesimian Date: 2-13-97

Location: K1 Pri Vent Exh. Rad. Monitoring (Sample pumps inlet)

Comments

COMP. ID: PI-AZK1

MANUF: US GAGE

TEST EQUIP: 814-31-05-001

DUE DATE: ²⁻¹²⁻⁹⁶
~~2-17-96~~ 6-96

INPUT RANGE 0-30" Hg Vac.

TOLERANCE $\pm 5\%$

PROCEDURE: PSCP-4-091

INPUT	OUTPUT	L0	H1	AS FOUND	IN/OUT	AS LEFT
0	0	-1.5	+1.5	0	IN	0
10	10	8.5	11.5	10.3	IN	10.3
20	20	18.5	21.5	20.2	IN	20.2

CALIBRATED BY:

Paul M. Zylushe

DATE: 2-12-96

LOCATION: K1 PRI. VENT EXH. RAD. MONITORING.
OTHER: SAMPLE PUMPS INLET

↑
Plural!

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 407

Tag: RAH_AZ_K1_1 I/O Type: DI Description: PvStac Rad

Cntlr: 17 Chan No: 5 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: Keypad prompt

Sensor Calibration: N/A (see Datasheet for RI-AZ-K1-1)

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU2-12	Screen1 18PriMon	Screen2 03LeakDt	Screen3 02Main.v
Lo (0): NORMAL	2	<u>OFF</u>	<u>norml</u>	<u>Norml</u>	<u>Norml</u>
Hi (1): HIGH	1	<u>ON</u>	<u>red</u>	<u>red</u>	<u>red</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 1 redLo: 0 —VERIFIED LOCAL ALARM RAH-AZK1-1A, STROBE RA-AZK1-1, BELL RA-AZK1-1A. AND
ACKNOWLEDGE SWRCH AS-AZK1-1A1

Other:

Alarm is NOT failsafe.

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L J HillDate: 2/7/97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 408

Tag: RAH_AZ_K19_1 I/O Type: DI Description: PVHeme RadHi

Cntlr: 28 Chan No: 1 P&ID: W-2-13/1025 SH.3 Logic:

Remarks: _____

Location: _____

Actuation Method: SET ALARM POINT BELOW BACKGROUND TO
TRIP RAH

Sensor Calibration:

☐ N/A per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU3-7	Screen1 16PriCoo	Screen2 03LeakDt	Screen3 02Main.v
Lo (0): HIGH	3-Yellow	<u>OFF</u>	<u>YELLOW</u>	<u>YELLOW</u>	_____
Hi (1): NORMAL	2-Green	<u>ON</u>	<u>GREEN</u>	<u>GREEN</u>	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	2	<u>YELLOW</u> yellow

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug [Signature] Date: 10/19/97

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 409

Tag: RAX_AZ_K1_1 I/O Type: DI Description: PvStac Rad

Cntlr: 17 Chan No: 6 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: Open detector housingSensor Calibration: N/A (See Data sheet for RA-AZ-K1-1)☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): NORMAL	2	<u>OFF</u>	<u>NORMAL</u>	<u>NORMAL</u>	<u>NORMAL</u>
Hi (1): FAILURE	3	<u>ON</u>	<u>yellow</u>	<u>yellow</u>	<u>no change</u> ^{if}

Annunciator(s)	Priority	Alarm Color (actual)
Hi:	2	<u>yellow</u>
Lo:	0	<u>_____</u>

* O2Main.v only shows the RAH high alarm not the failure alarm.

VERIFIED LOCAL ALARM RAX-AZK1-1A, STROBE XA-AZK1-1, NORM RA-AZK1-1B AND ACKNOWLEDGE SWITCH HS-AZK1-1B

Other: Alarm is NOT failsafe. Also a number of failures do not retrigger this output.

MTE Instr. No: N/A Due Date: _____

(signoff)

Loop Complete: LFL/leapDate: 2/7/97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 410

Tag: RAX_AZ_K19_1 I/O Type: DI Description: PVHeme RadFail

Cntlr: 28 Chan No: 2 P&ID: H-2-131075 S.H.3 Logic:

Remarks: _____

Location: _____

Actuation Method: POWER DOWN UNIT TO SIMULATE FAILURE

Sensor Calibration:

☒ N/A per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 20%

Process State	Color	LOI LCU3-7	Screen1 16PriCoo	Screen2 03LeakDt	Screen3 02Main.v
Lo (0): FAILURE	3 <u>yellow</u>	<u>OFF</u> <u>YELLOW</u>	<u>YELLOW</u>	<u>YELLOW</u>	_____
Hi (1): NORMAL	2 <u>green</u>	<u>ON</u>	<u>GREEN</u>	<u>GREEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 2 yellowyellow

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Link Date: 10/14/97

2/14/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 411

Tag: RI_AZ_K1_1 I/O Type: AI Description: PvStat Rad

Cntlr: 14 Chan No: 8 P&ID: H-2-131078 Logic:

Remarks: AI is RI-AZ-K1-1A; RI-AZ-K1-1 = 10[^]INPUT

Location: _____

Actuation Method: SPECIFY DESIRED OUTPUT VOLTAGE ON CAM

Sensor Calibration:

☐ 5 pt cal~~per procedure~~per procedure 6-TF-168

(data attached)

St Hill
(signoff)

Loop Tolerance: 20.0 % = $\sqrt{\text{(sensor)}^2 + \text{(xmmitter)}^2 + 20.0 \%^2 + 0.2 \%^2}$

Units: DPM/ft3

Process Input Readout Tolerance

* LOI
LCU2-12Screen1
18PriMonScreen2
03LeakDt

Screen3

Lo: 0.00 -20001.0 / 20001.00

0.11 decades 1 DPM0 DPM

Hi: 100000.0 79999.00 / 120001.0

5.06 dec 112,000113,00010^{0.11} = 1.29 DPM10^{5.06} = 114,800

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	0	99999.99	/	_____
Lo:	0	-9999.99	/	_____
LoLo:	0	-9999.99	/	_____
Min:	0	-9999.99	/	_____

Console Reading matches SAC value on CAM.

Other:

* LOI READOUT IN DECADES (RANGE IS 0-5)VALUE = READING IN DECADES * 10^{X=DECADES}

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: St HillDate: 3/19/97

10/13/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 412

Tag: RI_AZ_K19_1 I/O Type: AI Description: Heme Rad

Cntlr: 24 Chan No: 5 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: 421 MB

Sensor Calibration:

☐ 5 pt cal☒ _____ per procedure _____ (data attached) J.J.
(signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: R/Hr

Process Input Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU3-7

16PriCoo

03LeakDt

Lo: .10 -2009.87 / 2010.07

0.001.00 MB1.00 MB

Hi: 100000.0 97990.03 / 102009.9

6.0099.7 MB99.7 MB

Annunciator(s): Priority Setpoint

Tolerance

Trip Point

Max: 0 99999.99

/

HiHi: 0 99999.99

/

13.86 MB Hi: 2 500.00

1509.97 / 2509.97497

Lo: 0 -9999.99

/

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other:

ALSO TEST LOCAL LOOP RIAS-A2K19-1MTE Instr. No: 817-13-55-023Due Date: 5-24-98

(signoff)

Loop Complete: RLZantDate: 10-12-97

NUCLEAR RESEARCH CORPORATION

CERTIFICATE OF CALIBRATION

INSTRUMENT TYPE: Gamma Detector	SERIAL #: GP492901
MANUFACTURER: NRC	TEMPERATURE: 70° F
MODEL #: GP-100C	HUMIDITY: 43 %
CHECK SOURCE #:	REFERENCE #: G-15 (Cs-137)
TOLERANCE: +/- 10%	CUSTOMER: LOCKHEED MARTIN
PROCEDURE: 200857	JOB #: 17386L

AS FOUND

CALIBRATION POINT	ACTUAL READING
20 mR/h	18.4 mR/h
200 mR/h	196 mR/h
2 R/h	1.94 R/h
20 R/h	104 R/h
200 R/h	202 R/h
CHECK SOURCE	7.80 mR/h

AS LEFT

CALIBRATION POINT	ACTUAL READING
20 mR/h	20.1 mR/h
200 mR/h	200 mR/h
2 R/h	2.01 R/h
20 R/h	20.3 R/h
200 R/h	204 R/h
CHECK SOURCE	8.20 mR/h

Date calibrated: 10/3/97

Date due: 4/3/98 *

Calibrated by: R. BOMERINGER

* Or as required by local radiation safety policy.

All reference standards used by Nuclear Research Corporation are N.I.S.T. certified or N.I.S.T. traceable.
Calibration meets the requirements of NRC-STD-45662A. This certificate shall not be reproduced except in full,
without the consent of Nuclear Research Corporation.

Eberline AMS-4 Continuous Air Monitor

HNF-SD-W030-TD-002,
REV. 0, PAGE 414

CAM Serial Number S/N 431

Beta High Voltage

7.2.6.c	7.4.4.c
As-found	As-left
NA	1592 V

Beta Efficiency

7.2.7.L	7.4.2.c
As-found	As-left
12.76%	12.93%

Background High Voltage

7.2.6.c	7.4.4.c
As-found	As-left
NA	1494 V

INTERNAL FLOW SENSOR CHECK

CAM Flow Rate (7.6.3) (7.6.12.d)

Desired Output	Tolerance		As-Found	As-Left
	-Limit	+Limit		
2.00 1.85 CFM	1.95 1.75	2.05 1.95	1.56 CFM	2.00 CFM

CAM Flow Frequency (7.6.8)

Desired Output	TOLERANCE		As-Left
	-Limit	+Limit	
2000 CPS	1960	2040	1996

Completed 9.18.97
Due 9.18.97

Flow count rate (7.6.12)

Desired Output top display line	TOLERANCE		As-Left bottom display line
	+2% of Desired Output	-2% of Desired Output	
7504	7654	7354	7504

Step 7.6.20: ZERO FLOW CHECK OK. By 26.97 (Initial/Date)

MITE: 817-28-13-010

Due 12.4.96

Step 7.6.21 Non-Isokinetic Flow Status

Parameter	As-Found	Tolerance	AS LEFT
Stack Flow Velocity (SFPM)	1655	N/A	1655
Record Sample Flow Velocity (SFPM)	1660	Stack Flow $\pm 1\%$	1660
β - γ Sample Flow Velocity (SFPM)	1650	Stack Flow $\pm 1\%$	1650
CAM Flow (CFM)	$\leftarrow$ N/A $\rightarrow$	β - γ Flow ± 0.10 CFM	$\leftarrow$ N/A $\rightarrow$

Step 7.7 Gamma Factor

Perform Gamma factor update	Initial Aug 2-97 <u>Aug 4-24-97</u>
Gamma factor = $\frac{1.53}{2.89} \times 4.24-97$	

AMS4 CERTIFICATE OF CALIBRATION

9/97 13:53

Instrument serial number : 431
Technician ID : mcgowan
AMS4 Calibration version : 2.12
AMS4 Front Panel version : AMS4 FP V2.8
AMS4 Beta MDB version : UNINITIALIZED
AMS4 Flow MDB version : UNINITIALIZED

Calibration sources are traceable to the National Institute of Standards and Technology.

CALIBRATION PROCEDURES PERFORMED

BETA DETECTOR PARAMETER FILE

Alpha Threshold (% MAX) : ~~50~~ 45 *Prq 4-24-97*
Beta Threshold (% MAX) : ~~45~~ 6 *Prq 4-29-97*
High Voltage (VOLTS) : 1592

BKG DETECTOR PARAMETER FILE

Bkg Threshold (% MAX) : ~~45~~ 6 *Prq 4-29-97*
High Voltage (VOLTS) : 1494

OPERATE PARAMETERS

Alpha Subtract Factor : ~~2.75~~ 0 *Prq 4-24-97*
Gamma Subtract Factor : ~~4.00~~ 1.53 *Prq 4-24-97*
Fixed Beta Bkg (CPM) : 0.0
Fixed Flow Rate (FT3/ MIN) : 0.0
Stack Flow Rate (FT3/ MIN) : ~~4100.00~~ 0 *Prq 4-24-97*
Beta Efficiency (%) : 12.93
Logging Interval (MIN) : 1
Log To Printer : OFF
Min Analog Output (DPM/ FT3) : ~~60.00~~ 1.00 *DPM/FT³ Prq 3-20-97*

Minimum Flow Rate (FT3/ MIN) : 0.300
Maximum Flow Rate (FT3/ MIN) : 3.99
Flow Weighting Factor : 0.0
Minimum Beta Rate (CPM) : 0.0
Maximum Beta Rate (CPM) : 6.00E+05
Beta Weighting Factor : 0.0

Slow Alarm Interval (min.) : ~~30~~ 60 *Prq 4-24-98*
Slow Alarm Setpoint (DPM/ FT3) : ~~6.00~~ 10 *DPM/FT³ 4-7-97*
Fast Alarm Interval (sec.) : 60
Fast Alarm Setpoint (DPM/ FT3) : ~~63.00~~ 630 *DPM/FT³ Prq 3-20-97* 6.00 *DPM/FT³ 4-7-97*
Net Alarm Interval (SEC) : 60
Net Alarm Setpoint (CPM) : ~~6.00E+05~~ 1200 *Prq 4-29-97*
Stack Alarm Setpoint (DPM/ MIN) : 0.0
DAC Hour Alarm Setpoint (HRS) : 0.0
DAC Info : Sr-90
DAC Activity (DPM/ FT3) : 125.73

BRATED BY: *P. Stazis* *E McGowan* DATE: *8-16-96*

CURRENT MEASURED AT TERMINAL 4(+) OF SIGNAL ISOLATOR

RY-RX1-1

INPUT/OUTPUT REQUIREMENTS					RECORDED DATA		
CK PT	SPECIFIED		LIMIT OF TOL		AS FOUND VALUE 7.7 & (7.9)	TOL IN/OUT	AS LEFT VALUE 7.12
	INPUT	OUTPUT	MINUS (-)	PLUS (+)			
	Vdc	mA	mA	mA	mA	I/O	mA
1	0.0	4.0	3.9	4.1	3.99	I	3.99
2	.5-0 ⁺ 1.25	20.0 8.0	.39-9 ⁺ 7.7	.20-1 8.1	7.99	I	7.99
3	32.5	12.0	11.99	12.1	11.99	I	11.99
4	3.75	16.0	15.9	16.1	15.99	I	15.99
5	5.0	20.0	19.9	20.1	19.99	I	19.99

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 418

Tag: SI_AZ_K15_1A I/O Type: AI Description: PwFan1A Speed

Cntlr: 3 Chan No: 16 P&ID: H-2-131076 Logic:

Remarks: max speed ~ 3900 rpm

Location: _____

Actuation Method: operate fan & measure speed w/ tach

Sensor Calibration:

☒ 5 pt cal
☐ _____ per procedure VI (data attached) SPH
 (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$

Units: RPM

Process Input	Readout Tolerance	LOI LCU1-9	Screen1 17PriExh	Screen2 group 124	Screen3
Lo: 0.00	-40.20 - 40.20	<u>-0.16</u>	<u>0</u>	<u>-0.31</u>	
Hi: 2000.00	1959.80 - 2040.20	<u>3899.66</u>	<u>3899</u>	<u>3899.66</u>	

Test pt. 3900 3822-3978 ↗

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo: 2.0	0	500 9999.99	-540 / -460	<u>-505 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

Instrument range 0-4000MTE Instr. No: 819-23-05-001 Due Date: 6/7/97817-23-55-023 3/26/97(signoff) Loop Complete: SPH Date: 7/16/96Add & retest to alarm SPH 10/15/96

7/18/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 419

Tag: SIT-AZK105-1A

P&ID: ~~W-030-P3~~ H-2-131076 SH.1 LOOP: H-2-131309, SH 12

Manufacturer: RED LION

Model No.: IMIO4107

Serial No: 2494-1MTE Instr. No: 217-23-05-001Due Date: 8-7-97

Input Range 0 to 4,000

Tolerance 2.00 %

Units: RPM

		+/- 0.32			
Input	Output (RPM) - TACH.	Lo: RPM	Hi: RPM	As Found RPM In/Out	RPM As Left
0	4.00 (0)	3.68 (114)	4.32 (80)	4.00 (0) $\rightarrow$ 2N (0)	4.00
1000	8.00 (1000)	7.68 (920)	8.32 (1080)	7.99 (1K)	(1K) 7.99
2000	12.00 (2000)	11.68 (920)	12.32 (2080)	11.98 (2K)	(2K) 11.98
3000	16.00 (3000)	15.68 (2920)	16.32 (3080)	16.01 (3K)	(4K) 16.01
20.00		19.68	20.32		

(signoff) Calibrated By: R.W. [Signature] A. FryzkatDate: 7-13-97

Location: PV FLTR ROOM A

Comments 4,000 RPM NOT AVAILABLE. INPUT FROM MICONCALIBRATE PER VENDOR DATA SO 0 TO 4,000 RPM EQUALS 4 TO 20mA ON
OUTPUT

7/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 420

Tag: SIT-AZK105-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 12

Manufacturer: Red Lion

IMIO4107

Model No.: AF 500 + P_{15%}Serial No: 28 2494/1MTE Instr. No: 817-45-08-040
819-23-05-001Due Date: 2-5-97
6-7-97

Input Range 0 to 4,000

Tolerance 2%

Units: RPM

Input	Output (rpm) (ma)	Lo:	Hi:	As Found	In/Out	As Left
0	0 (4.00)	-80 (3.60)	80 (4.40)	N/A*	N/A*	0 (4.00)
1000	1000 (8.00)	920 (7.60)	1,080 (8.40)			1,000 (8.00)
2000	2000 (12.00)	1920 (11.60)	2,080 (12.40)			1,999 (11.99)
3000	3000 (16.00)	2920 (15.60)	3,080 (16.40)			3,001 (15.99)
^{P_{15%}} 4000	^{P_{15%}} 4000 (20.00)	^{P_{15%}} 3920 (19.60)	^{P_{15%}} 4,080 (20.40)			^{P_{15%}} 3,901 (19.60)
3,900	3,900 (19.60)	3,820 (19.30)	3,980 (19.90)			

(signoff) Calibrated By: P. J. K. GroomingDate: 7-16-96Location: I: E room A

Comments * initial setup, 4,000 Hz = 4000 rpm

CALIBRATE PER VENDOR DATA SO 0 TO 4,000 RPM EQUALS 4 TO 20mA ON
OUTPUT-VOID-
7-18-97
RKC

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 421

Tag: SI_AZ_K15_1B I/O Type: AI Description: P/Fan1B Speed

Cntlr: 14 Chan No: 16 P&ID: H-2-131076 Logic:

Remarks: max achievable speed was 3920 on fan.

Location: _____

Actuation Method: operate fan & measure speed w/ tach

Sensor Calibration:

☒ 5 pt cal☐per procedure VI

(data attached)

LH
(signoff)
$$\text{Loop Tolerance: } 2.0\% = \sqrt{\begin{matrix} 2 \\ (\text{sensor}) \end{matrix}^2 + \begin{matrix} 2 \\ (\text{xmitter}) \end{matrix}^2 + \begin{matrix} 2.0\% \\ (\text{other}) \end{matrix}^2 + \begin{matrix} 0.2\% \\ (\text{DCS}) \end{matrix}^2}$$

Units: RPM

Process Input

Readout Tolerance

LOI

LCU2-9

Screen1

17PriExh

Screen2

Screen3

Lo: 0.00

-40.20 - 40.20

-2.19-2Hi: 4000.00~~1959.80 - 2040.20~~38963900

Test Pt 3900

~~3920 - 4080~~3822 - 3978

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 99999.99

-

HiHi: 0 99999.99

-

Hi: 0 99999.99

-

Lo: 0 ~~500~~ 9999.99-540 / -460-495 yellow

LoLo: 0 -9999.99

-

Min: 0 -9999.99

-

Other:

Instrument range still 0-4000 rpmMTE Instr. No: 819-23-05-001Due Date: 6/7/97817-13-55-0233/26/97

(signoff)

Loop Complete: LHDate: 6/7/15/96Add & retask to damLH10/15/96

7/18/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 422

Tag: SIT-AZK105-1B

P&ID: ~~W-030-P3~~ H-2-131076 SH.1

LOOP: H-131309, SH 14

Manufacturer: RED LION

Model No.: IMIO4107

Serial No: 2494/2MTE Instr. No: 817-23-05-001Due Date: 8-7-97

Input Range 0 to 4,000

Tolerance 2.00 %

Units: RPM

		+/- 0.32					
Input	Output	Lo: RPM Hi: RPM As Found (RPM) In/Out (RPM) As Left					
0	4.00	(0)	3.68 (NA)	4.32 (80)	3.99 (0) IN	(0)	3.99
1000	8.00	(1K)	7.68 (920)	8.32 (1080)	8.01 (1K)	(1K)	8.01
2000	12.00	(2K)	11.68 (1920)	12.32 (2080)	12.03 (2K)	(2K)	12.03
3000	16.00	(3K)	15.68 (2920)	16.32 (3080)	16.08 (3K)	(3K)	16.08
	20.00		19.68	20.32	19.99		

2-18-97

(signoff) Calibrated By: RKD, A. FrazierDate: 7-18-97

Location: PV FLTR ROOM B

Comments 4000 RPM NOT ACHIEVABLE, INPUT FROM MICON

CALIBRATE PER VENDOR DATA SO 0 TO 4,000 RPM EQUALS 4 TO 20ma ON
OUTPUT

3921
2.72ma
7/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 423

Tag: SIT-AZK105-1B

P&ID: H-2-131076, SH 1

LOOP: H-131309, SH 14

Manufacturer: Red Lion IM104107
Danacore AF 5000 Model No.: AF 5000 Serial No: 2494/2

MTE Instr. No: 817-13-55-023
819-23-05-001

Due Date: 3-26-97
6-7-97

Input Range 0 to 4,000

Tolerance 2%

Units: RPM

Input	Output (mA)	Lo:	Hi:	As Found	In/Out	As Left
0	0 (4.00)	-80 (3.60)	80 (4.40)	* N/A	* (N/A)	* N/A
1000	1000 (8.00)	920 (7.60)	1080 (8.40)	()	()	1000 (8.00)
2000	2000 (12.00)	1920 (11.60)	2080 (12.40)	()	()	2000 (12.00)
3000	3000 (16.00)	2920 (15.60)	3080 (16.40)	()	()	3,000 (16.00)
4000	4000 (20.00)	3920 (19.60)	4080 (20.40)	()	()	3,900 (19.60)
3,900	3,900 (19.60)	3,820 (19.20)	3,980 (20.00)	()	()	3,900 (19.60)

(signoff) Calibrated By: Rybinski / P. Nasson

Date: 7-15-96

Location: I: E room B

Comments * initial setup, 4000 Hz = 4000 rpm.

CALIBRATE PER VENDOR DATA SO 0 TO 4,000 RPM EQUALS 4 TO 20mA ON OUTPUT

VOID
7-18-97
RKN

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 424

Tag: TAL_AY1_K12_1 I/O Type: DI Description: AY1InFtrTempLo

Cntlr: 47 Chan No: 2 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: Temperature Simulator

Sensor Calibration:

7 per procedure _____ (data attached) SAH
(signoff)

Setpoint: 35 F ; switched @ 35.0°F

Loop Tolerance:

Process State	Color	LOI LCU4-27	Screen1 15PriIn.	Screen2 O2M2in	Screen3
Lo (0): LOW	3	<u>OFF</u>	<u>yellow</u>	<u>yellow</u>	_____
Hi (1): NORMAL	2	<u>ON</u>	<u>yellow orange</u>	<u>orange or</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 2 yellow

Other: _____

MTE Instr. No: 817-13-55-013 Due Date: 4/24/97(signoff) Loop Complete: SAH Date: 5/16/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 425

Tag: TIC-AY101K102-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No: 11001/4594
817-45-08-040 2-28-98
817-13-55-014 11-8-97
MTE Instr. No: 817-13-55-026 Due Date: 12-17-97

Input Range 0-54		Tolerance 2%				
Units: mv						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-1	+1	-0.01	IN	-0.01
13.5	13.5	12.5	14.5	13.49	IN	13.49
27.0	27.0	26.0	28.0	27.00	IN	27.00
40.5	40.5	39.5	41.5	40.51	IN	40.51
54.0	54.0	53.0	55.0	53.99	IN	53.99

Ambient Temp = 73.1(CST) As Found Controller Temp = 73.9(CST) As Left Controller Temp = 73.9

(signoff) Calibrated By:

Paul M. ZylinskiDate: 5-9-97Location: 101AY Air Inlet Station (Heater Control Panel)Was analog output check performed Set? (Y)NOutput adjustment made? (Y)N

Comments

Calibrate cold junction so Final Controller temp = Ambient Temp $\pm 2^\circ\text{F}$
 Controller setpoint = 40°F

functional Lo Alarm Setpoint = $35 \pm 2^\circ\text{F}$
 (alarm 1)
 as found 35.0

IN/OUT as Left
IN 35.0

Did low alarm come in at Micon? Y/N

Hi Alarm Setpoint = $150^\circ\text{F} \pm 2^\circ\text{F}$
 (alarm 2)
 as found 150

IN/OUT
IN as left 150

Rewired micon alarm output to Term. 14 (wires 5 & 6)
 This is the only operational alarm at this time.

APPENDIX "G" - USER PARAMETER VALUE CHART

* Changes after auto-tune

UNIT NUMBER 101AY

MEMORIC	PARAMETER	USER SETTING
SP	Temperature Setpoint	<u>40.0</u>
OPPF	Output Power Offset	<u>0</u>
OP	Output Power	<u>0</u>
ProP	Proportional Band	<u>5.5</u>
Int	Integral Time	<u>99.0</u>
dEt	Derivative Time	<u>51</u>
AL-1	Alarm 1	<u>35.0</u>
AL-2	Alarm 2	<u>15.0</u>

CONFIGURE INPUT

TYPE	Input Sensor Type	<u>I</u>
SCAL	Temperature Scale Units	<u>°F</u>
dCP	Temperature Resolution	<u>0.0</u>
FLZ	Digital Filtering	<u>2</u>
SPAN	Input Slope	<u>1.00</u>
SHFI	Input Offset	<u>0.0</u>
SPLO	Setpoint Lower Limit	<u>0.0</u>
SPHI	Setpoint Upper Limit	<u>99.9</u>
SP/P	Ramp Rate	<u>0.0</u>
INP	User Input	<u>0</u>

CONFIGURE OUTPUT

CYC1	Cycle Time	<u>2</u>
OPAC	Control Action	<u>REV</u>
OPLO	Output Power Lower Limit Range	<u>0</u>
OPHI	Output Power Upper Limit Range	<u>100</u>
OPFL	Sensor Fail Power Preset	<u>0</u>
CHYS	ON/OFF Control Hysteresis	<u>2.0</u>
toad	Auto-Tune Damping Code	<u>2</u>
ANAS	4-20mA Output Assignment	<u>OP</u>
ANLO	4mA Value	<u>0.0</u>
ANH	20mA Value	<u>10.0</u>

CONFIGURE LOCKOUTS

MEMORIC	PARAMETER	USER SETTING
SP	Access Setpoint	<u>red</u>
OP	Access Output Power	<u>ent</u>
dEv	Access Deviation Display	<u>red</u>
UdSP	Access Display Units	<u>red</u>
Code	Access Code Number	<u>18</u>
PID	Access PID Values	<u>LOC</u>
AL	Access Alarm(s) Values	<u>LOC</u>
AL/S	Enable Reset Alarm(s)	<u>LOC</u>
INF	Enable Auto/Man Transfer	<u>enbl</u>
RUNE	Enable Auto-tune	<u>enbl</u>

CONFIGURE ALARMS

Act1	Alarm 1 Operation Mode	<u>A-Lo</u>
rSt1	Alarm 1 Reset Mode	<u>Auto</u>
Stb1	Alarm 1 Standby Enabled	<u>no</u>
AL-1	Alarm 1 Value	<u>35.0</u>
Act2	Alarm 2 Operation Mode	<u>A-HI</u>
rSt2	Alarm 2 Reset Mode	<u>Auto</u>
Stb2	Alarm 2 Standby Enabled	<u>no</u>
AL-1	Alarm 2 Value	<u>15.0</u>
ALYS	Alarm Hysteresis Value	<u>0.1</u>

CONFIGURE COOLING

CYC2	OP2 Output Cycle Time	<u>0</u>
GAN2	Relative Cooling Gain	<u>0</u>
db-2	Heat-Cool Overlap/Deadband	<u>0</u>

CONFIGURE SERIAL COMMUNICATIONS

MEMORIC	PARAMETER	USER SETTING
BAUD	Baud Rate	<u>0</u>
PARB	Parity Bit	<u>0</u>
Addr	Unit Address	<u>0</u>
Addr	Abbrev. or Full Transmission	<u>0</u>
PrN	Automatic Print Rate	<u>0</u>
PrPt	Print Options	<u>0</u>
INP		<u>0</u>
SEt		<u>0</u>
OPt		<u>0</u>
Ptd		<u>0</u>
INt		<u>0</u>
dEt		<u>0</u>
AL1		<u>0</u>
AL2		<u>0</u>
dEv		<u>0</u>
OPF		<u>0</u>
rP		<u>0</u>
Gr		<u>0</u>
Cdb		<u>0</u>

CONTROLLER OPERATING MODE

Automatic or Manual 0
Auto-tune invoked at 0

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 428

Tag: TAL_AY2_K12_1 I/O Type: DI Description: AY2InFtrTempLo

Cntlr: 48 Chan No: 2 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: ~~pressure switch~~ temperature simulator

Sensor Calibration:

~~per~~ procedure _____ (data attached) Lt/Slip
(signoff)

Setpoint: 35 F

switched @ 35.0°F

Loop Tolerance:

Process State	Color	LOI LCU4-28	Screen1 15PriIn.	Screen2 02Main	Screen3
Lo (0): LOW	3	<u>OFF</u>	<u>alarm (yellow)</u>	<u>alarm (yellow)</u>	
Hi (1): NORMAL	2	<u>ON</u>	<u>orange</u>	<u>orange</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 2

yellow

Other: _____

MTE Instr. No: 817-13-55-013 Due Date: 4/24/97

(signoff)

Loop Complete: Lt/SlipDate: 5/16/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 429

Tag: TIC-AY102K102-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No: 1100/4594/1
 MTE Instr. No: 817-45-08-040 Due Date: 2-28-98
817-13-55-01A 11-8-97
817-13-55-02L 12-17-97

Input Range 0-54		Tolerance 2%				
Units: mV						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	0.0	-1.0	+1.0	-0.01	IN	0.00
13.5	13.5	12.5	14.5	13.49	IN	13.50
27.0	27.0	26.0	28.0	26.99	IN	27.00
40.5	40.5	39.5	41.5	40.50	IN	40.50
54.0	54.0	53.0	55.0	53.99	IN	54.00

CJT { Ambient Temp = 73.4 IN/OUT
 As found controller Temp. = 62.4 OUT As Left Contr. Temp 73.0

(signoff) Calibrated By:

Paul M. ZylinskiDate: 5-12-97Location: 102AY Air Inlet Station (Htr Control PNL)Was analog output check Sat? Y/NWas output adjustment made? Y/N

Comments: Calibrate cold junction so final controller temperature
 equals ambient temp. $\pm 2^\circ\text{F}$
 Controller setpoint = 40°F

Functional (alarm 2) 35 $\pm 2^\circ\text{F}$
 Low Alarm Setpoint: ~~35 $\pm 2^\circ\text{F}$~~ IN/OUT as Left
 as found 35 IN 35

Did low alarm come in at Micon? Y/NHi Alarm setpoint $150^\circ\text{F} \pm 2^\circ\text{F}$

Local ind only (Alarm 2) as found IN/OUT as left
150 IN 150

* Required Micon alarm output (lo) to terms 14 & 16 (wires 5 & 6)
 this is the only operational alarm at this time.

5/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 430

Tag: TIC-AY102K102-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No.: 11001/4594/1MTE Instr. No.: 817-13-55-083 817-45-08-040 817-23-01-002-023 Due Date: 4-24-97 2-5-97 3-26-96 3-26-96 3-26-96

Input Range 0-54 mV

Tolerance 2%

Units: mV

Input (mV)	Output (°F)	Lo:	Hi:	As Found	In/Out	As Left
0	0	-1.0	+1.0	N/A		0.00
13.5	13.5	12.5	14.5			13.48
27	27	26.0	28.0			27.00
40.5	40.5	39.5	41.5		S.F.	25.97
54	54	53.0	55.0		51.5/41.5	40.47
						53.96

AMBIENT TEMP = 75.5AS FOUND CONTROLLER TEMP = N/A

N/A

AS LEFT CONTR. TEMP 76.0(signoff) Calibrated By: P. Zylinski / PetersonDate: 5.16.98Location: 102AY AIR INLET STATION. (NTR CONTROL TNL.)Was analog output check sat? Y/NWas output adjustment made? Y/NComments: Calibrate cold junction so final controller temperature equals ambient temp. $\pm 2^\circ\text{F}$.
Controller setpoint = 40°F

external

(alarm 1)
Low Alarm setpt. = $35 \pm 2^\circ\text{F}$ as found N/A

in/out

as left

N/A35.0°FDid low alarm come in at Micron? Y/NHi Alarm setpt. $150^\circ\text{F} \pm 2^\circ\text{F}$

(cal ind only) (alarm 2)

as found N/A

in/out

as left

N/A150.0°F

* Rewired micron alarm output (Lo) to terms. 14 & 16. (wires 5 & 6)

* Changes after autotune

APPENDIX "G" - USER PARAMETER VALUE CHART

UNIT NUMBER AY-102

MEMORIC	PARAMETER	USER SETTING
SP	Temperature Setpoint	<u>40.0</u>
OPPF	Output Power Offset	<u>0.0</u>
OP	Output Power	<u>5.16</u>
Prop	Proportional Band	<u>30.304</u>
Int	Integral Time	<u>51.44</u>
dEt	Derivative Time	<u>3.4</u>
AL-1	Alarm 1	<u>150.0</u>
AL-2	Alarm 2	<u>150.0</u>

CONFIGURE INPUT

TYPE	Input Sensor Type	<u>J</u>
SCAL	Temperature Scale Units	<u>°F</u>
OCPR	Temperature Resolution	<u>0.0</u>
FLS	Digital Filtering	<u>2</u>
SPAN	Input Span	<u>1.000</u>
SHFI	Input Offset	<u>0.0</u>
SPL0	Setpoint Lower Limit	<u>0.0</u>
SPH1	Setpoint Upper Limit	<u>99.9</u>
SPRP	Ramp Rate	<u>0.0</u>
IrPL	User Input	<u>0.0</u>

CONFIGURE OUTPUT

CYC1	Cycle Time	<u>2</u>
OPAC	Control Action	<u>CCV</u>
OPLO	Output Power Lower Limit Range	<u>0</u>
OPHI	Output Power Upper Limit Range	<u>100</u>
OPFL	Sensor Fail Power Percent	<u>0</u>
CHYS	ON/OFF Control Hysteresis	<u>2.0</u>
100d	Auto-Tune Damping Code	<u>2</u>
ANAS	4-20mA Output Assignment	<u>OP</u>
ANLO	4mA Value	<u>0.0</u>
ANHI	20mA Value	<u>10.0</u>

CONFIGURE LOCKOUTS

MEMORIC	PARAMETER	USER SETTING
SP	Access Setpoint	<u>red</u>
OP	Access Output Power	<u>ent</u>
dEv	Access Deviation Display	<u>red</u>
UdSP	Access Display Units	<u>red</u>
Code	Access Code Number	<u>18</u>
PD	Access PID Values	<u>LOC</u>
AL	Access Alarm(s) Values	<u>LOC</u>
ALIS	Enable Reset Alarm(s)	<u>LOC</u>
TrF	Enable Auto/Man Transfer	<u>Enbl</u>
TUNE	Enable Auto-tune	<u>Enbl</u>

CONFIGURE ALARMS

Act1	Alarm 1 Operation Mode	<u>Auto</u>
rSt1	Alarm 1 Reset Mode	<u>Auto</u>
Std1	Alarm 1 Standby Enabled	<u>No</u>
AL-1	Alarm 1 Value	<u>35.0</u>
Act2	Alarm 2 Operation Mode	<u>Auto</u>
rSt2	Alarm 2 Reset Mode	<u>Auto</u>
Std2	Alarm 2 Standby Enabled	<u>No</u>
AL-1	Alarm 2 Value	<u>150.0</u>
ANYS	Alarm Hysteresis Value	<u>0.1</u>

CONFIGURE COOLING

CYC2	OP2 Output Cycle Time	<u>0.0</u>
GANG	Relative Cooling Gain	<u>0.0</u>
db-2	Heat-Cool Overlap Deadband	<u>0.0</u>

CONFIGURE SERIAL COMMUNICATIONS

MEMORIC	PARAMETER	USER SETTING
BAUD	Baud Rate	<u>0.0</u>
PArb	Parity Bit	<u>0.0</u>
Addr	Unit Address	<u>0.0</u>
Abrr	Abbrev. or Full Transmission	<u>0.0</u>
Prn	Automatic Print Rate	<u>0.0</u>
PcPt	Print Options	<u>0.0</u>
INP	INP	<u>0.0</u>
SET	SET	<u>0.0</u>
OPr	OPr	<u>0.0</u>
Pod	Pod	<u>0.0</u>
IRN	IRN	<u>0.0</u>
dEt	dEt	<u>0.0</u>
AL1	AL1	<u>0.0</u>
AL2	AL2	<u>0.0</u>
dEv	dEv	<u>0.0</u>
OPF	OPF	<u>0.0</u>
rP	rP	<u>0.0</u>
Cng	Cng	<u>0.0</u>
Cob	Cob	<u>0.0</u>

CONTROLLER OPERATING MODE

Automatic or Manual	<u>0.0</u>
Auto-tune Invoked at	<u>0.0</u>

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 432

Tag: TAL_A21_K12_1 I/O Type: DI Description: AZ1InFtrTempLo

Cntlr: 52 Chan No: 2 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: temperature simulator

Sensor Calibration:

☒ per procedure _____ (data attached) _____ (signoff)Setpoint: 35 F 3 tripped @ 35.0 F

Loop Tolerance:

Process State	Color	LOI LCU3-34	Screen1 15PriIn.	Screen2 02Main	Screen3 group 103
Lo (0): LOW	3	<u>OFF</u>	<u>yellow</u>	<u>yellow</u>	<u>Low</u>
Hi (1): NORMAL	2	<u>ON</u>	<u>orange</u>	<u>orange</u>	<u>NORMAL</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 2

yellow

Other: _____

MTE Instr. No: 817-13-55-014 Due Date: 10/13/96

(signoff)

Loop Complete: L.H.HillDate: 9/20/96

Tag: TIC-AZ101K102-1

P&ID: H-2-131075. SH 2

LOOP: H-2-131344. SH 7

Manufacturer:

Red Lion Control

Model No.:

TCU

Serial No:

$$\underline{11001 \mid 4594 \mid 2}$$

MTE Instr. No:

817.13.55.014
817.13.55.026

Due Date:

11. 8.97
12. 17.97

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	0.0	-1.0	+1.0	0.00	IN	0.00
13.5	13.5	12.5	14.5	13.50	IN	13.50
27.0	27.0	26.0	28.0	27.00	IN	27.00
40.5	40.5	39.5	41.5	40.51	IN	40.51
54.0	54.0	53.0	55.0	53.99	IN	53.99

Ambient Temp = 75.0

(CJR) As left Controller Temp = 75.3

(CJT) As found Controller Temp. = 72.4

(signoff) Calibrated By:

Paul M. Zygmunt

Date: 5.9.97

Location: 101AZ Air Inlet Station (Htr Control Panel)

Was analog output check Sat? ☒ Y ☐ N

Was analog output alignment made? Y (N)

Comments

① Calibrate cold junction so final controller temperature equals ambient temp $\pm 2^\circ\text{F}$

② Controller setpoint = 40°F

functional (A) Low alarm setpoint (Alarm 2) = $35 \pm 2^\circ\text{F}$
as found IN/OUT as left
 35 IN 35

Did low alarm come in at Micon? Y/N

(B) High alarm setpoint (alarm 2) (local ind. only) = $150 \pm 2^{\circ}\text{F}$
as found IN/OUT as left

150 , IN 150

* Rewired Micon alarm output to term - 14 & 16 (wires 5 & 6)
This is the only operational alarm at this time.

5/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 434

Tag: TIC-AZ101K102-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No.: 11001/4544/2MTE Instr. No.: 817.13.55.013 4.24.97
817.13.55.023 3.26.97
817.45.08.040 Due Date: 2.5.97

Input Range 0-54 mv

Tolerance $\pm 2\%$ Units: mv

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-1.0	1.0	N/A	N/A	5.16.96 Pr 0.00
13.5	13.5	12.5	14.5			Pr 13.49
27	27	26	28			Pr 26.98
40.5	40.5	39.5	41.5			Pr 40.47
54	54	53	55			Pr 53.96

Ambient temp = 80.1
 As Found controller temp = N/A IN/OUT N/A AS LEFT 81 controller temp

(signoff) Calibrated By: Pzylinshi/D Peterson Date: 5.16.96Location: 102AZ AIR INLET STATION (HTR control PANEL)Was analog output check sat. (Y/N)Was analog output adjustment made (Y/N)

Comments

- ① Calibrate cold junction so final output of controller temperature equals ambient temp. $\pm 2^\circ\text{F}$.
 ② Controller setpoint = 40°F

Functional
cal.

Low alarm syst (Alarm 1) = 35 $\pm 2^\circ\text{F}$
 as found in/out as left
N/A N/A 35°F

Did low alarm come in at micron? (Y/N)

Hi alarm syst. (Alarm 2) 150°F $\pm 2^\circ\text{F}$
 (local in. only)
 as found in/out as left
N/A N/A 150°F

Revised micron alarm output (Lo) to terms. 14:16 (wires 5:16)
 This is the only operational alarm at this time.

APPENDIX "G" - USER PARAMETER VALUE CHART

* Changes after autotune.

UNIT NUMBER 101A2

MEMORIC	PARAMETER	USER SETTING
SP	Temperature Setpoint	<u>40.0</u>
OPPF	Output Power Offset	<u>0.0</u>
OP	Output Power	<u>0.0</u>
Prop	Proportional Band	<u>5.0</u>
Int	Integral Time	<u>30.0</u>
dEn	Derivative Time	<u>5.0</u>
AL-1	Alarm 1	<u>3.5</u>
AL-2	Alarm 2	<u>100.0</u>

CONFIGURE INPUT

TYPE	Input Sensor Type	<u>I</u>
SCAL	Temperature Scale Units	<u>0.0</u>
dPR	Temperature Resolution	<u>0.0</u>
FLY	Digital Filtering	<u>2</u>
SPAN	Input Span	<u>1.000</u>
SHFL	Input Offset	<u>0.0</u>
SPLO	Setpoint Lower Limit	<u>0.0</u>
SPHI	Setpoint Upper Limit	<u>99.9</u>
SP/P	Ramp Rate	<u>0.0</u>
INP	User Input	<u>0.0</u>

CONFIGURE OUTPUT

CYC1	Cycle Time	<u>2</u>
OPAC	Control Action	<u>REV</u>
OPLO	Output Power Lower Limit Range	<u>0</u>
OPHI	Output Power Upper Limit Range	<u>100</u>
OPFL	Sensor Fail Power Preset	<u>0</u>
CHYS	ON/OFF Control Hysteresis	<u>2.0</u>
load	Auto-Tune Damping Code	<u>0.0</u>
ANAS	4-20mA Output Assignment	<u>0.0</u>
ANLO	4mA Value	<u>0.0</u>
ANSH	20mA Value	<u>10.0</u>

CONFIGURE LOCKOUTS

MEMORIC	PARAMETER	USER SETTING
SP	Access Setpoint	<u>ENT</u> rec
OP	Access Output Power	<u>ENT</u>
dEv	Access Derivative Display	<u>red</u>
USDP	Access Display Units	<u>red</u>
Code	Access Code Number	<u>18</u>
PD	Access PID Values	<u>Ent</u> LOC
AL	Access Alarm(s) Values	<u>Ent</u> LOC
ALRS	Enable Reset Alarm(s)	<u>Ent</u> LOC
trif	Enable Auto/Man Transfer	<u>Ent</u>
RUNE	Enable Auto-tune	<u>Ent</u>

CONFIGURE ALARMS

Act1	Alarm 1 Operation Mode	<u>A-10</u>
rS1	Alarm 1 Reset Mode	<u>Auto</u>
Sb1	Alarm 1 Standby Enabled	<u>No</u>
AL-1	Alarm 1 Value	<u>35.0</u>
Act2	Alarm 2 Operation Mode	<u>A-10</u>
rS2	Alarm 2 Reset Mode	<u>Auto</u>
Sb2	Alarm 2 Standby Enabled	<u>No</u>
AL-1	Alarm 2 Value	<u>150.0</u>
ALYS	Alarm Hysteresis Value	<u>0.1</u>

CONFIGURE COOLING

CYC2	OP2 Output Cycle Time	<u>0.0</u>
GAH2	Relative Cooling Gain	<u>0.0</u>
db-2	Heat-Cool Overlap/Deadband	<u>0.0</u>

CONFIGURE SERIAL COMMUNICATIONS

MEMORIC	PARAMETER	USER SETTING
bWR	Band Rate	<u>0.0</u>
PAB	Parity Bit	<u>0.0</u>
Addr	Unit Address	<u>0.0</u>
ASV	Address, or Full Transmission	<u>0.0</u>
Prt	Automatic Print Rate	<u>0.0</u>
Pop	Print Options	<u>0.0</u>
INP	INP	<u>0.0</u>
SET	SET	<u>0.0</u>
OP	OP	<u>0.0</u>
Pod	Pod	<u>0.0</u>
IN	IN	<u>0.0</u>
dEr	dEr	<u>0.0</u>
AL1	AL1	<u>0.0</u>
AL2	AL2	<u>0.0</u>
dEv	dEv	<u>0.0</u>
OFF	OFF	<u>0.0</u>
r P	r P	<u>0.0</u>
Cig	Cig	<u>0.0</u>
Cob	Cob	<u>0.0</u>

CONTROLLER OPERATING MODE

Automatic or Manual	<u>0.0</u>
Auto-tune Invoked at	<u>0.0</u>

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 436

Tag: TAL_A22_K12_1 I/O Type: DI Description: A22InFtrTempLo

Cntlr: 53 Chan No: 2 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: temperature simulator

Sensor Calibration:

☒ per procedure _____ (data attached) _____ (signoff)Setpoint: 35 F ; tripped @ 35°F

Loop Tolerance:

Process State	Color	LOI LCU3-35	Screen1 15PriIn.	Screen2 02Main	Screen3 group104
Lo (0): LOW	3	<u>OFF</u>	<u>yellow</u>	<u>yellow</u>	<u>LOW</u>
Hi (1): NORMAL	2	<u>ON</u>	<u>orange</u>	<u>orange</u>	<u>NORMAL</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 2 yellow

Other: _____

MTE Instr. No: 817-13-55-014 Due Date: 10/13/96

(signoff)

Loop Complete: LJHDate: 5/17/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 437

Tag: TIC-AZ102K102-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No: 1101/4594/3
 MTE Instr. No: 817.45.08.040 817.13.55.014 817.13.55.026 Due Date: 2.28.98 11.8.97 12.17.97

Input Range 0-54		Tolerance $\pm 2\%$				
Units: mV						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	0	-1.0	+1.0	0.00	IN	0.00
13.5	13.5	12.5	14.5	13.50	IN	13.50
27.0	27.0	26.0	28.0	27.00	IN	27.00
40.5	40.5	39.5	41.5	40.51	IN	40.50
54.0	54.0	53.0	55.0	54.01	IN	54.00

Ambient Temp = 74.6
 (CJT) As found Temp = 74.8 (CJT) As left Controller Temp. = 74.8

(signoff) Calibrated By: Paul M. Zylinski Date: 5.12.97

Location: 101 AZ Air Inlet Station (Htr Control Panel)

Was analog output check Sat? (Y/N)

Was analog output alignment made? (Y/N)

Comments

- ① Calibrate cold junction so final controller temperature equals ambient temp $\pm 2^\circ\text{F}$
- ② Controller setpoint = 40°F

Functional (A) Low alarm setpoint (alarm 1) = $35 \pm 2^\circ\text{F}$
as found IN/OUT as left

35 IN 35
 Did low alarm come in at Micon? Y/N

(B) High alarm setpoint (Alarm 2) (local ind. only) = $150 \pm 2^\circ\text{F}$
As found IN/OUT As left

Required 150 IN 150
 Required ~~Required~~ micon alarm output (16) to terms 14816 (wire #1, 14816)

5/10/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 438

Tag: TIC-AZ102K102-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 7

Manufacturer: Red Lion Controls Model No.: TCU Serial No.: 1101/4594/3MTE Instr. No.: 817-13-55-014 10-13-96
817-13-55-023 Due Date: 3-26-97
817-45-08-040 2-5-97

Input Range 0-54

Tolerance $\pm 2\%$

Units: mv

Input	Output	Lo:	Hi:	As Found	In/out	As Left
0	0	-1.0	+1.0	N/A	N/A	0.00
13.5	13.5	+12.05	+14.05			13.50
27	27	+26	+28			27.00
40.5	40.5	39.5	41.5			40.51
54	54	53	55			53.99

(signoff) Calibrated By: Paul M. Zylinski / J. PetersonDate: 5-17-96Location: 101AE Air Inlet Station: (Htr Control Panel)Was analog output check sat? (Y/N)Was analog output alignment made? (Y/N)

Comments

① Calibrate cold junction so final controller temperature equals ambient temp $\pm 2^\circ\text{F}$ ② Controller setpoint = 40°F (A) Low alarm setpoint (alarm 1) = $35 \pm 2^\circ\text{F}$

as found	in/out	as left
N/A	N/A	35.8F

Did low alarm come in at union? (Y/N)(B) High alarm setpoint (alarm 2) (local ind. only) = $150 \pm 2^\circ\text{F}$

as found	in/out	as left
N/A	N/A	150.8F

at desired union 0 + 1.0 ... (union $\pm 5\%$) - this is the only

APPENDIX "G" - USER PARAMETER VALUE CHART

* Changes after autotune

UNIT NUMBER AZ102

MEMORIC	PARAMETER	USER SETTING
SP	Temperature Setpoint	<u>40.0</u>
OPOF	Output Power Offset	<u>0</u>
OP	Output Power	<u>5</u>
ProP	Proportional Band	<u>24.2</u>
Int	Integral Time	<u>370</u>
dEt	Derivative Time	<u>51</u>
AL-1	Alarm 1	<u>32.0</u>
AL-2	Alarm 2	<u>150.0</u>

CONFIGURE INPUT

TYPE	Input Sense or Type	<u>J</u>
SCAL	Temperature Scale Units	<u>°F</u>
SCR	Temperature Resolution	<u>0.0</u>
FLY	Digital Filtering	<u>7</u>
SPAN	Input Span	<u>1.000</u>
SHFI	Input Offset	<u>0.0</u>
SPLO	Setpoint Lower Limit	<u>0.0</u>
SPHI	Setpoint Upper Limit	<u>99.9</u>
SP/P	Ramp Rate	<u>0.0</u>
IsPt	User Input	<u>0</u>

CONFIGURE OUTPUT

CYC1	Cycle Time	<u>2</u>
OPAC	Control Action	<u>FCV</u>
OPLO	Output Power Lower Limit Range	<u>0</u>
OPHI	Output Power Upper Limit Range	<u>100</u>
OPFL	Sanitor Fill Power Percent	<u>0</u>
CHYS	ON/OFF Control Hysteresis	<u>0.2</u>
load	Auto-Tune Damping Code	<u>0.2</u>
ANAS	4-20mA Output Analog Segment	<u>0.0</u>
ANLO	4mA Value	<u>0.0</u>
ANHI	20mA Value	<u>10.0</u>

CONFIGURE LOCKOUTS

MEMORIC	PARAMETER	USER SETTING
SP	Access Setpoint	<u>red</u>
OP	Access Output Power	<u>red</u>
dEv	Access Deviation Display	<u>red</u>
UdSP	Access Display Units	<u>red</u>
Code	Access Code Number	<u>18</u>
P.O	Access PID Values	<u>LOC</u>
AL	Access Alarm(s) Values	<u>LOC</u>
AL/S	Enable Reset Alarm(s)	<u>LOC</u>
brf	Enable Auto/Man Transfer	<u>Enb</u>
RUNE	Enable Auto-tune	<u>Enb</u>

CONFIGURE ALARMS

Act1	Alarm 1 Operation Mode	<u>A-Lo</u>
rs1	Alarm 1 Reset Mode	<u>Auto</u>
Ss1	Alarm 1 Standby Enabled	<u>No</u>
AL-1	Alarm 1 Value	<u>32.0</u>
Act2	Alarm 2 Operation Mode	<u>Auto</u>
rs2	Alarm 2 Reset Mode	<u>Auto</u>
Ss2	Alarm 2 Standby Enabled	<u>No</u>
AL-1	Alarm 2 Value	<u>150.0</u>
ALYS	Alarm Hysteresis Value	<u>0.1</u>

CONFIGURE COOLING

CYC2	OP2 Output Cycle Time	<u>0</u>
GAQ2	Relative Cooling Gain	<u>0</u>
db-2	Heat-Cool Overlap/Deadband	<u>0</u>

CONFIGURE SERIAL COMMUNICATIONS

MEMORIC	PARAMETER	USER SETTING
BAUD	Baud Rate	<u>0</u>
PARB	Parity Bit	<u>0</u>
Addr	Unit Address	<u>0</u>
Addr	Address, or Full Transmission	<u>0</u>
PrAL	Automatic Print Rate	<u>0</u>
PrPt	Print Options	<u>0</u>
INP	INP	<u>0</u>
SEI	SEI	<u>0</u>
OPt	OPt	<u>0</u>
Pod	Pod	<u>0</u>
INt	INt	<u>0</u>
dEr	dEr	<u>0</u>
AL1	AL1	<u>0</u>
AL2	AL2	<u>0</u>
dEv	dEv	<u>0</u>
OFF	OFF	<u>0</u>
IP	IP	<u>0</u>
Cig	Cig	<u>0</u>
Cds	Cds	<u>0</u>

CONTROLLER OPERATING MODE

Automatic or Manual	<u>0</u>
Auto-tune Invoked at	<u>0</u>

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 440

Tag: TDC_AZ_K12_1A I/O Type: AO Description: Pvhtr1A Temp

Cntlr: 3 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks: MISCAN output % of F.S. - Watlow controller
reads input in Eng. Units - 0-250°F

Location: _____

Actuation Method: _____

Sensor Calibration: N/A (set watlow input range for 0-250.)☐ 5 pt cal per procedure _____ (data attached) _____
(signoff)Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 \\ \text{(sensor)} \end{matrix} + \begin{matrix} 2 \\ \text{(xmitter)} \end{matrix} + \begin{matrix} 2.0\% \\ \text{(other)} \end{matrix} + \begin{matrix} 0.2\% \\ \text{(DCS)} \end{matrix}}$ Units: PERCENT

Process Input	Readout Tolerance	<u>LOT</u> <u>Watlow Reading</u>	Screen1 17PriExh	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	<u>0.0</u>	<u>0.0</u>		
Hi: 100.00	97.99 - 102.01	<u>249.8 F</u>	<u>100%</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: LJLDate: 12/9/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 441

Tag: TDC_AZ_K12_1B I/O Type: AO Description: Pvhtr1B Temp

Cntlr: 14 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks: MICOR outputs 96 of FS. / Wetlow input 0-250F

Location: _____

Actuation Method: _____

Sensor Calibration: N/A (Set wetlow input range for 0-250F)☐ 5 pt cal☐ per procedure _____ (data attached) _____ (signoff)

$$\text{Loop Tolerance: } 2.0\% = \sqrt{\begin{matrix} 2 \\ (\text{sensor}) \end{matrix}^2 + \begin{matrix} 2 \\ (\text{xmitter}) \end{matrix}^2 + \begin{matrix} 2.0\% \\ (\text{other}) \end{matrix}^2 + \begin{matrix} 0.2\% \\ (\text{DCS}) \end{matrix}^2}$$

Units: PERCENT

Process Input	Readout Tolerance	LOL Wetlow Reading	Screen1 17PriExh	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	<u>0.0</u>	<u>0</u>	_____	_____
Hi: 100.00	97.99 - 102.01	<u>250.0F</u>	<u>100%</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:			-	_____
HiHi:			-	_____
Hi:			-	_____
Lo:			-	_____
LoLo:			-	_____
Min:			-	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L J 7/10Date: 12/9/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 442Tag: TI_AZ_K1³ I/O Type: AI Description: PvStk Temp

Cntlr: 14 Chan No: 9 P&ID: H-2-131078 Logic:

Remarks: _____

Location: RTD simulator

Actuation Method: _____

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) SEE FIT. AZK1³ PCB
☐ _____ (signoff)

$$\text{Loop Tolerance: } 2.0\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ \text{(sensor)} & \text{(xmmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$$

Units: DEG F

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
Lo: 0.00	-4.02 - 4.02	LCU2-12	18PriMon	group 141	
Hi: 200.00	195.98 - 204.02	<u>-0.13</u>	<u>0</u>	<u>-0.19</u>	
		<u>199.75</u>	<u>200</u>	<u>199.77</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	<u>2</u>	<u>-25.0</u> 9999.99	<u>-29.0 / -21.0</u>	<u>-25.15 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

MTE Instr. No: 817-63-02-002 Due Date: 6/14/97

(signoff)

Loop Complete: PCB

Date:

7/24/96Add & retos + LO Alarm L. H. Lee10/15/96

CURRENT MEASURED AT TERMINAL 4(+) OF SIGNAL ISOLATOR

TY-A2K1-3

INPUT/OUTPUT REQUIREMENTS					RECORDED DATA		
CK PT	SPECIFIED		LIMIT OF TOL		AS FOUND VALUE 7.7 & (7.9)	TOL IN/OUT	AS LEFT VALUE 7.12
	INPUT	OUTPUT	MINUS (-)	PLUS (+)			
	Vdc	mA	mA	mA	mA	I/O	mA
1	0.0	4.0	3.9	4.1	3.99	I	3.99
2	5.0 1.25	20.0 8.0	19.9 7.7	20.1 8.1	7.99	I	7.99
3	2.50	12.0	11.9	12.1	12.0	I	12.0
4	3.75	16.0	15.9	16.1	16.0	I	16.0
5	5.0	20.0	19.9	20.1	20.0	I	20.0

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 444

Tag: TI_AZ_K12_1A I/O Type: AI Description: Pvhtr1A Temp

Cntlr: 3 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: decade box on input

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) SLH
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: DEG F

Process Input	Readout Tolerance	LOI LCU1-6	Screen1 17PriExh	Screen2	Screen3
Lo: 0.00	-5.02 - 5.02	<u>0.09</u>	<u>0</u>		
Hi: 250.00	244.98 - 255.02	<u>249.69</u>	<u>250</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	2	175.00	169.98 - 180.02	<u>175 yellow</u>
Lo:	<u>2</u>	-31.25 -9999.99	-36.25 - 26.25	-30.63 yellow
LoLo:	0	-9999.99	-	
Min:	0	-9999.99	-	

Other: _____

MTE Instr. No: 817-63-02-010 Due Date: 6/19/96(signoff) Loop Complete: SLH Date: 5/21/96Add & Test LO alarm SLH 10/15/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 445

Tag: TI-AZK12-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 1

Manufacturer: Foxboro

Model No.:

893 RA

Serial No:

2E-000-762

MTE Instr. No:

817-63-02-016
817-45-08-044

Due Date:

6-14-97
2-12-98Input Range 0-250Tolerance 2%Units: °F

	Input	Output	Lo:	Hi:	As Found(mA)	In/Out	As Left(mA)
93.03	0°F (-17.77°C)	4.00	3.68	4.32	0.0 (3.98)	IN	0.0 (3.98)
106.60	62.5° (17.0°C)	8.00	7.68	8.32	62.0 (7.97)	IN	62.0 (7.97)
120.04	125° (52.0°C)	12.00	11.68	12.32	125.0 (11.98)	IN	125.0 (11.98)
133.33	187.5° (86.4°C)	16.00	15.68	16.32	187.0 (15.98)	IN	187.0 (15.98)
146.48	250° (121.1°C)	20.00	19.68	20.32	249.0 (19.98)	IN	249.0 (19.98)

(signoff) Calibrated By:

Fitzsimmons

Date:

5-7-97

Location:

ventilation building CAB-AZK1-1A

Comments

Zero and Span Transmitter and perform 5 point Calibration

5/14/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 446

Tag: TT-AZK102-1A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 1

Manufacturer: Foxboro Model No.: 893 RA Serial No: 2E-000-762MTE Instr. No: 817-45-05-042 Due Date: 2-76-97
817-63-02-010 6-14-96

Input Range 0-250

Tolerance 2%

Units: degrees F

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0°F (-17.77°C)	4.00	3.68	4.32	4.01	IN	4.00
106.60 106.60 106.60	62.5° (17.0°)	7.68	8.32	8.00	IN	8.00
120.04 120.04 120.04	125° (52.0°)	11.68	12.32	12.00	IN	12.00
133.33 133.33 133.33	187.5° (86.4°)	15.68	16.32	16.00	IN	16.00
146.44 146.44 146.44	250° (121.1°)	19.68	20.32	20.01	IN	20.00

(signoff) Calibrated By: S. M. Jovan / A. Frazier Date: 5-20-96Location: Ventilation building CAB-AZK1-1A

Comments

ZERO AND SPAN TRANSMITTER AND PREFORM 5 POINT CALIBRATION.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 447

Tag: TI_AZ_K12_1B I/O Type: AI Description: PvhtrlB Temp

Cntlr: 14 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: decide box on input

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) L J Hill
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ \text{(sensor)} & \text{(xmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$

Units: DEG F

Process Input	Readout Tolerance	LOI LCU2-6	Screen1 17PriExh	Screen2	Screen3
Lo: 0.00	-5.02 - 5.02	<u>.62</u>	<u>1</u>	_____	_____
Hi: 250.00	244.98 - 255.02	<u>252.11</u>	<u>252</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	2 ✓	175.00	169.98 - 180.02	<u>175 yellow</u>
Lo:	2 ✗	31.25 99999.99	-36.25 - -26.25	<u>-32 yellow</u>
LoLo:	0	-99999.99	-	_____
Min:	0	-99999.99	-	_____

Other: _____

MTE Instr. No: 817-63-02-010 Due Date: 6/19/96(signoff) Loop Complete: L J HillDate: 5/21/96
10/15/96Add & retest to Alarm L J Hill

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 448

Tag: TI-AZK12-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 2

Manufacturer:

Foxboro

Model No.:

893 RA

Serial No:

2E-000-764

MTE Instr. No:

817-63-02-016817-45-08-044

Due Date:

6-14-972-12-98Input Range 0-250Tolerance 2%Units: °F

Input	Output	mA	Lo: mA	Hi: mA	As Found (mA)	In/Out	As Left (mA)
93.03 Ω	0.0	(4.00)	-5.0	(3.68)	+5.0	(4.32)	0.0 (3.99)
106.60 Ω	62.5	(8.00)	57.5	(7.68)	67.5	(8.32)	63.0 (7.97)
120.04 Ω	125.0	(12.00)	120.0	(11.68)	130.0	(12.32)	126.0 (11.98)
133.33 Ω	187.5	(16.00)	182.5	(15.68)	192.5	(16.32)	189.0 (15.98)
146.48 Ω	250.0	(20.00)	245.0	(19.68)	255.0	(20.32)	252.0 (19.98)

(signoff) Calibrated By:

Fitzsimmons

Date:

5-7-97

Location:

Ventilation building CAB-AZK1-1B

Comments

Zero and Span Transmitter and perform 5 point Calibration

5/14/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 449

Taq: TT-AZK102-1B

P&ID: H-2-131076, SH 1

LOOP: H-2-13,1309, SH 2

Manufacturer: Foxboro Model No.: 893RA Serial No: 25-080-764

817-45-08-042

2-116-97

MTE Instr. No: 817-63-02-010

Due Date: 6-19-96

Input Range 0-250

Tolerance 2%

Units: degrees F

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
123.032 123.452	4.00m#	<u>3.68</u>	<u>4.32</u>	<u>4.023.99</u>	In	<u>4.023.99</u>
126.602 126.602	8.00m#	<u>7.68</u>	<u>8.32</u>	<u>8.018.02</u>	In	<u>8.018.02</u>
128.042 128.162	12.00m#	<u>11.68</u>	<u>12.32</u>	<u>12.0112.04</u>	In	<u>12.0112.04</u>
133.332 133.332	16.00m#	<u>15.68</u>	<u>16.32</u>	<u>16.0115.96</u>	In	<u>16.0115.96</u>
140.482 140.482	20.00m#	<u>19.68</u>	<u>20.32</u>	<u>20.0120.00</u>	In	<u>20.0120.00</u>

(signoff) Calibrated By: A. Grazian F. McGowan Date: 5-20-96

Location: Ventilation Building CAB-AZK1-1B

Comments

ZERO AND SPAN TRANSMITTER AND PREFORM 5 POINT CALIBRATION.

9/19/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 450

Tag: TI_AZ_K12_3A I/O Type: AI Description: Pvhtr1A Temp

Cntlr: 3 Chan No: 3 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: ^{CALIBRATED} USED 4-20 mA SIMULATOR TO TEST LOOP

Sensor Calibration:

☒ 5 pt cal
☐ _____ per procedure VI (data attached) D. Loh
 (signoff)

 Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: DEG F

Process Input	Readout	Tolerance	LOI LCU1-6	Screen1 17PriExh	Screen2 Group 121	Screen3
Lo: 0.00	-5.02 /	5.02	<u>101</u>	<u>0</u>	<u>1001</u>	
Hi: 250.00	244.98 /	255.02	<u>250.3</u>	<u>250</u>	<u>250.3</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	1	245.00	239.98 / 250.02	<u>245 (Red)</u>
HiHi:	1	230.00	224.98 / 235.02	<u>230 (Red)</u>
Hi:	2	220.00	214.98 / 225.02	<u>220 (Yellow)</u>
Lo:	<u>2</u>	<u>-36.25</u>	<u>-36.25 / -26.25</u>	<u>-32 yellow</u>
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Other: _____

MTE Instr. No: 817-13-SS-023 Due Date: 3/26/97(signoff) Loop Complete: Doug Loh Date: 10/14/96

Add & reset LO Limit

L. Loh

10/15/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 451

Tag: TI-AZK12-3A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 1

Manufacturer: Foxboro Model No.: 893 RA Serial No: 2F-000-763MTE Instr. No: 817-63-02-016
817-45-08-044 Due Date: 6-14-97
2-12-98

Input Range 0-250

Tolerance

Units: °F

Input	Output mA	Lo: mA	Hi: mA	As Found(mA)	In/Out	As Left(mA)
93.03Ω	0.0°F(4.00)	-5.0(3.68)	15.0(4.32)	0.0(3.97)	IN	0.0(3.97)
106.60Ω	62.5(8.00)	57.5(7.68)	67.5(8.32)	62.0(7.97)	IN	62.0(7.97)
120.04Ω	125.0(12.00)	120.0(11.68)	130.0(12.32)	125.0(11.98)	IN	125.0(11.98)
133.33Ω	187.5(16.00)	132.5(15.68)	192.5(16.32)	187.0(15.99)	IN	187.0(15.99)
146.48Ω	250.0(20.00)	245.0(19.68)	255.0(20.32)	250.0(20.00)	IN	250.0(20.00)

(signoff) Calibrated By:

FitzsimmonsDate: 5-7-97

Location:

Ventilation Building F/T Room B

Comments

5/14/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 452

Tag: TT-AZK102-3A

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 1

Manufacturer: Foxboro Model No.: 893RA Serial No: 2E-000-763MTE Instr. No: 817-45-08-042 Due Date: 2-16-97
817-63-02-010 6-19-96

Input Range 0-250

Tolerance 2%

Units: degrees F

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
25.03 24.00 mA		3.68	4.32	3.98 4.01	In	4.01
106.60 8.00 mA		7.68	8.32	8.01 8.01	In	8.01
120.04 12.00 mA		11.68	12.32	12.04 12.01	IN	12.01
132.33 16.00 mA		15.68	16.32	16.02	IN	16.02
146.48 20.00 mA		19.68	20.32	20.00 20.04	In	20.04

(signoff) Calibrated By: E. McNamee / A. Frazier Date: 5-20-96Location: Ventilation building

Comments

ZERO AND SPAN TRANSMITTER AND PREFORM 5 POINT CALIBRATION.

9/19/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 453

Tag: TI_AZ_K12_3B I/O Type: AI Description: PvhTr1B Temp

Cntlr: 14 Chan No: 3 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method: USEP 4-20mA Simulation TO TEST Loop

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

(signoff)

Loop Tolerance: 2.0 % = $\sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: DEG F

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU2-6

17PriExh

Group 126

Lo: 0.00 -5.02 / 5.02

Hi: 250.00 244.98 / 255.02

1.6122.0249.89250250.01

Annunciator(s): Priority Setpoint

Tolerance

Trip Point

Max: 1 245.00

239.98 / 250.02

245 (RED)

HiHi: 1 230.00

224.98 / 235.02

230 (RED)

Hi: 2 220.00

214.98 / 225.02

220 (YELLOW)Lo: 2.0 ~~244.98~~-36.25 / -26.25-30.78 yellow

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other:

MTE Instr. No: 817-13-SS-023Due Date: 3/26/97

(signoff)

Loop Complete:

Doug HillDate: 10/19/96Add & reset LO alarm L.Hill10/15/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 454

Tag: TI-AZK12-3B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 2

Manufacturer: Foxboro Model No.: 893RA Serial No: 2E-000-765MTE Instr. No: 817-63-02-016
817-45-08-044 Due Date: 6-14-97
2-12-98

Input Range 0-250		Tolerance				
Units: °F						
Input	Output (mA)	Lo: (mA)	Hi: mA	As Found (mA)	In/Out	As Left (mA)
93.03 Ω	0.0°F (4.00)	-50.0 (3.68)	+5.0 (4.32)	1.0 (4.09)	IN	0 (4.00)
106.60 Ω	62.5 (8.00)	57.5 (7.68)	62.5 (8.32)	64.0 (8.06)	IN	62.0 (8.00)
120.04 Ω	125.0 (12.00)	120.0 (11.68)	130.0 (12.32)	126.0 (12.05)	IN	125.0 (12.00)
133.33 Ω	187.5 (16.00)	182.5 (15.68)	192.5 (16.32)	188.0 (16.02)	IN	188.0 (16.00)
146.48 Ω	250.0 (20.00)	245.0 (19.68)	255.0 (20.32)	250.0 (20.00)	IN	250.0 (20.00)

(signoff) Calibrated By:

FitzsimmonsDate: 5-7-97

Location:

Ventilation Building CAB-AZK1-1B

Comments

5/14/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 455

Tag: TT-AZK102-3B

P&ID: H-2-131076, SH 1

LOOP: H-2-131309, SH 2

Manufacturer: Foxboro Model No.: 893RA Serial No: _____MTE Instr. No: 817-45-08-042 Due Date: 2-16-97
817-63-02-010 6-19-96

Input Range 0-250

Tolerance 2%

Units: degrees F

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
93.03R	4.00mA	3.68	4.32	4.12	In	4.12
106.60R	8.00mA	7.68	8.32	8.09	In	8.09
120.04R	12.00mA	11.68	12.32	12.07	In	12.07
133.33R	16.00mA	15.68	16.32	16.05	In	16.05
146.48R	20.00mA	19.68	20.32	20.03	In	20.03

(signoff) Calibrated By: A. Kruger E. McGowan Date: 5-20-96Location: Ventilation Bldg CAB-AZK1-1B

Comments

ZERO AND SPAN TRANSMITTER AND PREFORM 5 POINT CALIBRATION.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 456

Tag: TI_AZ_K18_1A I/O Type: AI Description: PvcDsr VapTempA

Cntlr: 24 Chan No: 1 P&ID: H-2-131075 SH4.3 Logic:

Remarks: _____

Location: _____

Actuation Method: ~~check ambient & pull sensor cable.~~

Sensor Calibration: (N/A) Non-calibratable transmitter. - Sp + cal check OK.

☒ ~~cal check~~ per procedure VI (data attached) _____ (signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$ (DCS)

Units: DEG F

Process Input	Readout Tolerance	LOI LCU3-6	Screen1 16PriCoo	Screen2	Screen3
Lo: 0.00	-3.01 - 3.01 ambient	70.32	70		
Hi: 150.00	146.99 - 153.01 pulled sensor cable	166.23	166		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	0	99999.99	-	
Lo:	0	-9999.99	-	
LoLo:	0	-9999.99	-	
Min:	0	-9999.99	-	

Other:

verified spare RTD was measuring
same resistance

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L. Hill Date: 5/14/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 457

Tag: TI-AZK18-1A

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 16

Manufacturer: Rosemount Model No.: 244P Serial No: 2E000-760
817-63-02-016 6-14-97
 MTE Instr. No: 817-45-08-044 Due Date: 2-12-98

Input Range 0 - 150		Tolerance 1.5%			
Units: °F					
Input	Output mA	Lo: (mA)	Hi: (mA)	As Found (mA)	In/Out As Left (mA)
93.03	0.00 (4.00)	-2.25 (3.76)	2.25 (4.24)	62.0 (3.80)	IN 0 (4.00)
101.19	37.50 (8.00)	35.25 (7.76)	39.75 (8.24)	38.0 (8.02)	IN 38.0 (8.02)
109.30	75.00 (12.00)	72.75 (11.76)	77.25 (12.24)	74.0 (11.96)	IN 74.0 (11.96)
117.36	112.50 (16.00)	110.25 (15.76)	114.75 (16.24)	112.0 (15.92)	IN 112.0 (15.92)
147.75 125.37	150.00 (20.00)	147.75 (19.76)	152.25 (20.24)	150.0 (19.99)	IN 150.0 (19.99)

(signoff) Calibrated By: FitzsimmonsDate: 5-6-97Location: Stack Monitor Room

Comments

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 458

Tag: TI_AZ_K18_1B I/O Type: AI Description: PvCdsr VapTempB

Cntlr: 24 Chan No: 2 P&ID: H-2-131075 skt. 3 Logic:

Remarks: _____

Location: _____

Actuation Method: check ambient & pull sensor cable

Sensor Calibration: Non-calibratable xmitter. 5pt cal check was OK.

☐ 5 pt cal N/A per procedure _____ (data attached) _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2^2 & + & 2^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ \text{(sensor)} & & \text{(xmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: DEG F

Process Input	Readout Tolerance	LOI LCU3-6	Screen1 16PriCoo	Screen2	Screen3
Lo: 0.00	2.01 = 2.01 ambient	<u>66.88</u>	<u>67</u>		
Hi: 100.00	97.99 = 102.01 <u>pull sensor cable</u>	<u>111.13</u>	<u>111</u>		

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	0	99999.99	-	
Lo:	<u>32</u>	9999.99 <u>34.0</u>	31.99 - 36.01	23.99 yellow
LoLo:	0	9999.99 <u>35.0</u>	<u>33.00 - 37.00</u>	<u>35.00 yellow</u>
Min:	0	-9999.99	-	

Other:

verified spare RTD was measuring

same resistance

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: LH Hill Date: 5/14/96

Retest Alarm change LH Hill 6/5/96

Retest Alarm on + 2000. Add 11.7 to 1.0.

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 459

Tag: TI-AZK18-1B

P&ID: H-2-131075, SH 3

LOOP: H-2-131309, SH 16

Manufacturer: Rosemount Model No.: 244P Serial No: 2E-000-761
 MTE Instr. No: 817-63-02-016 6-14-97
817-45-08-044 Due Date: 2-12-98

Input Range 0-100

Tolerance 1.5%

Units: °F

Input	Output	Lo: (mA)	Hi: (mA)	As Found (mA)	In/Out	As Left (mA)
93.03	0 (4.00)	-1.50 (3.76)	1.50 (4.24)	0.0 (3.97)	IN	0.0 (3.97)
98.48	25 (8.00)	23.50 (7.76)	26.50 (8.24)	24.0 (7.92)	IN	24.0 (7.92)
103.90	50 (12.00)	48.50 (11.76)	51.50 (12.24)	50.0 (11.97)	IN	50.0 (11.97)
109.30	75 (16.00)	73.50 (15.76)	76.50 (16.24)	74.0 (15.92)	IN	74.0 (15.92)
114.68	100 (20.00)	98.50 (19.76)	101.50 (20.24)	100.0 (19.95)	IN	100.0 (19.95)

(signoff) Calibrated By:

FitzsimmonsDate: 5-6-97

Location:

Stack Monitor Room

Comments

3/28/96

W-030. LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 460

Tag: YS_AZ_K12_1A I/O Type: DI Description: PVHtrA Status

Cntrl: 6 Chan No: 16 P&ID: H-2-131076 Logic: Y101

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU1-6	Screen1 17PriExh	Screen2 02Main.v	Screen3
Lo (0): OFF	4	<u>STATED</u>	<u>OFF</u>	<u>OFF</u>	_____
Hi (1): ON	7	<u>STATE1</u>	<u>ON</u>	<u>ON</u>	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug FisherDate: 6/29/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 461

Tag: YS_AZ_K12_1A1 I/O Type: DI Description: FVHtrA RemLoc

Cntrl: 6 Chan No: 17 P&ID: H-2-131076 Logic: Y101

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU1-6	Screen1 17PriExh	Screen2	Screen3
Lo (0): LOCAL	7	<u>STATE 1</u>	<u>LOCAL</u>	_____	_____
Hi (1): REMOTE	2	<u>STATE 7</u>	<u>MANUAL (REMOTE)</u>	_____	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	3	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Day LinkDate: 6/29/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 462

Tag: YS_AZ___K12_1B I/O Type: DI Description: PVHtrB Status

Cntrl: 17 Chan No: 16 P&ID: H-2-131076 Logic: Y112

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): OFF	4	LCU1-11 L02-6 <u>STATE0</u>	17PriExh	02Main.v	
Hi (1): ON	7	<u>STATE1</u>	<u>OFF</u>	<u>OFF</u>	
			<u>ON</u>	<u>ON</u>	

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: _____

Date: _____

6/25/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 463

Tag: YS_AZ_K12_1B1 I/O Type: DI Description: PVHtrB RemLoc

Cntlr: 17 Chan No: 17 P&ID: H-2-131076 Logic: Y112

Remarks: _____

Location: _____

Actuation Method: PLACED SWITCH IN LOCAL (HAND-OFF) AND
AUTO (REMOTE)

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU2-6	Screen1 17PriExh	Screen2	Screen3
Lo (0): LOCAL	7	<u>STATE 1</u>	<u>LOCAL</u>	_____	_____
Hi (1): REMOTE	2	<u>STATE 9</u>	<u>(manual)-REMOTE</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 3 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Day 11/11Date: 6/25/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 464

Tag: YS_AZ_K15_1A1 I/O Type: DI Description: PVFanA RemLoc

Cntlr: 6 Chan No: 20 P&ID: H-2-131076 Logic: Y110

Remarks:

Location:

Actuation Method: PLACED SWITCH IN AUTO (REMOTE)

Sensor Calibration:

☐ per procedure (data attached) (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU1-8	Screen1 17PriExh	Screen2	Screen3
Lo (0): LOCAL	7	<u>STATE 0</u>	<u>LOCAL</u>		
Hi (1): REMOTE	2	<u>STATE 9</u>	<u>INTERLOCK</u>		

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 3

Other:

MTE Instr. No: Due Date:

(signoff)

Loop Complete:

Date:

retested

6/19/96
7/16/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 465

Tag: YS_AZ_K15_1B1 I/O Type: DI Description: PVFanB RemLoc
Cntlr: 17 Chan No: 20 P&ID: H-2-131076 Logic: Y121

Remarks: _____

Location: _____

Actuation Method: operate HAND/OFF/AUTO switchSensor Calibration: N/A Switch adjusted to trip within 5% of OPEN

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint: _____

Loop Tolerance: _____

Process State	Color	LOI LCU2-8	Screen1 17PriExh	Screen2	Screen3
Lo (0): LOCAL	7	<u>state 1</u>	<u>LOCAL</u>	_____	_____
Hi (1): REMOTE	2	<u>state 9</u>	<u>NOT LOCAL</u>	_____	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	3	<u>white</u>

Other: _____

HAND/OFF positions ~~do give local~~ give LOCAL.

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L HillDate: 7/16/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 466

Tag: YS_AZ_K1WD_1A1 I/O Type: DO Description: PvDmpr2AWatchDog

Cntlr: 6 Chan No: 29 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: 29-30 Jumper out the PCM10 WD contacts. Show that the
PCM 6 outputs will close the valve & prevent opening it.

Sensor Calibration: N/A

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. J. AllenDate: 7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 467

Tag: YS_AZ_K1WD_1A2 I/O Type: 00 Description: PvDmpr2AWatchDog

Cntlr: 6 Chan No: 30 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method:

29-30
Turner out the RCM WD contacts, & show that the
RCM 6-7-22 outputs will close the damper & prevent opening it

Sensor Calibration: N/A

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	7	_____	_____	_____	_____
Hi (1): TRUE	4	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

*L. J. Hill*Date: *7/30/96*

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 468

Tag: YS_AZ_K1WD_2A1 I/O Type: DO Description: Pvdmp2AWatchDog

Cntlr: 10 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks:

Location: Tumper out the RDR 6 WD & show that theActuation Method: PER 10-1, 2 outputs will close the valve & prevent
opening itSensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi:	0	_____
Lo:	0	_____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

S. Hill

Date:

7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 469Tag: ^{YS}~~10~~ AZ K1WD_2A2 I/O Type: DO Description: Pvdmp2AWatchDog

Cntlr: 10 Chan No: 2 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Jump out the REM6 WD contacts & show that the
RCM 10-1, 2 outputs will close the valve & prevent opening it.Sensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	7	_____	_____	_____	_____
Hi (1): TRUE	4	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. J. HillDate: 7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 470

Tag: YS_AZ_K1WD_1B1 I/O Type: DO Description: PvDmpr2BWatchDog

Cntlr: 17 Chan No: 29 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: Turner out the REM 17 WD & show that the
REM 17 - ^{29,30}~~17~~ outputs will close the valve & prevent opening it.

Sensor Calibration: N/A

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. HillDate: 7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 471

Tag: YS_AZ_K1WD_B2 I/O Type: DO Description: PvDmpr2BWatchDog

Cntlr: 17 Chan No: 30 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method:

29,30
Turnper out the RCM21 WD, & show that the
REM 17 ~~432~~ outputs will close the valve & prevent opening it.

Sensor Calibration: *N/A*☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	7	_____	_____	_____	_____
Hi (1):	TRUE	4	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: *L & J Hill*Date: *2/3d 96*

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 472

Tag: YS_AZ_K1WD_2B1 I/O Type: DO Description: PvDmpr2BWatchDog

Cntlr: 21 Chan No: 1 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method:

jump out the controller 17 W.D. to show that
REM 21-1, 2 outputs will close the valve & prevent opening it.

Sensor Calibration:

N/A

per procedure

(data attached)

(signoff)

Setpoint:

Loop Tolerance:

Process State		Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s):

Priority

Alarm Color (actual)

Hi: 0

Lo: 0

Other: _____

MTE Instr. No: _____

Due Date: _____

(signoff)

Loop Complete:

LFH

Date:

7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 473

Tag: YS_AZ_K1WD_2B2 I/O Type: D0 Description: PvDmpr2BWatchDog

Cntlr: 21 Chan No: 2 P&ID: H-2-131076 Logic:

Remarks:

Location:

Actuation Method:

jump out the controller 17 W.D. & showREM 21-22 outputs will close the valve & prevent opening it.Sensor Calibration: N/A

per procedure

(data attached)

(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	7	_____	_____	_____	_____
Hi (1): TRUE	4	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 0

Other:

MTE Instr. No:

Due Date:

(signoff)

Loop Complete:

L. HillDate: 7/30/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
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Tag: YS_RCM_A2_1 I/O Type: DO Description: Rcm-A2 Status

Cntlr: 2 Chan No: 2 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate via HS-RCM-A2-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

L. J. Kelly

Date:

7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 475

Tag: YS_RCM_A3_1 I/O Type: DO Description: Rcm-A3 Status

Cntlr: 3 Chan No: 2 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate via HS-RCM-A3-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

L. J. LioDate: 7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 476

Tag: YS_RCM_A13_1 I/O Type: DO Description: Rcm-A13 Status

Cntlr: 13 Chan No: 2 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate via HS-RCM-A13-2

Sensor Calibration:

per procedure

(data attached)

(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 0

Other:

MTE Instr. No:

Due Date:

(signoff)

Loop Complete:

L. J. Hill

Date:

7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 477

Tag: YS_RCM_A14_1 I/O Type: DO Description: Rcm-A14 Status

Cntlr: 14 Chan No: 2 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate via HS-12CM-A14-2

Sensor Calibration:

per procedure

(data attached)

(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 0

Other:

MTE Instr. No:

Due Date:

(signoff)

Loop Complete:

L. J. LillieDate: 7/21/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 478

Tag: YS_RCM_D6_1 I/O Type: DO Description: Rcm-D6 Status

Cntlr: 6 Chan No: 32 P&ID: Logic:

Remarks: _____

Location: _____

Actuation Method: operate viz HS-RCM-D6-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

L. J. Hill

Date:

7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 479

Tag: YS_RCM_D7_1 I/O Type: D0 Description: Rcm-D7 Status

Cntlr: 7 Chan No: 1 P&ID: Logic:

Remarks: _____

Location: _____

Actuation Method: operate via HS-RCM-D7-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LS HillDate: 7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 480

Tag: YS_RCM_D17_1 I/O Type: DO Description: Rcm-D17 Status

Cntlr: 17 Chan No: 32 P&ID: Logic:

Remarks:

Location:

Actuation Method:

open to air HS-RCM-D17-2

Sensor Calibration:

per procedure (data attached)

(signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: Due Date:

(signoff)

Loop Complete:

LAHDate: 7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 481

Tag: YS_RCM_D18_1 I/O.Type: DO Description: Rcm-D18 Status

Cntlr: 18 Chan No: 32 P&ID: Logic:

Remarks: _____

Location: _____

Actuation Method: operate via HS-RCM-D18-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. J. HillDate: 7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 482

Tag: YS_RCM_DR9_1 I/O Type: D0 Description: Rcm-Dr9 Status

Cntlr: 9 Chan No: 32 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate via RIS RCM-DR9-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi:	0	_____
Lo:	0	_____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

S. J. J. J.

Date:

7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 483

Tag: YS_RCM_DR10_1 I/O Type: DO Description: Rcm-Dr10 Status

Cntlr: 10 Chan No: 32 P&ID: Logic:

Remarks:

Location:

Actuation Method:

operate viz HS-RCM-DR10-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4	_____	_____	_____	_____
Hi (1): TRUE	7	_____	_____	_____	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

LJ Hill

Date:

7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 484

Tag: YS_RCM_DR20_1 I/O Type: DO Description: Rcm-Dr20 Status

Cntlr: 20 Chan No: 32 P&ID: Logic:

Remarks: _____

Location: _____

Actuation Method: operate viz HS-RCM-DR20-2

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

	Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0):	FALSE	4	_____	_____	_____	_____
Hi (1):	TRUE	7	_____	_____	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. HillDate: 7/2/96

3/21/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 485Tag: YS_RCM_DR20²¹_1 I/O Type: DO Description: Rcm-Dr20 StatusCntlr: 21²⁰ Chan No: 32 P&ID: Logic:

Remarks:

Location:

Actuation Method: operate viz HS-RCM-DR20-2

Sensor Calibration:

☐ per procedure (data attached) (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): FALSE	4				
Hi (1): TRUE	7				

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	
Lo:	0	

Other:

MTE Instr. No: Due Date:

(signoff)

Loop Complete:

L. J. Hill

Date:

7/2/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 486

Tag: ZI_AY1_K1_1 I/O Type: AI Description: InDmpr Position

Cntlr: 46 Chan No: 5 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: open to valve

Sensor Calibration:

☒ 5 pt cal per procedure attached (data attached) L. F. Hico
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 \\ \text{(sensor)} \end{matrix}^2 + \begin{matrix} 2 \\ \text{(xmmitter)} \end{matrix}^2 + \begin{matrix} 2.0\% \\ \text{(other)} \end{matrix}^2 + \begin{matrix} 0.2\% \\ \text{(DCS)} \end{matrix}^2}$

Units: PERCENT

Process Input	Readout Tolerance	LOI LCU4-27	Screen1 15PriIn.	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	<u>0.59</u>	<u>1%</u>	_____	_____
Hi: 100.00	97.99 - 102.01	<u>101.38</u>	<u>101%</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	0	-9999.99	-	_____
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

MTE Instr. No: N/A (visual operation)

Due Date: _____

(signoff) Loop Complete: L. F. HicoDate: 5/7/96

4/16/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 487

Tag: ZT-AY101K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 1

Manufacturer: AUTOMAX/CENTURA Model No.: C177ATA Serial No: 44121-00-1-1MTE Instr. No: 817.45.08.044
817.23.01.006 Due Date: 2.12.98
6.10.97

Input Range 4-20mA

Tolerance 2%

Units: ma.

Input(ma)	Output(ma)	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	<u>3.68</u>	<u>4.32</u>	<u>3.57</u>	<u>OUT</u>	<u>4.07</u>
8.00	8.00	<u>7.68</u>	<u>8.32</u>	<u>7.63</u>	<u>OUT</u>	<u>8.08</u>
12.00	12.00	<u>11.68</u>	<u>12.32</u>	<u>11.59</u>	<u>OUT</u>	<u>12.06</u>
16.00	16.00	<u>15.68</u>	<u>16.32</u>	<u>15.61</u>	<u>OUT</u>	<u>16.05</u>
20.00	20.00	<u>19.68</u>	<u>20.32</u>	<u>19.57</u>	<u>OUT</u>	<u>19.96</u>

(signoff) Calibrated By: Stuzimovs Date: 4.17.97Location: 101 AY AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

Check zero and span (4-20ma) positions? Y/N
Adjust so: 4ma = full closed
20ma = full open

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 488

Tag: ZT-AY101K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 1

Manufacturer: AUTOMAX/CONTURA Model No.: CI77ATA Serial No: 44121-00-1-1MTE Instr. No: 817-45-08-040 Due Date: 2-5-97
817-13-55-023 3-26-97

3 26 11

Input Range 4-20mA		Tolerance 2%				
Units:						
Input(ma)	Output(ma)	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	3.68	4.32	N/A	N/A	4.01
8.00	8.00	7.68	8.32			7.90
12.00	12.00	11.68	12.32			11.96
16.00	16.00	15.68	16.32			15.97
20.00	20.00	19.68	20.32			20.01

(signoff) Calibrated By: P. J. Peterson Date: 5-2-96Location: 101 AY AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

VOID
4-17-97
fmg

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 489

Tag: ZI_AYL_K1_2 I/O Type: AI Description: OutDmpr Position

Cntlr: 13 Chan No: 2 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: operate valve from MCS controller

Sensor Calibration:

☒ 5 pt cal per procedure ~~12.01~~ 12.01 (data attached) 12.01 (signoff)

 Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: PERCENT

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
Lo: <u>14.60</u> <u>0.00</u>	<u>12.01</u> 16.01	<u>13.87</u>	<u>14</u>	<u>14</u>	<u>13.87</u>
Hi: 100.00	97.99 - 102.01	<u>100.07</u>	<u>100</u>	<u>100</u>	<u>100.01</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	<u>02</u>	<u>9999.99</u> <u>-12.5%</u>	<u>-10.5%</u> <u>14.5%</u>	<u>-12.8% (100.0)</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

Handstop @ 10%
controller ZS shut down @ 14%
MTE Instr. No: observation of valve Due Date: _____

(signoff)

Loop Complete:

L J Hill

Date:

6/28/96ADDED AND RETESTED LG ALARM D. Hill 10/19/96

Tag: ZT-A7101KI-2 P&ID: H-2-131075, SH-1 6TFA64
 Manufacturer: MODULINE Model No.: 100N Serial No: 4143P-5-195
 MTE Instr. No: 817-13-55-02L Due Date: 12-17-97
817-45-08-040 2-28-98

Input Range 4-20			Tolerance 2% - output 5% - mech. Ind.				
Units: ma							
Input	Output(ma)	(% output)	Lo:	Hi:	As Found	In/Out	As Left
4.0	4.0	(0)	3.68(5)	4.32(5)	* N/A	* N/A	4.03(0)
8.0	8.0		7.68	8.32			7.99
12.0	12.0	(50)	11.68(45)	12.32(55)			11.97(50)
16.0	16.0		15.68	16.32			15.98
20.0	20.0	(100)	19.68(95)	20.32(105)			19.97(100)

(signoff) Calibrated By:

Paul M. ZylinskiDate: 3-31-97Location: 101 AY RECIRC. MODULE

Comments * New setup, ZT(+) = 40 FC(+)=25, 4ma = 0% open, 20ma = 100% open
 ZT(-) = 23 FC(-) = 8

Set "closed" mechanical stop @ 1%, (+1/4% - 1/2%) $\Rightarrow$ (input I = 4.16 ma) Lo: Hi: As left
4.08 4.20 4.14
 Set "closed" LS @ 2%, (+0% - 1/2%) $\Rightarrow$ (input I = 4.32 ma) Lo: Hi: As left
4.24 4.32 4.28
 Set "open" mechanical stop just past left edge of "open" bubble and before edge of scale.
 Set "open" limit switch at left edge of "open" bubble.

switch settings

SW 1		SW 2	
(-1)	OFF	(-1)	OFF
(-2)	ON	(-2)	OFF
(-3)	OFF	(-3)	OFF
(-4)	OFF	(-4)	ON
(-5)	OFF	(-5)	ON
(-6)	OFF	(-6)	ON
(-7)	ON	(-7)	OFF
(-8)	ON	(-8)	ON

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 491

Tag: ZT-AY101K1-2

P&ID: H-2-131075, SH 1

Loop: H-2-131343, SH 3

Manufacturer: MODULINEModel No. 100NSerial No: 4134P-413-4P-5-195MTE Instr. No: 817-13-55-023Due Date: 3-26-97817-45-08-0402-5-97

Input Range 4-20mA

Tolerance 2%

Units: mA

Input (mA)	Output (mA)	FI (% of 0)	Lo:	Hi:	As Found	In/Out	As Left
6.5	6.5		6.18	6.82	N/A	N/A	6.49
8.0	8.0	25%(0)	7.68(20)	8.32(30)			7.96 (25%)
12.0	12.0	50%(0)	11.68(45)	12.32(55)			11.99 (50%)
16.0	16.0	75%(0)	15.68(70)	16.32(80)			16.01 (75%)
20.0	20.0	100%(0)	19.68(95)	20.32(105)			19.99 (100%)

(signoff) Calibrated By: Paul M. ZylinskiDate: 6/17/96Location: 101 AY RECIRC MODULE.

close
 Comments Set^v mechanical stops @ 10% open, operating range 15-100%
 OPEN
 4mA=0% OPEN, 20mA=100% OPEN
 ZT(+) = 40 FC(+) = 25
 ZTC(-) = 23 FC(-) = 8
 close (15% + 0.1% - 2.1%)

Set closed limit switch @ 14%, dead stop at 10%.

SW-2 (as left) - (-1) = OFF (-2) = OFF (-3) = OFF (-4) = ON (-5) = ON (-6) = ON (-7) = OFF (-8) = ON

SW-1 (as left) - (-1) = OFF (-2) = ON (-3) = OFF (-4) = OFF (-5) = OFF (-6) = OFF (-7) = ON (-8) = ON

12 7.80

16 4.10

20 0.12

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 492

Tag: ZI_AY2_K1_1 I/O Type: AI Description: InDmpr Position

Cntlr: 46 Chan No: 19 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) J. J. Hill
☐ _____ (signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$
(DCS)

Units: PERCENT

Process Input	Readout Tolerance	LOI LCU4-28	Screen1 15PriIn.	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	<u>0.10</u>	<u>0%</u>	_____	_____
Hi: 100.00	97.99 - 102.01	<u>100.09</u>	<u>100%</u>	_____	_____

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	0	-9999.99	-	_____
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

MTE Instr. No: observation Due Date: _____(signoff) Loop Complete: J. J. Hill Date: 3/9/96

4/16/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 493

Tag: ZT-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 2

Manufacturer: AUTOMAX/CENTURA Model No.: CIT77ATA Serial No: 44121-00-1-4MTE Instr. No: 817.45.08.044 Due Date: 2.12.98
817.23.01.006 4.10.97

Input Range 4-20mA

Tolerance 2%

Units: ma

Input(ma)	Output(ma)	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	3.68	4.32	4.25	IN	IN 4.25
8.00	8.00	7.68	8.32	8.17	FN	IN 8.17
12.00	12.00	11.68	12.32	12.08	IN	IN 12.08
16.00	16.00	15.68	16.32	15.97	IN	IN 15.97
20.00	20.00	19.68	20.32	19.83	IN	IN 19.83

S.F.
4.17.97(signoff) Calibrated By: S. Fitzsimmons Date: 4.17.97Location: 102 AY AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

Check zero and span (4-20ma) positions? Y/N
 Adjust so: 4ma = full closed
 20ma = full open

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 494

Tag: ZT-AY102K1-1

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH2

Manufacturer: AUTOMAX/CENTURA Model No.: CI77ATA Serial No.: 44121-00-1-4MTE Instr. No.: 817-45-08-040Due Date: 2-5-97817-13-55-0233-26-97

Input Range 4-20mA

Tolerance 2%

Units:

Input(mA)	Output(mA)	Lo: (mA)	Hi: (mA)	As Found	In/Out	As Left
4.00	4.00	3.68	4.32	N/A	N/A	4.00
8.00	8.00	7.68	8.32			8.037-84 P2 4-2-96
12.00	12.00	11.68	12.32			12.02
16.00	16.00	15.68	16.32			15.99
20.00	20.00	19.68	20.32			20.00

(signoff)Calibrated By:

Rylands/D PetersonDate: 5-2-96Location: 102AY AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

-VOID-
4-17-97
PFO

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 495

Tag: ZI_AY2_K1_2 I/O Type: AI Description: OutDmپر Position
 Cntl: 13 Chan No: 7 P&ID: H-2-131075 Logic: Y152

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 5 pt cal☐per procedure NI

(data attached)

L. J. Hill
(signoff)

Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0\%)^2 + (0.2\%)^2}$

Units: PERCENT

Process Input Readout Tolerance

Lo: 14.6% 12.6 - 16.6%
0.00 -2.01 - 2.01

Hi: 100.00 97.99 - 102.01

LCU2-33

LOI

LCU4-28Screen1
11RecAY2Screen2
15PriIn.Screen3
group 10214.6615%15%14.66101.11101%101%101.13

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: 0 99999.99

HiHi: 0 99999.99

Hi: 0 99999.99

Lo: -2 -9999.99 - 12.5% -10.5% - 14.5%

LoLo: 0 -9999.99

Min: 0 -9999.99

-13% (Yellow)

Other:

Hardstop @ 14.6%MTE Instr. No: value operation

Due Date: _____

(signoff)

Loop Complete: L. J. HillDate: 8/13/96ADDED AND RETESTED TO PLAN m D. John 10/14/96

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
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6TF-484

Tag: ZT-AV102KI-2

P&ID: H-2-131075, SH1

LOOP: H-2-131343, SH3

Manufacturer: MODULINE Model No.: 100N Serial No: 4143P-1-195MTE Instr. No: 817-13-55-026
817-45-08-040Due Date: 12-17-97
2-28-98Input Range 4-20Tolerance 2% - output
5% - mech. Ind.Units: ma

Input	Output (ma)	(% output)	Lo:	Hi:	As Found	In/Out	As Left
4.0	4.0	(0)	3.68(-5)	4.32(5)	* N/A	* N/A	4.08(0)
8.0	8.0		7.68	8.32			8.04
12.0	12.0	(50)	11.68(45)	12.32(55)			12.09(50)
16.0	16.0		15.68	16.32			16.12
20.0	20.0	(100)	19.68(95)	20.32(105)			20.16(100)

(signoff) Calibrated By: Paul M. ZglinichDate: 3-31-97Location: 102 AV RECIRC. MODULEComments * New setup, ZT(+)=40 FC(+)=50 4ma = 0% open, 20ma = 100% open
ZT(-)=23 FC(-)=31

Set "closed" mechanical stop @ 1%, (+1/4% - 1/2%) $\Rightarrow$ (input I = 4.16ma) Lo: Hi: As left
4.08 4.20 4.14

Set "closed" LS @ 2%, (+0% - 1/2%) $\Rightarrow$ (input I = 4.32ma) Lo: Hi: As left
4.24 4.32 4.32

Set "open" mechanical stop just past left edge of "open" bubble and before edge of scale.

Set "open" limit switch at left edge of "open" bubble.

switch settings

SW 1		SW 2	
(-1)	OFF	(-1)	OFF
(-2)	ON	(-2)	ON
(-3)	OFF	(-3)	ON
(-4)	OFF	(-4)	OFF
(-5)	OFF	(-5)	ON
(-6)	OFF	(-6)	ON
(-7)	ON	(-7)	OFF
(-8)	ON	(-8)	ON

6/26/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
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Tag: ZT-AY102K1-2

P&ID: H-2-131075, SH 1

LOOP: H-2-131343, SH 4

Manufacturer: MODULINE Model No.: 100N Serial No: 41345-1-195MTE Instr. No: 817-45-08-040
817 13-55-023 Due Date: 3-26-97

Input Range 4-20mA

Tolerance 2%

Units: (ma)

Input(ma)	Output(ma)	ZI(%open)	Lo:	Hi:	As Found	In/Out	As Left
6.5	6.5		6.18	6.82	N/A	N/A	6.58 (-)
8.0	8.0	25%	7.68 (20)	8.32 (30)			8.05 (25)
12.0	12.0	50%	11.68 (45)	12.32 (55)			12.10 (52)
16.0	16.0	75%	15.68 (70)	16.32 (80)			16.12 (77)
20.0	20.0	100%	19.68 (95)	20.32 (105)			20.16 (102)

(signoff) Calibrated By: Paul M. ZylinskiDate: 8-12-96Location: 102 AY RECIRC. BLDG.

Comments Set close mechanical stop @ 10% open, operating range
 4mA=0% OPEN, 20mA=100% OPEN $\approx 1.5 - 100\%$ (15, +0, -2%)

ZT(+) = 40

FC(+) = 50

ZT(-) = 23

FC(-) = 31

} unisolated input (exception)

SW2(as left) (-1) = OFF (-2) = ON (-3) = ON (-4) = OFF (-5) = ON (-6) = OFF

SW1(as left) (-1) = ON (-2) = OFF (-3) = OFF (-4) = OFF (-5) = OFF (-6) = OFF

Set close limit switch @ 14.4, mechanical stop at 10%

SW2(as left) (-7) = OFF (-8) = ON

SW1(as left) (-7) = ON (-8) = ON

Valid
 3-31-97
 [Signature]

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 498

Tag: ZI_AZ1_K1_1 I/O Type: AI Description: InDmpr Position

Cntlr: 51 Chan No: 5 P&ID: H-2-131075 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) 2/21
☐ _____ (signoff)

$$\text{Loop Tolerance: } 2.0 \% = \sqrt{\begin{matrix} 2 \\ (\text{sensor}) \end{matrix}^2 + \begin{matrix} 2 \\ (\text{xmitter}) \end{matrix}^2 + \begin{matrix} 2.0 \% \\ (\text{other}) \end{matrix}^2 + \begin{matrix} 0.2 \% \\ (\text{DCS}) \end{matrix}^2}$$

Units: PERCENT

Process Input	Readout Tolerance	LOI LCU3-34 <u>-1.6</u>	Screen1 15PriIn. <u>-1%</u>	Screen2	Screen3
Lo: 0.00	-2.01 - 2.01	<u>99.19</u>	<u>99%</u>		
Hi: 100.00	97.99 - 102.01				

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	9999.99	-	_____
HiHi:	0	9999.99	-	_____
Hi:	0	9999.99	-	_____
Lo:	0	-9999.99	-	_____
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. D. Smith Date: 5/10/96

4/16/97

W-030 CALIBRATION DATA SHEET

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Tag: ZT-AZ101K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 1

Manufacturer: AUTOMAX/CENTRAM Model No.: CI77ATA Serial No: 44121-00-1-3MTE Instr. No: 817.45.08.044 Due Date: 2.12.98
817.23.01.006 6.10.97

Input Range 4-20mA

Tolerance 2%

Units: mA

Input(mA)	Output(mA)	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	<u>3.68</u>	<u>4.32</u>	<u>4.19.97</u> <u>3.26</u>	<u>3.51 OUT</u>	<u>4.06</u>
8.00	8.00	<u>7.68</u>	<u>8.32</u>	<u>7.29</u>	<u>7.45 OUT</u>	<u>8.06</u>
12.00	12.00	<u>11.68</u>	<u>12.32</u>	<u>11.27</u>	<u>11.40 OUT</u>	<u>12.04</u>
16.00	16.00	<u>15.68</u>	<u>16.32</u>	<u>15.28</u>	<u>15.29 OUT</u>	<u>16.04</u>
20.00	20.00	<u>19.68</u>	<u>20.32</u>	<u>19.27</u>	<u>19.24 OUT</u>	<u>20.03</u>

(signoff) Calibrated By: R. J. L. / 15 FitzgeraldDate: 4.17.97Location: 101 AZ AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

Check zero and span (4-20mA) positions? PH
 Adjust so: 4mA = full closed
 20mA = full open.

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 500

Tag: ZT-AZ101K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 1

Manufacturer: AUTOMAX/CENTRA Model No.: CI77ATA Serial No: 44121-00-1-3MTE Instr. No: 817-45-08-040 Due Date: 2-5-97
817-13-55-023

Input Range 4-20mA

Tolerance 2%

Units: mA

Input(mA)	Output(mA)	Lo:(mA)	Hi:(mA)	As Found	In/Out	As Left
4.00	4.00	3.68	4.32	N/A	N/A	3.99
8.00	8.00	7.68	8.32			7.89
12.00	12.00	11.68	12.32			11.93
16.00	16.00	15.68	16.32			16.00
20.00	20.00	19.68	20.32			20.01

(signoff)Calibrated By: P.M. Zylinski / P. HansonDate: 5/3/96Location: 101A2 AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

- VOID -
4-17-97
Ang

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 501

Tag: ZI_AZ1_K1_2 I/O Type: AI Description: OutDmpr Position
 Cntl: 2 Chan No: 2 P&ID: H-2-131075 Logic: Y150

Remarks: _____

Location: _____

Actuation Method: operate valve from DCS

Sensor Calibration:

☒ 5 pt cal☐per procedure VI(data attached) L21

(signoff)

Loop Tolerance: $2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + 2.0\%^2 + 0.2\%^2}$

Units: PERCENT

Process Input	Readout Tolerance	LOI LCU1-42	Screen1 15PriIn.	Screen2 12RecAZ1	Screen3 group 103
Lo: <u>14.5</u> <u>0.00</u>	<u>12.5</u> - <u>16.5</u> <u>2.01</u> - <u>2.01</u>	<u>14.39</u>	<u>14</u>	<u>14</u>	<u>14.45</u>
Hi: 100.00	97.99 - 102.01	<u>101.35</u>	<u>101</u>	<u>101</u>	<u>101.35</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	<u>2</u>	<u>-9999.99</u> - <u>12.5%</u>	<u>105-14.5</u>	<u>-12</u> (yellow)
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other: _____

Hardstop @ 10%; electrical stop @ 14.5%MTE Instr. No: valve observation

Due Date: _____

(signoff)

Loop Complete: L21Date: 6/28/96ADDED AND RETESTED LO ALARM 0.110/19/96

6/6/98

W-030 CALIBRATION DATA SHEET

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REV. 0, PAGE 502

Tag: ZT-AZ101 K1-2

P&ID: H-2-131075, SH2

LOOP: H-2-131344, SH3

Manufacturer: MODULINE Model No.: 100N Serial No: 4143P-4-195MTE Instr. No: 817-13-55-026
817-45-08-04012-17-97
Due Date: 2-28-98Input Range 4-20Tolerance 2% - output
5% - mech. Ind.Units: ma

Input	Output (ma)	(% output)	Lo:	Hi:	As Found	In/out	As Left
4.0	4.0	(0)	3.68(-5)	4.32(5)	* N/A	* N/A	4.02(0)
8.0	8.0		7.68	8.32			8.03
12.0	12.0	(50)	11.68(45)	12.32(55)			12.05(51)
16.0	16.0		15.68	16.32			16.08
20.0	20.0	(100)	19.68(95)	20.32(105)			20.12(100)

(signoff) Calibrated By: Paul M. ZylinskiDate: 4-3-97Location: 101 AZ RECIRC. MODULEComments * New setup, ZT(+) = 40 FC(+)=25, 4ma = 0% open, 20ma = 100% open
ZT(-) = 23 FC(-) = 8

Set "closed" mechanical stop @ 1%, (+1/4%, -1/2%) $\Rightarrow$ (input I = 4.16ma) Lo: 4.08 Hi: 4.20 As left 4.12

Set "closed" LS @ 2%, (+0%, -1/2%) $\Rightarrow$ (input I = 4.32ma) Lo: 4.24 Hi: 4.32 As left 4.32

Set "open" mechanical stop just past left edge of "open" bubble and before edge of scale.

Set "open" limit switch at left edge of "open" bubble.

switch settings

SW 1		SW 2	
(-1)	OFF	(-1)	OFF
(-2)	ON	(-2)	OFF
(-3)	OFF	(-3)	OFF
(-4)	OFF	(-4)	ON
(-5)	OFF	(-5)	ON
(-6)	OFF	(-6)	ON
(-7)	ON	(-7)	OFF
(-8)	ON	(-8)	ON

5/1/96

W-030 CALIBRATION DATA SHEET

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Tag: ZT-AZ101K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 3

Manufacturer: MODULINE Model No.: 100N Serial No: 4134P-4-195MTE Instr. No: 817.45.08.040
817.13.55.073 Due Date: 3.26-97

Input Range 4-20mA		Tolerance 2%					
Units: mA							
Input	Output	<u>ZI (% open)</u>	Lo:	Hi:	As Found	In/Out	As Left
6.5	6.5		6.18	6.82	N/A	N/A	6.54
8.0	8.0	25% (0)	7.68 (20)	8.32 (30)			8.02 (25)
12.0	12.0	50% (0)	11.68 (45)	12.32 (55)			12.03 (50)
16.0	16.0	75% (0)	15.68 (70)	16.32 (80)			16.08 (75)
20.0	20.0	100% (0)	19.68 (95)	20.32 (105)			20.12 (100)

(signoff) Calibrated By: Paul M. ZylinskiDate: 6.12.96Location: 101 AZ RECIRC MODULE

close
 Comments Set ^v mechanical stop @ 10% open, operating range 15-100%
 4mA = 0% ^{OPEN} OPEN, 20mA = 100% OPEN ZT(+) = 40 FC(+) = 25
~~close~~ ZT(-) = 23 FC(-) = 8

Close limit switch opens at 14.75%, dead stop at 10%

SW2 - (as left) - (-1) = OFF (-2) = OFF (-3) = OFF (-4) = ON (-5) = ON (-6) = ON (-7) = OFF (-8) = 0

SW1 - (as left) - (-1) = OFF (-2) = ON (-3) = OFF (-4) = OFF (-5) = OFF (-6) = OFF (-7) = ON (-8) = 0

Void
4.3.97
fmg

4/16/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 505

Tag: ZT-AZ102K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 2

Manufacturer: AUTOMAX/CENTURA Model No.: CI77ATA Serial No: 44121-00-1-2MTE Instr. No: 817-45-08-044 Due Date: 2-12-98
817-23-01-006 6-10-97

Input Range 4-20mA

Tolerance 2%

Units: ma

Input(ma)	Output(ma)	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	<u>3.68</u>	<u>4.32</u>	<u>3.26</u>	<u>OUT</u>	<u>4.01</u>
8.00	8.00	<u>7.68</u>	<u>8.32</u>	<u>7.29</u>	<u>OUT</u>	<u>8.07</u>
12.00	12.00	<u>11.68</u>	<u>12.32</u>	<u>11.27</u>	<u>OUT</u>	<u>12.04</u>
16.00	16.00	<u>15.68</u>	<u>16.32</u>	<u>15.28</u>	<u>OUT</u>	<u>16.07</u>
20.00	20.00	<u>19.68</u>	<u>20.32</u>	<u>19.27</u>	<u>OUT</u>	<u>20.04</u>

(signoff) Calibrated By: P. J. Smith / 5/5/97Date: 4-17-97Location: 102 AZ AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

Check zero and span (4-20 ma) position? Y/N
 Adjust so: 4ma = full closed
 20 ma = full open

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
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Tag: ZT-AZ102K1-1

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH2

Manufacturer: AUTOMAX/CENTURA Model No.: CE77ATA Serial No: 44121-00-1-2MTE Instr. No: 817-45-08-040 Due Date: 2-5-97
817-13-55-023 3-26-97

Input Range 4-20mA

Tolerance 2%

Units:

Input(mA)	Output(mA)	Lo:(mA)	Hi:(mA)	As Found	In/Out	As Left
4.00	4.00	3.18	4.32	N/A	N/A	4.00
8.00	8.00	7.68	8.32			8.00
12.00	12.00	12.68	12.32			11.98
16.00	16.00	15.68	16.32			15.97
20.00	20.00	19.68	20.32			19.99

(signoff)Calibrated By:

Pzydzinski/D PetersonDate: 5-2-96

Location:

102 AE AIR INLET STATION

Comments

4mA=0% OPEN, 20mA=100% OPEN

VOID
4-17-97
fmg

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 507

Tag: ZI_AZ2_K1_2 I/O Type: AI Description: OutDmpr Position

Cntlr: 2 Chan No: 7 P&ID: H-2-131075 skt 2 Logic: Y150

Remarks: Hand stop @ 140%

Location: _____

Actuation Method: operate valve from ncs

Sensor Calibration:

☒ 5 pt cal per procedure V.I (data attached) 1/2/96
☐ _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$

Units: PERCENT

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
Lo: <u>14.00</u> <u>0.00</u>	<u>12.01 16.01</u> <u>-2.01 -2.01</u>	LCU1-43	15PriIn.	Screen2 <u>skt 9</u>	<u>109</u>
Hi: 100.00	97.99 - 102.01	<u>13.87</u>	<u>14</u>	<u>14</u>	<u>13.93</u>
		<u>101.57</u>	<u>102</u>	<u>102</u>	<u>101.54</u>

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	<u>02</u>	-9999.99 - 12.5%	<u>-10.5 - 14.5</u>	<u>-13% (YEL LOW)</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

Visual observation of valve position

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: 1/2/96 Date: 8/28/96ADDED AND RETESTED LO ALARM 10/14/96

Tag: ZT-AZ102KI-2

PAID: H-2-131075, SH2

LOOP: H-2-131344, SH4

Manufacturer: MODULINEModel No.: 100NSerial No: 4143P-6-195MTE Instr. No: 817-13-55-026
817-45-08-040Due Date: 12-17-97
2-28-98

Input Range 4.20

Tolerance 2% - output
5% - mech. Ind.

Units: ma

Input	Output (ma)	(% OUTPUT)	Lo:	Hi:	As Found	In/Out	As Left
4.0	4.0	(0)	3.68 (-5)	4.32 (5)	* N/A	* N/A	4.05 (0)
8.0	8.0		7.68	8.32			8.03
12.0	12.0	(50)	11.68 (45)	12.32 (55)			12.10 (52)
16.0	16.0		15.68	16.32			16.14
20.0	20.0	(100)	19.68 (95)	20.32 (105)			20.16 (100)

(signoff) Calibrated By: Paul M. ZylinskiDate: 4-2-97Location: 102AZ RECIRC. MODULEComments * New setup, ZT(+) = 40 FC(+) = 25, 4ma = 0% open, 20ma = 100% open
ZT(-) = 23 FC(-) = 8

Set "closed" mechanical stop @ 1%, (+1/4% - 1/2%) $\Rightarrow$ (input I = 4.16 ma) Lo: 4.08 Hi: 4.20 As left 4.17

Set "closed" LS @ 2%, (+0% - 1/2%) $\Rightarrow$ (input I = 4.32 ma) 4.24 4.32 4.29

Set "open" mechanical stop just past left edge of "open" bubble and before edge of scale.

Set "open" limit switch at left edge of "open" bubble.

switch settings

SW 1		SW 2	
(-1)	OFF	(-1)	OFF
(-2)	ON	(-2)	OFF
(-3)	OFF	(-3)	OFF
(-4)	OFF	(-4)	ON
(-5)	OFF	(-5)	ON
(-6)	OFF	(-6)	ON
(-7)	ON	(-7)	OFF
(-8)	ON	(-8)	ON

5/1/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
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Tag: ZT-AZ102K1-2

P&ID: H-2-131075, SH 2

LOOP: H-2-131344, SH 4

Manufacturer: MODULINE Model No.: 100N Serial No: 4134P-6-195
817.13.55.023 3.26.97
 MTE Instr. No: 817.45.08.040 Due Date: 2.5.97

Input Range 4-20mA		Tolerance 2%				
Units: (µA)						
Input (µA)	Output (µA)	ZF (% open)	Lo:	Hi:	As Found	In/Out
6.5	6.5		6.18	6.82	N/A	N/A
8.0	8.0	25% (0)	7.68 (20)	8.32 (30)		
12.0	12.0	50% (0)	11.68 (45)	12.32 (55)		
16.0	16.0	75% (0)	15.68 (70)	16.32 (80)		
20.0	20.0	100% (0)	19.68 (95)	20.32 (105)		

(signoff) Calibrated By: Paul M. ZelenakDate: 6.20.96Location: 102-AZ RECIRC MODULE

Comments Set close mechanical stop @ 10% open, operating range -15-100%
 OPEN, ZT(+) = 40 FC(+) = 25 (15, +0, -2)%
 4mA=0% OPEN, 20mA=100% OPEN ZT(-) = 23 FC(-) = 8
 CLOSED

Set close limit switch @ 13.8%, mechanical stop @ 10%

SW2 (as left) - (-1) = OFF (-2) = OFF (-3) = OFF (-4) = ON (-5) = ON (-6) = ON

SW1 (as left) - (-1) = OFF (-2) = ON (-3) = OFF (-4) = OFF (-5) = OFF (-6) = OFF

SW2 - (-7) = OFF (-8) = ON

SW1 - (-7) = ON (-8) = ON

Void
 4.2.97
 [Signature]

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 510

Tag: ZS_AZ_K1_1AA I/O Type: DI Description: PVHtrAInDprOpnLS

Cntlr: 6 Chan No: 10 P&ID: H-2-131076 Logic: Y107

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: set switcl to typ 5% from open☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-7	Screen1 17PriExh	Screen2 group 122	Screen3
Lo (0): NOT OPEN	4	<u>state 2</u>	<u>closed</u>	<u>NOT OPEN</u>	_____
Hi (1): OPEN	7	<u>state 1</u>	<u>open</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L J HillDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 511

Tag: ZS_AZ_K1_1AB I/O Type: DI Description: PVHtrAInDprClsLS

Cntlr: 6 Chan No: 11 P&ID: H-2-131076 Logic: Y107

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: set switch to trip 50% from closed☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: _____

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-7	Screen1 17PriExh	Screen2 grp122	Screen3
Lo (0): NOT CLS	4	<u>stat 1</u>	<u>open</u>	<u>NOT CLS</u>	_____
Hi (1): CLOSED	7	<u>stat 2</u>	<u>closed</u>	<u>CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. HillDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 512

Tag: ZS_AZ_K1_lBA I/O Type: DI Description: PVHtrBINdprOpnLS

Cntlr: 17 Chan No: 10 P&ID: H-2-131076 Logic: Y118

Remarks: _____

Location: _____

Actuation Method: operate MOV from MCSSensor Calibration: set switch to trip 50% from open☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): NOT OPEN	4	LCU2-7	17PriExh	group 127	
Hi (1): OPEN	7	<u>state 2</u>	<u>closed</u>	<u>NOT OPN</u>	
		<u>state 1</u>	<u>open</u>	<u>OPEN</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L.H. Lee Date: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 513

Tag: ZS_AZ_K1_1BB I/O Type: DI Description: FVHtrBINdprClsls
Cntlr: 17 Chan No: 11 P&ID: H-2-131076 Logic: Y118
Remarks: _____

Location: _____

Actuation Method: operate Mov from MCSSensor Calibration: set switch to trip 5% from closed

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI	Screen1	Screen2	Screen3
		LCU2-7	17PriExh	grp127	
Lo (0): NOT CLS	4	<u>state 1</u>	<u>open</u>	<u>NOT CLSD</u>	_____
Hi (1): CLOSED	7	<u>state 2</u>	<u>closed</u>	<u>CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____
Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L J LicoDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 514

Tag: ZS_AZ_K1_2AA I/O Type: DI Description: PVHtrAotDprOpnLS

Cntlr: 6 Chan No: 12 P&ID: H-2-131076 Logic: Y108

Remarks: _____

Location: _____

Actuation Method: OPERATOR OPENED AND CLOSED VALVE FROM
MICRO

Sensor Calibration:

☒ N/A per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

	Process State	Color	LOI LCU1-7	Screen1 17PriExh	Screen2 GROUP 122	Screen3
Lo (0):	NOT OPEN	4	<u>STATE 2</u>	<u>CLOSED</u>	<u>CLOSED</u>	_____
Hi (1):	OPEN	7	<u>STATE 1</u>	<u>OPEN</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Dory JohnDate: 6/10/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 515

Tag: ZS_AZ_K1_2AB I/O Type: DI Description: PVHtrAOtDprClsLS
Cntlr: 6 Chan No: 13 P&ID: H-2-131076 Logic: Y108
Remarks: _____

Location: _____

Actuation Method: OPERATOR OPENED AND CLOSED VALVE
FROM MICROWAVE

Sensor Calibration:

☒ N/A per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-7	Screen1 17PriExh	Screen2	Screen3
Lo (0): NOT CLS	4	<u>STATE1</u>	<u>OPEN</u>	<u>OPEN</u>	_____
Hi (1): CLOSED	7	<u>STATE2</u>	<u>CLOSED</u>	<u>CLOSED</u>	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Dany JakhDate: 6/10/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 516

Tag: ZS_AZ_K1_2BA I/O Type: DI Description: PVHtrBOTDprOpnLS

Cntlr: 17 Chan No: 12 P&ID: H-2-131076 Logic: Y119

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-7	Screen1 17PriExh	Screen2	Screen3
Lo (0): NOT OPEN	4	<u>STATE 2</u>	<u>OP-CLOSED</u>	_____	_____
Hi (1): OPEN	7	<u>STATE 1</u>	<u>OPEN</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Linker Date: 6/10/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 517

Tag: ZS_AZ_K1_2BB I/O Type: DI Description: PVHtrBotDprClsLS

Cntlr: 17 Chan No: 13 P&ID: H-2-131076 Logic: Y119

Remarks: _____

Location: _____

Actuation Method: _____

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-7	Screen1 17PriExh	Screen2	Screen3
Lo (0): NOT CLS	4	<u>STATE 1</u>	<u>NOT CLOSED</u>	_____	_____
Hi (1): CLOSED	7	<u>STATE 2</u>	<u>CLOSED</u> <u>STATE 1</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: DanyDate: 6/10/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 518

Tag: ZS_AZ_K1_3A I/O Type: DI Description: PVCsovrADprOpnLS

Cntlr: 6 Chan No: 7 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: open / close valve

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): NOT OPEN	4	LCV1-4 OFF	17PriExh Not open	_____	_____
Hi (1): OPEN	7	ON	open	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: M J Elns
Doug LuthDate: 6/10/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 519

Tag: MK-AZ-K1-3A

P&ID: H-2-131076

LOOP:

Manufacturer: KeystoneModel No.: 150-954-304-792-210Serial No: N/AMTE Instr. No: N/ADue Date: N/AInput Range functionalTolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. Zylinski / S. FitzgimmonsDate: 5-23-97Location: Vent bldg 'A' (X conn. damper)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) YN

Does system flow respond to damper repositioning? (fan on) YN

Do open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned? (fan off)

open - YN
closed - YN

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 520

Tag: ZS_AZ_K1_3B I/O Type: DI Description: PVCsovrBDprOpnLS

Cntlr: 17 Chan No: 7 P&ID: H-2-131076 Logic:

Remarks: _____

Location: _____

Actuation Method: open / close valve

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): NOT OPEN	4	<u>LCV2-9</u> <u>OFF</u>	<u>17PriExh</u> <u>Not open</u>	_____	_____
Hi (1): OPEN	7	<u>ON</u>	<u>open</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: M E EDate: 6/10/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 521

Tag: MK·AZ·K1·38

P&ID: H·2·131076

LOOP:

Manufacturer: Keystone Model No.: 150-954-304-792-210 Serial No: N/AMTE Instr. No: N/A Due Date: N/A

Input Range functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By:

P. J. Smith / J. FitzsimmonsDate: 5-23-97

Location:

Vent bldg. 'B' (X conn. damper)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) Y/NDoes system flow respond to damper repositioning? (fan on) Y/NDo open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned? (fan off)open - Y/Nclosed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 522

Tag: ZS_AZ_K15_1A1 I/O Type: DI Description: PVFanAInDprOpnLS

Cntlr: 6 Chan No: 21 P&ID: H-2-131076 Logic: Y110

Remarks: _____

Location: _____

Actuation Method: OPEN AND CLOSE FAN DAMPER AND VERIFY
DISPLAYS AND GROUPS READ PROPERLYSensor Calibration: VERIFY SWITCH READS ~~CLOSE~~ WITHIN 5% OF FULL OPEN.☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-9	Screen1 17PriExh	Screen2 GROUP 12g	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u> <u>NOT OPEN</u>	<u>NOT OPEN</u>	_____
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug SmithDate: 6/8/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 523

Tag: MK-AZ-K15-1A1

P&ID: H-2.131076

LOOP:

Manufacturer: Moniteur Devices Model No.: Sentinel Serial No.: 3331681MTE Instr. No.: N/A Due Date: N/A

Input Range functional

Tolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. J. Smith / S. Fitzgimmons Date: 5.23.97Location: Vent Bldg 'A' (1A1 DAMPER)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) Y/NDoes system flow respond to damper repositioning? (fan on) Y/NDo open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned?
(fan off) open - Y/N
closed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 524

Tag: ZS_AZ_K15_1A2 I/O Type: DI Description: PVFanAotDprOpnLS

Cntlr: 6 Chan No: 22 P&ID: H-2-131076 Logic: Y110

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE RAMPERSensor Calibration: N/A SWITCH ADJUSTED TO TRIP WITHIN 5% OF OPEN☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-9	Screen1 17PriExh	Screen2 Group 124	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u> <u>OPEN</u>	<u>NOT OPEN</u> <u>NOT OPEN</u>	_____
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug DukeDate: 6/2/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 525

Tag: MK-AZ-K15-1AZ

P&ID: H-2-131076

LOOP:

Manufacturer: Moniteur Devises Model No.: Sentinel Serial No: 3332447MTE Instr. No: N/A Due Date: N/AInput Range functionalTolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. J. Smith / S. J. Simmons Date: 5-23-97Location: Vent Bldg. 'A' (1AZ DAMPER)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) ☒ NDoes system flow respond to damper repositioning? (fan on) ☒ NDo open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned? (fan off)open - ☒ N
closed - ☒ N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

8/12/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 526

Tag: ZS_AZ_K15_1A3 I/O Type: DI Description: PVFanA VnsOpnLS

Cntlr: 6 Chan No: 23 P&ID: H-2-131076 Logic: Y110

Remarks: _____

Location: _____

Actuation Method: OPEN AND CLOSE DAMPERSensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-9	Screen1 17PriExh	Screen2	Screen3
Lo (0): CLOSED	4	<u>OFF</u>	<u>CLOSED(BLUE)</u>	_____	_____
Hi (1): NOT CLS	7	<u>ON</u>	<u>NOT CLOSED(DRINK)</u>	_____	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Danny Larkin Date: 8/30/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 527

Tag: ZS_AZ_K15_1B1 I/O Type: DI Description: FV Fan Bin Dpr Opn LS

Cntlr: 17 Chan No: 21 P&ID: H-2-131076 Logic: Y121

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPERSensor Calibration: N/A SWITCH ADJUSTED TO TRIP WITHIN 5% OF OPEN☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-9	Screen1 17PriExh	Screen2 GROUP 129	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u> <u>NOT OPEN</u>	<u>NOT OPEN</u>	_____
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Don HillDate: 6/2/96D.H.8/1/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 528

Tag: MK-AZ-K15-1B1

P&ID: H-2.131076

LOOP:

Manufacturer: Moniteur Devices Model No.: Sentinel Serial No: 3330859MTE Instr. No: N/A Due Date: N/AInput Range functionalTolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. Zylinski / S. Fitzginn Date: 5.23.97Location: Vent bldg 'B' (DAMPER 1B1)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) Y/NDoes system flow respond to damper repositioning? (fan on) Y/NDo open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned? (fan off) open - Y/N
closed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 529

Tag: ZS_AZ_K15_1B2 I/O Type: DI Description: PVFanBotDprOpnLS

Cntlr: 17 Chan No: 22 P&ID: H-2-131076 Logic: Y121

Remarks: _____

Location: _____

Actuation Method: OPEN + CLOSE DAMPERSensor Calibration: N/A SWITCH ADJUSTED TO TRIP WITHIN 5% OF OPEN☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-9	Screen1 17PriExh	Screen2 Group 129	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u>	<u>NOT OPEN</u>	_____
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Day Luke Date: 6/2/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 530

Tag: MK-AZ-K15-182

P&ID: H-2-131076

LOOP:

Manufacturer: Moniteur Devices Model No.: Sentinel Serial No.: 3332456MTE Instr. No.: N/A Due Date: N/AInput Range functionalTolerance N/A

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left

(signoff) Calibrated By: P. Zylinski / S. FitzgimmonsDate: 5.23.97Location: Vent bldg 'B' (DAMPER 182)

Comments

Does valve operate full stroke (open and closed) when operated with manual actuator; as indicated by local position indicator? (fan off) Y/NDoes system flow respond to damper repositioning? (fan on) Y/NDo open and closed limit switches actuate (indicated on MICON OP. SCREEN) when damper is repositioned? (fan off)open - Y/N
closed - Y/N

If any answer above is no, notify operations management and troubleshoot/repair per vendors manual, as required.

8/12/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 531

Tag: ZS_AZ_K15_1B3 I/O Type: DI Description: PVFanB VnsOpnLS

Cntlr: 17 Chan No: 23 P&ID: H-2-131076 Logic: Y121

Remarks: _____

Location: OPActuation Method: OPEN AND CLOSE PAMPENSensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-9	Screen1 17PriExh	Screen2	Screen3
Lo (0): CLOSED	4	<u>OFF</u>	<u>CLOSED (XVE)</u>		
Hi (1): NOT CLS	7	<u>ON</u>	<u>NOT CLOSED (XVAPVE)</u>		

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Doug LinkerDate: 8/30/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 532

Tag: ZS_AZ_K18_1AA I/O Type: DI Description: PVCdsrInDprOpnLS

Cntlr: 6 Chan No: 1 P&ID: H-2-131075 Sht. 3 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: OPENER VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: _____

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-2	Screen1 16PriCoo	Screen2 4700P/12	Screen3
Lo (0): NOT OPEN	4	OFF OFF	CLOSED BLUE	NOT OPE	_____
Hi (1): OPEN	7	ON ON	WHITE OPG	OPEN	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Dany HillDate: 2/2/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 533

Tag: ZS_AZ_K18_1AB I/O Type: DI Description: PVCdsrInDprClsLS

Cntlr: 6 Chan No: 2 P&ID: H-2-131075 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-2	Screen1 16PriCoo	Screen2 Group 112	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>PPV</u>	<u>NOT CLOSED</u>	_____
Hi (1): CLOSED	7	<u>ON</u>	<u>WHILE CLOSED</u>	<u>CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Gary Hink Date: 7/22/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 534

Tag: ZS_AZ_K18_1BA I/O Type: DI Description: FVCdsrOtDprOpnLS

Cntlr: 6 Chan No: 3 P&ID: H-2-131075 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: OPENED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-3	Screen1 16PriCoo	Screen2 Group 1B	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u>	<u>NOT OPEN</u>	
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: D. GubDate: 7/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 535

Tag: ZS_AZ_K18_1BB I/O Type: DI Description: PVCdsrOtDprClsLS

Cntlr: 6 Chan No: 4 P&ID: H-2-131075 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-3	Screen1 16PriCoo	Screen2 Grp113	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>OPEN</u>	<u>NOT CLOSED</u>	_____
Hi (1): CLOSED	7	<u>ON</u>	<u>CLOSED</u>	<u>CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. ShubDate: 7/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 536

Tag: ZS_AZ_K18_1CA I/O Type: DI Description: PvcdrByDprOpnLS

Cntlr: 6 Chan No: 5 P&ID: H-2-131075 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: OPENED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-2	Screen1 16PriCoo	Screen2	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u>	<u>GROUP 112</u> <u>NOT OPEN</u>	
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. J. H. Date: 7/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 537

Tag: 2S_AZ_K18_1CB I/O Type: DI Description: PVCdsrByDprClLS

Cntlr: 6 Chan No: 6 P&ID: H-2-131075 Logic: Y006

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-2	Screen1 16PriCoo	Screen2	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>open</u>	<u>Gas up 1/2</u> <u>STEP NOT CLOSED</u> <u>NOT CLOSED</u>	
Hi (1): CLOSED	7	<u>ON</u>	<u>CLOSED</u>	<u>CLOSED</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: D. L. M.Date: 7/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 538

Tag: ZS_AZ_K19_1AA I/O Type: DI Description: PVHemeInDprOpnLS

Cntlr: 17 Chan No: 1 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: OPENED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-2	Screen1 16PriCoo	Screen2	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>NOT OPEN</u> <u>CHS200</u>	<u>6000115</u> <u>NOT OPEN</u> <u>600500</u>	_____
Hi (1): OPEN	7	<u>ON</u>	<u>WHITE</u>	<u>OPEN</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: OK Date: 3/28/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 539

Tag: ZS_AZ_K19_1AB I/O Type: DI Description: PVHemeInDprClsLS

Cntlr: 17 Chan No: 2 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-2	Screen1 16PriCoo	Screen2	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>OPEN</u>	<u>GROUP 15</u> <u>NOT CLOSED</u>	<u>NOT CLOSED</u>
Hi (1): CLOSED	7	<u>ON</u>	<u>CLOSED</u>	<u>CLOSED</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. J. [Signature] Date: 3/28/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 540

Tag: ZS_AZ_K19_1BA I/O Type: DI Description: PVHemeOtDprOpnLS

Cntlr: 17 Chan No: 3 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: OPENED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-3	Screen1 16PriCoo	Screen2 Group 1155	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLASCO</u>	<u>LCU2-3</u>	<u>LCU2-3</u>
Hi (1): OPEN	7	<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	<u>OPEN</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. L. L. Date: 3/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 541

Tag: ZS_AZ_K19_1BB I/O Type: DI Description: PVHemeOtDprClsLS

Cntlr: 17 Chan No: 4 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-3	Screen1 16PriCoo	Screen2 4noOp 116	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>OPER</u> <u>NOT CLS</u>	<u>NOT CLS</u>	_____
Hi (1): CLOSED	7	<u>ON</u>	<u>CLOSED</u>	<u>CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual):

Hi: 0 _____

Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. Hub Date: 3/28/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 542

Tag: ZS_AZ_K19_1CA I/O Type: DI Description: PVHemeByDprOpnLS

Cntlr: 17 Chan No: 5 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: OPENED VALVESensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): NOT OPEN	4	<u>LCV2-2</u>	<u>16PriCoo</u>	<u>Group 125</u>	
Hi (1): OPEN	7	<u>OFF</u>	<u>CLOSED</u>	<u>NOT OPEN</u>	
		<u>ON</u>	<u>OPEN</u>	<u>OPEN</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: D. L. L.Date: 7/23/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 543

Tag: ZS_AZ_K19_1CB I/O Type: DI Description: PVHemeByDprClsLS

Cntlr: 17 Chan No: 6 P&ID: H-2-131075 Logic: Y017

Remarks: _____

Location: _____

Actuation Method: CLOSED VALVESensor Calibration: CLOSED N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-2	Screen1 16PriCoo	Screen2 Group 115	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>OPER</u>	<u>NOT CLOSED</u>	
Hi (1): CLOSED	7	<u>ON</u>	<u>CLOSED</u>	<u>CLOSED</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: D. J. [Signature] Date: 7/23/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 544

Tag: FI_AZ_K1_1 I/O Type: AI Description: PvStac MonFlow

Cntlr: 14 Chan No: 5 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source

Sensor Calibration:

☒ 5 pt calper procedure VI (data attached) PCB
(signoff)Loop Tolerance: $2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + \text{(other)}^2 + \text{(DCS)}^2}$

Units: CFM

Process Input	Readout Tolerance	LOI LCU2-13	Screen1 18PriMon	Screen2 group 142	Screen3 07M-in
Lo: 0.00	-.04 - .04	<u>0.00</u>	<u>0.0</u>	<u>0.00</u>	<u>alarm</u>
Hi: 2.00	1.96 - 2.04	<u>2.00</u>	<u>2.0</u>	<u>2.00</u>	<u>no alarm</u>

Annunciator(s)	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	2	.30	.26 - .34	<u>.29 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

817-63-02-002 6/14/97817-45-08-044 11/8/96MTE Instr. No: 817-28-09-003 Due Date: 01/12/97

(signoff)

Loop Complete:

PC Barrow
Doug J. Barrow

Date:

7/24/96

Tag: FIT-AZ KI-1

P&ID: HZ-131078(SH1)

HNF-SD-W030-TD-002,
REV. 0, PAGE 545Manufacturer: AMC Model No.: MASSTRON Serial No.: 6769-DMTE Instr. No.: 817-63-02-016
817-45-08-062
817-35-40-046 Due Date: 6-14-97
12-30-97
1-15-98

Input Range	0-200°F (93.04 - 135.97A)	DISPLAY - 2%				
	0-2.5 SCFM (0 - .5726 in. w.c.)	Tolerance OUTPUT - .5%				
Units:	°F SCFM					
Input (in.w.c)	Output (scfm) (V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	00.00	0.000	-.04 (-.025)	.04 (.025)	* N/A * (N/A)	* N/A 00.00 (0.000)
003.57	00.50	1.250	.46 (1.225)	.54 (1.275)	()	00.50 (1.242)
0.1431	01.00	2.500	.96 (2.475)	1.04 (2.525)	()	01.00 (2.495)
0.3221	01.50	3.750	1.46 (3.725)	1.54 (3.775)	()	01.50 (3.750)
0.5726	02.00	5.000	1.96 (4.975)	2.04 (5.025)	()	02.00 (5.009)

(signoff) Calibrated By: Paul M. ZylinskiDate: 1/31/97Location: Main stack Beta - Gamma sample (ENCL AZKI-1)

Comments * initial setup, generate 2 tables, one for today's barometric pressure, (compensated inputs), and one for 20.00" Hg, 200°F (uncompensated inputs)

input (in)	output (°F) (V)	Lo	Hi	As found	Input	As left
93.04	0	(0.000)	-4 (-0.025)	4 (.025)	* N/A * (N/A)	* N/A 00.00 (0.000)
103.90	50	(1.250)	.46 (1.225)	.54 (1.275)	()	00.50 (1.243)
114.68	100	(2.500)	.96 (2.475)	1.04 (2.525)	()	01.00 (2.499)
125.38	150	(3.750)	1.46 (3.725)	1.54 (3.775)	()	01.50 (3.749)
135.97	200	(5.000)	1.96 (4.975)	2.04 (5.025)	()	02.00 (5.000)

Tag: FIT-AZK1-1
FIT-AZ708K3-1P&ID: H2-131078 (SH1)
H2-131081 (SH-1) ^{7.24.96} LOOP:Manufacturer: AMC Model No.: MASSTRON Serial No: 6830 ^{7.24.96}MTE Instr. No: 817.28-09-003 Due Date: 1.12.97
817.63.02-002 6.14.97
817.45.08-044 11.8.96Input Range 0-150°F (93.04-125.38 °C) Tolerance DISPLAY - 2%
0-2 SCFM (0-.5257 in. w.c.) OUTPUT - .5%
Units: ^{°F}
SCFM

Input (in. w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00	(0.00)	<u>-.04 (1.025)</u>	<u>.04 (1.025)</u>	* N/A	* N/A	0.00 (0.00)
0.0328	0.50	(1.25)	<u>.46 (1.225)</u>	<u>.54 (1.275)</u>	()	()	0.50 (1.26)
0.1314	1.00	(2.50)	<u>.96 (2.475)</u>	<u>1.04 (2.525)</u>	()	()	1.00 (2.53)
0.2957	1.50	(3.75)	<u>1.46 (3.725)</u>	<u>1.54 (3.775)</u>	()	()	1.51 (3.76)
0.5257	2.00	(5.00)	<u>1.96 (4.975)</u>	<u>2.04 (5.025)</u>	()	()	1.98 (5.00)

(signoff) Calibrated By: [Signature] Date: 7.24.96Location: Main Stack Beta - Gamma sample (ENCL AZK1-1)
7.24.96 ^{7.24.96}

Comments * initial setup.

1017

----- Air Monitor Corp. Transmitter Span Calculation Data Sheet

D. No.: 22283

Name: WO-30 EXHAUST DUCT

Location: RECORD SAMPLE MASSTRON

Model: LO-FLO

Orifice Diameter: 0.370

-----Conditions-----

Actual Bar. Press: 29.190 in/hg

Actual Temp.F.: 200

Std. Temp.F.: 69

H2O: 0.00 %

Process Fluid: AIR

Duct Static: 0.000 in/wc

Differential Pressure: 0.5721 in/wc

Actual Den.: .05860 lb/cuft

Date: 01/31/97 10:40:06

Std. Den.: .07494 lb/cuft

%FLOW	DP(in/wc)	MADC	ACFM	SCFM	LB/HR
0	0.0000	4.00	0.00	0.00	0.00
5	0.0014	4.80	0.12	0.10	0.45
10	0.0057	5.60	0.25	0.20	0.90
15	0.0128	6.40	0.38	0.30	1.35
20	0.0228	7.20	0.51	0.40	1.80
25	0.0357	8.00	0.63	0.50	2.25
30	0.0514	8.80	0.76	0.60	2.70
35	0.0700	9.60	0.89	0.70	3.15
40	0.0915	10.40	1.02	0.80	3.60
45	0.1158	11.20	1.15	0.90	4.05
50	0.1430	12.00	1.27	1.00	4.50
55	0.1730	12.80	1.40	1.10	4.95
60	0.2059	13.60	1.53	1.20	5.40
65	0.2417	14.40	1.66	1.30	5.85
70	0.2803	15.20	1.79	1.40	6.30
75	0.3218	16.00	1.91	1.50	6.75
80	0.3661	16.80	2.04	1.60	7.20
85	0.4133	17.60	2.17	1.70	7.65
90	0.4633	18.40	2.30	1.80	8.10
95	0.5163	19.20	2.43	1.90	8.55
100	0.5720	20.00	2.55	2.00	9.00

Full scale lbs/hr = (SPAN FLOW) × (STD DENSITY) × (60)

Data generated for today's barometric pressure at ETF(1.31.97)

Note: Use full scale lbs/hr to obtain SCFM when generating this form.

FIT-AZKI-1

SERIAL # 6769D

STEP DESCRIPTION		INPUT	AS FOUND	TOLERANCE	AS LEFT
DIFFERENTIAL PRESSURE -at TP1(+) and TP0(com)	zero	zero inches w.c. diff. pressure		0Vdc, +/- 6.25 mVdc	0.00002 Vdc
<i>pressure uncompensated (from table for 20"Hg, 200°F)</i>	span	full scale span pressure 0.8349	$\frac{2}{N/A}$	1.25Vdc, +/- 6.25 mVdc	1.2502 Vdc
TEMPERATURE TRANSMITTER BOARD -at yellow TP4(+) and ground (green)	zero	93.04Ω		0Vdc, +/- 1.07 mVdc	.0002 Vdc
	span	135.97Ω	Limit	214.3 mV, +/- 1.07 mVdc	214.3 mVdc
-at 9A(+) and 10A(com)	zero	93.04Ω	Set	0Vdc, +/- 25 mVdc	.0002 Vdc
	span	135.97Ω	Set	V, +/- 25 mVdc	5.000 Vdc
COMPENSATED TRANSMITTER OUTPUT -at 1A(+) and 2A(com)	zero	135.97Ω & zero IN w.c. diff. pressure		0Vdc, +/- 25 mVdc	.0000 Vdc
	span	135.97Ω and calculated value .5726	$\frac{2}{N/A}$	5Vdc, +/- 25 mVdc	5.000 Vdc
DISPLAY -at 1A(+) and 2A(com)	zero/ ch-1	93.04Ω & zero IN w.c. diff. pressure		0000 SCFM ± .04 SCFM	0000 SCFM
	zero/ ch-2	93.04Ω & zero IN w.c. diff. pressure	$\frac{2}{N/A}$	0000 SFPM ± 40 SFPM	0000 SFPM
	zero/ ch-3	93.04Ω & zero IN w.c. diff. pressure		0°F ± 4°F	0000 °F
	span/ ch-1	135.97Ω & .5726 w.c. diff. pressure	$\frac{2}{N/A}$	02.00 SCFM ± .04 SCFM	02.00 SCFM
	span/ ch-2	135.97Ω & .5726 w.c. diff. pressure	$\frac{2}{N/A}$	2017 SFPM ± 40 SFPM	2017 SFPM
	span/ ch-3	135.97Ω & .5726 w.c. diff. pressure		0200 °F ± 4°F	0200 °F

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 549

Tag: FI_AZ_K1_2 I/O Type: AI Description: PvStac RecFlow

Cntlr: 14 Chan No: 6 P&ID: H-2-131078 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) PCB
☐ _____ (signoff)

 Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0\%)^2 + (0.2\%)^2}$

Units: CFM

Process Input	Readout Tolerance	LOI LCU2-13	Screen1 18PriMon	Screen2 group 142	Screen3 07Main
Lo: 0.00	-.04 - .04	<u>0.00</u>	<u>0.0</u>	<u>0.00</u>	<u>alarm</u>
Hi: 2.00	1.96 - 2.04	<u>2.00</u>	<u>2.0</u>	<u>2.00</u>	<u>no-alarm</u>

Annunciator(s)	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	_____
HiHi:	0	99999.99	-	_____
Hi:	0	99999.99	-	_____
Lo:	2	.30	.26 - .34	<u>30 yellow</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

817-63-02-002 6/14/97
817-45-08-44 11/8/96
MTE Instr. No: 817-28-09-003 Due Date: 1/12/97

(signoff)

Loop Complete:

PC Barrows
Doug Lab
Date: 7/24/96

Tag: FIT-AZKI-2

PID: H2-131078, SH1

Loop: H2-131309, SH 19

Manufacturer: AMC Model No.: MASSTRON Serial No.: 6758D

MTE Instr. No.: 817-13-02-016 Due Date: 6-14-97
817-45-08-062 12-30-97
817-38-40-046 1-15-98

Input Range		0-200°F (93.04-135.97)		Tolerance		2% - DISPLAY	
Units:		°F		0-2 SCFH (0-0.5620 in. w.c)		.5% - OUTPUT	
Input (h.w.c)		Output (SCFH) (V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	00.00	(0.000)	-0.04 (-0.25)	0.04 (.025)	* N/A	* N/A	00.00 (0.000)
0.0357	00.50	(1.250)	.46 (1.225)	.54 (1.275)	()	()	00.50 (1.248)
0.1430	01.00	(2.500)	.96 (2.475)	1.04 (2.525)	()	()	01.00 (2.498)
0.3218	01.50	(3.750)	1.46 (3.725)	1.54 (3.775)	()	()	01.50 (3.750)
0.5720	02.00	(5.000)	1.96 (4.975)	2.04 (5.025)	↓ ()	↓ ()	02.00 (5.000)

(signoff) Calibrated By: Paul M. Zylinski Date: 1-31-97

Location: Main Stack Record Sample

Comments * initial setup, generate 2 tables, one for today's barometric pressure (compensated inputs), and one for 20.00" Hg, 200°F (uncompensated inputs)

input (in.)	output (°F) (V)	Lo	Hi	As found	In/out	As left
93.04	0 (0.000)	-4 (-0.25)	4 (.025)	* N/A	* (N/A)	N/A 00 00 (.000)
103.90	50 (1.250)	46 (1.225)	54 (1.275)	()	()	00 50 (1.239)
114.68	100 (2.500)	96 (2.475)	104 (2.525)	()	()	01 00 (2.495)
125.38	150 (3.750)	146 (3.725)	154 (3.775)	()	()	01 50 (3.742)
135.97	200 (5.000)	196 (4.975)	204 (5.025)	↓ ()	↓ ()	02 00 (5.000)

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 551

Tag: FIT-AZKI-2 H2-131078(SH1)
FIT-AZ702K3-2 P&ID: H2-13108(SH1) 7-24-96 LOW.

Manufacturer: AMC Model No.: MASTRON Serial No: 6758D
68297-13 7-24-96

MTE Instr. No: 817-28-09-003 1-12-97
817-63-02-002 6-14-97
817-45-08-044 11-8-96

Input Range 0-150°F (93.04-125.38 n) Tolerance 2% - DISPLAY
0-2 SCFM (0-.5257 in. w.c.) .5% - OUTPUT

Units: °F
SCFM

Input(In. w.c.)	Output(SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00	(0.00)	<u>-.04 (.025)</u>	<u>.04 (.025)</u>	<u>* N/A</u>	<u>(N/A)</u>	<u>* N/A</u>
0.0328	0.50	(1.25)	<u>.46 (.1225)</u>	<u>.54 (.1275)</u>	<u>1</u>	<u>(1)</u>	<u>0.50 (.1250)</u>
0.1314	1.00	(2.50)	<u>.96 (.2475)</u>	<u>1.04 (.2525)</u>	<u>1</u>	<u>(1)</u>	<u>1.01 (.2520)</u>
0.2957	1.50	(3.75)	<u>1.46 (.3725)</u>	<u>1.54 (.3775)</u>	<u>1</u>	<u>(1)</u>	<u>1.51 (.3770)</u>
0.5257	2.00	(5.00)	<u>1.96 (.4975)</u>	<u>2.04 (.5025)</u>	<u>↓</u>	<u>(↓)</u>	<u>2.00 (.5000)</u>

(signoff)Calibrated By:

Date: 7-24-96

Location:

MainAZKI-1Bldg. Stack Record Sample (ENCL AZ702K3-1)Aug 7/24-96Aug 7/24-96

Comments

* initial setup

FCB
11/31/97

CURRENT MEASURED AT TERMINAL 4(+) OF SIGNAL ISOLATOR

FY-REK-1

INPUT/OUTPUT REQUIREMENTS					RECORDED DATA		
CK PT	SPECIFIED		LIMIT OF TOL		AS FOUND VALUE 7.7 & (7.9)	TOL IN/OUT	AS LEFT VALUE 7.12
	INPUT	OUTPUT	MINUS (-)	PLUS (+)			
	Vdc	mA	mA	mA	mA	I/O	mA
1	0.0	4.0	3.9	4.1	4.00	I	4.00
2	1.5 5.0 1.25	8.0 20.0	7.9 19.9	8.1 20.1	8.00	I	8.00
3	2.5 3.0	12.0	11.9	12.1	12.00	I	12.00
4	3.75	16.0	15.9	16.1	16.00	I	16.00
5	5.0	20.0	19.9	20.1	19.99	I	19.99

CURRENT MEASURED AT TERMINAL 4(+) OF SIGNAL ISOLATOR

FY-AZK1-2

INPUT/OUTPUT REQUIREMENTS					RECORDED DATA		
CK PT	SPECIFIED		LIMIT OF TOL		AS FOUND VALUE 7.7 & (7.9)	TOL IN/OUT	AS LEFT VALUE 7.12
	INPUT	OUTPUT	MINUS (-)	PLUS (+)			
	Vdc	mA	mA	mA	mA	I/O	mA
1	0.0	4.0	3.9	4.1	3.99	I	3.99
2	5.0 1.25	20.0 8.0	19.9 7.9	20.1 8.1	7.99	I	7.99
3	2.5	12.0	11.9	12.1	12.0	I	12.0
4	3.75	16.0	15.9	16.1	16.0	I	16.0
5	5.0	20.0	19.9	20.1	20.0	I	20.0

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 554

Tag: PDI-AY101K103-1

P&ID: H-2-131075, SH 1

LOOP:

Manufacturer: Dwyer Model No.: 2001C Serial No: R941012MTE Instr. No: 817-35-40-026 Due Date: 8-9-97

Input Range 0 to 1

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	<u>-.02</u>	<u>.02</u>	<u>.02</u>	<u>In</u>	<u>0.0</u>
.25	.25	<u>.23</u>	<u>.27</u>	<u>.26</u>	<u>In</u>	<u>.24</u>
.50	.50	<u>.48</u>	<u>.52</u>	<u>.51</u>	<u>In</u>	<u>.49</u>
.75	.75	<u>.73</u>	<u>.77</u>	<u>.76</u>	<u>In</u>	<u>.74</u>
1.00	1.00	<u>.98</u>	<u>1.02</u>	<u>1.01</u>	<u>In</u>	<u>.99</u>

(signoff) Calibrated By: R. Wilmoth C. Page Date: 7-16-97Location: 101 AY Air Inlet Filter

Comments

IMP. ID: PDI-AY101K103-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2001

SERIAL: ZE 000 689

TEST EQUIP: 817-35-40-021

DUG DATE: 5-17-96

INPUT RANGE 0-1 in Wg.

TOLERANCE $\pm 2.0\%$

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	LO	HI	AS FOUND	IN/out	AS LEFT
0.00	0.00	-0.02	+0.02	0.00	IN	0.00
0.50	0.50	+0.48	+0.52	0.49	IN	0.49
1.00	1.00	+0.98	+1.02	<u>+0.90</u> 0.99	SF IN 2-16-96	<u>+0.90</u> 0.99

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AY101K1 AIR INLET STATION PRE-FILTER

VOID
7-16-97
RHO

7/23/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 556

Tag: PDI-AY101K104-1

P&ID: H-2-131075, SH 1

LOOP:

Manufacturer: DWYER

Model No.: 2010C

Serial No: R970501MTE Instr. No: 817-35-40-026 Due Date: 8-9-97

Input Range 0 to 10

Tolerance 2.00 %

Units: IN WC

Input	Output	+/- 0.20		As Found	In/Out	As Left
		Lo:	Hi:			
0	0.00	-0.20	0.20	* <u>N/A</u>	* <u>N/A</u>	<u>0.0</u>
2.5	2.50	<u>2.30</u>	<u>2.70</u>	↓	↓	<u>2.55</u>
5	5.00	<u>4.80</u>	<u>5.20</u>			<u>5.00</u>
7.5	7.50	<u>7.30</u>	<u>7.70</u>			<u>7.55</u>
10	10.00	<u>9.80</u>	<u>10.20</u>	↓	↓	<u>10.10</u>

(signoff)Calibrated By: P. J. Linski / G. FrayserDate: 7-24-97

Location: AI STA AY101K1

Comments * New (REPLACEMENT) INSTRUMENT

CALIBRATE PER PROCEDURE 6-TF-511

OMP. ID: PDI-AY101K104-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2010C
SERIAL: 2E 000 690

TEST EQUIP: 817-35-40-021

DUE DATE: 5-17-96

INPUT RANGE: 0-10 in WG

TOLERANCE $\pm$ 2.0%

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	LO	HI	AS FOUND	IN/OUT	AS LEFT
0.00	0.00	-0.2	+0.2	0.00	IN	0.00
5.00	5.00	+4.8	+5.2	5.10	IN	5.10
10.00	10.00	+9.8	+10.2	10.00	IN	10.00

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AY101K1 AIR INLET STATION HEPA FILTER

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 558

Tag: PDI-AY102K103-1

P&ID: H-2-131075, SH 1

LOOP:

Manufacturer: Dwyer Model No.: 2001C Serial No: R941206MTE Instr. No: 817-35-40-026 Due Date: 8-9-97

Input Range 0 to 1

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-.02	.02	.03	Out	0.0
.25	.25	.23	.27	.28	Out	.25
.50	.50	.48	.52	.52	In	.50
.75	.75	.73	.77	.78	Out	.75
1.0	1.0	.98	1.02	1.02	In	.99

(signoff) Calibrated By: R. Wilmoth C. Kruger Date: 7-16-97Location: 102 AY Air Inlet Filter

Comments

PDI-AY102K102-1

OMP. ID: PE

MANUF: Dwyer
(Magnehelic)

MODGL: 2001
SERIAL: RE 000 691

TEST Equip: 817-35-40-021

DUE DATE: 5-17-96

INPUT RANGE 0-1" H₂O

TOLERANCE $\pm 2.0\%$

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	LO	HI	AS FOUND	IN/OUT	AS LEFT
0.0	0.0	-0.02	+0.02	0.00 SF. 0.02	2N	0.00
0.5	0.5	+0.48	+0.52	2N 0.502	2N	0.50
1.0	1.0	+0.98	+1.02	1.00 1.01	SF. 2N 2-16-96	1.00 1.01

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AY102K1 AIR INLET STATION PRE-FILTER

-VOID-
7-16-97
RXW

7/15/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 560

Tag: PDI-AY102K104-1

P&ID: H-2-131075, SH 1

LOOP:

Manufacturer: Dwyer Model No.: 2010 C Serial No: R941130MTE Instr. No: 817-35-40-026 Due Date: 8-9-97

Input Range 0 to 10		Tolerance 2%				
Units: IN WC						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	0.2	0.2	.2	In	.2
2.5	2.5	2.3	2.7	2.6	In	2.6
5	5	4.8	5.2	4.9	In	4.9
7.5	7.5	7.3	7.7	7.4	In	7.4
10	10	9.8	10.2	9.9	In	9.9

(signoff) Calibrated By: R. W. Imoth C. F. Jones Date: 7-16-97Location: 102 144 Air Inlet Filter

Comments

OMP ID: PDI-AY102K104-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2010C
SERIAL: 2F 000 692

TEST EQUIP: 817-35-40-021

DUE DATE: 5-17-96

INPUT RANGE 0-10 in Wg

TOLERANCE $\pm$ 2.0%

PROCEDURE: PSCP-4-006

	INPUT	OUTPUT	L0	H1	AS FOUND	IN/OUT	AS LEFT
	0.0	0.0	-0.2	+0.2	0.00	2N	0.00
SF	5.00	5.00	+4.80	+5.20	5.00	2N	5.00
10/96	<u>6.50</u>	<u>6.50</u>					
	10.00	10.00	+9.8	+10.2	9.90	2N	9.90

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AY102K1 AIR INLET STATION HEPA FILTER

-VOID-
7-16-97
RAN

7/15/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 562

Tag: PDI-AZ101K103-1

P&ID: H-2-131075. SH 2

LOOP:

Manufacturer:

Dwyer

Model No.:

2001C

Serial No:

R194#1209

MTE Instr. No:

817-35-40-026

Due Date:

8-9-97

Input Range 0 to 1

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0.0	0.0	-0.02	0.02	-0.00"	In	-0.01
.25	.25	.23	.27	.25	In	.24
.50	.50	.48	.52	.52	In	.50
.75	.75	.73	.77	.79	Out	.75
1.0	1.0	.98	1.02	1.04	Out	1.0

(signoff) Calibrated By:

R. Wilmoth G. King

Date:

7-16-97

Location:

101 A2 Inlet Filter bank

Comments

MP. ID: PDI-AZ101K103-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2001
SERIAL: 2E 000695

TEST EQUIP: 817-35-40-021

DUG DATE: 5-17-96

INPUT RANGE 0-1 in WG

TOLERANCE $\pm 2.0\%$

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	L0	H1	AS FOUND	IN/OUT	AS LEFT
0.00	0.00	-0.02	+0.02	0.00	DN	0.00
0.50	0.50	+0.48	+0.52	0.51	DN	0.51
1.00	1.00	+0.98	+1.02	1.00 1.01	$\textcircled{SF}$ DN 24/96	1.01

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AZ101K1 AIR INLET STATION PRE-FILTER

-VOID-
7-16-97
RHW

7/15/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 564

Tag: PDI-AZ101K104-1

P&ID: H-2-131075, SH 2

LOOP:

Manufacturer:

Dwyer

Model No.:

2010C

Serial No:

R94/201

MTE Instr. No:

817-35-40-026

Due Date:

8-9-97

Input Range 0 to 10

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-0.2	0.2	0.2	In	0
2.5	2.5	2.3	2.7	2.7	In	2.6
5.0	5.0	4.8	5.2	5.2	In	5.0
7.5	7.5	7.3	7.7	7.7	In	7.5
10.0	10.0	9.8	10.2	10.2	In	10.0

(signoff) Calibrated By:

R. W. Imoth A. J. Jager

Date:

7-16-97

Location:

101 A1 Inlet FilterAS 7-16-97

Comments

MP. ID: PDI-AZ101K104-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2010C
SERIAL: 2E 000 696

TEST EQUIP: 817-35-20-021

DUE DATE: 5-17-96

INPUT RANGE 0-10 in WG

TOLERANCE $\pm$ 2.0%

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	LO	HI	AS FOUND	IN/OUT	AS LEFT
0.00	0.00	-0.2	+0.2	0.00	IN	0.00
5.00	5.00	+4.8	+5.2	5.10	IN	5.10
10.00	10.00	+9.8	+10.2	10.00	IN	10.00

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AZ101K1 AIR INLET STATION HEPA FILTER

-VOID-
7-16-97
RXW

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 566

Tag: PDI-AZ102K103-1

P&ID: H-2-131075, SH 2

LOOP:

Manufacturer: Dwyer Model No.: 2001C Serial No.: 2941012MTE Instr. No: 817-35-40-026 Due Date: 8-9-97

Input Range 0 to 1

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	<u>-.02</u>	<u>.02</u>	<u>.02</u>	<u>In</u>	<u>-.01</u>
<u>.25</u>	<u>.25</u>	<u>.23</u>	<u>.27</u>	<u>.26</u>	<u>In</u>	<u>.25</u>
<u>.50</u>	<u>.50</u>	<u>.48</u>	<u>.52</u>	<u>.54</u>	<u>Out</u>	<u>.50</u>
<u>.75</u>	<u>.75</u>	<u>.73</u>	<u>.77</u>	<u>.79</u>	<u>Out</u>	<u>.77</u>
<u>1.0</u>	<u>1.0</u>	<u>.98</u>	<u>1.02</u>	<u>1.03</u>	<u>Out</u>	<u>1.01</u>

(signoff) Calibrated By: B. Wilmoth A. Jure Date: 7-16-97Location: 102 AZ Air Inlet
Intake Filter

Comments

OMP. ID: PDI-AZ102K103-1

MANUF: Dwyer
(Magnehelic)

MODEL: 2001
SERIAL: 2E 000 693

TEST EQUIP: 817-35-40-021

DUE DATE: 5-17-96

INPUT RANGE 0-11.1WG

TOLERANCE $\pm 2.0\%$

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	LO	HI	AS FOUND	IN/OUT	AS LEFT
0.00	0.00	-0.02	+0.02	0.00	IN	0.00
0.50	0.50	+0.48	+0.52	0.51	IN	0.50
1.00	1.00	+0.98	+1.02	1.10 1.01	SF. IN 2-16-96	1.10 1.01

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AZ102K1 AIR INLET STATION PRE-FILTER

-VOID-
7-16-97
RXW

7/15/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-002,
REV. 0, PAGE 568

Tag: PDI-AZ102K104-1

P&ID: H-2-131075. SH 2

LOOP:

Manufacturer:

Dwyer

Model No.:

2010C

Serial No:

R941130

MTE Instr. No:

817-35-46-026

Due Date:

8-9-97

Input Range 0 to 10

Tolerance 2%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-0.2	0.2	0	In	0
2.5	2.5	2.3	2.7	2.6	In	2.6
5.0	5.0	4.8	5.2	5.1	In	5.1
7.5	7.5	7.3	7.7	7.6	In	7.6
10.0	10.0	9.8	10.2	9.9	In	9.9

(signoff) Calibrated By:

R. Wilmoth R. Kruger

Date:

7-16-97

Location:

102 1A2 Air Inlet Filter

Comments

P. ID: PDI-AZ102K104-1

MANUF: Dwyer
(Magnehectic)

MODEL: 2D10L
SERIAL: 2E 000 694

TEST EQUIP: 817-35-40-021

DUE DATE: 5-17-96

INPUT RANGE 0-10 in WG

TOLERANCE $\pm 2\%$

PROCEDURE: PSCP-4-006

INPUT	OUTPUT	L ₀	H ₁	AS FOUND	IN/OUT	AS LEFT
0.00	0.00	± 0.2	± 0.2	0.00	IN	0.00
5.00	5.00	± 4.8	± 5.2	5.00	IN	5.00
10.00	10.00	± 9.8	± 10.2	9.90	IN	9.90

SF
2/10/97

CALIBRATED BY: Fitzsimmons

DATE: 2-16-96

LOCATION: AZ102K1 AIR INLET STATION HEPA FILTER

-VOID-
11-16-97
RHW