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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 622922

2. To: (Receiving Organization) W-030 TEST REVIEW BOARD		3. From: (Originating Organization) DISPOSAL PROJECTS		4. Related EDT No.: 616340	
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 Ventilation Bldg. HVAC System. Project W-030 provides the AY/AZ tank farms ventilation upgrade.				9. Equip./Component No.: NA	
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No				10. System/Bldg./Facility: AY/AZ Tank Farms	
				12. Major Assm. Dwg. No.: NA	
				13. Permit/Permit Application No.: NA	
14. Required Response Date: Immediate					
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
1	HNF-SD-W030-TD- 007	-	0	W030 AY/AZ TANK FARM PREOP. TEST, VENT BLDG VENT SYSTEMS	Q
16. KEY					
Approval Designator (F) E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)		Reason for Transmittal (G) 1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)		Disposition (H) & (I) 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
2	1	Design Authority	<i>W.M. Harty</i>	10/30/97	55-13
-	---	Design Agent	NA		
2	1	Cog.Eng.	DB Cole	10/30/97	83-53
2	1	Cog. Mgr.	KA Colos	10/31/97	83-55
2	1	QA	HM Chafin	10/31/97	83-55
3	---	Safety	SU Zaman	-----	
18. Signature of EDT Originator <i>W.M. Harty</i>		19. Authorized Representative Date for Receiving Organization <i>KA Colos</i>		20. Design Authority/ Cognizant Manager <i>W.M. Harty</i>	
Date 10/30/97		Date 10/31/97		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	

PREOPERATIONAL TEST REPORT, VENT BUILDING VENTILATION SYSTEM

FT CLIFTON

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

EDT/ECN: 622922 UC: 2030
Org Code: 8C473 Charge Code: NH107
B&R Code: EW3130010 Total Pages: 504

Key Words: TEST, COOLING, VENTILATION, UPGRADE, HVAC

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

The system provides Heating, Ventilation, and Air Conditioning (HVAC) for the W-030 Ventilation Building. 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
VENT BUILDING VENTILATION SYSTEM

ATTACHMENTS

Attachment 1 - Test Report Checklist.

Attachment 2 - Copy of original test procedure with recorded data, including its Attachments-A through -M, described below.

Attachment 3 - Miscellaneous Supporting Data, including:

Engineering Change Notices (ECNs);
Fan Vibration Report
List of Certified Vendor Information

Attachment 4 - Calibration, Grooming, and Alignment (CGA) Plan and data

REFERENCES

1. HNF-SD-W030-POTP-007/2A	<i>Preoperational Test Procedure, W-030 Vent Building Ventilation System</i>
2. WHC-SD-W030-SUP-003/0	<i>Startup Test Plan, W-030</i>
3. H-2-131073, Rev. 1	<i>P&ID AZ702, Vent Bldg Vent System</i>
4. H-2-131077, Rev. 1	<i>P&ID K1, Vent Bldg Vent System</i>
5. H-2-131081, Rev. 1	<i>P&ID K1, Vent Bldg Vent System</i>

INTRODUCTION

Preoperational Test HNF-SD-W030-POTP-007 was successfully completed in October 1997 in accordance with reference-1. Testing actually began in March 1997 under an earlier version of the procedure.

The tested system (AZ702) includes the W-030 Ventilation Building air-conditioning unit, the distribution supply and exhaust ducting, room exhaust HEPA filters, exhaust control valves and dampers, two parallel redundant Air Cleanup Trains (with fans and filters), and the exhaust stack monitor. In Attachments A-I (of Attachment-2), tests verified correct operation of the AZ702 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.

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. Performance data was collected primarily for information only, with minimal acceptance criteria. The AZ702 System operates as designed, and all

components tested by this procedure operate satisfactorily. A total of five test exceptions were noted and resolved during testing; approved resolutions are documented in Attachments-L&M.

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-007 under EDT-616340, underwent several revisions during testing; in chronological order, see ECN-613151, 613152, 613163, 613164, 640743, & 640745; a copy of each ECN (page-1 only) is included in Attachment-3. All revisions were incorporated into the implemented procedure and accomplished. ECN-640743 is a complete re-write, resulting in revision-2. ECN-640745 revised certain pages of Attachment-I; only the revised pages were added to the procedure for testing and are identified as revision-2A. Since testing began under revision-1, some of the earlier recorded data had to be manually transferred to the final version included herein and is noted at the top of the affected pages.

SUMMARY OF TEST OBJECTIVES & RESULTS BY ATTACHMENT (A-I)

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

- A. Tests verified correct operation of each automatic isolation damper serving ACT-A, in both manual and automatic modes.
- B. Tests verified correct operation of the AZ702 exhaust fan serving ACT-A, in both manual and automatic modes. Fan was operated both at the local selector switch 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 its normal control point; fan vibration data was recorded. Automatic switchover to the standby fan was demonstrated when a fan-failure signal was simulated. Interlock with the Air Conditioning unit was verified.
- C. Tests verified correct MCS alarm response to actual forced high filter differential pressure conditions for each of 2 filter stages in ACT-A (A simulated signal greater than the alarm setpoint was input to the field instrument).

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

- D. Same as Attachment-A.
- E. Same as Attachment-B.
- F. Same as Attachment-C.

3. Air Supply Control

- G. Tests verified correct operation of Vent Building Air Conditioning unit from local switch and remotely from MCS graphic screens, in both manual and automatic modes.

H. Tests verified that

- o building space/room design confinement pressures can be monitored and controlled in a stable operating mode and that correct alarms occur due to forced out-of-limit conditions;
- o emergency cooling valves function properly in both manual and automatic modes;
- o MCS MACRO control operates properly, i.e. that the system can be started and switched over to standby exhaust train by simple RUN commands from the MCS MACRO screen;
- o MCS PID controls can be established and tuned from the MCS screens by the MCS cognizant engineer (final PID loop tuning and alarm-logic time-delays were established in this section);
- o design space confinement pressures can be maintained during severe upset conditions.

I. Stack Monitor Instruments

Tests were successfully conducted to evaluate the performance of the AZ702 stack monitor instrumentation and controls, including the particulate 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-5.30 was a 24-hour test of the stack flow measuring system to verify accuracy, zero drift, and calibration drift; 3 sets of verification field measurements were made in accordance with 6-TF-155 at various intervals and flow rates during the period. Environmental Engineering personnel participated in the test and accepted the test results.

SUMMARY OF ACCEPTANCE CRITERIA AND RESULTS

Table I below summarizes acceptance criteria which were evaluated in the course of testing. Tables II-IV 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. Where expected data values are shown, it is not intended as acceptance criteria; however, where the expected values are significantly different from actual data, a test exception is noted.

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.

Test Notes:

Even though paragraph 2.3.5 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.

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. Recorded data were required primarily for information. A procedure validation checklist for the original test procedure is not available and is not included.

The building ventilation system was initially tested and balanced by the installing contractor; see CVI list, Attachment-3. The Operations contractor crafts personnel performed additional balancing under work package #2E-96-01655.

CONCLUSION

All testing under this procedure is considered complete and successful. The system performed in a stable manner and satisfied the operating conditions of references 3-5.

TABLE I

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 SWITCH & 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 CAPACITY CONTROL	AUTO FAN INLET-VANE DAMPER CONTROLS TO SETPOINT	CRITERIA MET
EXHAUST FAN VIBRATION AT PEAK SPEED	BASELINE DATA RECORDED	CRITERIA MET
SYSTEM INSTRUMENT RESPONSE	ALL SYSTEM INSTRUMENTS RESPOND TO ACTUAL OPERATING CONDITIONS	CRITERIA MET
SYSTEM DATA	DATA APPROXIMATES DESIGN	CRITERIA MET
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
ZONE CONTROL IN UPSET	SPACE PRESSURES REMAIN WITHIN SAFE LIMITS DURING FORCED UPSET	CRITERIA MET
STACK MONITOR	PASS VENDOR TEST	CRITERIA MET
STACK MONITOR	PASS 24-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. Fan vibration data at near peak flow was collected (in Attachments-B and -E, Exhibit-A) on each fan for baseline information only. 		

TABLE II

ATTACHMENT H - MCS FINAL PID LOOP TUNING		
Parameter	PID	Step Response
PIC-702K35-1A	1.5, 10.0, 0.04	30 seconds
PIC-702K35-1A	1.5, 10.0, 0.04	30 seconds
PDIC-702K3-1	0.30, 5.0, 0.03	60 seconds
PDIC-702K2-2	1.10, 9.0, 0.04	15 seconds
PDIC-702K2-3	1.10, 9.0, 0.04	15 seconds

TABLE III

ATTACHMENT H - MCS FINAL ALARM LEVELS & TIMING		
PARAMETER	ALARM VALUE	TIME TO OCCUR
PAH-702K35-1, Header Press.	-1.75 in. wc	65 seconds
FAL-FI-702K3-1, Stack Flow	700 CFM	2 seconds
PDAL-PDIC-702K3-1, Cell DP	-1.4 in. wc	65 seconds
PDAL-PDIC-702K2-2, DP, Filter-Room A	-0.2 in. wc	71 seconds
PDAL-PDIC-702K2-3, DP, Filter-Room B	-0.2 in. wc	71 seconds
PDAL-PDIC-702K2-1, DP, Monitor-Room	No alarm	---
PDAL-PDIC-702K2-7, DP, Zone-I/II	-0.1 in. wc	16 seconds
PDAL-PDIC-702K2-8, DP, Zone-II/IV	-0.1 in. wc	16 seconds

TABLE IV

ATTACHMENT H - SYSTEM RESPONSE TO UPSET ACTIONS				
PARAMETER & CRITERIA ----- UPSET CONDITION	STACK FLOW, WITHIN ALARM LIMITS	VENT CELL PRESS., RESTORE, NO ALARM	FILTER ROOM PRESS., RESTORE NO ALARM	STACK MONITOR ROOM PRESS., RESTORE, NO ALARM
Stop AC Unit for 5 minutes	Low-flow alarm. See TE#21.	OK (See Note, typical)	OK	OK (See Note, typical)
E&I Room A (IV), open outer door	OK, no effect.	OK, no effect.	OK, no effect.	OK, no effect
E&I Room B (IV), open outer door	OK, no effect	OK, no effect	OK, no effect	OK, no effect
E&I Room A, open door to Stack Monitor Room (IV) for 10 seconds	OK, no effect	OK, no effect	OK, no effect	OK, no effect
Fan Room A (II), open both outer doors 10 seconds	OK, no effect.	OK, no effect.	Lo-DP Alarm when airlock defeated. See TE-20.	OK
Fan Room B, same test	OK, no effect.	OK, no effect.	Lo-DP Alarm when airlock defeated. See TE-20.	OK
Switch exhaust trains	OK, no alarm.	OK, no alarm.	OK, no alarm.	OK, no alarm.
NOTE: These tests effected a need for TE#20 which reflects changes in system design (P&ID drawing H-2-131073, H-2-131081, and others) implemented under ECN-W030-264, as well as additional field changes being as-build documented in the same P&ID drawings. The ECN changes the method of controlling the exhaust system (resulting in a wider acceptable range of exhaust stack flow rate); other changes revise steady-state control points for room (zone) pressures.				

ATTACHMENT 1 - TEST REPORT CHECKLIST			
ITEM	REQUIRED ACTION TO BE VERIFIED	INITIALS	DATE
1	Test completed per approved procedure	JTC	10/21/97
2	Required enclosures provided	JTC	10/21/97
	a. Summary of test results	JTC	10/21/97
	b. Signed/dated procedure validation sheet	Not available JTC	10/21/97
	c. Applicable ECNs and NCRs none	JTC	10/21/97
	d. Onsite vendor test procedures/reports N/A	JTC	10/21/97
	e. Applicable/important vendor data N/A	JTC	10/21/97
	f. CVI list, Major equipment	JTC	10/21/97
	g. Instrument and Loop calibration data	JTC	10/21/97
3	Test Exceptions (TEs) - Qty. 5	JTC	10/21/97
	a. All listed in TE Log Master List attached.	JTC	10/21/97
	b. All TE reports closed/signed/dated	JTC	10/21/97
4	All applicable test steps signed/dated ⁽¹⁾	JTC	10/21/97
5	Test personnel	JTC	10/21/97
	a. All qualified ⁽²⁾	JTC	10/21/97
	b. All have signed/dated signature log	JTC	10/21/97
6	Recorded test data	JTC	10/21/97
	a. Summary of acceptance criteria incl.	JTC	10/21/97
	b. All required data entered	JTC	10/21/97
	c. All data meets acceptance criteria ⁽³⁾	JTC	10/21/97
7	Related Acceptance Test Report (ATR) ⁽⁴⁾ N/A	JTC	10/21/97
	a. Report No: N/A	JTC	10/21/97
	b. TEs covered in this test: N/A ⁽⁴⁾	JTC	10/21/97
8	Filename, original test record 2E-96-00288	JTC	10/21/97

- 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

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Author/Cognizant Engineer

T.G. HOWELL
Print Name/Signature

APPROVAL DESIGNATOR SO

PROCEDURE APPROVAL BY TEST REVIEW BOARD (TRB)

_____ TRB Chair	_____ Date	_____ TWRS Operations	_____ Date
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_____ TWRS Engineering	_____ Date	_____ TWRS Safety	_____ Date
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_____ Construction Projects Startup	_____ Date	_____ Quality Assurance	_____ Date
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_____ Project Management	_____ Date	_____ ICF-KH Construction	_____ Date
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The original signatures are on file.

*Note: Original issue of the
procedure contained approval
signatures.*

TC 10/2/87

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ATTACHMENTS:

Attachment A -	VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE
Attachment B -	VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE
Attachment C -	VENT BUILDING ACT TRAIN A DIFFERENTIAL PRESSURE MONITORING TEST PROCEDURE
Attachment D -	VENT BUILDING ACT TRAIN B DAMPER TEST PROCEDURE
Attachment E -	VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE
Attachment F -	VENT BUILDING TRAIN B DIFFERENTIAL PRESSURE MONITORING TEST PROCEDURE
Attachment G -	VENT BUILDING AIR CONDITIONING UNIT TEST PROCEDURE
Attachment H -	VENT BUILDING ROOM PRESSURE MONITORING AND CONTROL TEST PROCEDURE
Attachment I -	VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE
Attachment J -	SIGNATURE/INITIAL VERIFICATION
Attachment K -	TEST LOG
Attachment L -	TEST EXCEPTION REPORT
Attachment M -	TEST EXCEPTION LOG

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1.0 PURPOSE

- 1.1 This procedure has been prepared to verify the Ventilation Building Ventilation System and the Stack Monitor System operates in accordance with system design.

2.0 INFORMATION

2.1 SCOPE

2.1.1 This procedure will demonstrate the operation of the following in the Ventilation Building Ventilation System:

- Exhaust Train controls and monitoring, filter pressure differential monitoring and alarms, damper controls and interlocks, and fan controls, interlocks and performance.
- Vent Building air conditioning unit operation, Vent Building room pressure monitoring and controls.
- Vent Building ventilation stack monitor operation, controls and alarms.

2.1.2 The Ventilation Building Ventilation system and the Stack Monitor System interface with each other and the Monitoring and Control System.

2.1.3 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 HS - Hand Switch
2.2.2 LOI - Local Operator Interface device
2.2.3 MCS - Monitoring Control system
2.2.4 PCL - Process Logic Control
2.2.5 PI - Pressure Indicator
2.2.6 POTP - Preoperational Testing Procedure

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2.3 RESPONSIBILITIES

2.3.1 The Craft (TWRS Maintenance and/or Construction Forces) personnel are responsible for:

- Providing assistance during POPT testing.
- 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 Test Director (TD) responsibilities:

- Provides the equipment found in STEP 4.9 of this POTP.
- 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.

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2.3.3 The Test Engineering Personnel (TEP) responsibilities:

- Providing technical support during testing.
- Providing programming support during testing.
- Forcing data in PLC program during testing.
- Direct preoperational testing
- Review test documents to validate acceptance
- Prepare post testing documents
- Records equipment status and data per this procedure.
- Conducts pre-job system walkdown.

2.3.4 Operations Personnel (OP) responsibilities:

- Observing test activities for training purposes.

2.3.5 Quality Control (QC) responsibilities:

- Witnessing the performance of the test procedure.

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.

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2.5 EXCEPTIONS

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

2.6 REFERENCES

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

- Project W-030 Startup Test Plan Rev 0, WHC-SD-W030-SUP-003
- H-2-131073 Rev 1, Sht 1 and 2, AZ702 Vent Bldg. Vent Sys.
- H-2-131077-1, Rev. 1, Sht 1 of 1, AZ702 Vent Bldg. Vent Sys.
- H-2-131081 Rev 1, Sht 1 of 1, AZ702 Vent Bldg. Vent Sys.
- Tank Farm Ventilation Upgrade, W-030-C2
- Tank Farm Ventilation Upgrade, W-030-C3
- W-030-P04

2.7 ENVIRONMENTAL

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

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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 POTP:

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

2.9 RADIATION AND CONTAMINATION CONTROL

2.9.1 The work covered by this procedure is performed outside of the tank farm and does not require entry into a radiation/contamination control area.

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, holdpoints or verifications 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

2.11.1 None

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2.12 LIMITS AND PRECAUTIONS

- 2.12.1 If during performance of this procedure, any of the following conditions are found, immediately notify the assigned TD and TEP:
- Any equipment malfunction which could prevent fulfillment of it's functional requirements.
 - Personnel error or procedural inadequacy which could prevent fulfillment of procedural requirements.
- 2.12.2 The TD and TEP may choose to stop work and place equipment in a safe condition based on the significance of the malfunction, error or inadequacy.
- 2.12.3 Contact TD and TEP for additional instructions if changing plant conditions affect work or delays in work extend past end of the (testing) shift.
- 2.12.4 If any waste is generated during performance of this instruction consult Facility/Plant/Area Hazardous Waste Coordinator for specific instructions to ensure compliance with WHC and DOE environmental standards, as applicable, for correct disposal.
- 2.12.5 Comply with WHC and plant/facility specific lock and tag or over-tagging requirements, as applicable.

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- 2.12.6 All Measuring and Test Equipment (M&TE) used during performance of this procedure to collect qualitative data with the exception of "timing devices", shall meet the following requirements:
- Be within its current calibration cycle as evidenced by an affixed calibration label.
 - Be capable of the desired range.
 - Have an accuracy (consistent with state-of-the-art limitations) equal to or greater than the accuracy specified in the procedure.
- 2.12.7 Timing measurements shall be made with commercially available timing devices.
- 2.12.8 The Test Engineer has overall control of the testing process and change record authorization for this POTP. The Test Engineer is responsible for conducting the test, data collection, and ensuring compliance with all POTP requirements.
- 2.12.9 All test data readings are to be taken and recorded for each location where the capability exists (i.e. local instrument, LOI, OS).

3.0 RECORDS

- 3.1 This POTP as well as all completed attachments/appendices will be filed as a permanent test record.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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Effective Date _____

Data Transfer From Revision 0 TAG 4/1/97

4.0 PREREQUISITES

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

- 4.1 Perform a pretest briefing for all personnel involved in the performance of this POTP.

Test Director G. P. Hopkins 11/14/96

- 4.2 Perform a walkdown inspection of the systems tested by this POTP.

Test Engineer Z. A. Howell 11/15/96

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

Test Director G. P. Hopkins 11/14/96

- 4.4 The official POTP copy and all other photocopies that will be used during testing have been verified to be the latest approved/released document revision.

Test Director G. P. Hopkins 11/14/96

- 4.5 The Test Engineer has verified, by reviewing the TAG LOGBOOK and walkdown of RWS systems being tested, that all components within and including the test boundary have been "BLUE" tagged.

Test Engineer Z. A. Howell 11/15/96

- 4.6 All open items have been evaluated and verified to not affect the POTP performance (Quality Assurance Nonconformance Reports <NCRs>, Construction Punch Lists, outstanding Engineering Change Notices <ECNs>, Startup-originated Design Change Requests <CRs>, Test Deficiency Reports, and Master System Punch List items).

Test Director G. P. Hopkins 11/14/96

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

Test Director G. P. Hopkins 11/14/96

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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DATA TRANSFERED FROM REVISION 0 D-8. 4/1/97

- 4.8 Verify that the vent cell roof hatch has be closed and sealed.

Test Director *[Signature]*

4.9 EQUIPMENT/INSTRUMENTS

4.9.1 Digital Multi Meter

Manufacturer: FLUKE Model No. 23
Serial No. 954-45-08-025 Calibration Date 5/28/96
Calibration Due Date 5/28/97

[Note : See also, TEST LOG , Appendix K.]

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

5.0 PROCEDURE

| : NOTE: 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 The Vent Building Ventilation System testing shall be performed using Attachments A through H of this procedure.

- 5.2 The Vent Building Stack Monitor System testing shall be performed using Attachment I of this procedure.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT.

Revision No. 2

HNF-SD-W030-POTP-007

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ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

ATTACHMENT A

DATA TRANSFERRED FROM REVISION 0

D.J.
4/1/97

1 INITIAL CONDITIONS

- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Appendix A.

Test Engineer TGH Date 11/15/96

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Appendix B.

Test Engineer TGH Date 11/15/96

2 PROCEDURE

- 2.1 **SELECT** Damper MK-AZ702K3-2A **NORMAL** on MCS graphic 20BldExh.v.

- 2.2 **SELECT** Damper MK-AZ702K3-2A **AUTO** on MCS graphic 20BldExh.v.

- 2.3 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.

- 2.4 **VERIFY** the following:

- Damper MK-AZ702K3-2A stays **CLOSED**.
- MCS indicates **CLOSED** for Damper MK-AZ702K3-2A

Test Engineer TGH Date 11/15/96

- 2.5 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.

- 2.6 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.

- 2.7 **VERIFY** the following:

- Damper MK-AZ702K3-2A **OPENS**.
- MCS indicates **OPEN** for Damper MK-AZ702K3-2A

Test Engineer TGH Date 11/15/96

- 2.8 **SIMULATE** a pressure differential >0.5 " w.c. at PDE-AZ702K303-1A.

- 2.9 **VERIFY** that Damper MK-AZ702K3-2A stays **OPEN**.

Test Engineer D.J. Date 4/1/97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 2 of 7.
ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 D.J.
2.10 REMOVE simulation from PDE-AZ702K303-1A. *4/1/97*

2.11 SIMULATE a pressure differential >2.5" w.c. at PDE-AZ702K304-1A.

2.12 VERIFY that Damper MK-AZ702K3-2A stays OPEN.

Test Engineer *D.J.* Date *4/9/97*

2.13 REMOVE simulation from PDE-AZ702K304-1A.

2.14 SIMULATE a high radiation level at RE-AZ702K3-1.

2.15 VERIFY that Damper MK-AZ702K3-2A stays OPEN.

Test Engineer *D.J.* Date *4/9/97*

2.16 SELECT Damper MK-AZ702K3-2B NORMAL on MCS graphic 20BldExh.v.

2.17 SELECT Damper MK-AZ702K3-2B MANUAL on MCS graphic 20BldExh.v.

2.18 SELECT Damper MK-AZ702K3-2B OPEN on MCS graphic 20BldExh.v.

2.19 SELECT Exhaust fan AZ702-K3-5-1B NORMAL on MCS graphic 20BldExh.v.

2.20 SELECT Exhaust fan AZ702-K3-5-1B MANUAL on MCS graphic 20BldExh.v.

2.21 SELECT Exhaust fan AZ702-K3-5-1B START on MCS graphic 20BldExh.v.

2.22 VERIFY the following:

- Damper MK-AZ702K3-2A CLOSES.
- MCS indicates CLOSED for Damper MK-AZ702K3-2A

Test Engineer *TGH* Date *11/15/96*

2.23 REMOVE simulation from RE-AZ702K3-1.

2.24 SELECT exhaust fan AZ702-K3-5-1B MANUAL on MCS graphic 20BldExh.v.

2.25 SELECT exhaust fan AZ702-K3-5-1B STOP on MCS graphic 20BldExh.v.

2.26 SELECT Damper MK-AZ702K3-2B MANUAL on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

- 2.27 **SELECT** Damper MK-AZ702K3-2B **CLOSE** on MCS graphic 20BldExh.v.
- 2.28 **OPEN** Damper MK-AZ702K3-2A by selecting **OPEN** on MCS graphic 20BldExh.v.
- 2.29 **SIMULATE** a pressure differential $>0.5"$ w.c. at PDE-AZ702K303-1A.
- 2.30 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.
- 2.31 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.
- 2.32 **SELECT** exhaust fan AZ702-K3-5-1B **MANUAL** on MCS graphic 20BldExh.v.
- 2.33 **SELECT** exhaust fan AZ702-K3-5-1B **START** on MCS graphic 20BldExh.v.
- 2.34 **VERIFY** the following:
 - Damper MK-AZ702K3-2A **CLOSES**.
 - MCS indicates **CLOSED** for Damper MK-AZ702K3-2A

Test Engineer *P.H.* Date 4/9/97

- 2.35 **REMOVE** simulation from PDE-AZ702K303-1A.
- 2.36 **SELECT** exhaust fan AZ702-K3-5-1B **MANUAL** on MCS graphic 20BldExh.v.
- 2.37 **SELECT** exhaust fan AZ702-K3-5-1B **STOP** on MCS graphic 20BldExh.v.
- 2.38 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.
- 2.39 **SELECT** Damper MK-AZ702K3-2B **CLOSE** on MCS graphic 20BldExh.v.
- 2.40 **OPEN** Damper MK-AZ702K3-2A by selecting **OPEN** on MCS graphic 20BldExh.v.
- 2.41 **SIMULATE** a pressure differential $>2.5"$ w.c. at PDE-AZ702K304-1A.
- 2.42 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.
- 2.43 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.
- 2.44 **SELECT** exhaust fan AZ702-K3-5-1B **MANUAL** on MCS graphic 20BldExh.v.
- 2.45 **SELECT** exhaust fan AZ702-K3-5-1B **START** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 4 of 7.
ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

2.46 **VERIFY** the following:

- Damper MK-AZ702K3-2A **CLOSES**.
- MCS indicates **CLOSED** for Damper MK-AZ702K3-2A

Test Engineer D. H. Date 4/9/97

2.47 **REMOVE** simulation from PDE-AZ702K304-1A.

2.48 **SELECT** exhaust fan AZ702-K3-5-1B **STOP** on MCS graphic 20BldExh.v.

2.49 **SELECT** Damper MK-AZ702K3-2B **CLOSE** on MCS graphic 20BldExh.v.

2.50 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.

2.51 **SELECT** Damper MK-AZ702K3-2A **AUTO** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT F.

Revision No. 2

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ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

Appendix A

Electrical Line-up

BREAKER/SWITCH NO.	BREAKER/SWITCH LOCATION	REQUIRED POSITION
1	Vent Bldg. Exhaust Fan AZ702-K3-5-1A in Panelboard PP-16 located in E/I Room	CLOSED
2	Vent Facility Panelboard PP-5 in E/I Room	CLOSED
3	Vent Bldg. Air Conditioning Unit AZ702-K2-6-1 in Panelboard 16 in E/I Room.	CLOSED
4	Vent Bldg. Exhaust Fan AZ702-K3-5-1B in Panelboard PP-16 located in E/I Room	CLOSED

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

Appendix B

Damper/Valve Line-up

DAMPER/VALVE NO.	LOCATION	REQUIRED POSITION
MK-AZ702K3-1A	Filter Train A inlet isolation damper located in building filter room.	OPEN
MK-AZ702K305-1A	Exhaust Fan AZ702-K3-5-1A Discharge Damper located in building filter room.	OPEN
HV-AZ702K3-1A1	PDE-AZ702K303-1A Isolation valve located in building filter room.	OPEN
HV-AZ702K3-1A2	PDE-AZ702K303-1A/PDE-AZ702K304-1A Isolation valve located in building filter room.	OPEN
HV-AZ702K3-1A3	PDE-AZ702K304-1A Isolation valve located in building filter room.	OPEN
MK-AZ702K3-1B	Filter Train B inlet isolation damper located in building filter room.	OPEN
MK-AZ702K305-1B	Exhaust Fan AZ702-K3-5-1B Discharge Damper located in building filter room.	OPEN
HV-AZ702K3-1B1	PDE-AZ702K303-1B Isolation valve located in building filter room.	OPEN
HV-AZ702K3-1B2	PDE-AZ702K303-1B/PDE-AZ702K304-1B Isolation valve located in building filter room.	OPEN
HV-AZ702K3-1B3	PDE-AZ702K304-1B Isolation valve located in building filter room.	OPEN
HV-AZ702K2-1A	PDE-AZ702K2-1 Isolation valve located in Stack Monitor room.	OPEN
HV-AZ702K2-2A	PDE-AZ702K2-2 Isolation valve located in Stack Monitor room.	OPEN

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM

Revision No. 2

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ATTACHMENT A - VENT BUILDING ACT TRAIN A DAMPER TEST PROCEDURE

DAMPER/VALVE NO.	LOCATION	REQUIRED POSITION
HV-AZ702K2-3A	PDE-AZ702K2-3 Isolation valve located in Stack Monitor room.	OPEN
HV-AZ702K3-1A	PDE-AZ702K3-1 Isolation valve located in Stack Monitor room.	OPEN
HV-AZ702K3-1B	PDE-AZ702K3-1 Isolation valve located in Filter Room B.	OPEN
HV-AZ702K204-1A	PDE-AZ702K204-1 Isolation valve located in Primary Vent Filter Room A.	OPEN
HV-AZ702K204-1B	PDE-AZ702K204-1 Isolation valve located in Primary Vent Filter Room A.	OPEN
HV-AZ702K204-2A	PDE-AZ702K204-2 Isolation valve located in Primary Vent Filter Room B.	OPEN
HV-AZ702K204-1B	PDE-AZ702K204-2 Isolation valve located in Primary Vent Filter Room B.	OPEN
HV-AZ702K305-1	PT-AZ702K35-1A isolation valve located in exhaust fan room	OPEN

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT B - VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE

ATTACHMENT B

DATA TRANSFERRED FROM REV 15 0 D.J.
4/9/97

INITIAL CONDITIONS

- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Attachment A, Appendix A.

Test Engineer TGH Date 11/15/96

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.

Test Engineer TGH Date 11/15/96

- 1.3 **INSTALL** an electrical test jumper, with an on/off switch, in series with the output of PT-702K35-1 at terminal point 109 on TB01 in panel TB-LCU4-3S with the switch in the ON position.

PROCEDURE

- 2.1 **Fan AZ702-K3-5-1A Control from Local control switch HS-AZ702K305-1A1.**

- 2.1.1 **OPEN** manual damper MK-AZ702K3-1A.

Test Engineer TGH Date 11/15/96

- 2.1.2 **OPEN** manual damper MK-AZ702K305-1A.

Test Engineer TGH Date 11/15/96

- 2.1.3 **VERIFY** local control switch HS-AZ702K305-1A1 in the STOP position.

Test Engineer TGH Date 11/15/96

- 2.1.4 **SET** fan AZ702-K3-5-1A pressure control PIC-702K35-1A to -2 inches on MCS graphic 20BldExh.v.

- 2.1.5 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.

- 2.1.6 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.

- 2.1.7 **SELECT** Air Conditioning Unit AZ702-K2-6-1 **AUTO** on MCS graphic 20BldExh.v.

- 2.1.8 **SELECT** Exhaust Fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM

Revision No. 2

HNF-SD-W030-POTP-007

Page 2 of 6.

ATTACHMENT B - VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE

2.1.9 *DATA TRANSFERRED FROM RECORDS 18 D.S. 4/19/92*
SELECT Exhaust Fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.

2.1.10 **SELECT** Exhaust Fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.

2.1.11 **VERIFY** that fan AZ702-K3-5-1A does **NOT START**.

Test Engineer *D.S.* Date *4/10/92*

2.1.12 **PLACE** local control switch HS-AZ702K305-1A1 in the **START** position.

2.1.13 **VERIFY** the following:

2.1.13.1 Exhaust Fan AZ702-K3-5-1A **STARTS**.

2.1.13.2 Air Conditioning Unit AZ702-K2-6-1 **STARTS**.

Test Engineer *D.S.* Date *4/10/92*

2.1.14 After a stabilization period of 15 minutes **RECORD** the following data:

2.1.14.1 for exhaust fan AZ702-K3-5-1A:

Motor Current	<u><i>3.5</i></u> <i>4.0</i>	Amps. (II-702K35-1A)
Motor Voltage	<u><i>50.4</i></u>	Volts. (M. & T. E.)
→ Header Pressure	<u><i>-1.99</i></u> <i>4.08</i>	Inches (PIC-702K35-1A)
Total Airflow	<u><i>98</i></u> <i>960</i>	cfm (FI-702K3-1)

2.1.14.2 for air conditioning unit AZ702-K2-6-1:

Motor Current	<u><i>2.1</i></u>	Amps. (M. & T. E.)
Motor Voltage	<u><i>50.5</i></u>	Volts. (M. & T. E.)
Test Engineer	<u><i>D.S.</i></u>	Date <u><i>3/10/92</i></u>

2.1.15 Allow exhaust fan AZ702-K3-5-1A to operate for sufficient length of time needed to obtain vibration data. **RECORD** on Exhibit A data sheets.

2.1.16 **SELECT** Exhaust Fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.

2.1.17 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.

Test Engineer *D.S.* Date *4/10/92*

2.1.18 **SIMULATE** an air flow <200 cfm at FIT-AZ702K3-3.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT B - VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE

2.1.19 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.
Test Engineer D. J. Date 4/10/97

2.1.20 **SIMULATE** a header pressure <-1.0 inches wc by opening the switch in the test jumper.

2.1.21 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.
Test Engineer D. J. Date 4/10/97

2.1.22 **REMOVE** simulation from FIT-AZ702K3-3.

Test Engineer D. J. Date 4/10/97

2.1.23 **REMOVE** simulation from header pressure transmitter PT-702K35-1 by closing the switch in the test jumper.

2.1.24 **PLACE** local control switch HS-AZ702K305-1A1 in the **STOP** position.

2.1.25 **VERIFY** the following:

2.1.25.1 Exhaust Fan AZ702-K3-5-1A **STOPS**.

2.1.25.2 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.

Test Engineer D. J. Date 4/10/97

2.2 Fan AZ702-K3-5-1A Control from MCS

2.2.1 **SELECT** Damper MK-AZ702K3-2B **AUTO** on MCS graphic 20BldExh.v.

2.2.2 **SELECT** Exhaust Fan AZ702-K3-5-1B **NORMAL** on MCS graphic 20BldExh.v.

2.2.3 **SELECT** Exhaust Fan AZ702-K3-5-1B **AUTO** on MCS graphic 20BldExh.v.

2.2.4 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.

2.2.5 **SELECT** Damper MK-AZ702K3-2A **AUTO** on MCS graphic 20BldExh.v.

2.2.6 **PLACE** the local handswitch HS-AZ702K305-1A1 in **REMOTE**.

2.2.7 **SET** PIC-702K35-1A and 1B to -2 inches .

2.2.8 **SELECT** Exhaust Fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.

2.2.19 **REMOVE** simulation from header pressure transmitter PT-702K35-1 by closing the switch in the test jumper.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 5 of 6.
ATTACHMENT B - VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE

2.2.20 **VERIFY** the following:

- 2.2.20.1 Exhaust fan AZ702-K3-5-1A **STOPS**.
- 2.2.20.2 Damper MK-AZ702K3-2A **CLOSES**.
- 2.2.20.3 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.
- 2.2.20.4 Exhaust fan AZ702-K3-5-1B **STARTS**.
- 2.2.20.5 Damper MK-AZ702K3-2B **OPENS**.
- 2.2.20.6 Air Conditioning Unit AZ702-K2-6-1 **RE-STARTS**.

Test Engineer D.J. Date 4/10/97

2.2.21 **REMOVE** simulation from FI-AZ702K3-1.

Test Engineer D.J. Date 4/10/97

2.2.22 **SELECT** exhaust fan AZ702-K3-5-1A **AUTO** on MCS graphic 20BldExh.v.

2.2.23 **OPEN** circuit breaker no. 4 in Panelboard PP-16 to **SIMULATE** failure of exhaust fan AZ702-K3-5-1B.

2.2.24 **VERIFY** the following:

- 2.2.24.1 Exhaust fan AZ702-K3-5-1B **STOPS**.
- 2.2.24.2 Damper MK-AZ702K3-2B **CLOSES**.
- 2.2.24.3 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.
- 2.2.24.4 Exhaust fan AZ702-K3-5-1A **STARTS**.
- 2.2.24.5 Damper MK-AZ702K3-2A **OPENS**.
- 2.2.24.6 Air Conditioning Unit AZ702-K2-6-1 **RE-STARTS**.

Test Engineer D.J. D.J. Date 4/10/97 D.J.
4/10/97

2.2.25 **SELECT** exhaust fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.

2.2.26 **VERIFY** the following:

- exhaust fan AZ702-K3-5-1A **STOPS**.
- damper MK-AZ702K3-2A **CLOSES**.

Test Engineer D.J. Date 4/10/97

2.2.27 Leave test jumper installed in PT-702K35-1 circuit for Train B Exhaust Fan testing.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 6 of 6.
ATTACHMENT B - VENT BUILDING TRAIN A EXHAUST FAN TEST PROCEDURE

Exhibit A

System: Vent Bldg. Exhaust - Train A.	Fan No.: AZ702-K3-5-1A	Fan Type: Centrifugal
Drive Type: Belt.	Service: Vent Building 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 TEST REPORT. *JTC* 10/17/97

Performed by : _____ Date / /

Verified by : _____ Date / /

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 1 of 2.
**ATTACHMENT C- VENT BUILDING ACT TRAIN A DIFFERENTIAL PRESSURE
MONITORING TEST PROCEDURE**

ATTACHMENT C
DATA TRANSFERRED FROM REVISION 0 *DJ*
4/1/97

1 INITIAL CONDITIONS

- 1.1 **VERIFY/PERFORM** the electrical line-up in Attachment A, Appendix A.

Test Engineer TGH Date 11/15/96

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.

Test Engineer TGH Date 11/15/96

- 1.3 **OPEN** manual damper MK-AZ702K3-1A.

Test Engineer TGH Date 11/15/96

- 1.4 **OPEN** manual damper MK-AZ702K305-1A.

Test Engineer TGH Date 11/15/96

- 1.5 **VERIFY** local control switch HS-AZ702K305-1A1 in the **REMOTE** position.

Test Engineer TGH Date 11/15/96

- 1.6 **SET** fan AZ702-K3-5-1A pressure control PIC-702K35-1A to -2 inches on MCS graphic 20BldExh.v.

- 1.7 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.

- 1.8 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.

- 1.9 **SELECT** Air Conditioning Unit AZ702-K2-6-1 **AUTO** on MCS graphic 20BldExh.v.

- 1.10 **SELECT** exhaust fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.

- 1.11 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.

2 **PROCEDURE**

- 2.1 **START** the Building Vent System by selecting exhaust fan AZ702-K3-5-1A **START** command on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION
Revision No. 2 HNF-SD-W030-POTP-007 Page 2 of 2.
ATTACHMENT C- VENT BUILDING ACT TRAIN A DIFFERENTIAL PRESSURE
MONITORING TEST PROCEDURE

Data Transfer From Revision 0 7/24/97

- 2.2 WAIT 10 minutes for system to stabilize.
- 2.3 SIMULATE an increasing pressure differential at PDE-AZ702303-1A until PDAH-AZ702303-1A annunciates at the MCS.

- 2.4 RECORD pressure differential reading at PDI-AZ702303-1A.

PDI-AZ702303-1A 0.3 Ins. w.c.(0.3 ins. w.c. expected).
Test Engineer ZAH Date 11/15/96

- 2.5 INCREASE pressure differential simulation at PDE-AZ702303-1A until PDAHH-AZ702303-1A annunciates at the MCS.

- 2.6 RECORD pressure differential reading at PDI-AZ702303-1A.

PDI-AZ702303-1A 0.6 Ins. w.c.(0.5 ins. w.c. expected).
Test Engineer ZAH Date 11/15/96

- 2.7 REMOVE simulation from PDE-AZ702303-1A.

Test Engineer ZAH Date 11/15/96

- 2.8 SIMULATE an increasing pressure differential at PDE-AZ702304-1A until PDAH-AZ702304-1A annunciates at the MCS.

- 2.9 RECORD pressure differential reading at PDI-AZ702304-1A.

PDI-AZ702304-1A 2.0 Ins. w.c.(2.0 ins. w.c. expected).
Test Engineer D.G. Date 4/9/97

- 2.10 INCREASE pressure differential simulation at PDE-AZ702304-1A until PDAHH-AZ702304-1A annunciates at the MCS.

- 2.11 RECORD pressure differential reading at PDI-AZ702304-1A.

PDI-AZ702304-1A 2.5 Ins. w.c.(2.5 ins. w.c. expected).
Test Engineer D.G. Date 4/9/97

- 2.12 REMOVE simulation from PDE-AZ702304-1A.

Test Engineer D.G. Date 4/9/97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT D - VENT BUILDING ACT TRAIN B DAMPER TEST PROCEDURE

ATTACHMENT D

*Data Transferred from Revision 0
JAN 4/1/97*

1 INITIAL CONDITIONS

- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Attachment A, Appendix A.

Test Engineer ZOM Date 11/15/96

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.

Test Engineer ZOM Date 11/15/96

2 PROCEDURE

- 2.1 **SELECT** Damper MK-AZ702K3-2B **NORMAL** on MCS graphic 20BldExh.v.

- 2.2 **SELECT** Damper MK-AZ702K3-2B **AUTO** on MCS graphic 20BldExh.v.

- 2.3 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.

- 2.4 **VERIFY** the following:

- Damper MK-AZ702K3-2B stays **CLOSED**.
- MCS indicates **CLOSED** for Damper MK-AZ702K3-2B

Test Engineer ZOM Date 11/15/96

- 2.5 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.

- 2.6 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.

- 2.7 **VERIFY** the following:

- Damper MK-AZ702K3-2B **OPENS**.
- MCS indicates **OPEN** for Damper MK-AZ702K3-2B

Test Engineer ZOM Date 11/15/96

- 2.8 **SIMULATE** a pressure differential >0.5" w.c. at PDE-AZ702K303-1B.

- 2.9 **VERIFY** that Damper MK-AZ702K3-2B stays **OPEN**.

Test Engineer D.J. Date 4/9/97

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ATTACHMENT D - VENT BUILDING ACT TRAIN B DAMPER TEST PROCEDURE

As Ya Transfer From Rev. 0 HNF 4/1/97

- 2.10 **REMOVE** simulation from PDE-AZ702K303-1B.
- 2.11 **SIMULATE** a pressure differential $>2.5"$ w.c. at PDE-AZ702K304-1B.
- 2.12 **VERIFY** that Damper MK-AZ702K3-2B stays **OPEN**.
- Test Engineer *D-Y* Date *4/9/97*
- 2.13 **REMOVE** simulation from PDE-AZ702K304-1B.
- 2.14 **SIMULATE** a high radiation level at RE-AZ702K3-1.
- 2.15 **VERIFY** that Damper MK-AZ702K3-2B stays **OPEN**.

- Test Engineer *ZSN* Date *11/15/96*
- 2.16 **SELECT** Damper MK-AZ702K3-2A **NORMAL** on MCS graphic 20BldExh.v.
- 2.17 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.
- 2.18 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.
- 2.19 **SELECT** Exhaust fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.
- 2.20 **SELECT** Exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.21 **SELECT** Exhaust fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.
- 2.22 **VERIFY** the following:

- Damper MK-AZ702K3-2B **CLOSES**.
- MCS indicates **CLOSED** for Damper MK-AZ702K3-2B

Test Engineer *ZSN* Date *11/15/96*

- 2.23 **REMOVE** simulation from RE-AZ702K3-1.
- 2.24 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.25 **SELECT** exhaust fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.
- 2.26 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT D - VENT BUILDING ACT TRAIN B DAMPER TEST PROCEDURE

- 2.27 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.
- 2.28 **OPEN** Damper MK-AZ702K3-2B by selecting **OPEN** on MCS graphic 20BldExh.v.
- 2.29 **SIMULATE** a pressure differential >0.5" w.c. at PDE-AZ702K303-1B.
- 2.30 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.
- 2.31 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.
- 2.32 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.33 **SELECT** exhaust fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.
- 2.34 **VERIFY** the following:
 - Damper MK-AZ702K3-2B **CLOSES**.
 - MCS indicates **CLOSED** for Damper MK-AZ702K3-2B

Test Engineer D.J. Date 4/9/97

- 2.35 **REMOVE** simulation from PDE-AZ702K303-1B.
- 2.36 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.37 **SELECT** exhaust fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.
- 2.38 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.
- 2.39 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.
- 2.40 **OPEN** Damper MK-AZ702K3-2B by selecting **OPEN** on MCS graphic 20BldExh.v.
- 2.41 **SIMULATE** a pressure differential >2.5" w.c. at PDE-AZ702K304-1B.
- 2.42 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.
- 2.43 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.
- 2.44 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.45 **SELECT** exhaust fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT D - VENT BUILDING ACT TRAIN B DAMPER TEST PROCEDURE

2.46 **VERIFY** the following:

- Damper MK-AZ702K3-2B **CLOSES**.
- MCS indicates **CLOSED** for Damper MK-AZ702K3-2B

Test Engineer D.I. Date 4/9/97

2.47 **REMOVE** simulation from PDE-AZ702K304-1B.

2.48 **SELECT** exhaust fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.

2.49 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.

2.50 **SELECT** Damper MK-AZ702K3-2B **CLOSE** on MCS graphic 20BldExh.v.

2.51 **SELECT** Damper MK-AZ702K3-2B **AUTO** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

ATTACHMENT E

- 1 **INITIAL CONDITIONS** *DATA TRANSFERRED FROM REVISION 0 Dwg. 4/9/97*
- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Attachment A, Appendix A.
Test Engineer TGH Date 11/15/96
- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.
Test Engineer TGH Date 11/15/96
- 1.3 **INSTALL** an electrical test jumper, with an on/off switch, in series with the output of PT-702K35-1 at terminal point 109 on TB01 in panel TB-LCU4-3S with the switch in the ON position.
- 2 **PROCEDURE**
- 2.1 **Fan AZ702-K3-5-1B Control from Local control switch HS-AZ702K305-1B1.**
- 2.1.1 **OPEN** manual damper MK-AZ702K3-1B.
Test Engineer TGH Date 11/15/96
- 2.1.2 **OPEN** manual damper MK-AZ702K305-1B.
Test Engineer TGH Date 11/15/96
- 2.1.3 **VERIFY** local control switch HS-AZ702K305-1B1 in the STOP position.
Test Engineer TGH Date 11/15/96
- 2.1.4 **SET** fan AZ702-K3-5-1B pressure control PIC-702K35-1B to -2 inches on MCS graphic 20BldExh.v.
- 2.1.5 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.
- 2.1.6 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.
- 2.1.7 **SELECT** Air Conditioning Unit AZ702-K2-6-1 **AUTO** on MCS graphic 20BldExh.v.
- 2.1.8 **SELECT** exhaust fan AZ702-K3-5-1B **NORMAL** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

** DATA TRANSFERRED FROM REVISION 0 4/9/92 D.J.*
2.1.9 **SELECT** exhaust fan AZ702-K3-5-1B **MANUAL** on MCS graphic 20BldExh.v.

2.1.10 **SELECT** exhaust fan AZ702-K3-5-1B **START** on MCS graphic 20BldExh.v.

2.1.11 **VERIFY** that fan AZ702-K3-5-1B does **NOT START**.

Test Engineer D.J. Date 4/10/92

2.1.12 **PLACE** local control switch HS-AZ702K305-1B1 in the **START** position.

2.1.13 **VERIFY** the following:

2.1.13.1 Exhaust Fan AZ702-K3-5-1B **STARTS**.

2.1.13.2 Air Conditioning Unit AZ702-K2-6-1 **STARTS**.

Test Engineer D.J. Date 4/10/92

2.1.14 After a stabilization period of 15 minutes **RECORD** the following data for exhaust fan AZ702-K3-5-1B:

Motor Current	<u>4.0</u>	Amps. (II-702K35-1B)	} * - SEE NOTE ABOVE
Motor Voltage	<u>503</u>	Volts. (M. & T. E.)	
Header Pressure	<u>2.0</u>	Inches (PIC-702K35-1B)	
Total Airflow	<u>585</u>	cfm (FI-702K3-1)	
Test Engineer	<u>TGH</u>	Date	<u>4/15/96</u>

2.1.15 Allow exhaust fan AZ702-K3-5-1A to operate for sufficient length of time needed to obtain vibration data. **RECORD** on Exhibit A data sheets.

2.1.16 **SELECT** Exhaust Fan AZ702-K3-5-1B **STOP** on MCS graphic 20BldExh.v.

2.1.17 **VERIFY** that exhaust fan AZ702-K3-5-1B does **NOT STOP**.

Test Engineer D.J. Date 4/10/92

2.1.18 **SIMULATE** an air flow <200 cfm at FI-AZ702K3-1.

2.1.19 **VERIFY** that exhaust fan AZ702-K3-5-1B does **NOT STOP**.

Test Engineer D.J. Date 4/10/92

2.1.20 **SIMULATE** a header pressure <-1.0 inches wc by opening the switch in the test jumper.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

2.1.21 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.

Test Engineer D. J. Date 4/10/97

2.1.22 **REMOVE** simulation from FI-AZ702K3-1.

Test Engineer D. J. Date 4/10/97

2.1.23 **REMOVE** simulation from header pressure transmitter PT-702K35-1 by closing the switch in the test jumper.

2.1.24 **PLACE** local control switch HS-AZ702K305-1B1 in the **STOP** position.

2.1.25 **VERIFY** the following:

2.1.25.1 Exhaust Fan AZ702-K3-5-1A **STOPS**.

2.1.25.2 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.

Test Engineer D. J. Date 4/10/97

2.2 Fan AZ702-K3-5-1B Control from MCS

2.2.1 **SELECT** Damper MK-AZ702K3-2A **AUTO** on MCS graphic 20BldExh.v.

2.2.2 **SELECT** Exhaust Fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.

2.2.3 **SELECT** Exhaust Fan AZ702-K3-5-1A **AUTO** on MCS graphic 20BldExh.v.

2.2.4 **SELECT** Damper MK-AZ702K3-2B **CLOSE** on MCS graphic 20BldExh.v.

2.2.5 **SELECT** Damper MK-AZ702K3-2B **AUTO** on MCS graphic 20BldExh.v.

2.2.6 **PLACE** the local handswitch HS-AZ702K305-1B1 in **REMOTE**.

2.2.7 **SET** PIC-702K35-1A and 1B at -2 inches.

2.2.8 **SELECT** Exhaust Fan AZ702-K3-5-1B **START** on MCS graphic 20BldExh.v.

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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

2.2.9 ** DATA TRANSFERRED FROM REVISION 0 4/9/97*
VERIFY the following: *D.P.*

2.2.9.1 Damper MK-AZ702K3-2B **OPENS**.

2.2.9.2 Fan AZ702-K3-5-1B **STARTS**.

2.2.9.3 Air Conditioning Unit AZ702-K2-6-1 **STARTS**.

Test Engineer *D.P.* Date *4/10/97*

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

Motor Current	<u><i>4.0</i></u>	Amps. (II-702K35-1B)	} * - SEE NOTE ABOVE
Motor Voltage	<u><i>503</i></u>	Volts. (M. & T. E.)	
Header Pressure	<u><i>-2.0</i></u>	Inches (PIC-702K35-1B)	
Total Airflow	<u><i>800</i></u>	cfm (FI-702K3-1)	

Test Engineer *TGH* Date *11/15/96*

2.2.11 **SIMULATE** an air flow <200 cfm at FI-702K3-1.

2.2.12 **VERIFY** that exhaust fan AZ702-K3-5-1B does **NOT STOP**.

Test Engineer *D.P.* Date *4/10/97*

2.2.13 **REMOVE** simulation from FI-AZ702K3-1

2.2.14 **SIMULATE** a header pressure <-1.0 inches wc by opening the switch in the test jumper.

2.2.15 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.

Test Engineer *D.P.* Date *4/10/97*

2.2.16 At the MCS **SELECT** HS-AZ702K305-1BB **OVERRIDE** command.

2.2.17 **SIMULATE** an air flow <200 cfm at FI-AZ702K3-1.

2.2.18 **VERIFY** that exhaust fan AZ702-K3-5-1A does **NOT STOP**.

Test Engineer *D.P.* Date *4/10/97*

2.2.19 **SELECT** Exhaust Fan AZ702-K3-5-1B **NORMAL** on MCS graphic 20BldExh.v.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

2.2.20 **REMOVE** simulation from header pressure transmitter PT-702K35-1 by closing the switch in the test jumper.

2.2.21 **VERIFY** the following:

- 2.2.21.1 Exhaust fan AZ702-K3-5-1B **STOPS**.
- 2.2.21.2 Damper MK-AZ702K3-2B **CLOSES**.
- 2.2.21.3 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.
- 2.2.21.4 Exhaust fan AZ702-K3-5-1A **STARTS**.
- 2.2.21.5 Damper MK-AZ702K3-2A **OPENS**.
- 2.2.21.6 Air Conditioning Unit AZ702-K2-6-1 **RE-STARTS**.

Test Engineer D. J. Date 4/10/97

2.2.22 **REMOVE** simulation from FI-702K3-1.

Test Engineer D. J. Date 4/10/97

2.2.23 **SELECT** exhaust fan AZ702-K3-5-1B **AUTO** on MCS graphic 20BldExh.v.

2.2.24 **OPEN** circuit breaker no. 1 in Panelboard PP-16 to **SIMULATE** failure of exhaust fan AZ702-K3-5-1A.

2.2.25 **VERIFY** the following:

- 2.2.25.1 Exhaust fan AZ702-K3-5-1A **STOPS**.
- 2.2.25.2 Damper MK-AZ702K3-2A **CLOSES**.
- 2.2.25.3 Air Conditioning Unit AZ702-K2-6-1 **STOPS**.
- 2.2.25.4 Exhaust fan AZ702-K3-5-1B **STARTS**.
- 2.2.25.5 Damper MK-AZ702K3-2B **OPENS**.
- 2.2.25.6 Air Conditioning Unit AZ702-K2-6-1 **RE-STARTS**.

Test Engineer D. J. Date 4/10/97

2.2.26 **SELECT** exhaust fan AZ702-K3-5-1B **STOP** on MCS graphic 20BldExh.v.

2.2.27 **VERIFY** the following:

- exhaust fan AZ702-K3-5-1B **STOPS**.
- damper MK-AZ702K3-2B **CLOSES**.

Test Engineer D. J. Date 4/10/97

2.2.28 **REMOVE** the test jumper from PT-702K35-1 output circuit.

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ATTACHMENT E - VENT BUILDING TRAIN B EXHAUST FAN TEST PROCEDURE

EXHIBIT A

System: Vent Bldg. Exhaust - Train B.	Fan No.: AZ702-K3-5-1B	Fan Type: Centrifugal
Drive Type: Belt.	Service: Vent Building 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 TEST REPORT.

JTC 10/17/97

Performed by : _____ Date ____/____/____

Verified by : _____ Date ____/____/____

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION SYSTEM
Revision No. 2 HNF-SD-W030-POTP-007 Page 1 of 2
ATTACHMENT F- VENT BUILDING TRAIN B DIFFERENTIAL PRESSURE MONITORING
TEST PROCEDURE

ATTACHMENT F

- 1 INITIAL CONDITIONS DATA TRANSFERRED FROM REVISION 0
D & 9/9/97
- 1.1 VERIFY/PERFORM the electrical line-up in Attachment A, Appendix A.
Test Engineer TGH Date 11/15/96
- 1.2 VERIFY/PERFORM the valve/damper line-up in Attachment A, Appendix B.
Test Engineer TGH Date 11/15/96
- 1.3 OPEN manual damper MK-AZ702K3-1B.
Test Engineer TGH Date 11/15/96
- 1.4 OPEN manual damper MK-AZ702K305-1B.
Test Engineer TGH Date 11/15/96
- 1.5 VERIFY local control switch HS-AZ702K305-1B1 in the REMOTE position.
Test Engineer TGH Date 11/15/96
- 1.6 SET fan AZ702-K3-5-1B pressure control PIC-702K35-1B to -2 inches.
- 1.7 SELECT Damper MK-AZ702K3-2B MANUAL on MCS graphic 20BldExh.v.
- 1.8 SELECT Damper MK-AZ702K3-2B OPEN on MCS graphic 20BldExh.v.
- 1.9 SELECT Air Conditioning Unit AZ702-K2-6-1 AUTO on MCS graphic 20BldExh.v.
- 1.10 SELECT exhaust fan AZ702-K3-5-1B NORMAL on MCS graphic 20BldExh.v.
- 1.11 SELECT exhaust fan AZ702-K3-5-1B MANUAL on MCS graphic 20BldExh.v.
- 2 PROCEDURE
- 2.1 START by selecting exhaust fan AZ702-K3-5-1B START command on MCS graphic 20BldExh.v.
- 2.2 WAIT 10 minutes for system to stabilize.

PREOPERATIONAL TESTING, VENTILATION BUILDING VENTILATION
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ATTACHMENT F- VENT BUILDING TRAIN B DIFFERENTIAL PRESSURE MONITORING
TEST PROCEDURE

DATA TRANSFERRED FROM REVISION 0 4/9/97 D.J.

- 2.3 **SIMULATE** an increasing pressure differential at PDE-AZ702303-1B until PDAH-AZ702303-1B annunciates at the MCS.
- 2.4 **RECORD** pressure differential reading at PDI-AZ702303-1B.
PDI-AZ702303-1B 0.3 Ins. w.c.(0.3 ins. w.c. expected).
Test Engineer TGH Date 11/15/96
- 2.5 **INCREASE** pressure differential simulation at PDE-AZ702303-1B until PDAH-AZ702303-1B annunciates at the MCS.
- 2.6 **RECORD** pressure differential reading at PDI-AZ702303-1B.
PDI-AZ702303-1B 0.5 D.J. Ins. w.c.(0.5 ins. w.c. expected).
Test Engineer TGH Date 11/15/96
- 2.7 **REMOVE** simulation from PDE-AZ702303-1B.
Test Engineer TGH Date 11/15/96
- 2.8 **SIMULATE** an increasing pressure differential at PDE-AZ702304-1B until PDAH-AZ702304-1B annunciates at the MCS.
- 2.9 **RECORD** pressure differential reading at PDI-AZ702304-1B.
PDI-AZ702304-1B 2.0 Ins. w.c.(2.0 ins. w.c. expected).
Test Engineer D.J. Date 4/9/97
- 2.10 **INCREASE** pressure differential simulation at PDE-AZ702304-1B until PDAH-AZ702304-1B annunciates at the MCS.
- 2.11 **RECORD** pressure differential reading at PDI-AZ702304-1B.
PDI-AZ702304-1B 2.5 Ins. w.c.(2.5 ins. w.c. expected).
Test Engineer D.J. Date 4/9/97
- 2.12 **REMOVE** simulation from PDE-AZ702304-1B.
Test Engineer D.J. Date 4/9/97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT G - VENT BUILDING AIR CONDITIONING UNIT TEST PROCEDURE

ATTACHMENT G

Data Transfer From Rev. 0 7/14/97

1 INITIAL CONDITIONS

- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Attachment A, Appendix A.

Test Engineer 7/14 Date 11/15/96

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.

Test Engineer 7/14 Date 11/15/96

2 PROCEDURE

- 2.1 **Air Conditioning Unit AZ702-K2-6-1 Control from Local control switch HS-AZ702K206-1A.**

- 2.1.1 **VERIFY/PLACE** local handswitch HS-AZ702K206-1A in **STOP** position.

Test Engineer 7/14 Date 11/15/96

- 2.1.2 **SELECT** air conditioning unit AZ702-K2-6-1 **MANUAL** on MCS graphic 19BldSup.v

- 2.1.3 **SELECT** air conditioning unit AZ702-K2-6-1 **START** on MCS graphic 19BldSup.v

- 2.1.4 **VERIFY** that air conditioning unit AZ702-K2-6-1 does **NOT START**.

Test Engineer 7/14 Date 11/15/96

- 2.1.5 **PLACE** local handswitch HS-AZ702K206-1A in **START** position.

- 2.1.6 **VERIFY** that air conditioning unit AZ702-K2-6-1 **STARTS**.

Test Engineer 7/14 Date 11/15/96

Test Engineer _____ Date _____

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTILATION SYSTEM
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ATTACHMENT G - VENT BUILDING AIR CONDITIONING UNIT TEST PROCEDURE

- Data Transfer From Rev. 0 to 4/1/87*
- 2.2.9 **SELECT** air conditioning unit AZ702-K2-6-1 **AUTO** on MCS graphic 19BldSup.v
- 2.2.10 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.
- 2.2.11 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.
- 2.2.12 **SELECT** exhaust fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.
- 2.2.13 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.
- 2.2.14 **SELECT** exhaust fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.
- 2.2.15 **VERIFY** the following:
- exhaust fan AZ702-K3-5-1A **STARTS**.
 - air conditioning unit AZ702-K2-6-1 **STARTS**.

Test Engineer *ZDN* Date *11/15/96*

- 2.2.16 **SELECT** Damper MK-AZ702K3-2B **MANUAL** on MCS graphic 20BldExh.v.
- 2.2.17 **SELECT** Damper MK-AZ702K3-2B **OPEN** on MCS graphic 20BldExh.v.
- 2.2.18 **SELECT** exhaust fan AZ702-K3-5-1B **NORMAL** on MCS graphic 20BldExh.v.
- 2.2.19 **SELECT** exhaust fan AZ702-K3-5-1B **MANUAL** on MCS graphic 20BldExh.v.
- 2.2.20 **SELECT** exhaust fan AZ702-K3-5-1B **START** on MCS graphic 20BldExh.v.
- 2.2.21 **VERIFY** that exhaust fan AZ702-K3-5-1B **STARTS**.
- 2.2.22 **SELECT** exhaust fan AZ702-K3-5-1A **STOP** on MCS graphic 20BldExh.v.
- 2.2.23 **VERIFY** the following:
- exhaust fan AZ702-K3-5-1A **STOPS**.
 - air conditioning unit AZ702-K2-6-1 does **NOT STOP**.

Test Engineer *ZDN* Date *11/15/96*

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ATTACHMENT G - VENT BUILDING AIR CONDITIONING UNIT TEST PROCEDURE

2.2.24 **SELECT** exhaust fan AZ702-K3-5-1B **STOP** on MCS graphic 20BldExh.v.

2.2.25 **VERIFY** the following:

- exhaust fan AZ702-K3-5-1B **STOPS**.
- air conditioning unit AZ702-K2-6-1 **STOPS**.

Test Engineer TGH Date 11/15/96

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ATTACHMENT H - VENT BUILDING ROOM PRESSURE MONITORING AND CONTROL
TEST PROCEDURE.

ATTACHMENT H

1 INITIAL CONDITIONS

DATA TRANSFERRED FROM REVISION 1 D. J. 4/1/97

- 1.1 **VERIFY/PERFORM** the electrical line-up detailed in Attachment A, Appendix A.

Test Engineer TGH Date 3/10/97

- 1.2 **VERIFY/PERFORM** the valve/damper line-up in Attachment A, Appendix B.

Test Engineer TGH Date 3/10/97

- 1.3 **VERIFY/PERFORM** the following switch/control line-up:

1.3.1 **SELECT** Damper MK-AZ702K3-2A **MANUAL** on MCS graphic 20BldExh.v.

1.3.2 **SELECT** Damper MK-AZ702K3-2A **OPEN** on MCS graphic 20BldExh.v.

1.3.3 **PLACE** local handswitch HS-AZ702K305-1A1 in **REMOTE** position.

1.3.4 **SELECT** exhaust fan AZ702-K3-5-1A **NORMAL** on MCS graphic 20BldExh.v.

1.3.5 **SELECT** exhaust fan AZ702-K3-5-1A **MANUAL** on MCS graphic 20BldExh.v.

1.3.6 **PLACE** local handswitch HS-AZ702K206-1A in **REMOTE** position.

1.3.7 **SELECT** air conditioning unit AZ702-K2-6-1 **MANUAL** on MCS
graphic 19BldSup.v

Test Engineer TGH Date 3/10/97

- 1.4 At MCS graphic 20BldExh.v and 19BldSup.v, **SELECT** all system Proportional-integral-derivative (PID) control loops to AUTO mode; **SET** setpoints as follows:

Header Pressure	PIC-702K35-1A	-2 ins.wc
Header Pressure	PIC-702K35-1B	-2 ins.wc
Vent Cell DP	PDIC-702K3-1	-1.5 ins. wc
Filter room A DP	PDIC-702K2-2	-0.25 ins. wc
Filter room B DP	PDIC-702K2-3	-0.25 ins. wc

Test Engineer TGH Date 3/10/97

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- DATA TRANSFERRED FROM REVISION 1*
- 1.5 During system stabilization and related data-collection periods required by this section, entire ventilation building must be isolated (unoccupied and inaccessible, with all exterior and interior doors closed).
- 1.6 Test Engineer shall VERIFY the atmosphere reference leg located in the stack monitor room is sealed for use.

Test Engineer TGH Date 3/10/97

2 PROCEDURE

NOTE: During testing described in this section, Test Engineer will assess system performance compared with design intent and shall describe any evaluations in the Test Log.

2.1 Primary Vent Filter Room A Pressure Control

2.1.1 **START** the building ventilation system by performing the following steps:

- 2.1.1.1 **SELECT** exhaust fan AZ702-K3-5-1A **START** on MCS graphic 20BldExh.v.
- 2.1.1.2 **SELECT** air conditioning unit AZ702-K2-6-1 **START** on MCS graphic 19BldSup.v

2.1.2 After a stabilization period of 15 minutes **RECORD** the following data:

- Primary Vent Filter Room A press. diff -0.25 Ins. w.c.(PDIC-AZ702K2-2)
(-0.25 Ins. w.c. expected)
- Valve MK-AZ702K204-1 position 82 % Open.

NOTE: If system is deemed to operate in an unstable manner, **PERFORM** system PID loop tuning, step 2.8, then restart this section.

- 2.1.3 **SIMULATE** an increase of 0.2 Ins. w.c. in Primary Vent Filter Room A pressure at PDE-AZ702K2-2.

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ATTACHMENT H - VENT BUILDING ROOM PRESSURE MONITORING AND CONTROL
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2.1.4 **RECORD** the following data:

DATA TRANSFERRED FROM REVISION 1 D.S. 4/1/97

- Primary Vent Filter Room A press. diff. 0.02 Ins. w.c.(PDIC-AZ702K2-2)
- Valve MK-AZ702K204-1 position 99 % Open.

and **VERIFY**

- PDAL-AZ702K2-2 annunciates on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.1.5 **ACKNOWLEDGE** PDAL-AZ702K2-2 alarm on MCS graphic 19BldSup.v.

2.1.6 **REMOVE** simulation at PDE-AZ702K2-2.

2.1.7 **RECORD** the following data:

- Primary Vent Filter Room A press. diff. -0.27 Ins. w.c.(PDIC-AZ702K2-2)
- Valve MK-AZ702K204-1 position 46 % Open.

and **VERIFY**

- PDAL-AZ702K2-2 clears on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.2 **Primary Vent Filter Room B Pressure Control**

2.2.1 **RECORD** the following data:

- Primary Vent Filter Room B press. diff. -0.23 Ins. w.c.(PDIC-AZ702K2-3)
(-0.25 Ins. w.c. expected)
- Valve MK-AZ702K204-2 position 41 % Open.

2.2.2 **SIMULATE** an increase of 0.2 Ins. in Primary Vent Filter Room B pressure at PDE-AZ702K2-3.

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- 2.2.3 **RECORD** ^{DATA TRANSFERRED FROM REVISION 1} the following data: ^{82, 4/1/97}
- Primary Vent Filter Room B press. diff. -0.03 Ins. w.c.(PDIC-AZ702K2-3)
 - Valve MK-AZ702K204-2 position 29 % Open.

and **VERIFY**

- PDAL-AZ702K2-3 annunciates on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

- 2.2.4 **ACKNOWLEDGE** PDAL-AZ702K2-3 alarm on MCS graphic 19BldSup.v.

- 2.2.5 **REMOVE** simulation at PDE-AZ702K2-3.

- 2.2.6 **RECORD** the following data:

- Primary Vent Filter Room B press. diff. -0.25 Ins. w.c.(PDIC-AZ702K2-3)
- Valve MK-AZ702K204-2 position 42 % Open.

and **VERIFY**

- PDAL-AZ702K2-3 clears on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.3 **Primary Vent Cell Pressure Control**

- 2.3.1 **RECORD** the following data:

- Primary Vent Cell press. diff. -1.42 Ins. w.c.(PDIC-AZ702K3-1)
(-1.5 Ins. w.c. expected)
- Valve MK-AZ702K3-1 position 28 % Open.

- 2.3.2 **SIMULATE** an increase of 0.3 Ins. w.c. in Primary Vent Cell pressure at PDE-AZ702K3-1.

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2.3.3 **RECORD** *DATA TRANSFERRED FROM REVISION 1* the following data: *288*
9/1/97

- Primary Vent Cell press. diff. -0.01 Ins. w.c.(PDIC-AZ702K3-1)
- Valve MK-AZ702K3-1 position 100 % Open.

and **VERIFY**

- PDAL-AZ702K3-1 annunciates on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.3.4 **ACKNOWLEDGE** PDAL-AZ702K3-1 alarm on MCS graphic 19BldSup.v.

2.3.5 **REMOVE** simulation at PDE-AZ702K3-1.

2.3.6 **RECORD** the following data:

- Primary Vent Cell press. diff. -1.66 Ins. w.c.(PDIC-AZ702K3-1)
- Valve MK-AZ702K3-1 position 66 % Open.

and **VERIFY**

- PDAL-AZ702K3-1 clears on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

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DATA TRANSFERRED FROM REVISION 1 *22*
4/1/97

2.4 Stack Monitor Room Pressure Monitoring.

2.4.1 **RECORD** the following data:

- Stack Monitor Room press. diff. - 0.01 Ins. w.c.(PDI-AZ702K2-1)
(-0.1 Ins. w.c. expected)

2.4.2 **SIMULATE** an increase of 0.6 Ins. w.c. in Stack Monitor Room pressure at PDE-AZ702K2-1.

2.4.3 **RECORD** the following data:

- Stack Monitor Room press. diff. N/A Ins. w.c.(PDI-AZ702K2-1)

and **VERIFY**

- PDAL-AZ702K2-1 annunciates on MCS graphic 19BldSup.v.

Test Engineer N/A Date N/A

2.4.4 **ACKNOWLEDGE** PDAL-AZ702K2-1 alarm on MCS graphic 19BldSup.v.

2.4.5 **REMOVE** simulation at PDE-AZ702K2-1.

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2.4.6 **RECORD** the following data: *DATA TRANSFERRED FROM REV 10.1 B.D. 9/1/97*

- Stack Monitor Room press. diff. 0.62 Ins. w.c.(PDI-AZ702K2-1)

and **VERIFY**

- PDAL-AZ702K2-1 clears on MCS graphic 19BldSup.v.

Test Engineer N/A Date N/A

2.5 **Zone Pressure Monitoring.**

2.5.1 **RECORD** the following data:

- Zone I to Zone II press. diff. -1.12 * Ins. w.c.(PDI-AZ702K2-7)
(0.5 Ins. w.c. expected)
- Zone II to Zone IV press. diff. -0.31 * Ins. w.c.(PDI-AZ702K2-8)
(0.15 Ins. w.c. expected)

2.5.2 **DISCONNECT** 1/4" tubing at low and high side connections to the following instruments:

- PDE-AZ702K2-2
- PDE-AZ702K2-3

Test Engineer TGH Date 3/10/97

2.5.3 **VERIFY** the following:

- PDAH-AZ702K2-7 annunciates on MCS graphic 19BldSup.v.
- PDAL-AZ702K2-8 annunciates on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.5.4 **ACKNOWLEDGE** PDAH-AZ702K2-7 and PDAL-AZ702K2-8 alarms on MCS graphic 19BldSup.v.

* TE-20 changes the expected values. JTC 10/22/97

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2.5.5 **RECONNECT** ^{DATA TRANSFERRED FROM REVISION 1 P. 4/1/97} 1/4" tubing at low and high side connections to the following instruments:

- PDE-AZ702K2-2
- PDE-AZ702K2-3

Test Engineer TGH Date 3/10/97

2.5.6 **VERIFY** the following:

- PDAH-AZ702K2-7 clears on MCS graphic 19BldSup.v.
- PDAL-AZ702K2-8 clears on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.5.7 **DISCONNECT** 1/4" tubing at low and high side connections to PDE-AZ702K3-1.

Test Engineer TGH Date 3/10/97

2.5.8 **VERIFY** that PDAL-AZ702K2-7 annunciates on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.5.9 **ACKNOWLEDGE** PDAL-AZ702K2-7 alarm on MCS graphic 19BldSup.v.

2.5.10 **RECONNECT** 1/4" tubing at low and high side connections to PDE-AZ702K3-1.

Test Engineer TGH Date 3/10/97

2.5.11 **VERIFY** that PDAL-AZ702K2-7 clears on MCS graphic 19BldSup.v.

Test Engineer TGH Date 3/10/97

2.5.12 **DISCONNECT** 1/4" tubing at low and high side connections to PDE-AZ702K2-1.

Test Engineer D.S. Date 3/11/97

2.5.13 **VERIFY** that PDAH-AZ702K2-8 annunciates on MCS graphic 19BldSup.v.

Test Engineer D.S. Date 3/11/97

2.5.14 **ACKNOWLEDGE** PDAH-AZ702K2-8 alarm on MCS graphic 19BldSup.v.

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TEST PROCEDURE.

DATA TRANSFERRED FROM REVISION 1 4/11/97 D.J.
2.5.15 RECONNECT $\frac{1}{4}$ " tubing at low and high side connections to PDE-AZ702K2-1.

Test Engineer D.J. Date 3/11/97

2.5.16 VERIFY that PDAH-AZ702K2-8 clears on MCS graphic 19BldSup.v.

Test Engineer D.J. Date 3/11/97

2.6 Emergency Cooling Valves Function

2.6.1 On MCS graphic 22BldTmp.v, RECORD the following data:

- o Room temperature (E&I-A) 74 F (TI-702K2-2)
 - o Room temperature (Monitor Room) 70 F (TI-702K2-1)
 - o Room temperature (E&I-B) 77 F (TI-702K2-3)
- (expected range 60-85 F)

2.6.1.1 At MCS graphic 22BldTmp.v, SELECT remote handswitches to HS-AZ702K2-6, 7, & 8 to MANUAL.

2.6.2 At MCS graphic 22BldTmp.v, VERIFY the following HSs and MOVs CLOSED:

- o HS-AZ702K2-7, MK-AZ702-K2-7A, -7B
- o HS-AZ702K2-6, MK-AZ702-K2-6A, -6B
- o HS-AZ702K2-8, MK-AZ702-K2-8A, -8B

Test Engineer D.J. Date 3/11/97

2.6.3 At MCS graphic 22BldTmp.v, SELECT remote handswitch HS-AZ702K2-7 OPEN.

2.6.4 VERIFY valves MK-AZ702K2-7A, -7B OPEN within 30 seconds.

Test Engineer D.J. Date 3/11/97

2.6.4.1 At MCS graphic 22BldTmp.v, SELECT remote handswitch HS-AZ702K2-7 to CLOSE.

2.6.4.2 VERIFY valves MK-AZ702-7A & 7B CLOSED.

Test Engineer D.J. Date 3/11/97

2.6.5 REPEAT steps 2.6.3 & 2.6.4. VERIFY repeatability.

Test Engineer D.J. Date 3/11/97

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DATA TRANSFERRED FROM REVISION 1 9/1/97 D.J.
2.6.6 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-6 **OPEN**.

2.6.7 **VERIFY** valves MK-AZ702K2-6A, -6B **OPEN** within 30 seconds.

Test Engineer *D.J.* Date *3/11/97*

2.6.7.1 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-6 to **CLOSE**.

2.6.7.2 **VERIFY** valves MK-AZ702-6A & 6B **CLOSED**.

Test Engineer *D.J.* Date *3/11/97*

2.6.8 **REPEAT** steps 2.6.6 & 2.6.7. **VERIFY** repeatability.

Test Engineer *D.J.* Date *3/11/97*

2.6.9 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-8 **OPEN**.

2.6.10 **VERIFY** valves MK-AZ702K2-8A, -8B **OPEN** within 30 seconds.

Test Engineer *D.J.* Date *3/11/97*

2.6.10.1 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-8 to **CLOSE**.

2.6.10.2 **VERIFY** valves MK-AZ702-8A & 8B **CLOSED**.

Test Engineer *D.J.* Date *3/11/97*

2.6.11 **REPEAT** steps 2.6.9 & 2.6.10. **VERIFY** repeatability.

Test Engineer *D.J.* Date *3/11/97*

2.6.12 At MCS graphic 22BldTmp.v, **SELECT** remote handswitches HS-AZ702K2-6, -7, -8 **CLOSE**. **VERIFY** all six related valves closed.

Test Engineer *D.J.* Date *3/11/97*

2.6.13 At TT-AZ702K2-2 IN E&I ROOM-A, **SIMULATE** a temperature increase until TAH alarm occurs on MCS graphic 22BldTmp.v.

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DATA TRANSFERRED FROM REVISION 1 D.G. 4/1/97
2.6.14 **RECORD** temperature indication at TAH alarm point:

TI-AZ702K2-2 90 F (expected, 90° F)

2.6.15 At TT-AZ702K2-2 IN E&I ROOM-A, INCREASE **SIMULATED** temperature until
TAHH alarm occurs on MCS graphic 22BldTmp.v.

2.6.16 **VERIFY** valve MK-AZ702K2-7A&B REMAIN CLOSED on MCS graphic
22BldTmp.v.

Test Engineer D.G. Date 3/1/97

2.6.17 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-7 to
AUTO.

2.6.18 **VERIFY** valve MK-AZ702K2-7A&B OPEN on MCS graphic 22BldTmp.v.

Test Engineer D.G. Date 3/1/97

2.6.19 **RECORD** temperature indication at TAHH alarm point:

TI-AZ702K2-2 110 F (expected, 110 F)

2.6.20 At TT-AZ702K2-2 IN E&I ROOM-A, DECREASE **SIMULATED** temperature until
TAHH alarm clears on MCS graphic 22BldTmp.v.

2.6.21 **VERIFY** valve MK-AZ702K2-7A&B REMAIN OPEN on MCS graphic
22BldTmp.v.

Test Engineer D.G. Date 3/1/97

2.6.22 At TT-AZ702K2-2 IN E&I ROOM-A, DECREASE **SIMULATED** temperature until
TAH alarm clears on MCS graphic 22BldTmp.v.

2.6.23 **VERIFY** valve MK-AZ702K2-7A&B CLOSE on MCS graphic 22BldTmp.v.

Test Engineer D.G. Date 3/1/97

2.6.24 At TT-AZ702K2-3 IN E&I ROOM-B, **SIMULATE** a temperature increase until TAH
alarm occurs on MCS graphic 22BldTmp.v.

2.6.25 **RECORD** temperature indication at TAH alarm point:

TI-AZ702K2-3 90 F (expected, 90° F)

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- 2.6.26 *DATA TRANSFERED ROOM REVISION 1 D.J. 9/1/97*
At TT-AZ702K2-3 IN E&I ROOM-B, INCREASE **SIMULATED** temperature until
TAHH alarm occurs on MCS graphic 22BldTmp.v.
- 2.6.27 **VERIFY** valve MK-AZ702K2-8A&B REMAIN CLOSED on MCS graphic
22BldTmp.v.
Test Engineer D.J. Date 3/11/97
- 2.6.28 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-8 to
AUTO.
- 2.6.29 **VERIFY** valve MK-AZ702K2-8A&B OPEN on MCS graphic 22BldTmp.v.
Test Engineer D.J. Date 3/11/97
- 2.6.30 **RECORD** temperature indication at TAHH alarm point:
TI-AZ702K2-3 110 F (expected, 110 F)
- 2.6.31 At TT-AZ702K2-3 IN E&I ROOM-B, DECREASE **SIMULATED** temperature until
TAHH alarm clears on MCS graphic 22BldTmp.v.
- 2.6.32 **VERIFY** valve MK-AZ702K2-8A&B REMAIN OPEN on MCS graphic
22BldTmp.v.
Test Engineer D.J. Date 3/11/97
- 2.6.33 At TT-AZ702K2-3 IN E&I ROOM-B, DECREASE **SIMULATED** temperature until
TAH alarm clears on MCS graphic 22BldTmp.v.
- 2.6.34 **VERIFY** valve MK-AZ702K2-8A&B CLOSE on MCS graphic 22BldTmp.v.
Test Engineer D.J. Date 3/11/97
- 2.6.35 At TT-AZ702K2-1 IN MONITOR ROOM, **SIMULATE** a temperature increase until
TAH alarm occurs on MCS graphic 22BldTmp.v.
- 2.6.36 **RECORD** temperature indication at TAH alarm point:
TI-AZ702K2-1 90 F (expected, 90° F)
- 2.6.37 At TT-AZ702K2-1 IN MONITOR ROOM, INCREASE **SIMULATED** temperature
until TAHH alarm occurs on MCS graphic 22BldTmp.v.

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DATA TRANSFERRED FROM REVISION 1 D.D. 4/1/97

2.6.38 **VERIFY** valve MK-AZ702K2-6A&B REMAIN CLOSED on MCS graphic 22BldTmp.v.

Test Engineer D.D. Date 3/11/97

2.6.39 At MCS graphic 22BldTmp.v, **SELECT** remote handswitch HS-AZ702K2-6 to AUTO.

2.6.40 **VERIFY** valve MK-AZ702K2-6A&B OPEN on MCS graphic 22BldTmp.v.

Test Engineer D.D. Date 3/11/97

2.6.41 **RECORD** temperature indication at TAHH alarm point:

TI-AZ702K2-1 110 F (expected, 110 F)

2.6.42 At TT-AZ702K2-1 IN MONITOR ROOM, DECREASE **SIMULATED** temperature until TAHH alarm clears on MCS graphic 22BldTmp.v.

2.6.43 **VERIFY** valve MK-AZ702K2-6A&B REMAIN OPEN on MCS graphic 22BldTmp.v.

Test Engineer D.D. Date 3/11/97

2.6.44 At TT-AZ702K2-1 IN E&I ROOM-A, DECREASE **SIMULATED** temperature until TAH alarm clears on MCS graphic 22BldTmp.v.

2.6.45 **VERIFY** valve MK-AZ702K2-6A&B CLOSE on MCS graphic 22BldTmp.v.

Test Engineer D.D. Date 3/11/97

2.7 Vent Building Vent System MCS MACRO Test

2.7.1 **PLACE** system in automatic mode as follows: At MCS graphic 20BldExh.v, **SELECT** all components to NORMAL.

2.7.2 At MCS graphic 27mBld.v, **SELECT** AC "ON", and Fan 1A "ON". **RUN** MACRO, **VERIFY** system STARTS with AC and Fan 1A ON.

Test Engineer TGH Date 11/21/96

2.7.3 At MCS graphic 27mBld.v, **SELECT** Config, AC and Fan 1B "ON". **RUN** MACRO and **VERIFY** AC and Fan 1B are ON, Fan 1A OFF.

Test Engineer TGH Date 11/21/96

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ATTACHMENT H - VENT BUILDING ROOM PRESSURE MONITORING AND CONTROL
TEST PROCEDURE.

DATA TRANSFERRED FROM REVISION 1 D.D. 9/1/97

- 2.7.4 At MCS graphic 27mBld.v, **SELECT** Config, AC OFF, Fan 1B ON. RUN MACRO.
VERIFY AC is OFF and Fan 1B stays ON.

Test Engineer

TGH Date 11/21/96

2.8 Final Tuning of System PID Controls by MCS Cognizant Engineer

- 2.8.1 At MCS graphic 20BldExh.v and 19BldSup.v, **SELECT** all PID controls in AUTO mode. At MCS graphic 27mBld.v, **SELECT** AC "ON", and Fan 1B "ON". RUN MACRO, **VERIFY** system STARTS with AC and Fan 1B ON. RUN system for 10 minutes to stabilize; **MAINTAIN** Vent Bldg. in isolation mode during this entire section.

Test Engineer

J. L. Lill

Date 9/26/97

- 2.8.2 At MCS graphic 20BldExh.v and 19BldSup.v, **RECORD** the following data:

Header Pressure	PIC-702K35-1A	-2.00 ins. wc
Header Pressure	PIC-702K35-1B	-2.00 ins. wc
Stack flow	FI-702K3-1	846 scfm
Vent Cell DP	PDIC-702K3-1	-1.53 ins. wc
Filter room A DP	PDIC-702K2-2	-0.26 ins. wc
Filter room B DP	PDIC-702K2-3	-0.26 ins. wc
Stack Mon. room DP	PDI-702K2-1	0.00 ins. wc
Zone I/II DP	PDI-702K2-7	-1.27 ins. wc
Zone II/IV DP	PDI-702K2-8	-0.25 ins. wc

Test Engineer

J. L. Lill

Date 9/26/97

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- 2.8.3 At MCS Engineering station, TUNE PID loops as follows. RECORD initial PID rate settings for above controllers in the table below. Then REPEAT for Train B.

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	
	Train A	Train B
Header Pressure, PIC-702K35-1A	$P=1.50, I=10.0, D=0.04$ Step Response ≈ 30 sec	Same as Train A
Header Pressure, PIC-702K35-1B	$P=1.50, I=10.0, D=0.04$ Step Response ≈ 30 sec	
Stack flow, FI-702K3-1	Indication only	
Vent Cell diff press, PDIC-702K3-1	$P=0.30, I=5.0, D=0.05$ Step Response ≈ 60 sec	
Filter Room-A diff press, PDIC-702K2-2	$P=1.10, I=9.0, D=0.04$ Step Response ≈ 15 sec	
Filter Room-B diff press, PDIC-702K2-3	$P=1.10, I=9.0, D=0.04$ Step Response ≈ 15 sec	

Test Engineer

J. Hill

Date

9/26/97

- 2.8.4 **PERFORM** the upset actions described below in order to determine system response to each. **RECORD** observations, corresponding PID adjustment settings, and final system response observations; **PERFORM** PID tuning according to the following criteria.

- Stack flow- Maintain indicated stack airflow at ~~925~~ ⁷⁰⁰⁻¹⁰⁰⁰ ~~50~~ ⁹⁰⁰ scfm, under steady-state conditions; during defined upset conditions (as described below), flow shall remain between the high and low alarm levels. ~~Control should be tuned for a highly stable flow signal.~~

AC 20
TE-17
POTP-007

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20
TE-17

TE-17
AC

Vent Cell pressure- Maintain indicated Vent Cell DP (with respect to atmosphere) at -0.25 ± 0.1 ins. wc under steady-state conditions; normal DP shall be automatically restored following each defined upset condition such that no alarm occurs, during or following the upset.

Filter Room pressure- Maintain indicated Filter Room DP at -0.25 ± 0.05 ins. wc (to atmosphere) under steady-state conditions; normal DP shall be automatically restored following each defined upset condition, such that no alarm occurs, during or following the upset. Also, no Zone-II/IV alarm shall occur.

TE-20 0.0 ± 0.1

Stack Monitor Room pressure- Maintain indicated room DP at -0.1 ± 0.05 ins. wc (to atmosphere) under steady-state conditions; normal DP shall be automatically restored following each defined upset condition such that no alarm occurs, during or following the upset. Also, no Zone-II/IV alarm shall occur.

2.8.5 RECORD data for Upset-1; STOP AC unit; RE-START after 5 minutes:

TE-17
021 TE-POTP7-018
TE-POTP7-018
Low stack flow Alarm. Filter Rooms DP drop to -0.80 to -0.85 .
TE-POTP7-018. No alarms on restart; Min Filter Rm DP on restart ≈ 0.1 ". Min Zone II/IV DP ≈ 0.09 ".

2.8.6 RECORD data for Upset-2; HOLD open outer door to E&I room A:

No effect on Filter Rms, Vent Cell, or Header Pressures.
Generates a very small (barely noticeable) change in K2-S (about 0.02 " change).

2.8.7 RECORD data for Upset-3; HOLD open outer door to E&I room B:

Same as 2.8.6

2.8.8 RECORD data for Upset-4; OPEN interior door between E&I room A and Stack Monitor room (hold 10 seconds):

No effect on Filter Rms, Vent Cell, or Header Pressures.
No effect on any other readings either.

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- 2.8.9 RECORD data for Upset-5; BRIEFLY OPEN both outer doors to Fan Room A (hold 10 seconds):

Zone II/IV alarm may occur with both doors open. Repeat with each door open individually for 10 sec, which should not reduce or produce an alarm see below

- 2.8.10 RECORD data for Upset-6; BRIEFLY OPEN both outer doors to Fan Room B (hold 10 seconds):

Zone II/IV alarm may occur with both doors open. Repeat until each door open individually for 10 seconds, which should not produce an alarm see below

- 2.8.11 RECORD data for Upset-7; SWITCH exhaust fans:

No alarms. Lowest PDI.. K2-8 about 0.10"

- 2.8.12 VERIFY that all PID control adjustments are complete.

MCS Cog. Engineer *ST Hill*

Date *9/26/97*

Test Engineer *ST Hill*

Date *9/26/97*

2.9 Alarm Logic Timing Checks by MCS Cognizant Engineer

- 2.9.1 At MCS graphic 20BldExh.v and 19BldSup.v, SELECT all PID controls in AUTO mode, Fan 1A to STOP. At MCS graphic 27mBld.v, SELECT AC "OFF", and Fan 1B "ON". RUN MACRO, verify system STARTS with AC OFF and Fan 1B ON. RUN system for 10 minutes to stabilize; maintain Vent Bldg. in isolation mode during this entire section. PREPARE MCS alarm printer to print alarms as noted below.

Test Engineer *ST Hill*

Date *9/26/97*

Outer Door: (PDI...K2-8)
2.8.9 No alarms. Min Zone II/IV DP during transient = *0.11"*

Inner Door: No alarms negligible transient.

Both Doors: PDAL 902-K2-8 Alarm. Lowest DP $\approx$ 0.7"

2.8.10 *Outer Door: No alarms. Min Zone II/IV (PDI..K2-8) = 0.13"*

Inner Door: No alarms - negligible transient

Both Doors: PDAL: K2-8 Alarm. Lowest DP $\approx$ 0.6"

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- 2.9.2 At MCS graphic 20BldExh.v, **SELECT** Fan 1B to STOP. **RECORD** alarm level and time required for each of the following alarms to occur after fan STOP command.

	Header Pressure	PAH PIC-702K35-1A	-1.75 ins. wc	65 seconds
*	Header Pressure	PIC-702K35-1B	ins. wc	seconds
	Stack flow	FAL-FI-702K3-1	700 scfm	2 seconds
	Vent Cell DP	PDAL-PDIC-702K3-1	-1.4 ins. wc	65 seconds
	Filter room A DP	PDAL-PDIC-702K2-2	-0.2 ins. wc	71 seconds
	Filter room B DP	PDAL-PDIC-702K2-3	-0.2 ins. wc	71 seconds
*	Stack Mon. room	PDAL-PDI-702K2-1	ins. wc	seconds No alarm
	Zone I/II DP	PDAL-PDI-702K2-7	-0.1 ins. wc	16 seconds
	Zone II/IV DP	PDAL-PDI-702K2-8	-0.1 ins. wc	16 seconds

Test Engineer

J. Hill

Date

9/26/97

- 2.9.3 **VERIFY** that all alarm logic timing is satisfactory.

MCS Cog. Engineer

J. Hill

Date 9/26/97

Test Engineer

J. Hill

Date 9/26/97

* TE-20
JC

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer From Rev. 7 Tag 4/22/07

1.0 INITIAL CONDITIONS

- 1.1 Vent and Balance group are available to support testing.

Test Engineer: D. G.

- 2.0 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: D. G.

- 3.0 VERIFY the SYSTEM IS ALIGNED for preoperational testing in accordance with Appendix B.

Test Engineer: D. G.

- 4.0 CYCLE all MANUAL VALVES, listed in Appendix C, full travel and verify proper operation.

Test Engineer: D. G.

- 4.1 RECORD ALL Valve Deficiencies in Attachment K, Test Log.

5.0 VENTILATION BUILDING VENTILATION STACK MONITOR

- 5.1 VERIFY that system has been energized for a minimum of one hour prior to recording data in in step 5.28.

Test Engineer: D. G.

- 5.2 VERIFY flow and sample probe assembly is correctly oriented and securely mounted in place.

Test Engineer.: D. G.

- 5.3 VERIFY instrumentation cabinet is securely mounted to floor/pad.

Test Engineer.: D. G.

- 5.4 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.: D. G.

- 5.5 VERIFY sample exhaust from cabinet is routed back to the stack.

Test Engineer: D. G.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

- Data Transferred From Rev. 2 7/24/97*
- 5.6 **VERIFY** incoming electrical power is connected to the terminal blocks TB-1 and TB-2.
Test Engineer: D. G.
- 5.7 **VERIFY** all wiring for remote signals is properly connected to terminal block TB-6.
Test Engineer.: D. G.
- 5.8 **VERIFY** stack exhaust fan status wiring is connected to terminal block TB-4.
Test Engineer.: D. G.
- 5.9 **VERIFY** PUMP AUTO/OFF selector switches AZ702K3-11-1 and AZ702K3-11-2 are in the OFF position.
Test Engineer.: D. G.
- 5.10 **PLACE** Power Switch SW-1 in the ON position.
- 5.11 **VERIFY** POWER ON light L-1 is ON.
Test Engineer.: D. G.
- 5.12 **PLACE** Power Switch SW-2 in the ON position.
- 5.13 **VERIFY** instrumentation cabinet cooling fan starts.
Test Engineer.: D. G.
- 5.14 **ENERGIZE** the Power Module.
- 5.15 **VERIFY** displays in FT-1, FT-2, and FT-3 are ON.
Test Engineer.: D. G.
- 5.16 **Place** Power Switch SW-3 in the ON position.
- 5.17 **VERIFY** display in Beta monitor is ON.
Test Engineer.: D. G.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transferred From REV. 2 10/14/12/97

5.18 **DEPRESS** alarm acknowledge button PB-1 **AND VERIFY** the light in the button comes ON.
Test Engineer.: D. G.

5.19 **VERIFY** that a building exhaust fan is running.

Test Engineer.: D. G.

5.20 **PLACE** Sample Pump AZ702-K3-11-1 local control switch HS-AZ702K311-1 in AUTO.

5.21 **VERIFY** Sample Pump AZ702-K3-11-1 starts.

Test Engineer.: D. G.

5.22 **PLACE** Sample Pump AZ702-K3-11-2 local control switch HS-AZ702K311-2 in AUTO.

5.23 **VERIFY** Sample Pump AZ702-K3-11-2 starts.

Test Engineer.: D. G.

5.24 **STOP** the building exhaust fan by placing it's control switch in OFF on graphics 20 bldExh.v.

5.25 **VERIFY** Sample Pumps AZ702-K3-11-1 and AZ702-K3-11-2 stop.

Test Engineer.: D. G.

5.26 **PLACE** Sample Pump local control switches HS-AZ702K311-1 and HS-AZ702K311-2 in OFF.

5.27 **DEPRESS** alarm acknowledge but PB-1 **AND VERIFY** the light in the button goes OFF.

Test Engineer.: D. G.

5.28 Sample Flow Control Loop

NOTE - Record required data for this section on Appendix D

5.28.1 **START** a building ventilation exhaust fan from graphics screen 20BldExh.v.

5.28.2 **PLACE** Sample Pump local control switches HS-AZ702K311-1 and HS-AZ702K311-2 in auto.

5.28.3 **VERIFY** Sample Pumps AZ702-K3-11-1 and AZ702-K3-11-2 start.

Test Engineer.: D. G.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Date Transfer From Rev. 2. 7/8/97 4/22/97

5.28.4 **ADJUST** Ventilation header pressure to approximately -2 inches using the header pressure controller for the operating exhaust fan on graphics screen 20BldExh.v.

5.28.5 **CALCULATE** percent of full scale (%FS) stack flow using stack flow (SCFM) displayed on FI-702K3-3 and the following formula:

NOTE - 1050 SCFM represents full scale stack flow.

$$\%FS \text{ Stack Flow} = (\text{Displayed SCFM} \div 1050 \text{ SCFM}) \times 100$$

5.28.6 **RECORD** the value for displayed stack flow and the %FS Stack Flow calculated in step 5.28.5.

Test Engineer.: D. G.

5.28.7 **CALCULATE** Ideal Output of V/I-1 channel 1 using %FS calculated in step 5.28.5 and the following formula:

$$\text{Ideal Output} = (\%FS \text{ Stack Flow} \div 100) \times 16.00 \text{ mA} + 4 \text{ mA}$$

5.28.8 **USING** a DMM, **MEASURE AND RECORD** the output of V/I-1 channel 1.

Test Engineer.: D. G.

5.28.9 **CALCULATE** the percent deviation from the ideal output, calculated in step 5.28.7. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[\text{Actual Output (mA)} - 4 \text{ mA}] - [\text{Ideal Output (mA)} - 4 \text{ mA}]}{\text{Ideal Output (mA)} - 4 \text{ mA}} \times 100$$

7/8/97 4/22/97

5.28.10 **RECORD** %Deviation calculated in step 5.28.9.

Test Engineer.: D. G.

5.28.11 **CALCULATE** Ideal Sample Flow for Record and Beta Samples using %FS Stack Flow calculated in step 5.28.5 and the following formula:

NOTE - 2 SCFM represents full scale sample flow.

$$\text{Ideal Sample Flow} = \%FS \text{ Stack Flow} \div 100 \times 2.00 \text{ SCFM}$$

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

5.28.12

DATA Transfer From Rev. 2 7/24/93
RECORD the Ideal Sample Flow calculated in step 5.28.11.

Test Engineer.: D. G.

5.28.13

RECORD sample flows as indicated on FIC-AZ702K3-1 and FIC-AZ702K3-2.

Test Engineer.: D. G.

5.28.14

CALCULATE the % Deviation, for the Record sample flow, from the Ideal Sample flow calculated in step 5.28.11. This deviation should be $\leq 5\%$.

$$\text{Record Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

5.28.15

RECORD the Record Sample Flow % Deviation calculated in step 5.28.14.

Test Engineer.: D. G.

5.28.16

CALCULATE the % Deviation, for the Beta sample flow, from the Ideal Sample flow calculated in step 5.28.11. This deviation should be $\leq 5\%$.

$$\text{Beta Sample Flow \% Deviation} = \frac{\text{Displayed SCFM} - \text{Ideal SCFM}}{\text{Ideal SCFM}} \times 100$$

5.28.17

RECORD Beta Sample Flow % Deviations calculated in step 5.28.16.

Test Engineer.: D. G.

5.28.18

CALCULATE the ideal output for V/I-1 channel 2 using the displayed sample flow recorded in step 5.28.13.

$$\text{Channel 2 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.00 \text{ SCFM}}$$

5.28.19

RECORD the Channel 2 Ideal Output calculated 5.28.18.

Test Engineer.: D. G.

5.28.20

CALCULATE the ideal output for V/I-1 channel 3 using the displayed sample flow recorded in step 5.28.13.

$$\text{Channel 3 Ideal Output} = \frac{\text{Displayed SCFM} \times 16.00\text{mA} + 4.00\text{mA}}{2.00 \text{ SCFM}}$$

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5.28.21 *Data Traces from Rev. 2 Stack 4/12/97*
RECORD the Channel 3 Ideal Output calculated 5.28.20.

Test Engineer.: D. G.

5.28.22 **USING** a DMM, **MEASURE AND RECORD** the output of V/I -1 channel 2 and 3.

5.28.23 **CALCULATE** the % Deviation from the ideal output for the Record sample flow. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4 mA} \times 100$$

5.28.24 **RECORD** % Deviation, for the Record sample flow, from ideal output calculated 5.28.23.

Test Engineer.: D. G.

5.28.25 **CALCULATE** the % Deviation from the ideal output for the Beta sample flow. This deviation should be $\leq 2\%$.

$$\%Deviation = \frac{[Actual Output (mA) - 4mA] - [Ideal Output (mA) - 4mA]}{Ideal Output (mA) - 4 mA} \times 100$$

5.28.26 **RECORD** % Deviation, for the Beta sample flow, from ideal output calculated in step 5.28.25.

Test Engineer.: D. G.

5.28.27 **CALCULATE** the percent full scale (%FS) stack temperature using stack temperature indicated on TI-AZ702K3-3.

NOTE - 150°F represents full scale stack temperature.

$$\% FS Stack Temperature = \frac{Displayed ^\circ F}{150^\circ F} \times 100$$

5.28.28 **RECORD** Full stack temperature and %FS Stack Temperature calculated in step 5.28.27.

Test Engineer.: D. G.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

- 5.28.29 *No To Transfer From Rev. 7, JHA 4/12/97*
CALCULATE the ideal output of V/I -2 channel 2 using the %FS Stack Temperature calculated in step 5.28.27.

$$\text{Ideal Output (mA)} = \frac{\%FS \text{ Stack Temperature} \times 16.00\text{mA} + 4\text{mA}}{100}$$

- 5.28.30 **RECORD** V/I channel 2 Ideal Output calculated in step 5.28.29.

Test Engineer.: D. G.

- 5.28.31 **USING** a DMM, **MEASURE AND RECORD** the output of V/I -2 channel 2.

Test Engineer.: D. G.

- 5.28.32 **CALCULATE** the % Deviation, for V/I -2 channel 2, from the Ideal output calculated in step 5.28.29. This deviation should be $\leq 2\%$.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4\text{mA}] - [\text{Ideal Output (mA)} - 4\text{mA}]}{\text{Ideal Output (mA)} - 4\text{mA}} \times 100$$

- 5.28.33 **RECORD** the % Deviation for V/I -2 channel 2 calculated in step 5.28.32.

Test Engineer.: D. G.

- 5.28.34 **REMOVE** all DMMs and reconnect all wiring.

Test Engineer.: D. G.

5.29 Beta Monitor

NOTE - Record all data from this section on Appendix E.

- 5.29.1 **INSTALL** a known check source into remote detector head and allow sufficient time for monitor to perform count.

- 5.29.2 **CALCULATE** the ideal output for RE-AZK1-1 using the displayed value. 100,000 DPM represents fullscale value.

$$\text{Ideal Output (mA)} = \frac{\log \text{Displayed Value} \times 16.00\text{mA} + 4\text{mA}}{\log 100,000 \text{ (Full Scale)}}$$

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer From Rev. 2 HNF 4/22/97

5.29.3 **RECORD** the ideal output calculated in step 5.29.2 and the displayed output.

Test Engineer.: 7.8.94

5.29.4 **USING** a DMM, **MEASURE** and **RECORD** the current output of RE-AZK1-1.

Test Engineer.: 7.8.94

5.29.5 **CALCULATE** the percent deviation from the ideal output calculated in step 5.29.2.

$$\% \text{Deviation} = \frac{[\text{Actual Output (mA)} - 4 \text{mA}] - [\text{Ideal Output (mA)} - 4 \text{mA}]}{\text{Ideal Output (mA)} - 4 \text{mA}} \times 100 \quad 2.8\% \quad 4/22/97$$

5.29.6 **RECORD** the actual output and the percent deviation calculated in step 5.29.5.

Test Engineer.: 7.8.94

5.29.7 **REPEAT** steps 5.29.1 through 5.29.6 for all check sources to be used.

5.29.8 **REMOVE** DMM and reconnect all wiring.

5.29.9 **CREATE** a failure of the Beta Monitor by installing a jumper from 41 RD to H1 RD on the back of the Beta Monitor.

5.29.10 **VERIFY** the following events occur:

- The local horn sounds.
- The local amber beacon flashes (both are on top of the instrumentation cabinet).

Test Engineer.: D. G.

5.29.11 **DEPRESS** the horn acknowledge button PB-1.

5.29.12 **VERIFY** the following events occur:

- The horn stops sounding.
- The amber beacon continues to flash.
- The light in PB-1 is ON.

Test Engineer.: D. G.

5.29.13 **REMOVE** the jumper installed in Step 5.29.9

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

5.29.14

Data Transfer From Rev. 2 7/24 4/22/93
VERIFY the amber beacon stops flashing.

Test Engineer.: D. G.

5.29.15

DEPRESS acknowledge button PB-1.

5.29.16

VERIFY horn does not sound and light in PB-1 is OFF.

Test Engineer.: D. G.

5.29.17

CREATE a high radiation condition of the Beta Monitor by installing a jumper from terminal 40 RD to H1 RD on the back of the Beta Monitor.

5.29.18

VERIFY the horn sounds and the local red beacon flashes.

Test Engineer.: D. G.

5.29.19

DEPRESS the horn acknowledge button PB-1.

5.29.20

VERIFY the following events occur:

- The horn stops sounding.
- The red beacon continues to flash.
- The light in PB-1 is ON.

Test Engineer.: D. G.

5.29.21

REMOVE the jumper installed in Step 5.29.17.

5.29.22

VERIFY the red beacon stops flashing.

Test Engineer.: D. G.

5.29.23

DEPRESS horn acknowledge button PB-1.

5.29.24

VERIFY horn does not sound and light in PB-1 is OFF.

Test Engineer.: D. G.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer From Rev. 2 JSH 4/22/97

- 5.30 Test for Accuracy, Zero Drift and Calibration Drift.
- 5.31 **SELECT** Damper MK-AZ702K3-2A **CLOSE** on MCS graphic 20BldExh.v.
- 5.32 **SELECT** Damper MK-AZ702K3-2A **AUTO** on MCS graphic 20BldExh.v.
- 5.33 **PLACE** the local handswitch HS-AZ702K305-1A1 in **REMOTE**.
- 5.34 At the MCS **SELECT** HS-702K35-1A **START** command.
- 5.35 **VERIFY** the following:

- damper MK-AZ702K3-2A **OPENS**.
- fan AZ702-K3-5-1A **STARTS**.

5.35.1 **INSTALL** the Reference Method Apparatus.

NOTE - The Stack monitoring system will be operated for a 24 hour conditioning period, during which it shall be continuously measuring stack flow.

5.35.2 **RECORD** the start date and time for this conditioning portion of the test.

Start Date *4/24/97*

Time *2:30 PM*

Test Engineer: *D. G.*

5.35.3 **RECORD** the start date and time for the data collection portion of the test.

Start Date *4/24/97*

Time *2:30 PM*

Test Engineer: *JSH*

5.35.4 **DURING** the 24 hour test, take three sets of flow measurements at least one hour apart, using the reference method and the monitoring system.

NOTE: Additional data sheets will be provided for this portion of the test.

5.35.5 **COLLECT** Reference Method data using 6-TF-155, Air Flow Test for Tank Farm Stacks and Ducts.

5.35.6 **RECORD** reference method data taken in step 5.35.4 on Appendix H.

Test Engineer: *JSH*

5.35.7 **RECORD** data taken in step 5.35.4 on Appendix F.

Test Engineer *JSH*

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5.35.8 **DURING** the 24 hour test, subject the monitoring system to the manufacturers' specified zero and calibration procedures, after the first set of flow data and after the second set of flow data, to test for calibration drift and zero drift.

5.35.9 **RECORD** the monitoring system output reading (Volts DC) on Appendix G before and after the adjustments in step 5.35.8.

Test Engineer.: 7.8.14

5.36 **UPON** completion of steps 5.35.1 through 5.35.9 **THEN PERFORM** the following calculations on Appendix F:

5.36.1 **CALCULATE** the mean (average) value of the 3 reference method values (volumetric) using the following equation:

$$\overline{RM} \text{ (mean reference method value)} = \sum RM \div 3$$

where, $\sum RM$ = sum of the individual reference method values:

5.36.2 **CALCULATE** the individual differences between the 3 pairs of reference method values (RM) and the measurement system values (MS) using the following equation:

$$d_i = RM - MS$$

5.36.3 **CALCULATE** the sum of the differences of the 3 pairs calculated in step 5.36.2.

$$\sum d_i$$

5.36.4 **CALCULATE** the mean value of the differences of the 3 pairs calculated above, using the following equation:

$$\overline{d} \text{ (mean difference)} = \sum d_i \div 3$$

5.36.5 **CALCULATE** the square of each of the 3 values of d_i calculated in step 5.36.2.

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5.36.6 **CALCULATE** the sum of the squares of the differences calculated in step 5.36.5.

$$\sum d_i^2$$

5.36.7 **PERFORM** the following calculations for both Zero and Calibration on Appendix G:

5.36.8 **CALCULATE** the individual differences between the 2 pairs of successive readings.

5.36.9 **CALCULATE** the sum of the differences of the 2 pairs calculated in step 5.36.8.

$$\sum d_i$$

5.36.10 **CALCULATE** the mean value of the differences for the 2 pairs, using the following equation:

$$\bar{d}_i = \sum d_i \div 2$$

5.36.11 **CALCULATE** the square of each of the 2 values of d_i calculated in step 5.36.8.

5.36.12 **CALCULATE** the sum of the squares of the differences calculated in step 5.36.11.

$$\sum d_i^2$$

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5.36.13

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CALCULATE the Relative Accuracy of the measurement system versus the reference method used in the following equation:

$$RA = \frac{|\bar{d}| + cc}{\overline{RM}} \times 100$$

$\overline{RM}$ = arithmetic mean of the reference method.

$\bar{d}$ = the absolute value of the mean difference between the reference method values (volumetric) and the corresponding measurement system values (volumetric)

cc = confidence coefficient.

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{3}}$$

$T_{0.025}$ for 3 = 4.303

$$Sd = \sqrt{\frac{\sum d_i^2 - \frac{(\sum d_i)^2}{3}}{2}}$$

NOTE - The values of $\overline{RM}$, $\bar{d}$, $\sum d_i^2$, and $\sum d_i$ can be found on Appendix F.

5.36.14

RECORD the values calculated for Sd, cc, and RA in Appendix F.

Test Engineer.: *[Signature]*

Data Transferred From REV. 2 TBAH 4/22/93

5.36.15

CALCULATE the Zero Drift of the measurement system using the following equation:

$$\text{Zero Drift} = \left[\frac{|\bar{d}| + cc}{5V} \right] \times 100$$

where,

$\bar{d}$ = the absolute value of the mean difference between the 2 pairs of successive readings.
 cc = confidence coefficient

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{2}}$$

 $T_{0.025} \text{ for } 2 = 12.706$

$$Sd = \sqrt{\sum_{i=1}^2 d_i^2 - \frac{\left(\sum_{i=1}^2 d_i \right)^2}{2}}$$

NOTE - The values of $\bar{d}$, $\sum_{i=1}^2 d_i^2$, and $\sum_{i=1}^2 d_i$ can be found on Appendix G.

5.36.16

RECORD the values calculated for Sd, cc, and Zero Drift on Appendix G.Test Engineer.: *TBAH*

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- 5.36.17 **CALCULATE** the Calibration Drift of the measurement system using the following equation:

$$\text{Calibration Drift} = \left[\frac{|\bar{d}| + cc}{5V} \right] \times 100$$

where,

$|\bar{d}|$ = the absolute value of the mean difference between the 2 pairs of successive readings.

cc = confidence coefficient

$$\text{Where } cc = t_{0.025} \frac{Sd}{\sqrt{2}}$$

$T_{0.025}$ for 2 = 12.706

$$Sd = \sqrt{\sum d_i^2 - \frac{\left(\sum d_i\right)^2}{2}}$$

NOTE -

The values of $\bar{d}$, $\sum d_i^2$, and $\sum d_i$ can be found on Appendix G.

- 5.36.18 **RECORD** the values calculated for Sd, cc, and Calibration Drift on Appendix G.

7.8.97

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5.36.19 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

5.37 Stack Monitor Roof Cabinet Cooling Fan *TE-024*

5.37.1 VERIFY that detector head in cabinet is operating. *X*

Test Engineer _____ Date _____

5.37.2 VERIFY that internal recirculation fan is OFF when cabinet temperature is below 80 F.

Test Engineer _____ Date _____

5.37.3 VERIFY that internal recirculation fan is ON when cabinet temperature is above 100 F.

Test Engineer _____ Date _____

5.37.4 VERIFY that internal cabinet temperature is a maximum of 5 F warmer than ambient under the following conditions: Ambient temperature is above 100 F, bright sun fully directed on cabinet for a minimum of 2 hours. RECORD actual conditions.

Ambient outdoor temperature: _____ F
Equilibrium temperature inside cabinet: _____ F
Test Engineer _____ Date _____

6.0 SECURE FROM POTP

6.1 VERIFY that all temporary test equipment has been removed from the Ventilation Building Ventilation System.

Test Engineer: *[Signature]*

6.2 VERIFY that all temporary test equipment has been removed from the Ventilation Building Ventilation Stack Monitor.

Test Engineer: *[Signature]*

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Note Transfer From Rev 2 7891 4/22/99

APPENDIX A - List of Instrumentation Requiring Calibration Verification

Equipment Number	Functional Description	Signature	Date/Time
FT-AZ702K3-1	Beta Monitor Sampler Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>D. G.</i>	<i>4/2/99 / 1:00 PM</i>
FT-AZ702K3-2	Record Monitor Sampler Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>D. G.</i>	<i>4/2/99 / 1:00 PM</i>
FT-AZ702K3-3	Stack Discharge Flow Transmitter in Monitor Panel in Stack Monitor Room.	<i>D. G.</i>	<i>4/2/99 / 1:00 PM</i>
PI-AZ702K3-1	Beta Monitor Sampler Pressure Gauge in Monitor Panel in Stack Monitor Room.	<i>D. G.</i>	<i>4/2/99 / 1:00 PM</i>
PI-AZ702K3-2	Record Monitor Sampler Pressure Gauge in Monitor Panel in Stack Monitor Room.	<i>D. G.</i>	<i>4/2/99 / 1:00 PM</i>
RI-AZ702K3-1	Beta Monitor Sampler Radiation Indicator in E/I Room B	<i>D. G.</i>	<i>4/4/99 / 1:00 PM</i>

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer From Rev. 2 71~~4~~ 4/22/97

Page 1, Appendix B - RWS Manual Valves Alignment

[illegible]

Performed

By Paul M. Zyprinski PMZ 4/2/97 BY Doug Gorker DG 4/2/97
PRINT NAME INITIALS DATE PRINT NAME INITIALS DATE

Verified

BY Doug Becker AG. 4/2/97
PRINT NAME INITIALS DATE

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Page 2 Appendix B - Building Ventilation System Setup

Air Conditioning Unit AZ702-K2-5-1 Controls are as follows:

Remote/Local switch in Local

Supply fan Auto/On Switch in On

Thermostat set to maintain building temperature.

Primary Filter Train Room Pressure Controllers

PDIC-AZ702K2-2 Auto with set point of "0.25".

PDIC-AZ702K2-3 Auto with set point of "0.25".

Primary Vent Cell Pressure Controller

PDIC-AZ702K3-1 Auto with Set point of "1.5".

Building Exhaust Filter Train Inlet valves

MK-AZ702K3-2A Auto

MK-AZ702K3-2B Auto

Building Exhaust Fans

Fan "A" (AZ702-K3-5-1A) will be the lead fan and "B" fan (AZ702-K3-5-1B) in standby.

The pressure controllers will be set as follows:

PIT-AZ702K35-1A Auto with set point adjusted to maintain desired flow.

PIT-AZ702K35-1B Auto with set point adjusted to maintain desired flow.

The Interlock controls will be set in Normal

Building Exhaust Sampling System

AZ702-K3-11-1 and AZ702-K3-11-2 will be in Auto

During this test run the pressure controllers may be placed in Manual and the output deviation adjusted to maintain the desired flowrate and steady state conditions.

System Shutdown

Take standby fan out of standby.

Stop running fan

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ATTACHMENT I- VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer From Rev. 2 7/8/94 4/22/95

APPENDIX C - MANUAL VALVE CYCLE LIST

[illegible]

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

Data Transfer from Rev 2 7/11/19

APPENDIX D		
STEP	PARAMETER	STACK FLOW
		960 SCFM
5.28.6	FI-Display (SCFM)	930
	%Full Scale Stack Flow	88.5
5.28.7	V/I-1 Channel 1 Ideal Output (mA)	18.17
5.28.8	V/I-1 Channel 1 Actual Output (mA)	18.17
5.28.10	V/I-1 Channel 1 % Deviation ($\leq 2\%$)	0
5.28.12	Ideal Record and Beta Sample Flow (SCFM)	1.77
5.28.13	FI-AZ702KE-2 Display (SCFM)	1.77
	FI-AZ702K3-3 Display (SCFM)	1.78
5.28.15	% Deviation Record Sample ($\leq 5\%$)	0
5.28.17	% Deviation Beta Sample ($\leq 5\%$)	0.56
5.28.19	V/I-1 Channel 2 Ideal Output (mA)	18.16
5.28.21	V/I-1 Channel 3 Ideal Output (mA)	18.24
5.28.22	V/I-1 Channel 2 Actual Output (mA)	18.17
	V/I-1 Channel 3 Actual Output (mA)	18.24
5.28.24	V/I-1 Channel 2 % Deviation ($\leq 2\%$)	0.07
5.28.26	V/I-1 Channel 3 % Deviation ($\leq 2\%$)	0.0
5.28.28	TI-AZ702K3-3 Display ($^{\circ}\text{F}$)	68
	% Full Scale Stack Temperature	45.3
5.28.30	V/I-2 Channel 2 Ideal Output (mA)	11.25
5.28.31	V/I-2 Channel 2 Actual Output (mA)	11.24
5.28.33	V/I-2 Channel 2 % Deviation ($\leq 2\%$)	0.14

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX E					
STEP	PARAMETER	1 ST CHECK SOURCE	2 nd CHECK SOURCE	3 rd CHECK SOURCE	4 th CHEC SOURCE
5.29.3	Displayed Activity	3750.12 Bq/m			
5.29.3	V/I-2 Channel 1 Ideal Output (mA)	15.43			
5.29.4	V/I-2 Channel 1 Actual Output (mA)	15.56			
5.29.6	V/I-2 Channel 1 % Deviation ($\leq 2\%$)	0.84%			

Source
used
7/10/97

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APPENDIX F

TEST FOR ACCURACY

RUN NO.	DATE	TIME	REFERENCE METHOD (SCFM)	MEASUREMENT SYSTEM (SCFM)	DIFFERENCE $d_i = RM - MS$	d_i^2
1	4/4/99	0830	976	930	46	2116
2	4/4/99	0955	955	935	20	400
3	4/4/99	1100	939	932	7	49
			$\overline{RM} = 957$			$\sum d_i = 73$
						$\sum d_i^2 = 2565$
					$\bar{d} = 24$	

Sd = 20
cc = 49.7
RA = 7.6%

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APPENDIX G

TEST FOR CALIBRATION DRIFT AND ZERO DRIFT

Run No.	Date	Time	Zero Reading Volts		Difference		Calibration Reading Volts		Difference	
			Before	After	d_1	d_1^2	Before	After	d_1	d_1^2
0	4/4/97			0.000				5.000		
1	4/4/97		0.000	0.000	0	0	5.014	5.000	14	196
2	4/4/97		0.000	0.000	0	0	5.000	5.000	0	0
					0	0				
					$\sum d_1 = 0$	$\sum d_1^2 = 0$			$\sum d_1 = 14$	$\sum d_1^2 = 196$
					$\bar{d}_1 = 0$				$\bar{d}_1 = 7$	

Sd: 0

cc: 0

Zero Drift: 0

Sd: 9.9

cc: 88.9

Calibration Drift: 107%

APPENDIX H, 241-AZ-702 BLDG EXHAUST STACK SITE-SPECIFIC DATA

GENERAL INFORMATION

Stack:	10" (circular diameter), approx. 16' tall
Flow Test Ports:	FTPs D and E, 3/4" half cplng w/plug, height: approx. 6' (above work platform).
Scaffolding:	Work platform installed for stack access.
Exhaust Fan:	AZ702-K3-5-1A and AZ702-K3-5-1B; 1000 CFM @ 70 °F
HEPA Filter:	AZ702-K3-4-1A and AZ702-K3-4-1B (each w/prefilter in series); see H-2-131271 & H-2-131073.

REFERENCES

Include the following references if requested by Air Balance (AB), Operations (NPO), or Tank Farm Power Operator (OP) personnel:

H-2-131073, P & ID Vent Bldg Ventilation System.

TO-060-350, Start, Stop and Operate 241-AZ-702 Building Ventilation System.

PRECAUTIONS & LIMITATIONS

No additional precautions & limitations. See 6-TF-155, Section 4.0.

PREREQUISITES

No additional prerequisites. See 6-TF-155, Section 6.0.

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

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>3</i>
	WHSL Code Number <i>702-28-09-018</i>	WHSL Code Number <i>799-32-01-002</i>
	WHSL Cal Due Date <i>8-2-97</i>	WHSL Cal Due Date <i>12-6-97</i>
		WHC Cal Due Date <i>N/A</i>
7.1.2	ADDITIONAL INSTRUMENT CALIBRATION DATA	
	COMMENTS: _____	

Initials/Date *hsc*
4-4-97

ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

241-AZ-702 BLDG VENT	
MEASUREMENT	TEST PORT
Humidity	D
Static Pressure	D
Temperature	D, E
Velocity Pressure	D, E
Stack Diameter:	10 in.
Stack Area:	0.5454 sq ft
Port Elevation:	703 ft

APPENDIX H, Figure 1. 241-AZ 702 Exhaust Stack 296-A-43 Air Flow Test Ports.

ATTACHMENT I - VENT BUILDING VENTILATION 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	0800	29.27 (P _b)
	COMMENTS: _____				

STEP 7.3	INSTALLED INSTRUMENT READINGS				
7.3.1	Operating exh fan:		AZ702-K3-5-1A	AZ702-K3-5-1B	
7.3.2	Instrument		Location		Reading
	Stack Flow Indicator FI-702-K3-3		241-AZ-271 Graphics Screen 21BldMon.v		930 (FI-1) (SCFM)
7.3.3	Instrument calibration sticker current?			<u>YES</u>	NO
	Instrument in proper working condition?			<u>YES</u>	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.]			<u>PASS</u>	FAIL
	Impact Pressure ☒ Static Pressure ☒				
	COMMENTS: _____				

Any supporting Data sheets are to be appended to this data sheet.

Initials/Date luc
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APPENDIX H, DATA SHEET 3 (Sheet 1 of 2)

STEP 7.5		STACK AIR FLOW MEASUREMENTS				
		TEST PORT D				
		Relative Humidity:	16.4% (RH)		RETEST (IF REQUIRED)	
		Static Pressure:	.02" 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	62	.21	1835		
	1/2	62	.21	1835		
	7/8	62	.22	1879		
7.5.3	1 1/4	62	.22	1879		
	1 3/4	62	.20	1791		
7.5.4	2 1/4	62	.19	1746		
	2 7/8	62	.19	1746		
7.5.5	3 3/4	62	.21	1835		
	6 1/4	62	.20	1791		
7.5.6	7 1/8	62	.21	1835		
	7 3/4	62	.22	1879		
	8 1/4	62	.24	1962		
	8 3/4	62	.24	1962		
	9 1/8	62	.24	1962		
	9 1/2	62	.22	1879		
	9 1/2	62	.22	1879		
	TOTAL ts	992	TOTAL FPM	29695	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 √V

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 0825 Initials/Date lc

4-4-97

ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITORING

APPENDIX H, DATA SHEET 3 (Sheet 2 of 2)

STEP 7.5	STACK AIR FLOW MEASUREMENTS					
	TEST PORT E					
	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)
7.5.2	1/2	62	.25	2003		
	1/2	62	.25	2003		
	7/8	62	.26	2042		
	1 1/4	62	.19	1699		
	1 3/4	62	.16	1602		
7.5.3	2 1/4	62	.14	1499		
	2 7/8	62	.14	1499		
	3 3/4	62	.17	1651		
7.5.4	6 1/4	62	.19	1746		
	7 1/8	62	.20	1791		
7.5.5	7 3/4	62	.20	1791		
	8 1/4	62	.21	1835		
7.5.6	8 3/4	62	.22	1879		
	9 1/8	62	.22	1879		
	9 1/2	62	.22	1879		
	9 1/2	62	.22 (VP1)	1879	(VP1)	
	TOTAL ts	992	TOTAL FPM	28677	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 / 17

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 0830 Initials/Date lu
4-4-97

APPENDIX H, DATA SHEET 4

STEP 7.6	APPENDIX H, PITOT TUBE PERFORMANCE CHECK		
7.6.1 7.6.3 7.6.4	(PASS = $P \leq \pm 5\%$; FAIL = $P > \pm 5\%$)		PASS/FAIL
	$P = \left[\left(\frac{.22}{VP1} - \frac{.22}{VP2} \right) \div \frac{.22}{VP1} \right] \times 100 = \underline{0} \%$		
	If $P > \pm 5\%$ AND $VP1 < 0.04$ in. wg, air flow retest is NOT required; COG Engineer will determine acceptability of pitot tube performance.		
COMMENTS: _____			
STEP 7.7	POST-TEST PRESSURE LEAK CHECK		
7.7.1 7.7.2	[Reading ≥ 3.0 in. wg and stable (± 0.2 in. wg) for 15 sec.]		PASS/FAIL
	Impact Pressure ☒ Static Pressure ☒		
	COMMENTS: _____		
STEP 7.9	STACK AIR FLOW CALCULATIONS		
7.9.1	Total $t_s = t_{s1} + t_{s2} + t_{s3} + \dots$	Total Port D	992 (Sht 3)
		Total Port E	992 (Sht 3)
		$t_s(\text{total}) (D + E)$	1984
7.9.2	Average $t_s = \text{Total } t_s \div 32$	$t_s(\text{avg})$	62
7.9.3	Velocity (FPM) = 4005 $\sqrt{V}$	Data Sheet 3	
7.9.4	Total FPM = FPM1 + FPM2 + FPM3 + ...	Total Port D	29695 (Sht 3)
		Total Port E	28677 (Sht 3)
		FPM(total) (D + E)	58372
7.9.5	Average FPM = Total FPM $\div 32$	fpm(avg)	1824
7.9.6	Total CFM = Average FPM $\times 0.5454$ sq ft	cfm(total)	995

Any supporting Data sheets are to be appended to this data sheet.

Initials/Date arc

4-4-97

APPENDIX H, DATA SHEET 5 (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW CALCULATION WORKSHEET		
<p>AVERAGE ACTUAL STACK GAS VELOCITY (v_s)</p> $v_s = \rho_s \cdot \sqrt{\frac{P_s}{\rho_s}}$ <p>AVERAGE STACK GAS DRY VOLUMETRIC FLOW RATE (Q_{sd})</p> $Q_{sd} = \left(\frac{P_{sd}}{P_s} \right) \left(\frac{v_s}{v_{std}} \right) \left(\frac{P_s}{P_{std}} \right) \left(\frac{V_s}{v_{std}} \right)$		
Eq. Input	Description	Value
B_{ws}	Stack gas water vapor: $B_{ws} = \left(\frac{P_{ws}}{P_s} \right) \left(\frac{v_s}{v_{std}} \right)$	4.003
RH	Stack relative humidity, percent	16 % (Sht 3)
P_{ws}	Vapor pressure of H ₂ O at temperature $t_{s(avg)}$	4.56029
K_p	Pitot tube constant: $K_p = \frac{1}{2} \left(\frac{100 \text{ mm Hg}}{100 \text{ mm Hg}} \right) \left(\frac{100 \text{ mm Hg}}{100 \text{ mm Hg}} \right) \left(\frac{1}{2} \right)$	85.49
C_p	Pitot tube coefficient, standard	0.99
v_{avg}	Average of velocity pressure sqrt, in. wg: $v_{avg} = \sqrt{P_{avg} \cdot 0.005}$	4.4554
fpm_{avg}	Average stack gas velocity, ft/min	1824 (Sht 4)
A	Cross-sectional stack area, ft ²	0.5454
T_{std}	Standard absolute temperature, °R	528

ATTACHMENT I - VENT BUILDING VENTILATION STACK MON.

APPENDIX H, 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: $P_s = P_b - (P_g \cdot 13.6)$	29.27
P_b	Barometric pressure at test port, in. Hg	29.27 (Sht 2)
P_g	Stack static pressure, in. wg	0.02 (Sht 3)
$T_{s(avg)}$	Average absolute stack temperature, °R $T_{s(avg)} = 1.8 \cdot t_{s(avg)}$	522
$t_{s(avg)}$	Average stack gas temperature, °F	62 (Sht 4)
M_s	Molecular weight stack gas, wet, lb/lb-mole: $M_s = 29(1 - X_{H_2O}) + 18X_{H_2O}$	28.97
<p>Calculation (Q_{sd})</p> $60(1 - 0.003) 85.44(0.44) \frac{1824}{4005} (0.5454) \left[\frac{522}{29.42} \right] \sqrt{\frac{29.27}{522(28.97)}}$ $= 976.3$		
		$Q_{sd} = 976 \text{ dscfm}$

FI 930
995 CFM

COG Engr Initials/Date:

Carl

4-4-97

ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITORING

APPENDIX H, DATA SHEET 6

STEP 10	DISPOSITION		
10.1	Vent & Balance Reviewer shall ensure Data Sheets are accurate, complete, and legible.		
10.2	<u>Steven V. Carroll</u> V&R Review (print name)	<u>Steven V. Carroll</u> Signature	<u>4-4-97</u> 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>SP-4</u> Facility PIC	<u>4/4/97</u> Date	
	<u>N/A</u> Work Request Number	<u>N/A</u> Work Request Number	<u>N/A</u> Date
10.5	Facility PIC forward work package to Environmental for effluent and emissions calculations (Env. Engr. sign when complete & return work package to Planner):		
10.6	<u>Gary Crummett</u> Env. Engr. (print name)	<u>Gary Crummett</u> Signature	<u>4-4-97</u> Date
COMMENTS: _____			

Any supporting Data sheets are to be appended to this data sheet.

Effluent Engineering Worksheet (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS					
RUN	DATE	TIME	Q_{id}	D_i	$(D_i)^2$
1	4-4-97	0830	976	46	2116
2					
3					
SUM = RUN1 + RUN2 + ...			(ΣQ_{id})	(ΣD_i)	$(\Sigma (D_i)^2)$
AVG = SUM ÷ 3			$\bar{Q}_{id}$	$\bar{D}_i$	

COG Engr Initials/Date:

10/3/97

ATTACHMENT I - VENT BUILDING VENTILATION 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	0930	29.28 (P _b)
	COMMENTS: _____				
STEP 7.3	INSTALLED INSTRUMENT READINGS				
7.3.1	Operating exh fan:		AZ702-K3-5-1A	AZ702-K3-5-1B	
7.3.2	Instrument		Location		Reading
	Stack Flow Indicator FI-702-K3-3		241-AZ-271 Graphics Screen 21BldMon.v		935 (FI-1) (SCFM)
7.3.3	Instrument calibration sticker current?			<u>YES</u>	NO
	Instrument in proper working condition?			<u>YES</u>	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.]			<u>PASS</u>	FAIL
	Impact Pressure <u>✓</u> Static Pressure <u>✓</u>				
	COMMENTS: _____				

Any supporting Data sheets are to be appended to this data sheet.

Initials/Date SK

4-4-97

APPENDIX H, DATA SHEET 3 (Sheet 1 of 2)

STEP 7.5		STACK AIR FLOW MEASUREMENTS					
		TEST PORT D					
		Relative Humidity:		14.3 % (RH)		RETEST (IF REQUIRED)	
		Static Pressure:		.02" w.g. (P _g)		(P _g)	
		Traverse Points* (in.)	Temp.	Velocity		Velocity	
			t _s (°F)	VP (in. wg)	FPM** (ft/min)	VP (in. wg)	FPM** (ft/min)
7.5.2	1/2	63	.21	1835			
	1/2	63	.21	1835			
	7/8	63	.21	1835			
7.5.3	1 1/4	63	.21	1835			
	1 3/4	63	.18	1699			
7.5.4	2 1/4	63	.17	1651			
	2 7/8	63	.18	1699			
7.5.5	3 3/4	63	.18	1699			
	6 1/4	63	.21	1835			
7.5.6	7 1/8	63	.21	1835			
	7 3/4	63	.21	1835			
	8 1/4	63	.25	2003			
	8 3/4	63	.24	1962			
	9 1/8	63	.25	2003			
	9 1/2	63	.25	2003			
	9 1/2	63	.25	2003			
	TOTAL t _s	1008	TOTAL FPM	29567	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 CFM

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 0950 Initials/Date

4-4-97

ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 3 (Sheet 2 of 2)

STEP 7.5	STACK AIR FLOW MEASUREMENTS					
7.5.2	TEST PORT E					
	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	63	.21	1835		
	1/2	63	.21	1835		
	7/8	63	.23	1921		
	1 1/4	63	.22	1879		
	1 3/4	63	.20	1791		
	2 1/4	63	.18	1699		
	2 7/8	63	.16	1602		
	3 3/4	63	.14	1499		
7.5.3	6 1/4	63	.14	1499		
7.5.4	7 1/8	63	.14	1499		
7.5.5	7 3/4	63	.15	1551		
7.5.5	8 1/4	63	.16	1602		
7.5.6	8 3/4	63	.19	1746		
7.5.6	9 1/8	63	.20	1791		
7.5.6	9 1/2	63	.23	1921		
7.5.6	9 1/2	63	.23 (VPI)	1921	(VPI)	
7.5.6	TOTAL ts	1008	TOTAL FPM	27591	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 ft/min

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 0955 Initials/Date *lc*

4-4-97

APPENDIX H, DATA SHEET 4

STEP 7.6		APPENDIX H, PITOT TUBE PERFORMANCE CHECK	
		(PASS = $P \leq \pm 5\%$; FAIL = $P > \pm 5\%$)	
7.6.1	$P = \left[\left(\frac{.23}{VP1} - \frac{.23}{VP2} \right) \div \frac{.23}{VP1} \right] \times 100 = 0\%$		PASS/FAIL
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.]	
		Impact Pressure ☒ Static Pressure ☒	PASS/FAIL
7.7.1	COMMENTS: _____		
7.7.2	_____		

STEP 7.9		STACK AIR FLOW CALCULATIONS	
7.9.1	Total ts = ts1 + ts2 + ts3 + ...	Total Port D	1008 (Sht 3)
		Total Port E	1008 (Sht 3)
		ts(total) (D + E)	2016
7.9.2	Average ts = Total ts $\div$ 32	ts(avg)	63
7.9.3	Velocity (FPM) $\div$ 4005 $\sqrt{V}$	Data Sheet 3	
7.9.4	Total FPM = FPM1 + FPM2 + FPM3 + ...	Total Port D	29567 (Sht 3)
		Total Port E	27591 (Sht 3)
		FPM(total) (D + E)	57158
7.9.5	Average FPM = Total FPM $\div$ 32	fpm(avg)	1786
7.9.6	Total CFM = Average FPM $\times$ 0.5454 sq ft	cfm(total)	974

Any supporting Data sheets are to be appended to this data sheet.

Initials/Date *je*

4-4-97

PREOPERATIONAL TESTING - VENTILATION BUILDING, UNIT

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 5 (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW CALCULATION WORKSHEET		
<p>AVERAGE ACTUAL STACK GAS VELOCITY (v_s)</p> $v_s = K_p \rho^{1/2} \sqrt{\frac{P_s (avg)}{P_s P_s}}$ <p>AVERAGE STACK GAS DRY VOLUMETRIC FLOW RATE (Q_{sd})</p> $Q_{sd} = 60 (1 - f_{ws}) v_s \left(\frac{P_{std}}{P_s (avg)} \right) \left(\frac{P_s}{P_{std}} \right)$ $= 60 (1 - f_{ws}) K_p \rho^{1/2} \sqrt{\frac{P_{std}}{P_s (avg)}} \left(\frac{P_s}{P_{std}} \right)$		
Eq. Input	Description	Value
B_{ws}	Stack gas water vapor: $f_{ws} = \left(\frac{W}{100} \right) \left(\frac{P_{ws}}{P_s} \right)$	4.003
RH	Stack relative humidity, percent	14.3 % (Sht. 3)
P_{ws}	Vapor pressure of H_2O at temperature $t_s (avg)$	4.58039
K_p	Pitot tube constant: $K_p = \frac{1}{2} \left(\frac{1/2 \ln \frac{P_1}{P_2}}{\ln \frac{P_1}{P_2}} \right)^2$	85.49
C_p	Pitot tube coefficient, standard	0.99
ρ_{avg}	Average of velocity pressure sqrt, in. wg: $\rho_{avg} = \rho_{std} (avg) \cdot 4005$	4.4459
$f_{pm (avg)}$	Average stack gas velocity, ft/min	1786 (Sht. 4)
A	Cross-sectional stack area, ft^2	0.5454
T_{std}	Standard absolute temperature, °R	528

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

Revision No. 2

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, 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: $P_s = P_b + (P_g \cdot 13.6)$	29.28
P_b	Barometric pressure at test port, in. Hg	29.28 (Sht 2)
P_g	Stack static pressure, in. wg	4.02 (Sht 3)
$T_{s(avg)}$	Average absolute stack temperature, °R $T_{s(avg)} = 459 + t_{s(avg)}$	523
$t_{s(avg)}$	Average stack gas temperature, °F	63° (Sht 4)
M_s	Molecular weight stack gas, wet, lb/lb-mole: $M_s = 29(1 - x_{ws}) + 18x_{ws}$	28.97

CALCULATION (Q_{sd})

$$60(1 - 0.003)(85.44)(0.99) \frac{1786}{4005} (4.5454) \left[\frac{523}{29.92} \right] \sqrt{\frac{29.28}{523(28.97)}}$$

$$= 955.4$$

$Q_{sd} = 955$ dscfm

FI 935
974 CFM

COG Engr Initials/Date:

Comer

4-4-97

ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 6

STEP 10	DISPOSITION
10.1 10.2	Vent & Balance Reviewer shall ensure Data Sheets are accurate, complete, and legible. <div style="display: flex; justify-content: space-between;"> <u>Steven V. Carrick</u> V&B Review (print name) <u>[Signature]</u> Signature <u>4-4-97</u> Date </div>
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: <div style="display: flex; justify-content: space-between;"> <div>System configuration restored:</div> <div><u>[Signature]</u> Facility PIC</div> <div><u>4-4-97</u> Date</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div><u>n/a</u> Work Request Number</div> <div><u>n/a</u> Work Request Number</div> <div><u>n/a</u> Date</div> </div>
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): <div style="display: flex; justify-content: space-between;"> <u>Gary Curren</u> Env. Engr. (print name) <u>[Signature]</u> Signature <u>4-4-97</u> Date </div>
COMMENTS: _____ _____ _____ _____ _____ _____ _____	

Any supporting Data sheets are to be appended to this data sheet.

Effluent Engineering Worksheet (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS

RUN	DATE	TIME	Q_{sd}	D_i	$(D_i)^2$
1					
2	4-4-97	0955	955	20	400
3					
SUM = RUN1 + RUN2 + ...			$(\sum Q_{sd})$	$(\sum D_i)$	$(\sum (D_i)^2)$
AVG = SUM +3			$\bar{Q}_{sd}$	$\bar{D}_i$	

COG Engr Initials/Date: ad

10/3/97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

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ATTACHMENT I - VENT BUILDING VENTILATION 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	1030	29.28 (P _b)
	COMMENTS: _____				
STEP 7.3		INSTALLED INSTRUMENT READINGS			
7.3.1		Operating exh fan:		AZ702-K3-5-1A	AZ702-K3-5-1B
7.3.2	Instrument		Location		Reading
	Stack Flow Indicator FI-702-K3-3		241-AZ-271 Graphics Screen 21BldMon.v		932 (FI-1) (SCFM)
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.

Initials/Date me
4-4-97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 3 (Sheet 1 of 2)

STEP 7.5	STACK AIR FLOW MEASUREMENTS					
	TEST PORT D					
	Relative Humidity:		16% (RH)		RETEST (IF REQUIRED)	
	Static Pressure:		.02" w.g. (P _s)		(P _e)	
	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	63	.21	1835		
	1/2	63	.21	1835		
	7/8	63	.21	1835		
7.5.3	1 1/4	63	.20	1791		
	1 3/4	63	.20	1791		
7.5.4	2 1/4	63	.18	1699		
	2 7/8	63	.19	1746		
7.5.5	3 3/4	63	.20	1791		
	6 1/4	63	.21	1835		
7.5.6	7 1/8	63	.21	1835		
	7 3/4	63	.21	1835		
	8 1/4	63	.21	1835		
	8 3/4	63	.22	1879		
	9 1/8	63	.23	1921		
	9 1/2	63	.22	1879		
	9 1/2	63	.22	1879		
	TOTAL ts	1008	TOTAL FPM	2922	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 / FT

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 1055 Initials/Date gk

4-4-97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 3 (Sheet 2 of 2)

STEP 7.5		STACK AIR FLOW MEASUREMENTS				
		TEST PORT E				
		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)
7.5.2	1/2	63	.22	1879		
	1/2	63	.22	1879		
	7/8	63	.23	1921		
	1 1/4	63	.22	1879		
	1 3/4	63	.20	1791		
7.5.3	2 1/4	63	.16	1602		
	2 7/8	63	.16	1602		
	3 3/4	63	.15	1551		
7.5.4	6 1/4	63	.16	1602		
	7 1/8	63	.16	1602		
7.5.5	7 3/4	63	.16	1602		
	8 1/4	63	.18	1699		
7.5.6	8 3/4	63	.19	1746		
	9 1/8	63	.20	1791		
	9 1/2	63	.22	1879		
	9 1/2	63	.22 (VP1)	1879	(VP1)	
TOTAL ts		100%	TOTAL FPM	27904	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 / TS

Any supporting Pitot Traverse Data sheets are to be appended to this data sheet.

Time test completed: 1100 Initials/Date *de*

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PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 4

STEP 7.6		APPENDIX H, PITOT TUBE PERFORMANCE CHECK	
		(PASS = $P \leq \pm 5\%$; FAIL = $P > \pm 5\%$)	PASS/FAIL
7.6.1	$P = \left[\left(\frac{.22}{VP1} - \frac{.22}{VP2} \right) \div \frac{.22}{VP1} \right] \times 100 = \underline{0} \%$		
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 $ts = ts1 + ts2 + ts3 + \dots$	Total Port D	1008 (Sht 3)
		Total Port E	1008 (Sht 3)
		$ts(\text{total}) (D + E)$	2016
7.9.2	Average $ts = \text{Total } ts \div 32$	$ts(\text{avg})$	63
7.9.3	Velocity <small>(FPM) = 4005 $\sqrt{P}$</small>	Data Sheet 3	
7.9.4	Total FPM = FPM1 + FPM2 + FPM3 + ...	Total Port D	29221 (Sht 3)
		Total Port E	27904 (Sht 3)
		FPM(total) (D + E)	57125
7.9.5	Average FPM = Total FPM $\div 32$	fpm(avg)	1785
7.9.6	Total CFM = Average FPM $\times 0.5454$ sq ft	cfm(total)	974

Any supporting Data sheets are to be appended to this data sheet.

Initials/Date fre
4-4-97

PREOPERATIONAL TESTING - VENTILATION BUILDING VENT

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, DATA SHEET 5 (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW CALCULATION WORKSHEET		
<p>AVERAGE ACTUAL STACK GAS VELOCITY (v_s)</p> $v_s = v_p \cdot p \cdot (\bar{m}_{avg}) \sqrt{\frac{T_s(avg)}{T_s n_s}}$ <p>AVERAGE STACK GAS DRY VOLUMETRIC FLOW RATE (Q_{sd})</p> $Q_{sd} = \omega(1 - x_{ws}) v_s A \left(\frac{T_{std}}{T_s(avg)} \right) \left(\frac{p_s}{p_{std}} \right)$ $= \omega(1 - x_{ws}) K_p C_p (\bar{m}_{avg}) A \left(\frac{T_{std}}{T_s(avg)} \right) \sqrt{\frac{p_s}{T_s(avg) n_s}}$		
Eq. Input	Description	Value
B_{ws}	Stack gas water vapor: $B_{ws} = \left(\frac{dw}{100} \right) \left(\frac{T_{ws}}{T_s} \right)$	4.003
RH	Stack relative humidity, percent	16% (Sht 3)
P_{ws}	Vapor pressure of H_2O at temperature $T_s(avg)$	4.58039
K_p	Pitot tube constant: $K_p = 0.5 \cdot \frac{ft}{sec} \left(\frac{1 in (in. Hg)}{10^{-6} (in. Hg)} \right)^{\frac{1}{2}}$	85.49
C_p	Pitot tube coefficient, standard	0.99
$(\bar{m})_{avg}$	Average of velocity pressure sqrt, in. wg: $(\bar{m})_{avg} = \sqrt{p_{avg} (avg)} \cdot 4005$	4.4457
$fpm_{(avg)}$	Average stack gas velocity, ft/min	1785 (Sht 4)
A	Cross-sectional stack area, ft^2	0.5454
T_{std}	Standard absolute temperature, °R	528

PREOPERATIONAL TESTING - VENTILATION BUILDING VENTI

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ATTACHMENT I - VENT BUILDING VENTILATION STACK MONITOR TEST PROCEDURE

APPENDIX H, 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: $P_s = P_b \cdot (P_g^{13.6})$	29.28
P_b	Barometric pressure at test port, in. Hg	29.28 (Sht. 2)
P_g	Stack static pressure, in. wg	9.02 (Sht. 3)
$T_{s(avg)}$	Average absolute stack temperature, °R $T_{s(avg)} = 460 + t_{s(avg)}$	523
$t_{s(avg)}$	Average stack gas temperature, °F	63 (Sht. 4)
M_s	Molecular weight stack gas, wet, lb/lb-mole: $M_s = 29(1 - R_{H_2O}) + 18R_{H_2O}$	29.97

CALCULATION (Q_{sd})

$$60(1 - 0.003) 85.49(4.99) \frac{1785(4.5454) \left[\frac{528}{29.92} \right]}{4005} \sqrt{\frac{29.28}{523(29.97)}}$$

$$= 938.5$$

$Q_{sd} = 939$ dscfm

CI=932

974 CFM

COG Engr Initials/Date:

line

4-4-97

PREOPERATIONAL TESTING - VENTILATION BUILDING v.I
Revision No. 2 HNF-SD-W030-POTP-007
ATTACHMENT I - VENT BUILDING VENTILATION STACK M

HNF-SD-W030-TD-007,
REV. 0, PAGE 120

Effluent Engineering Worksheet (Sheet 1 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS					
RUN	DATE	TIME	Q_{ad}	D_i	$(D_i)^2$
1	4-4-97	0830	976	46	2116
2	4-4-97	0955	955	20	400
3	4-4-97	1100	939	7	49
SUM = RUN1 + RUN2 + ...			2870 (ΣQ_{ad})	73 (ΣD_i)	2,565 ($\Sigma (D_i)^2$)
AVG = SUM $\div$ 3			957 ($\bar{Q}_{ad}$)	24 ($\bar{D}_i$)	

COG Engr Initials/Date:

4-4-97

Effluent Engineering Worksheet (Sheet 2 of 2)

COGNIZANT ENGINEER AIR FLOW DATA ANALYSIS		
95% CONFIDENCE COEFFICIENT (CC) <div style="text-align: center; margin-top: 10px;"> $CC = 4.303 \sqrt{\frac{(1) \sum (x - \bar{x})^2}{n - 1}}$ </div>		
Eq. Input	Description	Value
$(x_i)^2$	Sum of 3 squared flow rate differences	2 565
$\sum x_i$	Sum of 3 flow rate differences	73
<div style="text-align: center;"> CALCULATION (CC) <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> $CC = 4.303 \sqrt{\frac{(2565 - (73)^2/3)/6}{1}}$ <div style="text-align: right;">= 49.3</div> </div> </div>		
		CC = 49
PERCENT RELATIVE ACCURACY (RA)		
$RA = \left \frac{\bar{x} - \bar{x}_d}{\bar{x}_d} \right \cdot 100$		
$ \bar{x} $	Absolute average flow rate difference	24
$\bar{x}_d$	Average reference flow rate	957
<div style="text-align: center;"> CALCULATION (RA) <div style="display: flex; justify-content: space-between; align-items: center; margin-top: 10px;"> $RA = \frac{24 + 49}{957} = 7.6\%$ <div style="text-align: right;">RA = 7.6 %</div> </div> </div>		
24-HOUR AIR FLOW TEST RESULTS		
PASS = RA ≤ 10% FAIL = RA > 10%		<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> PASS </div> FAIL

PREOPERATIONAL TESTING - VENTILATION BUILDING VE
Revision No. 2 A HNF-SD-W030-POTP-007
ATTACHMENT J - SIGNATURE/INITIAL VERIFICATION

HNF-SD-W030-TD-007,
REV. 0, PAGE 122

All persons involved in procedure performance, data recording, and verification or evaluation of test steps shall provide their name, job title, signature, and initials in the following table.

Data Transfer From Rev. 2 7/24 4/22/97

NAME (PRINT)	TITLE	SIGNATURE	INITIAL
Thomas G. Howell	Test Engineer	<i>Thomas G. Howell</i>	<i>TGH</i>
	Control Room Operator		
	Local Test Operator		
	Witness		
	Witness		
	Witness		
Doug Genker	Test Engineer		<i>D.G.</i>
Gary Hopkins	Test Director		<i>G.H.H.</i>
M. T. Stern	Electrician		<i>M.T.S.</i>
T.R. Vearring	LNPO		<i>T.R.V.</i>
C.A. Willoughby	Fitter		<i>C.A.W.</i>
Lowell F. H. 11	MIS Control Eng.		<i>L.F.H.</i>

PREOPERATIONAL TESTING - VENTILATION BUILD. 'G VI
Revision No. 2 A HNF-SD-W030-POTP-007
ATTACHMENT K - TEST LOG

HNF-SD-W030-TD-007,
REV. 0, PAGE 123

DATA Transferred From Rev. 2 2004/02/97

[illegible]

PREOPERATIONAL TESTING - VENTILATION BUILDING VI
 Revision No. 2 A IINF-SD-W030-POTP-007
 ATTACHMENT L - TEST EXCEPTION REPORT

HNF-SD-W030-TD-007,
 REV. 0, PAGE 124

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	

PREOPERATIONAL TESTING - VENTILATION BUILDING VE
Revision No. 2A HNF-SD-W030-POTP-007
ATTACHMENT M - TEST EXCEPTION LOG

HNF-SD-W030-TD-007,
REV. 0, PAGE 125

Data Transferred From Rev. 2 2/24/97

TEST EXCEPTION LOG

TE #	DATE	DESCRIPTION	DISPOSITIONED	DATE CLOSED
14	11/25/96	Attachment G, steps 2.2.6 thru 2.2.8 are incorrect.	Procedure Revised	11/26/96
16	3/25/97	Attachment E, F, & H The control set points on the VAV cells, AHSS CTL. Have changed along with the Ritten AH's	Corrected Rev. 2 of Procedure.	3/25/97
18 20	9/26/97	Attachment H, sect. 2.8 correct typo errors and comply with design changes.	Corrected rev. 2A of procedure.	9/26/97
19 21	9/26/97	Attachment H, sect. 2.8.5; Stack Flow Alarm occurs on loss of AC Unit.	Correct rev. 2A of procedure to allow Flow Alarm.	9/26/97
24	10/22/97	DELETE SECTION 5.37	PROVIDED EPHA CALC TO DOCUMENT COOLING TEST NOT READ.	10/22/97

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-W030-POTP-007, Attachment G.		TEST NAME: Preoperational Testing, Ventilation Building Ventilation System	T.E. NUMBER: W030-TE-014
DESCRIPTION OF PROBLEM: Steps 2.2.6 through 2.2.8 are incorrect. They attempt to start the Vent Building A/C unit manually from the MCS without having a building exhaust fan in operation. The system design allows the A/C unit to operate without an exhaust fan in service only when selected to local control, not from the MCS.			
ORIGINATOR: <u>28 Howell</u> <u>11/25/96</u> ORG: _____ DATE: _____		IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE <u>D.P. [Signature]</u> <u>11/26/96</u> PIC _____ DATE _____	
DISPOSITION: Delete Steps 2.2.6 through 2.2.8 from the procedure as they are incorrect and cannot be performed successfully as written.			
DISPOSITION AND RETEST REQUIREMENTS BY: <u>None</u>		DISPOSITION ACTIONS COMPLETE:	
<u>28 Howell</u> <u>11/25/96</u> DATE _____		Verified <u>D.B. Coole</u> <u>11/25/96</u> By: _____ DATE _____	
QAE CONCURRENCE WITH DISPOSITION (if required): <u>Hank M. Chapin</u> <u>11-26-96</u> DATE _____		RETEST COMPLETE: <u>N/A</u> PIC _____ DATE _____	

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: WHC-SD-
W030-POTP-007, ECN 613163,
attachment E, F & H

TEST NAME: Preoperational
Testing. Ventilation
Building Ventilation System

T.E. NUMBER: W030-TE-016

DESCRIPTION OF PROBLEM: Setpoints for filter differential pressure alarms in Attachment E and F have been changed. The control setpoint for Vent Cell pressure controller has also been changed. The new setpoints need to be reflected in the test procedure.

ORIGINATOR:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

Doug Lusk 3/25/97
ORG: DATE:

D.L. Lusk 3/25/97
PIC DATE

DISPOSITION: Attachment C, page 26 step 2.9 change expected value to 2.0"wc. ✓
Attachment C, page 26, step. 2.11 change expected value to 2.5". ✓
Attachment F, page 38, step 2.9 change expected value to 2.0"wc. Attachment F, page 38, step 2.11 change expected value to 2.5"wc. ✓
Attachment H, page 46, step 2.3.1 change expected value to -1.5" wc. ✓

DISPOSITION AND RETEST REQUIREMENTS BY:
NONE

DISPOSITION ACTIONS COMPLETE:

Doug Lusk 3/25/97
DATE

Verified D.B. Cole 3/25/97
By: DATE

QAE CONCURRENCE WITH DISPOSITION (if required):

RETEST COMPLETE:

Frank M. Chieffo 3/25/97
DATE

[Signature] 3/25/97
PIC DATE

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION:

HNF-SD-W030-POTP-007,
Revision 2. Attachment H,
Section 2.8

TEST NAME:

W030 Pre-Operational Test
Procedure Bldg Monitor and
Control Test

T.E. NUMBER:

W030-TE-019
020 *ag*

DESCRIPTION OF PROBLEM:

Design changes to the bldg control points need to be incorporated into the procedure reflecting 1) Pressure control of the header rather than stack flow control (Ref ECN-W030-264), 2) lower pressure setpoint of the Vent Cell, and 3) treating the Filter room access as air-locks, so that an alarm is expectable when both doors are open.

ORIGINATOR:

LF Hill

PER TELLO Doug Hill 9/26/97
DATE:

IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION ☒ CONTINUE

JR NORRIS

9/26/97

JR
PIC

DATE

DISPOSITION:

Page 56, 2.8.1: Change "SELECT... Fan1A" to "SELECT...Fan1B" (typo error).

Page 57, 2.8.4: change "925 +/-50" to "700-1000". Delete last sentence "Control should be...".

Page 58, first bullet: change "0.75 +/-0.1" to "1.50 +/-0.1".

Page 58, third bullet: change "-0.1 +/-0.05" to "0.0 +/-0.1".

Page 59, 2.8.9 & 2.8.10: Add "Zone II/IV alarm may occur with both doors open.

Repeat with each outer door open individually for 10 sec, which should not produce and alarm."

Page 60, 2.9.2: Change the two lines "PIC-702K35-1A/B" to a single PAH_702K35_1. Also there is no alarm on Stack Mon room.

DISPOSITION AND RETEST REQUIREMENTS BY:

LF Hill

PER TELLO Doug Hill 9/26/97
DATE

DISPOSITION ACTIONS COMPLETE:

Verified

By:

JR 9/26/97
DATE

QAE CONCURRENCE WITH DISPOSITION (if required):

Frank M. Chafin 9-26-97
DATE

RETEST COMPLETE:

DR 9/26/97
DATE

ENGINEERING CHANGE NOTICE

Page 1 of 6Proj.
ECN

W-030-264

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☐ Change ECN ☐ Temporary ☐ Supersede ☒ Standby ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. M.A. Friedrich, FDNW, G3-14 376-7408	4. USQ Required? ☐ Yes ☒ No	5. Date 02-03-97
12a. Modification Work ☒ Yes (fill out Blk. 12b) ☐ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. NA	12c. Modification Work Complete N/A 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 1. <u>H-2-131073 SH 2, Rev. 1</u> a. Revise per page 3 2. <u>H-2-131081 SH 1, Rev. 1</u> a. Revise per page 4 3. <u>H-2-131305 SH 3, Rev. 0</u> a. Revise per page 5 4. <u>H-2-131314 SH 1, Rev. 0</u> a. Field locate and mount pressure transmitter as shown on page 6 5. <u>H-2-131314 SH 2, Rev. 0</u> a. Void drawing		13b. Design Baseline Document? ☐ Yes ☒ No SC-3	
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 building vent system has been changed from a flow control system to a pressure control system.			
15. Distribution (include name, MSIN, and no. of copies) FDNW DISTRIBUTION Const Doc Control S2-53		DISTRIBUTION S. R. Briggs-NHC R3-25 D. B. Cole-NHC R3-25 K. A. Colosi-NHC R3-25 C. Pacheco-DOE S7-54 S. R. Pierce-LMHC S5-05

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: HNF-SD-W030-POTP-007, Revision 2. Attachment H, Section 2.8.5		TEST NAME: W030 Pre-Operational Test Procedure Bldg Monitor and Control Test	T.E. NUMBER: W030-TE-020-021 <i>D.S.</i>
DESCRIPTION OF PROBLEM: With the AC off, stack flow reduces to ~660 scfm (Fan 1B), and get Stack Lo Flow Alarm (700 setpoint). Also Filter room pressures go to -0.81 and -0.85, respectively, but this does not generate an alarm.			
ORIGINATOR: LF HILL <i>PER TELCON Doug Hill</i> ORG: DATE: 9/26/97		IMPACT ON TESTING: ☒ HOLD FOR RESOLUTION ☐ CONTINUE JB NORRIS <i>[Signature]</i> PIC DATE: 9/26/97	
DISPOSITION: Accept as is. System is designed for the AC to run continuously. With the AC off, the inlet is "starved" so the room pressures cannot be controlled by the control valves and hence go lower than specified. The alarm is appropriate and provides for correcting the problem. Doors to the Filter Rooms can still be opened with the Filter rooms at this lower pressure.			
DISPOSITION AND RETEST REQUIREMENTS BY: LF HILL <i>PER TELCON Doug Hill</i> DATE: 9/26/97		DISPOSITION ACTIONS COMPLETE: Verified <i>[Signature]</i> 9/26/97 By: DATE	
OAE CONCURRENCE WITH DISPOSITION (if required): <i>Hauck M. Chapin</i> DATE: 9-26-97		RETEST COMPLETE: <i>[Signature]</i> 9/26/97 PIC DATE	

TEST EXCEPTION REPORT

TEST PROCEDURE NO. & SECTION: HNF-SD-W030-POTP-007, Rev. 2A; Attachments I, par. 5.37.		TEST NAME: W030 Pre- Operational Test Procedure Bldg. Vent System Test	T.E. NUMBER: TE-024
DESCRIPTION OF PROBLEM: Noted procedure section is weather-dependent and unnecessary. Test would prove that roof mounted instrument cabinet (stack monitor) internal temperature does not exceed instrument limitations. Also, procedure is in error stating that internal fan is temperature-activated (whereas, the fan runs continuously).			
TEST ENGINEER: MD GERKEN <i>Doug J. 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): Procedure section 5.37 deleted. Acceptable results have been predicted by formal calculation in lieu of testing. Reference Fluor-Daniel Northwest (Kaiser Engineers Hanford) calculation # W-030-097 (10/16/97, summary attached). Also, the test is not mandated for safety reasons since the instrumentation in question is not safety-significant.			
DISPOSITION AND RETEST REQUIREMENTS BY: <i>Doug J. Gerken</i> 10/21/97 TEST ENGINEER _____ DATE _____		DISPOSITION ACTIONS COMPLETE: <i>R. Gutierrez</i> 10/21/97 TEST DIRECTOR _____ DATE _____	
QAE CONCURRENCE WITH DISPOSITION (if required): <i>HMC</i> <i>N/A-10/21/97</i> <i>Hank M. Chepin</i> 10-21-97 QA ENGINEER _____ DATE _____		RETEST COMPLETE: N/A TEST DIRECTOR _____ DATE _____	

KAISER ENGINEERS
HANFORD

Calc. No. W-030-09/

Revision 0

Page No. 1 of 14

DESIGN ANALYSIS

Client WHC

WO/Job No. CR1132/W-030

Subject Instrument Cabinets Maximum
Temperatures

Date 10/16/97

By Kelly Hayase

Location 241-AY/241-AZ

Checked 10/16/97

By A K BISWAS

Revised

By

OBJECTIVE:

The objective of this calculation is to determine the maximum internal temperature of Instrumentation Cabinets AY101K4, AY102K4, AZ101K4, and AZ102K4 for W-030-P7, Cabinets FT-AY101K1-1 and FT-AY102K1-1 for W-030-P6, and of the enclosure for the exhaust stack sampling probe.

DESIGN INPUTS:**CRITERIA AND SOURCE:**

1. WHC-SD-W030-FDC-001, Rev. 3B.

GIVEN OR KNOWN DATA:

1. Cabinet dimensions: AY101K4, AY102K4, AZ101K4, and AZ102K4
72"H x 60"W x 36"D, bottom supported on ground. (Ref. #5)

Cabinet dimensions: FT-AY101K1-1 and FT-AY102K1-1
28.5"H x 21.5"W x 8.5"D (Ref. #5)

Sampling probe enclosure dimensions:
30"H x 18"W x 22"D
2. A 275 cfm fan provides cooling for cabinets AY101K4, AY102K4, AZ101K4, and AZ102K4. A 200 cfm fan may provide cooling for cabinets FT-AY101K1-1 and FT-AY102K1-1. A 275 cfm fan may provide cooling for the sampling probe enclosure.
3. Peak outside air temperature is 110°F. (Ref. # 1)
4. Average wind speed is 7 mph. (Ref. #1)
5. All cabinet types are stainless steel.

ASSUMPTIONS:

1. Assume a 600 Watt heat source due to instrumentation in cabinets AY101K4, AY102K4, AZ101K4, and AZ102K4. Assume a 46 Watt heat source in cabinets FT-AY101K1-1 and FT-AY102K1-1, of which 33 Watts are generated by the fan. Assume there are no heat sources in the sampling probe enclosure except for the fan which generates 40 Watts.
2. Assume the largest side facing south.

METHODS TO BE USED:

DESIGN ANALYSIS

Client WHC
Subject Instrument Cabinets Maximum
Temperatures
Location 241-AV/241-AZ

WO/Job No. CR1132/W-030
Date 10/16/97 By Kelly Hayase
Checked 10/16/97 By A K BISWAS
Revised By

Basic engineering formulations along with data from reference 2 shall be used for this calculation.

REFERENCES/SOURCES:

- SDC-5.1, Rev. 7, "Standard Design Criteria for Heating, Ventilation, and Air Conditioning".
- ASHRAE Handbook, Fundamentals, 1993.
- "Heat Transfer", 7th Ed., By J.P. Holman.
- Owens/Corning, Fiberglas 700 Series Insulations. (Appx A-1)
- Drawing Numbers: H-2-131358, Sheets 1 to 3, Rev. 0
H-2-131331, Sheet 1, Rev. 0
H-2-131332, Sheet 1, Rev. 0
H-2-131345, Sheet 1, Rev. 0
H-2-131305, Sheet 5, Rev. 0
- Crane Technical Paper No. 410

CONCLUSIONS:

Cabinets AY101K4, AY102K4, AZ101K4, and AZ102K4 maximum internal temperatures:

123°F, exposed to the sun, with fan
115°F, completely shaded, with fan

Cabinets FT-AY101K1-1 and FT-AY102K1-1 maximum internal temperatures:

112°F, exposed to the sun, with the fan
137°F, exposed to the sun, without the fan
111°F, completely shaded, with the fan
113°F, completely shaded, without the fan

Sampling probe enclosure maximum internal temperatures:

137°F, exposed to the sun, without insulation, without the fan
136°F, exposed to the sun, with insulation, without the fan
112°F, exposed to the sun, without insulation, with the fan

ATTACHMENT 3

MISCELLANEOUS SUPPORTING DATA

CVI FILE, 22525-	EQUIPMENT	SUPPLIER
13, 15, 18, 19	Emergency Dampers	Charcoal Services
58	HEPA Filter Housings	Charcoal Services
102	Stack Monitor	Air Monitor
115	Exhaust Fans	Barry Blower
131	HVAC System Balance Tests	Northwest Air Systems

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **613151**

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 12-04-96
	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-007, REV. 0	10. Related ECN No(s). N/A	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 <hr/> Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) NA <hr/> Design Authority/Cog. Engineer Signature & Date
---	-----------------------------	--	--

13a. Description of Change
 Control logic for EMERGENCY COOLING VALVES MK-AZ702-6A&B, 7A&B, and 8A&B. This ECN changes section 2.6 of Attachment H, of WHC-SD-W030-POTP-007, to incorporate the control logic changes into the test method.

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

Section 2.6 of Attachment H has been rewritten to test the emergency cooling valves as they now operate. The valves now close when the high temperature condition clears whereas before they would remain open until operator action was taken to close the valves.

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

RELEASE STAMP

DATE/STA

DEC 10 1996

HANFORD
RELEASE

ID:

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 613152

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 01-02-97
	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-007, REV. 0A	10. Related ECN No(s). 613151	11. Related PO No. NA

12a. Modification Work ☐ Yes (fill out B1k. 12b) ☒ No (NA B1ks. 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 This ECN adds steps to section 2.6 of Attachment H, of WHC-SD-W030-POTP-007, to clarify the test method used in performing the initial testing of the emergency dampers.	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 Steps 2.6.1 and steps 2.6.3 through 2.6.12 have been changed to clarify the testing method and which steps specifically are performed a second time to prove repeatability of valve performance.
--

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	RELEASE STAMP DATE: STA: ID: JAN 10 1997
--	--

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **613163**

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 03-04-97	
		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-007, REV. 0B		10. Related ECN No(s). W-030-260		11. Related PO No. NA	
12a. Modification Work ☒ Yes (fill out Btk. 12b) ☒ No (NA Btk. 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 This ECN revises POTP-007 to incorporate the change over from system flow control to pressure control in the Ventilation Building Ventilation 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 design change has been issued to change the method of system control from flow control to pressure control. The flow controllers have been removed from the system and pressure controllers have been added at the inlet to building ventilation filter train inlets. This procedure change incorporates this design change and tests the new components and control schemes.							
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						RELEASE STAMP DATE <u>4</u> <u>MAR 06 1997</u> STA. <u>4</u> <u>RELEASE</u> <u>100</u>	

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 613164
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 03-12-97
	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.) HNH-SD-W030-POTP-007, REV. 1	10. Related ECN No(s). W-030-260	11. Related PO No. NA

12a. Modification Work ☒ Yes (fill out B1k. 12b) ☐ No (NA B1ks. 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
This ECN revises PTOP-007 to incorporate changes made to the fan switchover logic on low system flow.

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 change has been made to the fan switchover logic to prevent the failure of a single instrument from disabling both building exhaust fans. This ECN changes the applicable test methodology to test this change in logic.

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

RELEASE STAMP

DATE:
STA: 4
MAR 13 1997
ID: 2

ENGINEERING CHANGE NOTICE

Page 1 of 21. ECN **640743**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 03-27-97
	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.) HNF-SD-W030-POTP-007, REV. 1A	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 Condi- tion (Temp. or Standby ECN only) NA Design Authority/Cog. Engineer Signature & Date
--	---------------------------------------	---	--

13a. Description of Change..... 13b. Design-Baseline Document? ☐ Yes ☒ No

This ECN corrects step number discrepancy between procedure steps and data sheets. Also adds wording to allow performance of testing out of sequence, adds a page of controller information and valve alignment for Attachment A, Appendix B.

14a. Justification (mark one) Criteria Change ☒ As-Found ☐	Design Improvement ☐ Facilitate Const ☐	Environmental ☐ Const. Error/Omission ☐	Facility Deactivation ☐ Design Error/Omission ☐
---	--	--	--

14b. Justification Details

This ECN incorporates all previous changes to this document and clarifies testing method by including information for system alignment for the stack sampler portion of the test. There was a discrepancy between step numbers in Attachment I and referenced step numbers on data sheets in this same attachment.

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>Prof. Jones</i> 63-11	RELEASE STAMP DATE: <u>4</u> STA: <u>4</u> RELEASE APR 01 1997 ID: <u>3</u>
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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 640745

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 04-10-97
	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.) HNF-SD-W030-POTP-007, REV. 2A 7/11/97	10. Related ECN No(s). NA	11. Related PO No. NA
12a. Modification Work ☒ Yes (fill out Btk. 12b) ☒ No (NA Btk. 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 This ECN revises PTO-007 to incorporate corrections to formulas in Attachment I and to correct typographical errors in this same attachment.			
14a. Justification (mark one) Criteria Change ☐ Design Improvement ☒ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐			
14b. Justification Details Formulas provided by the vendor, Air Monitoring Corp., were incorrect. Discussed with Air Monitoring personnel and received their concurrence to make the corrections.			
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>proj files 63-11</i>			

RELEASE STAMP	
DATE	3
STA: 4	ID:
APR 21 1997	

FROM: M.JENNINGS
TO: G.HOWELL
DATE: 16 APR 97

cc; S.PIERCE, H.FOX, E.STAPLES, G.HOPKINS, D.COLE

SUBJ: W030 BUILDING VENTILATION AND 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 FANS WERE RECORDED AS "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 MINUTE (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-K3-5-1A

	BEARING 1	BEARING 2	BEARING 3	BEARING 4
HORIZ	.177 OA .041 X1	.118 OA .031 X1	N/A	N/A
VERT	.136 OA .041 X1	.111 OA .014 X1	.096 OA .048 X1	.057 OA .025 X1

AZ702-K3-5-1B

	BEARING 1	BEARING 2	BEARING 3	BEARING 4
HORIZ	.128 OA .015 X1	.148 OA .007 X1	N/A	N/A
VERT	.160 OA .019 X1	.113 OA .015 X1	.058 OA .019 X1	.065 OA .056 X1

AZ702-K1-5-1A

(READINGS AT 100% FAN SPEED, 3630 CPM)

	BEARING 1	BEARING 2	BEARING 3	BEARING 4
HORIZ	.169 OA .113 X1	.213 OA .132 X1	N/A	N/A

VERT	.261 OA	.274 OA	.240 OA	.143 OA
	.228 X1	.255 X1	.115 X1	.039 X1

BEARING 3, VERTICAL READINGS AT VARIOUS SPEEDS

@ 25% (930 CPM) - .033 OA, .025 X1
 @ 50% (1860 CPM) - .096 OA, .088 X1
 @ 75% (2790 CPM) - .279 OA, .215 X1

AZ702-K1-5-1B
 (READINGS AT 100% FAN SPEED, 3630 CPM)

	BEARING 1	BEARING 2	BEARING 3	BEARING 4
HORIZ	.169 OA .113 X1	.213 OA .132 X1	N/A	N/A
VERT	.159 OA .027 X1	.139 OA .020 X1	.267 OA .259 X1	.117 OA .105 X1

BEARING 3, VERTICAL READINGS AT VARIOUS SPEEDS

@ 25% (930 CPM) - .055 OA, .044 X1
 @ 50% (1860 CPM) - .130 OA, .092 X1
 @ 75% (2790 CPM) - .201 OA, .151 X1

1. ALL VALUES - IPS PEAK VELOCITY
2. BEARING DESIGNATOR;
 - 1 INDICATES MOTOR SHAFT OPEN END
 - 2 INDICATES MOTOR SHAFT SHEAVE END BEARING
 - 3 INDICATES FAN SHAFT SHEAVE END BEARING.
 - 4 INDICATES FAN SHAFT FAN END BEARING.

THE ABOVE VALUES LISTED FOR THE K3-5-1A AND B FANS WERE OBTAINED ON 14 MAR 97. THESE VALUES MEET THE INTENT AND THE CRITERIA OF ASME N509. THESE FANS SHOULD PROVIDE RELIABLE OPERATION THROUGH THE LIFE OF THE FACILITY.

THE ABOVE VALUES LISTED FOR THE K1-5-1A AND B FANS WERE OBTAINED ON 15 APR 97. ALTHOUGH THESE LEVELS ARE ACCEPTABLE FOR SAFE AND GENERALLY RELIABLE OPERATION OF THE EQUIPMENT, THESE VALUES DO NOT MEET THE CRITERIA OF ASME N509. SINCE THE HIGHEST AMPLITUDES ARE AT THE SHEAVE END OF THE MOTOR AND FAN SHAFTS, THE DRIVE BELTS ARE THE MOST LIKELY CONTRIBUTOR TO THE HIGHER VIBRATION LEVELS. REPLACEMENT AND REALIGNMENT OF THE DRIVE BELTS IS RECOMMENDED.

AS A SECONDARY ISSUE TO THE HIGH OVERALL LEVELS AT 100% FAN SHAFT SPEED, WHEN THE FAN IS OPERATED AT THE 30 TO 35% RANGE, INITIAL INDICATION IS THAT THE WHEEL IS AT ITS FIRST CRITICAL SPEED, I.E. THE WHEEL IS IN RESONANCE WITH ITS SPEED. ANY UNBALANCE, NO MATTER HOW MINOR, CAUSE LARGE SHAFT DEFLECTIONS DUE TO CENTRIFUGAL FORCE. THE 1A FAN ALSO SHOWS HINTS OF THIS CONDITION AT 75%, INDICATING THIS COULD BE THE WHEELS SECOND CRITICAL SPEED: OPERATING AT ONE OF THE FANS CRITICAL SPEEDS, EVEN WITH LOW VIBRATION AMPLITUDES, IS ALWAYS DESTRUCTIVE AND WILL SUBSTANTIALLY SHORTEN THE FAN SHAFT BEARING LIFE.

TO CHANGE THIS CHARACTERISTIC, THE WHEEL HAS TO BE PHYSICALLY MODIFIED TO STIFFEN ITS STRUCTURE OR ADD MASS. ATTEMPTING TO BALANCE THE WHEEL MAY REDUCE THE AMPLITUDE BUT WILL NOT REMOVE THE CONDITION.

TO DETERMINE THE EXACT CRITICAL SPEED RANGE(S), I WOULD LIKE TO TAKE READINGS FROM 10% TO 100% OF THE FANS FULL SPEED IN 5% INCREMENTS.

ONCE THE CRITICAL SPEED(S) ARE DETERMINED, SOMETHING AS SIMPLE AS PARTIALLY SHUTTING THE FANS DISCHARGE DAMPER, FORCING THE FAN TO OPERATE AT A FASTER SPEED TO MAINTAIN THE SAME CAPACITY, CAN BE WRITTEN INTO THE OPERATIONS PROCEDURE.

IF YOU HAVE ANY QUESTIONS, PLEASE GIVE A CALL, 373-9035.

MARK M. JENNINGS
MAINTENANCE CONCEPTS

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

FOR PROJECT W-030

HNF-SD-W030-TD-007,
REV. 0, PAGE 146

TANK FARM VENTILATION UPGRADE

PLAN APPROVAL

Frank Clifton
Startup Manager

3/6/96
Date

M.D. Harding
TWRS Operations

3-7-96
Date

Scott R. Taylor
TWRS Engineering

3/6/96
Date

W.H. Brule
TWRS Maintenance

3-7-96
Date

Thomas G. Howell
Construction Projects Startup

3-6-96
Date

Frank M. Chapin
Quality Assurance

3-7-96
Date

J.A. Colvin
Project Management
The original signatures are on file.

3/7/96
Date

L.J. Hiler
Loweil Hill

3/6/96
Date

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4.0 Change Control	3
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6.0 Precautions and Limitations	4
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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

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 (ie: 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.

11.0 RECORDS

- 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 SHEET
for the
VENT BUILDING VENTILATION SYSTEM

LOOP DIAGRAMS

H-2-131310

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.

TEST EXCEPTION REPORT		
TEST PROCEDURE NO. & SECTION: CGA Package 3,4,5,7	TEST NAME: Evap Towers, etc	T.E. NUMBER: 005
DESCRIPTION OF PROBLEM: Current transformers are all 0-5A, whereas each should be matched to the motor current (and MCS expected range). <ul style="list-style-type: none"> - IT AZ-CWP 1A/1B (chiller pumps) should be 0-10A (2 total) - IT-702-K305-1A/1B (bldg vent) should be 0-10A (2 total) - IT AZ101 EWP-1A/1B should be 0-50A (2 total) - IT AY101-EWP-1A/1B (typ AY1, AY2, AZ2) should be 0-20A(6 total) - IT AY1-K405-1 (typ 4 plcs) should be 0-10A (4 total) 		
ORIGINATOR: LF Hill <i>[Signature]</i> ORG: _____ DATE: 4/17/96	IMPACT ON TESTING: ☐ HOLD FOR RESOLUTION x CONTINUE Continue testing on other loops. <i>[Signature]</i> 4/17/96 PIC _____ DATE _____	
DISPOSITION: Current transformers were replaced and retested in the applicable CGA package.		
DISPOSITION AND RETEST REQUIREMENTS BY: <i>[Signature]</i> 8/12/96 _____ DATE	DISPOSITION ACTIONS COMPLETE: Verified <i>[Signature]</i> 8/12/96 By: _____ DATE _____	
QAE CONCURRENCE WITH DISPOSITION (if required): <i>[Signature]</i> 8/12/96 _____ DATE	RETEST COMPLETE: <i>[Signature]</i> 8/12/96 PIC _____ DATE _____	

CGA PACKAGE #7 INSTRUMENT LIST
VENT BUILDING VENTILATION SYSTEM

Tag	Complete	Date
FI 702K3_1	MZ E D.J.	7/29/96
FI 702K3_2	MZ E D.J.	7/29/96
FI 702K3_3	ZFA	7/24/96
EC-702K3-3A Deleted 7/10/97	TCB D.J.	7/24/96
II_AZ702K35_1A	ZFA	5/17/96
II_AZ702K35_1B	ZFA	5/17/96
MK_702_K2_6AA	D.J.	6/6/96
MK_702_K2_6AB	D.J.	6/6/96
MK_702_K2_6BA	D.J.	6/6/96
MK_702_K2_6BB	D.J.	6/6/96
MK_702_K2_7AA	ZFA	6/5/96
MK_702_K2_7AB	ZFA	6/5/96
MK_702_K2_7BA	ZFA	6/5/96
MK_702_K2_7BB	ZFA	6/5/96
MK_702_K2_8AA	D.J.	6/5/96
MK_702_K2_8AB	D.J.	6/5/96
MK_702_K2_8BA	D.J.	6/5/96
MK_702_K2_8BB	D.J.	6/5/96
MK_702_K3_2AA	ZFA	5/31/96
MK_702_K3_2AB	ZFA	5/31/96
MK_702_K3_2BA	ZFA	5/31/96
MK_702_K3_2BB	ZFA	5/31/96
FC-702K3-3B	TCB D.J.	7/24/96
PI-702-K35-1	ZFA	3/3/97
PI-AZ702K3-1 (non microp loop)	D.J.	3/13/97
PI-AZ702K3-2 (non microp loop)	Page 1 D.J.	3/13/97
PC-702K35-1A	D.J.	4/2/97
PC-702K35-1B	A. D.	4/2/97

DELETED
D.J.

CGA PACKAGE #7 INSTRUMENT LIST
VENT BUILDING VENTILATION SYSTEM

Tag	Complete	Date
PDC_702_K2_2	D.S.	7/5/96 10/12/96
PDC_702_K2_3	D.S.	8/5/96
PDC_702_K3_1	D.S.	10/17/96
PDI_702K2_1	L.F.	7/29/96
PDI_702K24_1	L.F.	7/31/96
PDI_702K24_2	D.S.	7/30/96
PDI_702K33_1A	D.S.	8/27/96
PDI_702K33_1B	L.F.	8/23/96
PDI_702K34_1A	L.F.	8/23/96
PDI_702K34_1B	L.F.	8/23/96
PDIC_702K2_2	D.S.	10/17/96
PDIC_702K2_3	D.S.	7/30/96
PDIC_702K3_1	D.S.	10/17/96
RAH_AZ702K3_1A	L.F.	5/7/97
RAH_702_K3_1	L.F.	5/7/97
RAX_702_K3_1	L.F.	5/7/97
RI_702_K3_1	L.F.	5/7/97
TI_AZ702K2_1	L.F.	7/8/96
TI_AZ702K2_2	L.F.	7/8/96
TI_AZ702K2_3	L.F.	7/8/96
TI_AZ702K2_4	L.F.	7/8/96
TI_AZ702K2_5	L.F.	7/8/96
TI_AZ702K3_3	L.F.	7/24/96
PDI_702_K2_2	L.F.	7/31/96
PDI_702_K2_3	D.S.	7/30/96
PDI_702_K3_1	D.S.	9/3/96

CGA PACKAGE #7 INSTRUMENT LIST
VENT BUILDING VENTILATION SYSTEM

Tag	Complete	Date
TIC_AZ702K206_1	NA	
UC_AZ702K3	O.S. POTP, ATTE	9/22/97
UE_AZ702K3_1	See P. 4 & 7 702-K3-3	7/24/96
YS_702_K26_1	L. J. Hill	10/15/96
YS_702_K26_1A1	L. J. Hill	10/15/96
YS_702_K35_1A1	D. J.	6/6/96
YS_702_K35_1B1	L. J. Hill	6/10/96
ZI_702_K3_1	D. J.	10/17/96
ZI_702_K24_1	D. J.	10/17/96
ZI_702_K24_2	D. J.	8/5/96
ZS_702_K2_6AA	D. J.	6/6/96
ZS_702_K2_6AB	D. J.	6/6/96
ZS_702_K2_6BA	D. J.	6/6/96
ZS_702_K2_6BB	D. J.	6/6/96
ZS_702_K2_7AA	L. J. Hill	6/5/96
ZS_702_K2_7AB	L. J. Hill	6/5/96
ZS_702_K2_7BA	L. J. Hill	6/5/96
ZS_702_K2_7BB	L. J. Hill	6/5/96
ZS_702_K2_8AA	D. J.	6/5/96
ZS_702_K2_8AB	D. J.	6/5/96
ZS_702_K2_8BA	D. J.	6/5/96
ZS_702_K2_8BB	D. J.	6/5/96
ZS_702_K3_2AA	L. J. Hill	5/31/96
ZS_702_K3_2AB	L. J. Hill	5/31/96
ZS_702_K3_2BA	L. J. Hill	5/31/96

LOCAL

LOCAL

25

CGA PACKAGE #7 INSTRUMENT LIST
VENT BUILDING VENTILATION SYSTEM

Tag	Complete	Date
ZS_702_K3_2BB	<i>L.H.</i>	5/31/96
HS_702_K26_1A	<i>L.H.</i>	10/5/96
HS_702_K26_1B	<i>L.H.</i>	10/5/96
HS_702_K35_1AA	<i>D.J.</i>	6/5/96
HS_702_K35_1AB	<i>D.J.</i>	6/5/96
HS_702_K35_1BA	<i>L.H.</i>	6/10/96
HS_702_K35_1BB	<i>L.H.</i>	6/10/96
HS-A2K1-1A1	<i>D.J.</i>	
HS-A2K1-1B5	<i>D.J.</i>	
HS-A2702 K2-1	<i>D.J.</i>	7/29/96
HS-A2702 K2-2	<i>D.J.</i>	7/21/96
HS-A2702 K2-3	<i>D.J.</i>	7/30/96
HS-A2702 K204-1	<i>D.J.</i>	7/31/96
HS-A2702 K204-2	<i>D.J.</i>	7/30/96
HS-A2702 K206-1A1	<i>D.J.</i>	10/15/96
HS-A2702 K3-1A	<i>L.H.</i> (see RAH-702 K3-1)	5/7/97
HS-A2702 K3-1C	<i>D.J.</i>	9/3/96
HS-A2702 K303-1A	<i>D.J.</i>	8/27/96
HS-A2702 K303-1B	<i>D.J.</i>	8/23/96
HS-A2702 K304-1A	<i>D.J.</i>	8/23/96
HS-A2702 K304-1B	<i>D.J.</i>	8/23/96
HS-A2702 K311-1	<i>D.J.</i> POTP7, ATT I	9/22/97
HS-A2702 K311-2	<i>D.J.</i> POTP7, ATT I	9/22/97
ZT-A2702 K204-1	<i>L.H.</i>	10/11/96
ZT-A2702 K204-2	<i>L.H.</i>	10/11/96
ZT-A2702 K3-1	<i>L.H.</i>	10/17/96

SEE YS-A202 K26-1A1 LOCAL
LOCAL

LOCAL
LOCAL

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 160

Tag: FI_702_K3_1 I/O Type: AI Description: BvStk MonFlow

Cntlr: 36 Chan No: 20 P&ID: H-2-131079⁸¹ Logic:

Remarks: _____

Location: _____

Actuation Method: dp sense

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) TCB
☐ _____ (signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$
(sensor) (xmitter) (other) (DCS)

Units: CFM

Process Input Readout Tolerance

LOI
LCU4-47Screen1
21BldMonScreen2
02Maingroup 192
Screen3
~~04Tbldg~~

Lo: 0.00 -.04 - .04

0.00.0

Hi: 2.00 1.96 - 2.04

2.02.0

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>.31</u>
LoLo:	0	-9999.99	-	_____
Min:	0	-9999.99	-	_____

Other:

Also 031111 & 04TbldgMTE Instr. No: 817-28-09-003
817-03-02-002Due Date: 1-12-97
4-14-97

(signoff)

Loop Complete:

M2 elad & J. J. J.

Date:

7/29/96

Tag: FIT-AZ702-K3-1P&ID: H-2-13108(SH1)HNF-SD-W030-TD-007,
REV. 0, PAGE 161Manufacturer: AMC Model No.: MASSTRON Serial No.: 68301MTE Instr. No: 817.63.02.016 Date: 6.14.97
817.45.08.062 12.30.97
817.35.40.046 1.15.98

Input Range	0-150°F (93.04-125.38)	Tolerance	5% - output			
	0-2 SCFM (0 - in w.c.)		2% - DISPLAY			
Units:	°F SCFM					
Input	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 (0.0001)
0.0325	00.50 (1.250)	.46(.125)	.54(.125)	()	()	00.51 (1.2640)
0.1301	01.00 (2.500)	.96(.245)	1.04(.2525)	()	()	01.00 (2.4992)
0.2929	01.50 (3.750)	1.46(.3725)	1.54(.3775)	()	()	01.50 (3.743)
0.5207	02.00 (5.000)	1.96(.4975)	2.04(.5025)	↓ ()	↓ ()	02.00 (5.000)

(signoff) Calibrated By: Paul M. ZylinskiDate: 3.14.97Location: Bldg. Stack Beta/Gamma sample (Encl. AZ702K3-1)Comments * initial setup.

Input (in)	Output (°F) (ma)	Lo:	Hi:	As found	Input	As left
93.04	0 (4.000)	-3(3.920)	3(4.080)	* N/A (N/A)	* N/A	4.002 (-000)
102.82	45 (8.800)	42(8.720)	48(8.880)	()	()	8.767 (0045)
109.30	75 (12.000)	72(11.920)	78(12.080)	()	()	11.962 (0075)
118.97	120 (16.800)	117(16.720)	123(16.880)	()	()	16.806 (012)
125.38	150 (20.000)	147(19.920)	153(20.080)	↓ ()	↓ ()	20.000 (0150)

Tag: FIT AZ702K3-1P&ID: H2-131081(SH1)Manufacturer: AMC Model No.: MASTRON Serial No: 6830DMTE Instr. No: 817-28-09-003
817-63-02-003
817-45-08-040Due Date: 1-12-97
6-14-97
2-5-97Input Range 0-150°F (93.04-125.38°C)
Units: °F
SCFMTolerance DISPLAY -2%
OUTPUT - .5%

Input (H ₂ O)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/out	As Left
0.0000	0.00	(0.000)	<u>-.04 (-0.025)</u>	<u>.04 (.025)</u>	* <u>N/A</u>	<u>(N/A)</u>	<u>N/A</u>
0.0330	0.50	(1.250)	<u>.46 (1.225)</u>	<u>.54 (1.275)</u>	<u>()</u>	<u>()</u>	<u>00.50 (1.240)</u>
0.1322	1.00	(2.500)	<u>.96 (2.475)</u>	<u>1.04 (2.525)</u>	<u>()</u>	<u>()</u>	<u>01.00 (2.490)</u>
0.2976	1.50	(3.750)	<u>1.46 (3.725)</u>	<u>1.54 (3.775)</u>	<u>()</u>	<u>()</u>	<u>01.50 (3.743)</u>
0.5291	2.00	(5.000)	<u>1.96 (4.975)</u>	<u>2.04 (5.025)</u>	<u>()</u>	<u>()</u>	<u>02.00 (5.000)</u>

(signoff) Calibrated By: Paul M. ZylinskiDate: 7-26-96Location: BLDG STACK BETA/GAMMA SAMPLE (ENCL AZ702K3-1)Comments * initial setup

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 163

Tag: FI_702_K3_2 I/O Type: AI Description: BvStk RecFlow

Cntlr: 36 Chan No: 21 P&ID: H-2-131079⁸¹ Logic:

Remarks: _____

Location: _____

Actuation Method: dp source

Sensor Calibration:

☒ 5 pt cal
☐ _____

per procedure

VI

(data attached)

TCR
(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

Screen1

Screen2

Screen3

LCU4-47

21BldMon

02Man

group 19:
~~02Man~~

Lo: 0.00

-.04 - .04

0.00.0

Hi: 2.00

1.96 - 2.04

2.02.0

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

-

HiHi:

0

99999.99

-

Hi:

0

99999.99

-

Lo:

2

.30

.26 - .34

.30

LoLo:

0

-9999.99

-

Min:

0

-9999.99

-

Other:

Also 04 Totals, ~~#23 tested~~

MTE Instr. No:

817-28-09-003

817-63-02-002

Due Date:

1-12-97

6-14-97

(signoff)

Loop Complete:

MZ elat D. Sal

Date:

7/29/96

Tag: FIT-AZ702-K3-2P&ID: H2-131081 (SHI)

LOOP:

HNF-SD-W030-TD-007,
REV. 0, PAGE 164Manufacturer: AMC Model No.: MA55TRON Serial No: 6829DMTE Instr. No: 817-43-02-016 Due Date: 6-14-97
817-45-08-062 12-30-97
817-35-40-046 1-15-98Input Range 0-150°F (93.04-125.38) Tolerance .5% - output
0-2 SCFM (0-0.5224 in.w.c.) 2% - display
Units: °F
SCFM

Input	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	-000 (-.0001)
0.0326	00.50 (1.250)	.46(1.225)	.54(1.275)	()	()	0050 (1.2357)
0.1306	01.00 (2.500)	.96(2.475)	1.04(2.525)	()	()	0100 (2.4935)
0.2938	01.50 (3.750)	1.46(3.725)	1.54(3.775)	()	()	0150 (3.745)
0.5224	02.00 (5.000)	1.96(4.975)	2.04(5.025)	↓ (↓)	↓	0200 (5.000)

(signoff) Calibrated By: Paul M. Zylinski Date: 3-14-97Location: Bldg Stack Record Sample (ENCL. AZ702K3-1)Comments * initial setup

input(n)	Output (°F) (ma)	Lo:	Hi:	As found	in/out	As left
93.04	0 (4.000)	-3(3.920)	3(4.080)	N/A	(N/A)	-000 (4.000)
102.82	45 (8.800)	42(8.720)	48(8.880)	↓	()	0045 (8.797)
109.30	75 (12.000)	72(11.920)	78(12.080)	↓	()	0075 (11.989)
118.97	120 (16.800)	117(16.720)	123(16.880)	↓	()	0120 (16.818)
125.38	150 (20.000)	147(19.920)	153(20.080)	↓	(↓)	0150 (20.003)

Tag: FIT AZ702K3-2P&ID: H2-131081(SH1)

LOOP:

Manufacturer: AMCModel No.: MASSTRONSerial No.: 6829DMTE Instr. No.: 817-28-09-003
817-63-02-002
817-45-08-040Due Date: 11-12-97
6-14-97
7-5-97Input Range 0-150°F (93.04-125.38 °C)
0-2 SCFM (0-.5289 m³/min)Tolerance DISPLAY -2%
OUTPUT -5%Units: °F
SCFM

Input (m ³ /min)	Output (SCFM) (V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0.00 (0.000)	-.04 (-.025)	.04 (.025)	* N/A (* N/A)	* N/A	-0.00 (0.000)
0.0330	0.50 (1.250)	.46 (1.225)	.54 (1.275)	()	()	0.50 (1.250)
0.1322	1.00 (2.500)	.96 (2.475)	1.04 (2.525)	()	()	1.00 (2.490)
0.2975	1.50 (3.750)	1.46 (3.725)	1.54 (3.775)	()	()	1.50 (3.747)
0.5289	2.00 (5.000)	1.96 (4.975)	2.04 (5.025)	↓ (↓)	↓ (↓)	2.00 (5.000)

(signoff) Calibrated By: Paul M. Zylinski / P. HansonDate: 7-25-96Location: BIDGE STACK RECORD SAMPLE (ENCL-AZ702K3-1)Comments * initial setup

6/11/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 166

Tag: FI_702_K3_3 I/O Type: AI Description: BvStk Flow

Cntlr: 36 Chan No: 22 P&ID: H-2-131081 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source, 4-20mA not source for -70 limit

Sensor Calibration:

☒ 5 pt cal☐ _____per procedure UI(data attached) PHH

(signoff)

$$\text{Loop Tolerance: } 2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0\%)^2 + (0.2\%)^2}$$

Units: SCFM

Process Input

Readout Tolerance

LOI

LCU4-46

Screen1

21BldMon

Screen2

group 91

Screen3

02M2m

Lo: 0.00 -21.10 / 21.10

-0.690-0.37 empty

Hi: 1050.00 1028.90 / 1071.10

1049.9810501050.29Fill

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: 0 99999.99

/

HiHi: 0 99999.99

/

Hi: 2 1000.00

978.90 / 1021.10

1001.73 yellow

Lo: 2 700.00

678.90 / 721.10

700.0 yellowLoLo: 0 99999.99

/

Min: 3 -70.00

-91.10 / -48.90

-70.20 white

Other:

03 level + 0.4 Total - empty / fill 25 pps. PHH817-63-02-0026/14/97MTE Instr. No: 817-13-55-023Due Date: 3/26/97817-28-04-0031/12/97

(signoff)

Loop Complete: PHHDate: 7/24/96

6/6/96

W-030-CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 167

Tag: FIT-AZ702K3-3

P&ID:

LOOP:

Manufacturer: AMC Model No.: MASSTRON Serial No: 6828DMTE Instr. No: 817-63-02.016
817-45-08.062
817-35-40.046Due Date: 6.14.97
12.30.97
1.15.98

0-150°F (93.04°-125.38°)		Tolerance		OUTPUT - .5 %			
Input Range 0-1050 SCFM (0-0.2715 in. w.c.)		Tolerance		DISPLAY - 2 %			
Units: °F SCFM							
Input (in. w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	0000	(0.0000)	-21 (-0.025)	21 (.025)	* N/A (N/A)	* N/A	- 000 (-0.0000)
0.0169	0263	(1.2500)	242 (1.225)	284 (1.275)	()	()	0260 (1.244)
0.0678	0525	(2.500)	504 (2.475)	546 (2.525)	()	()	0522 (2.490)
0.1527	0788	(3.750)	767 (3.725)	809 (3.775)	()	()	0786 (3.750)
0.2715	1050	(5.000)	1029 (4.975)	1071 (5.025)	↓ (↓)	↓	1051 (5.014)

(signoff) Calibrated By: Paul M. ZylinskiDate: 3.11.97Location: Bldg. Stack (ENCLOSURE AZ702K3-1)

Comments * Initial setup.

input (in)	output (°F)	V	Lo:	Hi:	As found	In/out	As left
93.04	0	(0.000)	-3 (-0.025)	3 (.025)	* N/A (N/A)	* N/A	-000 (-0.000)
102.82	45	(1.500)	42 (1.475)	48 (1.525)	()	()	0045 (1.498)
109.30	75	(2.500)	72 (2.475)	78 (2.525)	()	()	0075 (2.492)
118.97	120	(4.000)	117 (3.975)	123 (4.025)	()	()	0120 (4.000)
125.38	150	(5.000)	147 (4.975)	153 (5.025)	↓ ()	↓ ()	0150 (5.000)

Tag: FIT-AZ702K3-3P&ID: H2-13108(K#1)

LOOP:

Manufacturer: AMC Model No.: MASSTRON Serial No.: 68281MTE Instr. No.: 817-28-09-003
817-63-02-002 Due Date: 1-12-97
817-45-08-040 6-14-97
2-5-97Input Range 0-150°F (93.04A-125.38A) Tolerance .5%
0-1050 SCFM (0-0.2663 in.w.c.)Units: °F
SCFM

Input (in.w.c.)	Output (SCFM)	(V)	Lo:	Hi:	As Found	In/Out	As Left
0.0000	(0.00)	(0.000)	-5 (-0.25)	5 (-0.25)	* N/A	* N/A	-0.01 (0.000)
0.0240	315	(1.500)	310 (1.475)	320 (1.525)	()	()	315 (1.503)
0.0666	525	(2.500)	520 (2.475)	530 (2.525)	()	()	523 (2.500)
0.1704	840	(4.000)	835 (3.975)	845 (4.025)	()	()	838 (3.999)
0.2663	1050	(5.000)	1045 (4.975)	1055 (5.025)	()	()	1050 (5.010)

(signoff) Calibrated By: Pzyliński / P. HuronDate: 7-24-96Location: BLDG. STK. FLOW (ENCL. AZ702K3-1)Tolerance: DISPLAY - 2%
OUTPUT - .5%Comments *initial setup.

input (in)	output (°F)	(V)	Lo	Hi	As Found	In/out	As left
93.04	0	(0.00)	-3 (-0.25)	3 (.025)	* N/A	* N/A	-0.00 (0.00)
102.82	45	(1.50)	42 (1.475)	48 (1.525)	()	()	0045 (1.50)
109.30	75	(2.50)	72 (2.475)	78 (2.525)	()	()	0075 (2.50)
118.97	120	(4.00)	117 (3.975)	123 (4.025)	()	()	0120 (4.00)
125.38	150	(5.00)	147 (4.975)	153 (5.025)	()	()	0150 (5.00)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 169

Tag: II_702_K35_1A I/O Type: AI Description: BvFana Current
 Cntrlr: 36 Chan No: 15 P&ID: H-2-131073 Logic: Y905

Remarks: _____

Location: _____

Actuation Method: current source thru CT, measure w/ ammeter
(use different measurement pt, due to limitation of source)

Sensor Calibration: N/A - CT is only factory calibratable

☐ 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: AMP

Process Input	Readout Tolerance	LOI LCU4-39	Screen1 20BldExh	Screen2 03LeatDt	Screen3 04Totalz
Lo: 0.00	-.20 - .20	0	0A (empty)	empty	empty
Hi: 10.00 9.8	9.80 - 10.20 9.60 - 10.00	9.87	10A (filled)	filled	filled

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: _____

Also 02M2in - empty/filled

MTE Instr. No: 0199

Due Date: 1/24/97

(signoff)

Loop Complete: L.Hill

Date: 5/17/96

Tag: IT-AZ702K305-1A

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 14

Manufacturer: KATY INSTRS Model No.: 420 Serial No:

MTE Instr. No: 817-45-02-004 Due Date: 5-16-97
817-45-08-040 2-28-98

Input Range 0-1000 Tolerance 10% screen 2% output

Units: Amps

Input(A)	Output(mA)	(micron)	Lo:	Hi:	As Found	In/Out	As Left
0	4.00	0	3.68(-1)	4.32(1)	3.99(0)	IN	3.99(0)
10	20.00	10	19.68(9)	20.32(11)	20.10(9.9)	IN	20.10(9.9)

(signoff) Calibrated By: P. Zylanski / S. Tappin Date: 5-16-97

Location: Bldg Exhaust Penthouse (FAN 1A)

Comments: Factory Calibrated; check zero; span. Use current generator w/ calibrated M:TE clamp on meter

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 171

Tag: II_702_K35_1B I/O Type: AI Description: BvFanB Current
 Cntl: 36 Chan No: 16 P&ID: H-2-131073 Logic: Y908

Remarks: _____

Location: _____

Actuation Method: current source feeding CT
(but can't get precise value so used slightly different)

Sensor Calibration: N/A CT is only factory calibratable☐ 5 pt cal☐ per procedure _____ (data attached) _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{\text{(sensor)}^2 + \text{(xmmitter)}^2 + 2.0\%^2 + 0.2\%^2}$

Units: AMP

Process Input	Readout Tolerance	LOI LCU4-41	Screen1 20BldExh	Screen2 03LeakDt	Screen3 04Totalz
Lo: 0.00	-.20 - .20	<u>0</u>	<u>empty (OA)</u>	<u>empty</u>	<u>empty</u>
Hi: <u>10.00</u>	<u>9.80 - 10.20</u>	<u>9.61</u>	<u>Filled (QA)</u>	<u>Filled</u>	<u>Filled</u>
<u>9.6</u>	<u>9.40 - 9.80</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: _____

Also 02 M2in - empty / FilledMTE Instr. No: 0199 Due Date: 1/24/97

(signoff)

Loop Complete: SP HillDate: 5/17/96

5/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 172

Tag: IT-AZ702K305-1B

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 14

Manufacturer: KATY INSTRS. Model No.: 420 Serial No: _____MTE Instr. No: 817-45-02-004 Due Date: 5-16-97
817-45-08-040 2-28-98

Input Range	Output (ma)	(micon)	Lo:	Hi:	As Found	In/Out	As Left
0-10	4.00	0	3.68(-1)	4.32(1)	3.99(0)	IN	3.99(0)
10	20.00	10	19.68(9)	20.32(11)	20.10(10)	IN	20.10(10)

10% - Screen
Tolerance 2% - OUTPUT

Units: Amps

(signoff) Calibrated By: P. Zylinski / S. Stetson Date: 5-16-97

Location: Bldg. Exhaust Penthouse (FAN 1B)
May 5-16-97

Comments: Factory calibrated; check zero & span. Use current generator w/ calibrated HITE clamp on meter.

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 173

Tag: MK_702_K2_6AA I/O Type: DO Description: RmDmpr6A Open

Cntlr: 10 Chan No: 20 P&ID: H-Z-131077, SH-1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE FROM PCS

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: Doug Clark

Date: 6/6/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 174

Tag: MK_702_K2_6AB I/O Type: DO Description: RmDmpr6A Close

Cntlr: 10 Chan No: 21 P&ID: H-2-131077, 5H.1 Logic:

Remarks: _____

Location: _____

Actuation Method: Open & Close From PCSSensor 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: Don Park Date: 6/6/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 175

Tag: MK-702-K2-6A

P&ID: H-2-131077

LOOP:

Manufacturer: Bernard Controls Model No.: OAB-025-92005 Serial No: 94-11934-2MTE 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
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(signoff) Calibrated By:

Przybylski/StutzmannDate: 5.22.97

Location:

Stack Rm Toilet Dmper. (DAMPERS 6A)

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-007,
REV. 0, PAGE 176

Tag: MK_702_K2_6BA I/O Type: DO Description: RmDmpr6B Open

Cntlr: 10 Chan No: 22 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: Open & Close From PCSSensor 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: Doug LinkDate: 6/6/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 177

Tag: MK_702_K2_6BB I/O Type: DO Description: RmDmpr6B Close

Cntlr: 10 Chan No: 23 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE FROM PCSSensor Calibration: N/A SWITCHES SET TO OPERATE
☐ _____ 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 LohDate: 6/6/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 178

Tag: MK-702-K2-6B

P&ID: H-2-131077

LOOP:

Manufacturer: Ch Bernard Controls Model No.: 0A8-025-92005 Serial No: 94-11934-3MTE 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
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(signoff) Calibrated By: Paul M. Zylinski / 5th Summers Date: 5-22-97Location: Stack Rm. Outlet Damper (DAMPER 6B)

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/NDo 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-007,
REV. 0, PAGE 179

Tag: MK_702_K2_7AA I/O Type: DO Description: RmDmpr7A Open

Cntlr: 10 Chan No: 24 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: open close valve from DCSSensor Calibration: N/A ~~SWITCHES SET TO OPERATE WITHIN 5% FULL OPEN/CLOSE~~☐ _____ 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: R J HillDate: 6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 180

Tag: MK_702_K2_7AB I/O Type: DO Description: RmDmpr7A Close

Cntlr: 10 Chan No: 25 P&ID: H-2-131077, 5H.1 Logic:

Remarks: _____

Location: _____

Actuation Method: open close valve from DCSSensor 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: Left HillDate: 6/5/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 181

Tag: MK-702-K2-7A

P&ID: H-2-131077

LOOP:

Manufacturer: Bernard Controls Model No.: 0A8-025-92005 Serial No: 94-11934-5MTE 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: Amzyluski / S. Fitzgimmons Date: 5-22-97Location: E/F Room 'A' Inlet DAMPER (DAMPER 7A)

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/NDo 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-007,
REV. 0, PAGE 182

Tag: MK_702_K2_7BA I/O Type: DO Description: RmDmpr7B Open

Cntlr: 10 Chan No: 26 P&ID: H-2-131077, SH-1 Logic:

Remarks: _____

Location: _____

Actuation Method: open/close valve from DCSSensor 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: [Signature]

Date:

6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 183

Tag: MK_702_K2_7BB I/O Type: DO Description: RmDmpr7B Close

Cntlr: 10 Chan No: 27 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: open/close valve from DCSSensor 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.H. HillDate: 6/5/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 184

Tag: MK-702-K2-7B

P&ID: H-2-131077

LOOP:

Manufacturer: Bernard Controls Model No.: 0A8-025-92005 Serial No.: 94-11934-4MTE 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: Amzylinch/STJgimmons Date: 5-22-97Location: E/I Room 'A' Outlet DAMPER (DAMPER 7B)

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-007,
REV. 0, PAGE 185

Tag: MK_702_K2_8AA I/O Type: DO Description: RmDmpr8A Open

Cntlr: 21 Chan No: 20 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE VALVE FROM DCS & WATCH VALVE
IN FIELD OPEN & CLOSE.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: Doug Luhn Date: 6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 186

Tag: MK_702_K2_8AB I/O Type: DO Description: RmDmpr8A Close

Cntlr: 21 Chan No: 21 P&ID: H-2-131077, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE VALVE FROM DCS & WATCH VALVE
IN FIELD OPEN & CLOSE.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: Doug LarkDate: 6/5/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 187

Tag: MK-702-K2-8A

P&ID: H-2-131077

LOOP:

Manufacturer: Bernard Controls Model No.: 0A8-025-92005 Serial No.: 94-11934-1MTE 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: Pm Zylinski / J. Summers Date: 5-22-97Location: E/I Room B' inlet damper (Damper 8A)

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-007,
REV. 0, PAGE 188

Tag: MK_702_K2_8BA I/O Type: DO Description: RmDmpr8B Open

Cntlr: 21 Chan No: 22 P&ID: H-2-131677, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM PCS & WATCH VALVE
IN FIELD OPEN & CLOSESensor 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: Doug DubDate: 6/5/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 189

Tag: MK_702_K2_8BB I/O Type: DO Description: RmDmpr8B Close

Cntlr: 21 Chan No: 23 P&ID: H-2-131077, SH-1 Logic:

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM DCS & WATCH VALVE
IN FIELD OPEN & CLOSESensor 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: Doug LubaDate: 6/5/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 190

Tag: MK-702-KZ-8B

P&ID: H-2-131077

LOOP:

Manufacturer: Bernard Controls Model No.: QAB-025-92005 Serial No: 94-11934-6MTE 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: PM Zylinski / J Fitzjimmerson Date: 5-22-97Location: E/I Room 'B' outlet DAMPER (DAMPER 8B)

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? Y/NDo 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-007,
REV. 0, PAGE 191

Tag: MK_702_K3_2AA I/O Type: DO Description: BvDmpr2A Open

Cntlr: 40 Chan No: 0 P&ID: H-2-131073, SH.2 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor 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: ~ 8.0 sec to open

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L. J. Hill Date: 3/31/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 192

Tag: MK_702_K3_2AB I/O Type: DO Description: BvDmpr2A Close

Cntlr: 40 Chan No: 1 P&ID: H-2-131073, SH. Z Logic:

Remarks: _____

Location: _____

Actuation Method: _____

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:

~ 8.0 sec to close

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: *LA Hill*Date: *5/31/96*

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 193

Tag: MK-702-K3-2A

P&ID: H-2-131073

LOOP:

Manufacturer: TEXSTREAM INC. Model No.: MAR10-10 Serial No: AX07330MTE 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: PM Zylinski / B. Fitzgibbon Date: 5.27.97Location: Bldg. Vent. Penthouse (DAMPER 2A)

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? (Y)N~~Does system flow respond to valve position changes?~~ (Y)N 5.27.97

Do open and closed limit switches actuate (indicated at 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-007,
REV. 0, PAGE 194

Tag: MK_702_K3_2BA I/O Type: DO Description: BvDmpr2B Open

Cntlr: 40 Chan No: 2 P&ID: H-2-131073, SH. 2 Logic:

Remarks: _____

Location: _____

Actuation Method: _____

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:

~ 8.3 sec to open

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: *LJH*Date: *5/31/96*

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 195

Tag: MK_702_K3_2BB I/O Type: DO Description: BvDmpr2B Close

Cntlr: 40 Chan No: 3 P&ID: H-2-131073, SH. 2 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor 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: _____

~ 8.3 sec to close

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LJL/sepDate: 5/31/96

5/19/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 196

Tag: MK-702-K3-ZB

P&ID: H-2-131073

LOOP:

Manufacturer: Texstream Inc. Model No.: MAR10-10 Serial No.: AX07333MTE 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:

Am Zylinski / StetymannDate: 5-22-97Location: Bldg. Vent. Penthouse (DAMPER 2B)

Comments

Does valve travel full stroke (open and closed) when operated from MICON DCS, as indicated by local position indicator? (Y/N)~~Does system respond (flow) to valve position changes?~~ (Y/N) on 5-22-97

Do open and closed limit switches actuate (indicated at 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.

3/3/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 197

Tag: PI_702_K35_1 I/O Type: AI Description: Bldg Vent. Hdr Press

Cntlr: 36 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: pressure source

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) LLH
☐ _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ \text{(sensor)} & \text{(xmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-39

20BldExh

19BldSup

LCU4-43

Lo: -5.00

-5.14 / -4.86

-5.00-5.01-5.01-4.98

Hi: 2.00

1.86 / 2.14

+1.97+1.98+1.97+1.97

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 99999.99

/

HiHi: 0 99999.99

1.61 / 1.89Hi: 2.2 -1.75 -5.01.34 2.36-1.73 yellowLo: 2.2 -2.25 -5.02.14 2.39-2.23 yellow

LoLo: 0 -9999.99

/

Min: 0 -9999.99

/

Other:

groups 182 & 184 read same as LOI groups,817-35-40-0268-9-97MTE Instr. No: 817-45-08-044Due Date: 2/12-98

(signoff)

Loop Complete: LLHDate: 3/3/97

7/28/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 198

Tag: PT-AZ702K305-1

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 22

Manufacturer: YokogawaModel No.: 777-70Serial No: 97151606MTE Instr. No: 817-45-08-033Due Date: 4-7-98

Input Range -5-2"

Tolerance 0.50 %

Units: IN WC

+/- 0.08

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
-5"	4.00 (-5.0)	3.92 (-5.04)	4.08 (-4.96)	3.99 (NA)	NA	3.99 (-5.0)
-3.25	8.00 (-3.25)	7.92 (-3.29)	8.08 (-3.21)	NA (NA)	NA	8.00 (-3.25)
-1.50	12.00 (-1.50)	11.92 (-1.54)	12.08 (-1.46)	NA (NA)	NA	12.00 (-1.51)
0.25	16.00 (0.25)	15.92 (0.29)	16.08 (0.29)	NA (NA)	NA	16.01 (0.25)
2"	20.00 (2.0)	19.92 (1.96)	20.08 (2.04)	NA (NA)	NA	20.01 (2.00)

(signoff) Calibrated By: G. Anger D. EddieDate: 7-28-97

Location: BV FILTER ROOM

Comments

FUNCTIONAL TEST ALARMS TO MICON, LOW ALARM TRIPS AT -2.25" AFTER 60 SECONDS YES X, NO . HI ALARM TRIPS AT -1.75" AFTER 60 SECONDS YES X, NO .

3/3/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 199

Tag: PT-AZ702K305-1

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 22

Manufacturer: Foxboro Model No.: 823DP-I35196 Serial No: 93100240MTE Instr No: 817-35-40-026 Due Date: 8-9-97
817-45-08-044 2-12-98

Input Range -5-2"		Tolerance .5%			
Units: IN WC		Lo:	Hi:	As Found	In/Out As Left
Input	Output				
-5.00	4.00	3.90	4.10	4.01	IN 4.01
-3.25	8.00	7.90	8.10	8.01	IN 8.01
-1.50	12.00	11.90	12.10	12.00	IN 12.01
0.25	16.00	15.90	16.10	16.00	IN 16.01
2.00	20.00	19.90	20.10	20.01	IN 20.01
		3397			

(signoff) Calibrated By: FitzsimmonsDate: 3-3-97Location: Bldg. Vent Penthouse

Comments

New Instrument. MTE accuracy = $\pm .02$ "wc = $\pm .3\%$
of field instrument range
MTE-Output = $\pm 18\text{mA} = \pm .0625\%$

Sensor failed

see rec'd
on 7/28/97

3/13/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 200

Tag: PI-AZ702K3-1

P&ID: H-2-131081, SH 1

LOOP:

Manufacturer: V.S. Gauge Model No.: Vacuum Serial No.: 2E-000-687MTE Instr. No: 817-35-40-032 Due Date: 8-8-97

Input Range 0-20

Tolerance 5%

Units: Hg Vac.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	<u>-1.5</u>	<u>1.5</u>	<u>0</u>	<u>IN</u>	<u>0</u>
5	5	<u>3.5</u>	<u>6.5</u>	<u>5.5</u>	<u>IN</u>	<u>5.5</u>
10	10	<u>8.5</u>	<u>11.5</u>	<u>10.2</u>	<u>IN</u>	<u>10.2</u>
15	15	<u>13.5</u>	<u>16.5</u>	<u>15.2</u>	<u>IN</u>	<u>15.2</u>
20	20	<u>18.5</u>	<u>21.5</u>	<u>20.0</u>	<u>IN</u>	<u>20.0</u>

(signoff) Calibrated By: Fitzsimmons Date: 3-13-97

Location: _____

Comments

3/13/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 201

Tag: PI-AZ702K3-2

P&ID: H-2-131081, SH 1

LOOP:

Manufacturer: V.S. Gauge Model No.: Vacuum Serial No: 2E-000-688MTE Instr. No: 817-35-40-032 Due Date: 8-8-97

Input Range 0-20

Tolerance 5%

Units: Hg Vac.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0	0	-1.5	1.5	0	IN	0
5	5	3.5	6.5	5.0	IN	5.0
10	10	8.5	11.5	9.8	IN	9.8
15	15	13.5	16.5	14.5	IN	14.5
20	20	18.5	21.5	19.2	IN	19.2

(signoff) Calibrated By: FitzsimmonsDate: 3-13-97

Location: _____

Comments

4/7/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 202

Tag: PC_702_K35_1A I/O Type: AO Description: BvFanA Pressure

Cntlr: 36 Chan No: 3 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Damper only needs adequate range for PI
loop control to function.

Sensor Calibration:

☐ 5 pt cal☐ _____per procedure visual verification (data attached) LTH
(signoff)Loop Tolerance:
SEE OTHER

$$0.0\% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ \text{(sensor)} & \text{(xmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$$

Units:

observation
LOI

Screen1

Screen2

Screen3

Process Input

Readout Tolerance

Lo: 0.00

-5.00 / 5.00

closed (tight)

Hi: 50.00

40.00 / 60.00

50% ± 10%

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

/

HiHi:

/

Hi:

/

Lo:

/

LoLo:

/

Min:

/

Other: Normal PID control point ± 30% of range.Verify by visual observation that damper is fully closed
+/-10% at 0% output (4Ma) and 50% open +/-20% at 100%
output (20Ma).

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LTHDate: 4/7/97

Tag: PC-702K35-1A

P&ID: H-2-131073, SH2

Loop: H-2-131310, SH18

Manufacturer: Honeywell Model No.: M7284A1004 Serial No.: 2E 000 713

MTE Instr. No.: _____ Due Date: _____

Input Range

Tolerance $\pm 20, -10\%$

Units:

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
4ma	0%	Close stop		close stop		
20ma	50%	40%	70%	50%	IN.	50%

(signoff) Calibrated By:

Paul M. ZylinskiDate: 4.7.97

Location:

702 Bldg. Penthouse

Comments

Functional test; Valve operator needs a label.

- (1) Does Actuator cycle from close stop to 50% mark (approx.) when a close and open signal are input from micron DCS? (Y/N)
- (2) Can header pressure be controlled from MKON DCS within the actuator stroke range? (Y/N)

4/7/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 204

Tag: PC_702_K35_1B I/O Type: AO Description: BvFanB Pressure

Cntlr: 36 Chan No: 4 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Damper only needs adequate range for PDD
control loop to function.

Sensor Calibration:

☐ 5 pt cal☐ per procedure visual verification (data attached) LFH (signoff)Loop Tolerance:
SEE OTHER.

$$0.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (\text{other})^2 + (\text{DCS})^2}$$

Units:

observation
-10%

Screen1

Screen2

Screen3

Process Input Readout Tolerance

Lo: 0.00 -5.0 / +5.0Hi: 50.00 40.0 / 60.0closed (tight)50% ± 10%

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max:

/

HiHi:

/

Hi:

/

Lo:

/

LoLo:

/

Min:

/

Other: Normal PDD control point ≈ 30% of range.Verify by visual observation that damper is fully closed
+/-10% at 0% output (4Ma) and 50% open +/-20% at 100%
output (20Ma).

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LFHDate: 4/7/97

Tag: PC-702K35-1BP&ID: H-2-131073 SH2LOOP: H-2-131310, SH 1BManufacturer: HONEYWELLModel No.: M7284A1004Serial No.: 2E000714

MTE Instr. No: _____

Due Date: _____

Input Range		Tolerance				
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
4ma	0%	close stop		close stop		
20ma	50%	40%	70%	50%	IN	50%

(signoff) Calibrated By: Paul M ZylinskiDate: 4.7.97Location: 702 Building Penthouse

Comments

Functional test; Valve operator needs a label.

(1) Does Actuator cycle from close stop to 50% mark (approx.) when a close and open signal are input from micon DCS?
(Y/N)

(2) Can header pressure be controlled from MICON DCS within the actuator stroke range?
(Y/N)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 206

Tag: PDC_702_K2_2 I/O Type: AO Description: E/iRmA Dp

Cntlr: 35 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Operate Valve from MCS controls
(Visual verification of valve position)

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) PCB
☐ _____ (signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$
(DCS)

Units:

Process Input Readout Tolerance

Lo: 0.00 -2.01 - 2.01
Hi: 100.00 97.99 - 102.01

Screen1	Screen2	Screen3
19BldSup	64540	Grp 162
0	0	0
100	100	100

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max: _____

HiHi: _____

Hi: _____

Lo: _____

LoLo: _____

Min: _____

Other:

VERIFIED PROPER OPERATION OF
PID LOOP PDIC-702K2-2MTE Instr. No: N/A Due Date: _____(signoff) Loop Complete: L J HillDate: 10/17/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 207

Tag: PDC_702_K2_3 I/O Type: AO Description: E/iRmB Dp

Cntlr: 35 Chan No: 2 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Operate valve from MCS controller
(Visual verification of valve position)

Sensor Calibration:

☒ 5 pt calper procedure VI (data attached) FCS
(signoff)Loop Tolerance: $2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 2.0\%^2 + 0.2\%^2}$ (DCS)

Units:

Process Input Readout Tolerance

~~100~~
VALVEScreen1
19BldSupScreen2
GRP 540Screen3
GRP 162

Lo: 0.00 -2.01 - 2.01

CLOSED0%0%0%

Hi: 100.00 97.99 - 102.01

FULL OPEN100%100%100%

Annunciator(s): Priority Setpoint Tolerance Trip Point

Max:

-

HiHi:

-

Hi:

-

Lo:

-

LoLo:

-

Min:

-

Other:

VERIFIED PROPER OPERATION OFPID Loop PDC-702K2-3MTE Instr. No: N/A Due Date: _____

(signoff)

Loop Complete:

Doug Herber

Date:

8/5/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 208

Tag: PDC_702_K3_1 I/O Type: AO Description: Cell Dp
 Cntlr: 36 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve & observe travel

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) [Signature]
☐ _____ (signoff)

Loop Tolerance: $2.0\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 2.0\% ^2 & + & 0.2\% ^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units:	LOI	Screen1	Screen2	Screen3
Process Input	Readout Tolerance	19BldSup		
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: Verify PID control works in proper
direction.

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: [Signature]Date: 10/17/96

3/5/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 209

Tag: PDI_702_K2_1 I/O Type: AI Description: StkMonRm Dp

Cntlr: 35 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Pressure Source

Sensor Calibration:

☒ 5 pt cal☐ _____

per procedure

VI

(data attached)

StkMonRm
(signoff)

$$\text{Loop Tolerance: } 4.0 \% = \sqrt{\begin{matrix} 2 & 2 & 2 & 2 \\ (\text{sensor}) & + & (\text{xmitter}) & + & (4.0 \% \text{ (other)}) & + & (0.2 \% \text{ (DCS)}) \end{matrix}}$$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU4-35	Screen1 19BldSup	Screen2 Group164	Screen3
Lo: -.30	-.32 / -.28	<u>-0.31</u>	<u>-0.30</u>	<u>-0.30</u>	_____
Hi: .20	.18 / .22	<u>0.20</u>	<u>0.19</u>	<u>0.21</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: Verified operation of 3-value manifold by
placing hand switch (HS) in OFF-RUN-SPAN positions.

817-35-40-020

8-8-97

MTE Instr. No: 817-45-08-044Due Date: 2-12-98

(signoff)

Loop Complete: StkMonRmDate: 3/5/97

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 210

Tag: PDT-AZ702K2-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 1

Manufacturer: Foxboro Model No.: 823DP-D35NLI-A Serial No: 96220195MTE Instr. No: 817-28-09-003 Due Date: 4-7-98
817-45-08-088 9-11-97

Input Range -0.3 to 0.2

Tolerance 4%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
-0.3	4Ma	3.90	4.10	3.75	OUT	4.02
-175	8Ma	7.90	8.10	7.30	OUT	8.02
-.05	12Ma	11.90	12.10	11.65	OUT	12.03
.075	16Ma	15.90	16.10	15.68	OUT	16.03
0.2	20Ma	19.90	20.10	19.67	OUT	20.01

(signoff) Calibrated By: R. Wilburth/P. ZylinskiDate: 7-15-97Location: Stack Monitor Room J/PComments Loop check 0-100% to Micon, tag in configurator (HAT) = PDTAZ702K2-1

CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

Output tolerances < % because input tolerance (device) is 4%.

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 211Tag: PDI-AZ 702 K2-1P&ID: H-2-131073, SH 1LOOP: H-2-131310, SH 1

Manufacturer: _____

Model No.: _____

Serial No.: _____

MTE Instr. No.: _____

Due Date: _____

Input Range 4 to 20 mA

Tolerance

Units: mA±6%

Input mA	Output INWC	Lo:	Hi:	As Found	In/Out	As Left
4.00	-0.3	-0.297	-0.303	* N/A	* N/A	-0.30
8.00	-0.175	-0.172	-0.178			-0.17
12.00	-0.05	-0.047	-0.053			-0.05
16.00	0.075	0.072	0.078			0.07
20.00	0.2	0.197	0.203			+0.20

(signoff) Calibrated By: R. Wilmette / P. ZylinskiDate: 7.15.97Location: Stack Monitor Room DIPComments ^{*} Initial deck

- MICON DATA SHEET -

4/29/96

W-030 LOOP TEST DATA SHEET

Tag: PDI_702_K2_1 I/O Type: AI Description: StkMonRm Dp

CntlR: 35 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: dp source JOID

Sensor Calibration:

☒ 5 pt calper procedure VI(data attached) PHI

(signoff)

Loop Tolerance: $0.8\% = \sqrt{(0.8\% \text{ (sensor)})^2 + (0.2\% \text{ (xmmitter)})^2 + (0.8\% \text{ (other)})^2 + (0.2\% \text{ (DCS)})^2}$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-35

19BldSup

02Main.v

group 169

Lo: -1.00 -1.01 / -0.99

-1.00-1.0no alarm-1.00

Hi: 0.00 -0.01 / .01

0.000.0alarm0.00(white)
after 30sec per logic

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	/	_____
HiHi:	0	99999.99	/	_____
Hi:	0	99999.99	/	_____
Lo:	0	-99999.99	/	_____
LoLo:	0	-99999.99	/	_____
Min:	0	-99999.99	/	_____

VERIFIED PROPER OPERATION OF ELECTRIC ACTUATOR
 OTHER: BY PLACING HAND SWITCH(HS) IN OFF-RUN-SPAN POSITIONS
(REVERSE TBI AND 4 AT SENSOR)

Also got white alarm on 03 lerkot.vMTE Instr. No: 817-45-08-040 Due Date: 2/15/9728-09-0031/12/97

(signoff)

Loop Complete: PHIDate: 7/29/96

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 213

Tag: PDT-AZ702K2-1

P&ID: H-2-131073, SH.1

LOOP: H-2-131310, SH 1

Manufacturer: Foxboro Model No.: 833DP-D35INLI-A Serial No: 96220195MTE Instr. No: 817.45.08.040 817.28.09.003 Due Date: 2.5.97 1.12.97

Input Range 0-1"			Tolerance ^{2%} 5% - OUTPUT 5% - DISPLAY				
Units: IN WC							
Input	Output	%	Lo:	Hi:	As Found	In/out	As Left
0"	20Ma	100	19.92 (95)	20.08 (105)	*N/A (N/A)	N/A	20.00 (99)
.25"	16Ma	75	15.92 (70)	16.08 (80)			16.00 (73)
.40.5"	12Ma	50	11.92 (45)	12.08 (55)			12.00 (49)
.75"	8Ma	25	7.92 (20)	8.08 (30)			8.00 (22)
1"	4Ma	0	3.92 (5)	4.08 (5)			4.00 (-1)

(signoff) Calibrated By: Paul M. ZylinskiDate: 7.29.96Location: STACK MONITOR RM.

Comments * initial Setup, tag in configurator (HAT) = ADT-A ^{7.29.96} PDT-AZ702K2-
 CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

MTE ACCURACY = $\pm .02$ " WC EQUALS 2%
 OF FIELD INSTRUMENT RANGE

VOID

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 214

Tag: PDI_702_K24_1 I/O Type: AI Description: K3Hepal Dp
 Cntrlr: 35 Chan No: 10 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal☐ _____

per procedure

VI

(data attached)

LSA
(signoff)

Loop Tolerance:

$$2.0\% = \sqrt{\begin{matrix} 2 & + & 2 & + & 2.0\% & + & 0.2\% \\ \text{(sensor)} & & \text{(xmmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-33

1981dSup.v

GROUP 162

Lo: 0.00

-.02 - .02

-0.010.0-0.01

Hi: 1.00

.98 - 1.02

1.001.01.00

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 PROPER OPERATION OF ELECTRIC ACTUATORBY PLACING HAND SWITCH (HS) IN OFF-RUN-PAN
POSITIONS.

MTE Instr. No:

812-49-08-055

Due Date:

11-8-96812-28-09-0031-12-97

(signoff)

Loop Complete:

LSA

Date:

7/31/96

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 215

Tag: PDT-AZ702K204-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 6

Manufacturer: FoxboroModel No.: 823DP-D35NLI-ASerial No: 96220198MTE Instr. No: 817-45-08-088
817-28-09-003Due Date: 9-11-97
8-7-98

Input Range 0-1"

Tolerance 5% 2%

Units: IN WC

DISPLAY - 5%

Input	Output	%	Lo:	Hi:	As Found	In/Out	As Left
0"	4Ma	(0)	3.92(-5)	4.08(5)	3.75(-53)	OUT	4.03(-1)
.25"	8Ma	(25)	7.92(20)	8.08(20)	7.13(19)	OUT	8.01(24)
.5"	12Ma	(50)	11.92(45)	12.08(55)	11.21(43)	OUT	12.01(48)
.75"	16Ma	(75)	15.92(70)	16.08(80)	15.13(68)	OUT	16.00(74)
1"	20Ma	(100)	19.92(95)	20.08(105)	19.21(94)	OUT	19.97(99)

(signoff) Calibrated By: R. Wilmoth / PzykushDate: 7-15-97Location: Vent Room 'A' (101)Comments installed in config. (HMT) as PDT-AZ72K24-1. Check 0-100% to Micron.

CALIBRATE PER VENDOR DATA

Tag: PDI-AZ702 K204-1 P&ID: H-2-131073, SH1 Loop: H-2-131310, SH6

Manufacturer: _____ Model No.: _____ Serial No: _____

MTE Instr. No: _____ Due Date: _____

Input Range 0-1"Tolerance 5%Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
<u>4</u>	<u>0.0</u>	<u>-0.05</u>	<u>0.05</u>	<u>-0.02</u>	<u>IN</u>	<u>*0.00</u>
<u>8</u>	<u>0.25</u>	<u>0.20</u>	<u>0.30</u>	<u>0.20</u>	<u>#IN</u>	<u>0.25</u>
<u>12</u>	<u>0.50</u>	<u>0.45</u>	<u>0.55</u>	<u>0.45</u>	<u>IN</u>	<u>0.50</u>
<u>16</u>	<u>0.75</u>	<u>0.70</u>	<u>0.80</u>	<u>0.70</u>	<u>IN</u>	<u>0.75</u>
<u>20</u>	<u>1.00</u>	<u>0.95</u>	<u>1.05</u>	<u>0.95</u>	<u>IN</u>	<u>1.00</u>

(signoff) Calibrated By: R. Wilmoth/PzylnskiDate: 7.15.97Location: Vent Run A' (101)

Comments

MICON DATA SHEET

31/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 217

Tag: PDT-AZ702K204-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 6

Manufacturer: Foxboro Model No.: 823DP-D3SINLI-A Serial No: 96220198MTE Instr. No: 817-49-08-055 Due Date: 11-8-96
817-28-09-003 1-12-97

Input Range 0-1"

Tolerance 5% ^{2%}Units: IN WC
%

DISPLAY = 5%

Input	Output	%	Lo:	Hi:	As Found	In/Out	As Left
0"	4Ma	(0)	3.92 (-5)	4.08 (5)	*N/A	*N/A	4.00 (-1)
.25"	8Ma	(25)	7.92 (20)	8.08 (30)	()	()	8.01 (25)
.5"	12Ma	(50)	11.92 (45)	12.08 (55)	()	()	12.01 (49)
.75"	16Ma	(75)	15.92 (70)	16.08 (80)	()	()	16.01 (75)
1"	20Ma	(100)	19.92 (95)	20.08 (105)	()	()	20.01 (100)

(signoff) Calibrated By: P. J. GroeningDate: 7-31-96Location: Vent Room "A", 101Comments * initial setup, installed in config (HHT) as PDT-AZ72K24-
CALIBRATE PER VENDOR DATAMTE Accuracy = $\pm .02$ " WC = 2%
OF FIELD INSTRUMENT RANGEVOID 7-15-97
[Signature]

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 218

Tag: PDI_702_K24_2 I/O Type: AI Description: K3Hepa2 Dp
 Cntlr: 35 Chan No: 11 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

CALIBRATED PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

D. J.
(signoff)

Loop Tolerance:

$$2.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (\text{other})^2 + (\text{DCS})^2}$$

Units: IN WC

Process Input

Readout Tolerance

LOI
LCU4-34Screen1
19B1dSup.vScreen2
Group 163

Screen3

Lo: 0.00

-.02 - .02

-.010.0-.01

Hi: 1.00

.98 - 1.02

1.001.0.99YELLOW ALARM
AFTER 30 SECONDS

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 PROPER OPERATION OF ELECTRIC ACTUATOR BY PLACINGHAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONS

817-45-08-040

2/5/97

MTE Instr. No:

817-28-09-003

Due Date:

1/12/97

(signoff)

Loop Complete:

Dorey J. J.

Date:

2/30/96

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 219

Tag: PDT-AZ702K204-2

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 7

Manufacturer: Foxboro823DP-D3S1NL7-A

823DP-D3S1NL7-A

Model No.: 964220199Serial No: 966220199MTE Instr. No: 817-28-09-004912-45-08-088Due Date: 7-15-979-11-97

Input Range 0-1"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	.4Ma	3.92	4.08	3.75	Out	4.02
.25"	8Ma	7.92	8.08	7.66		8.00
.5"	12Ma	11.92	12.08	11.63		12.04
.75"	16Ma	15.92	16.08	15.59		16.03
1"	20Ma	19.92	20.08	19.58		20.01

(signoff) Calibrated By: Fitzsimmons/WilmethDate: 7-14-97Location: B Train Filter Room

Comments

CALIBRATE PER VENDOR DATA

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 220

Tag: PDT-AZ702K204-2

F&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 7

Manufacturer: Foxboro Model No.: 823DP-D35INLI-A Serial No: 96220199MTE Instr. No: 817-45-08-040 Due Date: 2.5.97
817-28-09-DD3 1.12.97

Input Range 0-1"		Tolerance 5% 2%				
Units: IN WC		DISPLAY - 5% 5%				
Input	Output (%)	Lo:	Hi:	As Found	In/Out	As Left
0"	4Ma (0)	3.92 (-5)	4.08 (5)	* N/A	* (N/A)	* N/A
.25"	8Ma (25)	7.92 (20)	8.08 (30)	()	()	8.00 (24)
.5"	12Ma (50)	11.92 (45)	12.08 (55)	()	()	12.00 (49)
.75"	16Ma (75)	15.92 (70)	16.08 (80)	()	()	16.00 (75)
1"	20Ma (100)	19.92 (95)	20.08 (105)	()	()	20.00 (100)

(signoff) Calibrated By: Przybylski/K. Greening Date: 7.30.96Location: Vent Room 'B' 102Comments * initial setup, Entered in config. (HAT) as ~~X~~ ^{7.30.96} PDTAZ72K24
CALIBRATE PER VENDOR DATAMTE ACCURACY = $\pm .02$ " WC = 2%
OF FIELD INSTRUMENT RANGEVOID
7.15.97
pry

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 221

Tag: PDI_702_K33_1A I/O Type: AI Description: BvFiltr1A Dp
 Cntrlr: 36 Chan No: 10 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

CALIBRATED PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

O.S.
(signoff)

Loop Tolerance:

$$1.0\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 1.0\%^2 + 0.2\%^2}$$

Units: IN WC

Process Input

Readout Tolerance

LOI
LCU4-42Screen1
2081dExh.vScreen2
02Main.vScreen3
03LeakDt.vGroup
185

Lo: 0.00

-.02 - .02

-0.010.0EmptyEmpty-0.01

Hi: 2.00

1.98 - 2.02

2.002.0REDRED2.0

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 99999.99

HiHi: 1 .50 .48 - .52

Hi: 2 .30 .28 - .32

Lo: ~~0-2~~ ~~-9999.99~~ ~~-0.25~~ ~~-0.27~~ ~~-0.23~~

LoLo: 0 -9999.99

Min: 0 -9999.99

0.50 RED0.30 YELLOW-0.25 YELLOW

Other: VERIFIED PROPER OPERATION OF ELECTRICAL ACTUATION BY
 PLACING HAND SWITCH (HS) IN OFF-RUN-STOP POSITIONS.

ADD & RETEST LO ALARM 10/15/96 (LPH)

MTE Instr. No:

817-35-40-026

Due Date:

8/9/97

(signoff)

Loop Complete:

Danish

Date:

8/27/96

7/21/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 222

Tag: PDT-AZ702K303-1A

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 10

Manufacturer: FOXBORO

Model No.: 823DP-D3SINLI-A

Serial No: 96220201MTE Instr. No: 817-45-08-033Due Date: 3-3-98

Input Range 0-2"

Tolerance $\frac{1.0\%}{0.50} \times 1\%$ 7-21-97

Units: IN WC

+/- 0.08

Input	Output	Micon	Lo:	Hi:	As Found	In/Out	As Left
0"	4.00	(0)	3.92 (-0.02)	4.08 (.02)	3.98 (0)	In	3.98 (0)
.5"	8.00	(.5)	7.92 (-.08)	8.08 (.02)	8.01 (.5)	In	8.01 (.5)
1"	12.00	(1)	11.92 (-.08)	12.08 (.02)	12.01 (1)	In	12.01 (1)
1.5"	16.00	(1.5)	15.92 (-.08)	16.08 (.02)	16.04 (1.5)	In	16.04 (1.5)
2"	20.00	(2)	19.92 (-.08)	20.08 (.02)	20.08 (2.01)	In	20.08 (2.01)

(signoff) Calibrated By: A. McGowan Pzyliński Date: 7-21-97

Location: BV FILTER ROOM

Comments

M&TE TOLERANCE ONLY 1%; MATCH WITHIN 0.5%

Tag: PDT-AZ702K303-1AP&ID: H-2-131073, SH2LOOP: H2-1313105H 10
96220201 Pr 8-22-96Manufacturer: FOXBOROModel No.: PA3DP-D35INH-ASerial No: 96220201MTE Instr. No: 817-35-40-026
817-45-08-040Due Date: 8-9-97
2-5-97Input Range 0-2"Tolerance ±5% 1%Units: IN W.C.

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	4Ma	3.92	4.08	* N/A	* N/A	4.01
.5"	8Ma	7.92	8.08			8.02
1"	12Ma	11.92	12.08			12.02
1.5"	16Ma	15.92	16.08			16.01
2"	20Ma	19.92	20.08			20.00

(signoff) Calibrated By: P. J. J. / C. CharlestonDate: 8-22-96Location: Bldg Vent Rm.Comments * initial cal.

M&TE TOLERANCE = $\pm .02$ IN WC = $\pm 0\%$
OF RANGE OF FIELD INSTRUMENT

VOID
7-21-97
Rmg

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 224

Tag: PDI_702_K33_1B I/O Type: AI Description: BvFiltr1B Dp
 CntTr: 36 Chan No: 11 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

CALIBRATOR PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

L. J. Hill
(signoff)

Loop Tolerance:

$$1.0\% = \sqrt{\begin{matrix} 2 & 2 & 1.0\% & 0.2\% \\ (\text{sensor}) & (\text{xmitter}) & (\text{other}) & (\text{DCS}) \end{matrix}}$$

Units: IN WC

Process Input

Readout Tolerance

LOI
LCU4-42Screen1
20B1dExh.vScreen2
02Main.vScreen3
03LeakDt.v ^{Group} 185

Lo: 0.00

-.02 - .02

0.000.0EMPTYEMPTY 0.00

Hi: 2.00

1.98 - 2.02

2.002.0ALARMALARM 2.00

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

9999.99

-

HiHi:

1

.50

.48 - .52

.51 RED

Hi:

2

.30

.28 - .32

.30 YELLOW

Lo:

0.2-9999.99 - 0.25-0.27/-0.23-0.25 YELLOW

LoLo:

0

-9999.99

-

Min:

0

-9999.99

-

Other:

Verified 3 valve manifold operation by placing
H/S in OFF-RUN-SPAN positions & checking
pressure porting.

MTE Instr. No:

812-35-40-026

Due Date:

8/9/97

(signoff)

Loop Complete:

L. J. Hill

Date:

8/23/96

ADDED & RETESTED

LO

ALARM

L. J. Hill10/15/96

7/21/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 225

Tag: PDT-AZ702K303-1B

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 12

Manufacturer: FOXBORO

Model No.: 823DP-D3SINLI-A

Serial No: 96220201MTE Instr. No: 817-45-08-033
817-28-09-003Due Date: 3-3-98
4-7-98

Input Range 0-2"		Tolerance $\frac{1.0}{0.50} = 2\%$				
Units: IN WC		+/- 0.08				
Input	Output	MICON	Lo:	Hi:	As Found	In/Out
0"	4.00	(0)	3.92 (-.02)	4.08 (.02)	4.00 (0)	In
.5"	8.00	(.5)	7.92 (-.08)	8.08 (.02)	8.02 (.5)	In
1"	12.00	(1)	11.92 (-.08)	12.08 (.02)	12.03 (.03)	In
1.5"	16.00	(1.5)	15.92 (-.08)	16.08 (.02)	16.01 (.5)	In
2"	20.00	(2)	19.92 (-.08)	20.08 (.02)	20.04 (2.0)	In

(signoff) Calibrated By: P. McGowan, P. Zylinski Date: 7-21-97

Location: BV FILTER ROOM

Comments

M&T TOLERANCE ONLY 1%; MATCH WITHIN 0.5%

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 226

Tag: PDT-A2702K303-1B

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 12

Manufacturer: FOXBORO Model No.: 823DP-D35/INLL-A Serial No: 96220202
817-45-08-018 09-20-96
 MTE Instr. No: 817-35-40-019 Due Date: 11-09-96

Input Range 0-2"		Tolerance 5% / 1% DISPLAY - 5% / 1% / 5%				
Units: IN WC						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	4Ma	3.92 (-5)	4.08 (5)	*N/A	*N/A	4.00
.5"	8Ma	7.92 (20)	8.08 (30)	()	()	7.97
1"	12Ma	11.92 (45)	12.08 (55)	()	()	11.98
1.5"	16Ma	15.92 (70)	16.08 (80)	()	()	15.98
2"	20Ma	19.92 (95)	20.08 (105)	()	()	20.01

(signoff) Calibrated By: [Signature]Date: 08-13-96Location: Bldg. Vent Rm.

Comments * initial setup,

CALIBRATE PER VENDOR DATA

MTE TOLERANCE = ± 0.02 IN WC = 1%
 OF RANGE OF FIELD INSTRUMENT

VOID
 7-21-97
 [Signature]

3/13/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 227

Tag: PDI_702_K34_1A I/O Type: AI Description: BvHepalA Dp

Cntlr: 36 Chan No: 12 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Pressure Source / 4-20 mA Source

Sensor Calibration:

☒ 5 pt cal☐ _____per procedure VI

(data attached)

JH
(signoff)

Loop Tolerance: $0.8\% = \sqrt{\begin{matrix} \text{(sensor)}^2 & + & \text{(xmmitter)}^2 & + & 0.8\%^2 & + & 0.2\%^2 \\ & & & & \text{(other)} & & \text{(DCS)} \end{matrix}}$

Units: IN WC

Process Input

Readout Tolerance

LOI

LCU4-42

Screen1

20BldExh

Screen2

02Main.v

Screen3

03LeakDt

18s

Gm

0.0

0.0

5.9

Lo: 0.00

-.05 / .05

0.00.0greengreen

0.0

Hi: 6.00

5.95 / 6.05

6.06.0redred

5.9

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

/

HiHi:

1

2.50

2.45 / 2.55

2.54 red

Hi:

2

2.00

1.95 / 2.05

2.00 yellow

Lo:

2

-.75

-.80 / -.70

-0.75 yellow

LoLo:

0

-9999.99

/

Min:

0

-9999.99

/

* undervalue alarm only trips numeric - not graphic symbols.

Other:

Verify operation of electric actuator & valvepressure porting using HS in OFF-RUN-SPAN position.MTE Instr. No: 817-13-55-026Due Date: 12/17/97

(signoff)

Loop Complete: JHDate: 3/24/97

7/21/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 228

Tag: PDT-AZ702K304-1A

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 11

Manufacturer: FOXBORO

Model No.: 823DP-D3SISMI-A

Serial No: 96220204MTE Instr. No: 817-45-08-033Due Date: 3-3-98817-28-09-0034-7-98

Input Range 0-6"

Tolerance .5%

Units: IN WC

+/- 0.08

Input	Output	MICON	Lo:	Hi:	As Found	In/Out	As Left
0"	4.00	(0)	3.92 (-03)	4.08 (.03)	4.01 (0)	In	4.01 (0)
1.5"	8.00	(1.5)	7.92 (1.47)	8.08 (1.53)	8.03 (1.5)	In	8.03 (1.5)
3"	12.00	(3)	11.92 (2.97)	12.08 (3.03)	12.04 (3.0)	In	12.04 (3.0)
4.5"	16.00	(4.5)	15.92 (4.47)	16.08 (4.53)	16.06 (4.5)	In	16.06 (4.5)
6"	20.00	(6)	19.92 (5.47)	20.08 (6.03)	20.07 (6.0)	In	20.07 (6.0)

(signoff) Calibrated By: E. Alderson P. ZylinkskiDate: 7-21-97

Location: BV FILTER ROOM

Comments

CALIBRATE PER VENDOR DATA

3/25/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 229

Tag: PDI_702_K34_1A I/O Type: AI Description: BvHepala Dp
 Cntl'r: 36 Chan No: 12 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

Pressure Source

Sensor Calibration:

☒ 5 pt cal

per procedure

VZ

(data attached)

L. H. Lee
(signoff)

Loop Tolerance:

$$0.8\% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + 0.8\%^2 + 0.2\%^2} \text{ (DCS)}$$

Units: IN WC

Process Input

Readout Tolerance

LOI
LCU4-42Screen1
20B1dExh.Screen2
02Main.vScreen3 ~~screen~~
03LeakDt. ~~loop~~
it's

Lo: 0.00

-.05 - .05

-0.010.0emptyempty - 0.0

Hi: 6.00

5.95 - 6.05

5.976.0alarmalarm 5.98

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max: 0 9999.99

HiHi: 1.8 5.00

4.95 - 5.05

5.02 redHi: 2.8 3.00

2.95 - 3.05

3.01 yellowLo: 1.82 ~~9999.99~~ -0.75-0.80 / -0.70-0.75 yellow

LoLo: 0 -9999.99

Min: 0 -9999.99

Other:

check per Scott PierceVERIFIED PROPER OPERATION OF ELECTRIC ACTUATIONBY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONSAlso checked valve pressure porting.MTE Instr. No: 817-35-40-026

Due Date:

8/9/97

(signoff)

Loop Complete:

L. H. Lee

Date:

8/23/96Add & reset LO AlarmL. H. Lee10/15/96

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 230

Tag: PDT-AZ702K304-1A

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 11

Manufacturer: FOXROD

Model No.:

B23AP-B3515M-ASerial No: 96220204MTE Instr. No: 817-45-08-018
817-35-40-019Due Date: 09-20-96
11-09-96

Input Range 0-6"

Tolerance .5%

DISPLAY - .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/out	As Left
0"	4Ma	3.98 (15)	4.08 (5)	* N/A	* N/A	4.00
1.5"	8Ma	7.92 (20)	8.08 (30)	()	()	8.00
3"	12Ma	11.92 (45)	12.08 (55)	()	()	12.00
4.5"	16Ma	15.92 (70)	16.08 (80)	()	()	16.00
6"	20Ma	19.92 (95)	20.08 (105)	()	()	20.00

(signoff) Calibrated By:

Paul M. Zylinski / P. HansonDate: 8-15-96

Location:

Paul M. Old Vent Rm.

Comments * initial setup,

CALIBRATE PER VENDOR DATA

VOID
7-21-97
Ruf

3/13/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 231

Tag: PDI_702_K34_1B I/O Type: AI Description: BvHepalB Dp

Cntlr: 36 Chan No: 13 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED PRESSURE SOURCE / 4-20mA Source

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) SPH
☐ _____ (signoff)

 Loop Tolerance: $0.8\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + 0.8\%^2 + 0.2\%^2}$

Units: IN WC

Process Input	Readout Tolerance	LOI LCU4-42	Screen1 20BldExh .v	Screen2 02Main.v	Screen3 03LeakDt .v	Group 185
Lo: 0.00	-.05 / .05	<u>0.00</u>	<u>0.0</u>	<u>green</u>	<u>green</u>	0.00
Hi: 6.00	5.95 / 6.05	<u>5.99</u>	<u>6.0</u>	<u>red</u>	<u>red</u>	6.00

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	9999.99	/	
HiHi:	1	2.50	2.45 / 2.55	<u>2.52 red</u>
Hi:	2	2.00	1.95 / 2.05	<u>2.01 yellow</u>
Lo:	2	-.75	-.80 / -.70	<u>* 0.75 yellow</u>
LoLo:	0	-9999.99	/	
Min:	0	-9999.99	/	

Handrange slam only trips numeric - not graphic symbols.

Other:

Verify operation of electric actuator at valve
porting w/ HS in OFF-RUN-SPAD Position.

MTE Instr. No: 817-13-55-026 Due Date: 12/17/97

(signoff)

Loop Complete: SPHDate: 3/24/97

7/21/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 232

Tag: PDT-AZ702K304-1B

P&ID: H-2-131073, SH 2

LOOP: H-2-131310, SH 13

Manufacturer: FOXBORO

Model No.: 823DP-D3SISMI-A

Serial No: 96220205

817-45-08-033

3-3-98

MTE Instr. No: 817-28-09-003Due Date: 4-7-98

Input Range 0-6"

Tolerance .5%

Units: IN WC

+/- 0.08

Input	Output	Micon	Lo:	Hi:	As Found	In/Out	As Left
0"	4.00	(0)	3.92(-.03)	4.08(.03)	4.17(.1)	Out	4.00(0)
1.5"	8.00	(1.5)	7.92(1.47)	8.08(1.53)	8.17(1.6)	Out	8.00(1.5)
3"	12.00	(3)	11.92(2.97)	12.08(3.03)	12.19(3.1)	Out	12.04(3.0)
4.5"	16.00	(4.5)	15.92(4.47)	16.08(4.53)	16.26(4.6)	Out	16.00(4.5)
6"	20.00	(6)	19.92(5.97)	20.08(6.03)	20.27(6.1)	Out	20.03(6.0)

(signoff) Calibrated By: G. Hogan E. McGowan P. Zginski Date: 7-21-97

Location: BV FILTER ROOM

Comments

CALIBRATE PER VENDOR DATA

3/25/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 233

Tag: PDI_702_K34_IB I/O Type: AI Description: BvHepa1B Op
 Cntl'r: 36 Chan No: 13 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

Pressure Source

Sensor Calibration:

5 pt cal

per procedure

VI

(data attached)

L. J. Hill
(signoff)

Loop Tolerance:

$$0.8\% = \sqrt{\begin{matrix} 2 & + & 2 & + & 0.8\% & + & 0.2\% \\ \text{(sensor)} & & \text{(xmmitter)} & & \text{(other)} & & \text{(DCS)} \end{matrix}}$$

Units: IN WC

Process Input

Readout Tolerance

LOI
LCU4-42Screen1
2081dExh.Screen2
02Main.vScreen3 screen
03LeakDt. group

Lo: 0.00

-.05 - .05

0.000.0offoff 0.00

Hi: 6.00

5.95 - 6.05

5.955.952.002.00 5.9

6.0

Annunciator(s):

Priority

Setpoint

Tolerance

Trip Point

Max:

0

99999.99

HiHi:

1.2

5.00

4.95 - 5.05

5.01 red

Hi:

2.2

3.00

2.95 - 3.05

3.00 yellow

Lo:

P. 82-0.75-0.80 / -0.70-0.74

LoLo:

0

-9999.99

Min:

0

-9999.99

end per Scott Pierce L. J. Hill

Other:

VERIFIED PROPER OPERATION OF BURETAL ACTUATORBY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONSVerified pressure porting.

MTE Instr. No:

817-35-40-026

Due Date:

8/9/97

(signoff)

Loop Complete:

L. J. Hill

Date:

8/23/96Add 2 test to Mann L. J. Hill10/15/96

CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 234

Tag: PBT-AZ702K304-1B ^{-1B} ₈₂₂₋₁ PEID: H2-131073, 5H2 LOOP: H2-131310 5H13
823 DP-D3 S15M1-A
Manufacturer: FOXBORO Model No.: 823DP-D3 S15M1-A Serial No: 96220205
MTE Instr. No: 817.45.08.018 817.35.45.019 Due Date: 09-20-96
11-09-96

Input Range 0-6"		Tolerance -5%				
Units: in wc.						
Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	4 Ma	3.92	4.08	N/A	N/A	4.00
1.5"	8 Ma	7.92	8.08			8.00
3"	12 Ma	11.92	12.08			12.00
4.5"	16 Ma	15.92	16.08			16.00
6"	20 Ma	19.92	20.08			20.00

(signoff) Calibrated By: [Signature] Date: 8-13-96

Location: Bld. Vent Rm.

Comments

CALIBRATE PER VENDOR DATA

VOID
7-21-97
[Signature]

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 235

Tag: PDI_702_K2_2 I/O Type: AI Description: E/IRMA Dp
 Cntl'r: 35 Chan No: 2 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATE PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal☐ _____

per procedure

VI

(data attached)

D.H.
(signoff)

Loop Tolerance:

$$2.0 \% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0 \% \text{ (other)})^2 + (0.2 \% \text{ (DCS)})^2}$$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-33

1981dSup.v

02Main.v

GROUP 162

Lo: -1.00

-1.02 - -0.98
-1.00 - 1.00-1.00-1.0NO Alarm-1.00

Hi: 0.00

0.00 - 0.00
-0.02 - 0.020.000.0Alarm0.0

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

-

VERIFIED PROPER OPERATION OF ELECTRIC ACTUATOR

Other: BY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONS

~~(REVERSE TB1 AND 4 AT SENSOR TO INVERT)~~ALSO GOT ALARM ON 03 LEAK DET817-45-08-0402/5/97

MTE Instr. No:

817-28-09-003

Due Date:

1/12/97

(signoff)

Loop Complete:

[Signature]

Date:

7/21/96

6/6/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 236

Tag: PDI-AZ702K2-2

P&ID: H-2-131073, SH1

LOOP: H-2-131310, SH2

Manufacturer: _____ Model No.: _____ Serial No.: _____

MTE Instr. No.: _____ Due Date: _____

Input Range 0-1"

Tolerance 5%

Units: IN/OUT

Input MA	Output "H ₂ O	H ₂ O As Found	Lo As Left	As Found	In/Out	As Left
20	0	+0.95	-0.05	-0.01	IN	0.00
16	-0.25	-0.20	-0.30	-0.27	IN	-0.25
12	-0.5	-0.45	-0.55	-0.52	IN	-0.50
8	-0.75	-0.70	-0.80	-0.78	IN	-0.75
4	-1.0	-0.95	-1.05	-1.02	OUT	-1.00

(signoff) Calibrated By: R. Widmuth/P. ZylinskiDate: 7-15-97Location: Vent Room 'A' (Feltu room 'A')

Comments

← MICON DATA SHEET →

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 237

Tag: PDT-AZ702K2-2

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 2

Manufacturer: FoxboroModel No.: B23DP-D3SINH-A Serial No: 96220196MTE Instr. No: 817.45.08.088
817.28.09.003Due Date: 9.11.97
7.7.98

Input Range 0-1"

Tolerance ^{Pr 3-15.97} 5% 2%
DISPLAY = 5%

Units: IN WC

Input	Output	%	Lo:	Hi:	As Found	In/Out	As Left
0"	20Ma	(100)					
.25"	16Ma	(75)	19.92 (95)	20.08 (105)	19.79 (101)	OUT	19.98 (102)
			15.92 (70)	16.08 (80)	15.69 (76)	OUT	15.96 (77)
+0.5"	12Ma	(50)	11.92 (45)	12.08 (55)	11.64 (49)	OUT	11.98 (51)
.75"	8Ma	(25)	7.92 (20)	8.08 (30)	7.64 (24)	OUT	7.98 (25)
1"	4Ma	(0)	3.92 (-5)	4.08 (5)	3.75 (0)	OUT	3.97 (1)

(signoff) Calibrated By: L. Wilmoth / J. ZylinskiDate: 7.15.97Location: Vent Room A' (for E.I. Room A) ^{Pr 3-15.97}Comments entered in HHT as PDT-AZ702K2-2. Check to Micron 0-100%

CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

Actual range (to micron is 0 - (-1")), data sheet reflects 0 - (+1") because cal port is on high side.

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 238

Tag: PDT-AZ702K2-2

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 2

Manufacturer: Foxboro Model No.: 823DP-D35INL1-A Serial No: 96220196MTE Instr. No: 817.45.08.040 Due Date: 2.5.96
817.28.09.003 1.12.97

Input Range 0-1"		Tolerance 5% 2%	
Units: IN WC		DISPLAY - 5%	
Input	Output	(%)	
0"	20Ma	(100)	
.25"	16Ma	(75)	
-0.5"	12Ma	(50)	
.75"	8Ma	(25)	
1"	4Ma	(0)	

Lo:	Hi:	As Found	In/Out	As Left
19.92 (95)	20.08 (105)	* N/A *	(N/A) * N/A	20.02 (102)
15.92 (70)	16.08 (80)		()	16.00 (76)
11.92 (45)	12.08 (55)		()	12.00 (50.5)
7.92 (20)	8.08 (30)		()	8.00 (25.5)
3.92 (-5)	4.08 (5)	↓	(↓)	4.00 (1)

(signoff) Calibrated By: P. J. GeringDate: 7.31.96Location: Vent Room "A" 101Vent Room 7.31.96

Comments * initial setup, entered in AHT as PDT-AZ702K2-2

CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

MATE ACCURACY = $\pm .02$ " WC EQUALS 2%
OF FIELD INSTRUMENT RANGEValid 7.15.97
pmf

3/4/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 239

Tag: PDI_702_K2_3 I/O Type: AI Description: E/iRmB Dp
 Cntl'r: 35 Chan No: 3 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED PRESSURE SOURCE

Sensor Calibration:

☒ 5 pt cal☐ _____

per procedure

UI

(data attached)

D.S.
(signoff)

Loop Tolerance:

$$2.0 \% = \sqrt{(\text{sensor})^2 + (\text{xmitter})^2 + (2.0 \% \text{ (other)})^2 + (0.2 \% \text{ (DCS)})^2}$$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-34

19B1dSup.v

02Main.v

GROUP 163

Lo: -1.00

~~-1.02 - -1.98~~
~~1.00 1.00~~-1.00-1.0NO ALARM-1.00

Hi: 0.00

~~0.00 0.00~~
~~-0.02 - 0.02~~0.000.0ALARM
(WRITE)
AFTER 2 MIN
PER LOGIC Y0350.00

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 PROPER OPERATION OF ELECTRAID ACTUATOR
 BY PLACING HAND SWITCH (HS) IN OFF-RUN-SPAN POSITIONS

~~(REVERSE T01 AND 4 AT SENSOR TO INVERT)~~~~817-45-08-040~~~~817-28-09-003~~

MTE Instr. No:

817-45-08-040

817-28-09-003

Due Date:

2/5/97

11/2/97

(signoff)

Loop Complete:

Doug D.S.

Date:

7/30/96

7/14/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 240

Tag: PDT-AZ702K2-3

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 4

Manufacturer: Foxboro Model No.: 833DP-D3S1NCL1A Serial No: 96220197MTE Instr. No: 817-28-09-004
812-45-08-008 Due Date: 7-15-97
7-11-97

Input Range 0-1"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	20Ma	<u>19.92</u>	<u>20.08</u>	<u>20.41</u>	<u>Out</u>	<u>20.00</u>
.25"	16Ma	<u>15.92</u>	<u>16.08</u>	<u>16.40</u>		<u>15.90</u> <u>16.01</u>
-0.5"	12Ma	<u>11.92</u>	<u>12.08</u>	<u>12.40</u>		<u>11.95</u> <u>11.90</u>
.75"	8Ma	<u>7.92</u>	<u>8.08</u>	<u>8.40</u>		<u>8.01</u>
1"	4Ma	<u>3.92</u>	<u>4.08</u>	<u>4.40</u>	<u>✓</u>	<u>3.99</u>

(signoff) Calibrated By: Fitzsimmons/Wilmoth Date: 7-14-97Location: B Train Filter Room

Comments

CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

2/26/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 241

Tag: PDI_702_K3_1 I/O Type: AI Description: Cell Dp
 Cntrlr: 36 Chan No: 7 P&ID: H-2-131073 Logic:
 Remarks: Supersedes prior calibration. Increased range of channel.

Location: _____

Actuation Method: calibrated pressure source (Nutronics)

Sensor Calibration:

☒ 5 pt calper procedure VI

(data attached)

(signoff)

* Calibration accuracy only 1% with available MTE.

Loop Tolerance: $\sqrt{\frac{0.8\%}{1\%}^2 + \frac{0.8\%}{1\%}^2 + \frac{0.8\%}{1\%}^2 + 0.2\%^2}$
 (sensor) (xmmitter) (other) (DCS)

Units: IN WC

Process Input	Readout Tolerance	LOI	Screen1	Screen2	Screen3
LCU4-32			19BldSup	02Main.v	Group161
Lo: -2.00	-2.02 / -1.98	-2.00	.v	(no alarm green)	-2.00
Hi: 0.00	-.02 / .02	-0.01	-0.01	alarm (white)	-0.01

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: ~~Supersedes~~

MTE Instr. No: 817-28-09-004 Date: 7-15-97
817-45-08-062 Date: 12-30-97

(signoff)

Loop Complete: L. HillDate: 2/27/97

2/26/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 242

Tag: PDT-AZ702K3-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 8

Manufacturer: Foxboro Model No.: 823DP-D3SINLI-A Serial No: 96220200MTE Instr. No: 817-28-09-004
817-45-08-062 Due Date: 7-15-97
12-30-97

Input Range 0-2"

Tolerance .5%

Units: IN WC

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
0"	20Ma	19.920	20.080	19.956	IN	19.956
.5	16Ma	15.920	16.080	15.975	IN	15.975
1"	12Ma	11.920	12.080	11.986	IN	11.986
1.5"	8Ma	7.920	8.080	8.010	IN	8.010
2"	4Ma	3.920	4.080	4.065	IN	4.065

(signoff) Calibrated By:

Paul W. ZylinskiDate: 2-27-97

Location:

Filter Room 'B'Comments MTE tolerance = $\pm .017$ in w.c. = .85% of range of field instrum.

CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

7/30/96

W-030 LOOP TEST DATA SHEET

Tag: PDI_702_K3_1 I/O Type: AI Description: Cell Dp

Cntlr: 36 Chan No: 7 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: USED CALIBRATED PRESSURE SOURCE TO
ZERO AND SPAN TRANSMITTER

Sensor Calibration:

☒ 5 pt cal☐ _____

per procedure

VI

(data attached)

D.J.
(signoff)Loop Tolerance: $0.8\% = \sqrt{\text{(sensor)}^2 + \text{(xmitter)}^2 + \text{(other)}^2 + \text{(DCS)}^2}$

Units: IN WC

Process Input

Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-32

19BldSup

02Main.v

4200161

Lo:	-1.00	-1.01 /	-0.99	<u>-0.99</u>	<u>-1.0</u>	<u>GREEN</u>	<u>-0.99</u>
Hi:	0.00	-0.01 /	0.01	<u>0.01</u>	<u>0.02</u>	<u>WHITE</u>	<u>0.01</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: VERIFIED OPERATION OF ELECTRIC ACTUATOR BYREVERSE TRI AND 3 AT SENSORPLANNING (HS) IN SPAN/ZERO/RUN ALSO VERIFIED
PRESSURE POINT 24MTE Instr. No: 917-35-40-019Due Date: 11/9/96

(signoff)

Loop Complete: Darryl JankDate: 9/3/96

7/29/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 244

Tag: PDT-AZ702K2-3

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 4

Manufacturer: Foxboro Model No.: 823DP-D33INLI-A Serial No: 96220197MTE Instr. No: 817-45-08-040 Due Date: 2.5.96
817-88-09-003 1.12.97

Input Range 0-1"

Tolerance .5%
DISPLAY-.5%

Units: IN WC

Input	Output	%	Lo:	Hi:	As Found	In/Out	As Left
0"	20Ma	(100)	19.92 (95)	20.08 (105)	* N/A *	* N/A *	20.00 (99)
.25"	16Ma	(75)	15.92 (70)	16.08 (80)	()	()	16.00 (76)
-0.5"	12Ma	(50)	11.92 (45)	12.08 (55)	()	()	12.00 (51)
.75"	8Ma	(25)	7.92 (20)	8.08 (30)	()	()	8.00 (25)
1"	4Ma	(0)	3.92 (-5)	4.08 (5)	()	()	4.00 (0)

(signoff) Calibrated By:

Paul M. Zylinski / K. GroeningDate: 7-30-96Location: FILTER ROOM 'B' 102

Comments * initial cal. Entered in config. as ^(HHT) PDT-AZ702K2-3
CALIBRATE PER VENDOR DATA, SET UP INSTRUMENT TO BE REVERSE ACTING

m & TG ACCURACY = $\pm .02$ " WC EQUALS 2%
OF FIELD INSTRUMENT RANGE

VOID
7-15-97
RAW

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 245

Tag: RAH_702_K3_1 I/O Type: DI Description: BldStk RadHi

Cntlr: 39 Chan No: 25 P&ID: H-2-131081 Logic:

Remarks: _____

Location: _____

Actuation Method: front-panel controlSensor Calibration: N/A (see Data Sheet for RI-702-K3)☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
		LCU4-46	21BldMon	02Main.v	LeakDt
Lo (0): NORMAL	2	<u>OFF</u>	<u>green</u>	<u>green</u>	<u>green</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~~yellow~~ red LHLo: 0

VERIFIED LOCAL ALARM RAH-A2702K3-1A, HORN RA-A2702K3-1A
AND HORN ACKNOWLEDGE SWITCH HS-A2702K3-1A, ALSO STABGE RA-A2702K3-1

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: SH HillDate: 5/7/97

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 246

Tag: RAX_702_K3_1 I/O Type: DI Description: BldStk RadFail

Cntlr: 39 Chan No: 26 P&ID: H-2-131081 Logic:

Remarks: _____

Location: _____

Actuation Method: front panel manualSensor Calibration: N/A (see Datasheet for RI-702-K3-1)☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU4-46	Screen1 21BldMon	Screen2 02Main.v	Screen3 LestDt
Lo (0): NORMAL	2	<u>OFF</u>	<u>green</u>	<u>green</u>	<u>green</u>
Hi (1): FAILURE	3	<u>ON</u>	<u>yellow</u>	<u>yellow</u>	<u>yellow</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 2 yellowLo: 0 —

Other:

VERIFIED LOCAL ALARM RAX-A2702 K3-1A, STROBE XA-A2702 K3-1,HORN RA-A2702 K3-1A, AND ACKNOWLEDGE SWITCH HS-A2702 K3-1A

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L J HillDate: 5/7/97

3/5/97

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 247

Tag: RI_702_K3_1 I/O Type: AI Description: BvStac Rad
 Cntrlr: 36 Chan No: 23 P&ID: H-2-131079-81 Logic:

Remarks: _____

Location: _____

Actuation Method: _____

specify desired output on CAM for Loop Check

Sensor Calibration:

☐ 5 pt cal☒ ~~procedure~~

per procedure

G-TF-168

(data attached)

(signoff) _____

Loop Tolerance:

$$20.0\% = \sqrt{\begin{matrix} 2 & 2 & 20.0\% & 0.2\% \\ \text{(sensor)} & \text{(xmmitter)} & \text{(other)} & \text{(DCS)} \end{matrix}}$$

Units: DPM/ft³

Process Input

Readout Tolerance

* LOI

Screen1

Screen2

Screen3

LCU4-46

21B1dMon.v

03LeakDt.v

Lo:

.10

-20000.90 - 20001.10

0.1111

Hi: 100000.00

79999.00 - 120001.00

5.03106,400105973

$$10^{0.11} = 1.29 \text{ DPM}; 10^{5.03} = 107152$$

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:

* LOI reads decades (0-5) where DPM = 10^x
 At 85 DPM/ft³ - CAM SAE Reading matches MICOM $\pm 10\%$. (functional test)

MTE Instr. No: _____

Due Date: _____

(signoff)

Loop Complete: _____

S. Hill

Date:

5/7/97

Eberline AMS-4 Continuous Air Monitor

Address 1

CAM Serial Number S/N 456 (EB-M1, K3 EXHAUST)

Beta High Voltage

7.2.6.c 7.4.4.c

As-found	As-left
N/A *	1611

Beta Efficiency

7.2.7.L 7.4.2.c

As-found	As-left
N/A *	12.21%

HNF-SD-W030-TD-007
REV. 0, PAGE 248

Background High Voltage

7.2.6.c 7.4.4.c

As-found	As-left
N/A *	1592

* initial cal.

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	N/A *	2.0

CAM Flow Frequency (7.6.8)

Desired Output	TOLERANCE		As-Left
	-Limit	+Limit	
2000 CPS	1960	2040	2000

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 (O.K.) Aug 9/96 (Initial/Date)

MTC: 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)	1620	N/A	1620
Record Sample Flow Velocity (SFPM)	1618	Stack Flow $\pm 1\%$	1618
β - γ Sample Flow Velocity (SFPM)	1622	Stack Flow $\pm 1\%$	1622
CAM Flow (CFM)	$\leftarrow$ N/A $\rightarrow$	β - γ Flow ± 0.10 CFM	1.73 $\xrightarrow{9-10-96}$

Step 7.7 Gamma Factor

Perform Gamma factor update	Initial <i>Prof</i>
Gamma factor = <u>0.8264</u>	

RY - A2702 K3-1

Current measured at terminal 4(+) of signal isolator.

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	4.00	3.9	4.1			
2	5.0	20.0	19.9	20.1			

0.0	4.00	3.9	4.1	4.00	I	4.00
1.25	8.00	7.9	8.1	8.00	I	8.00
2.50	12.00	11.99	12.01	12.00	I	12.00
3.75	16.00	15.99	16.01	16.01	I	16.01
5.00	20.00	19.99	20.01	20.01	I	20.01

817-13-55-026

812-45-08-088

9-11-97

12-17-97

K. J. / Rick Wilmoth

9-11-97

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 251

Tag: TI_702_K2_1 I/O Type: AI Description: StkMonRm Temp

Cntlr: 2 Chan No: 15 PID: H-2-131077 Logic:

Remarks: _____

Location: _____

Actuation Method: decade box

Sensor Calibration:

☒ 5 pt cal
☐ _____per procedure VI

(data attached)

S J Z Lio
(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 LCU1-19	Screen1 22BldTmp	Screen2 group 174	Screen3
Lo: -20.00	-23.01 - -16.99	<u>-19.95</u>	<u>-20</u>	<u>-19.91</u>	
Hi: 150.00	146.99 - 153.01	<u>149.36</u>	<u>149</u>	<u>149.37</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	1	110.00	106.99 - 113.01	<u>110.26</u> red
Hi:	2	90.00	86.99 - 93.01	<u>90.0</u> yellow
Lo:	<u>2</u>	9999.99 <u>91.25</u>	38.25 <u>44.25</u>	110.0 <u>112.0</u> yellow
LoLo:	0	-9999.99	-	
Min:	0	-9999.99	-	

Other: _____

MTE Instr. No: 817-63-02-002 Due Date: 6/14/97

(signoff)

Loop Complete: S J Z LioDate: 7/8/96

ADDED AND RETESTED LO ALARM

D. Barker10/14/96

4/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 253

Tag: TT-AZ702K2-1

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 15

Manufacturer: RdF Model No.: 2800T Serial No: 2E-000-755MTE Instr. No: 817-63-02-003 5-13-97Due Date: 817-45-08-044 2-12-98

(88.61 to 125.36)		Tolerance 2%			
Input Range -20 to 150					
Units: Degrees (°F)					
Input (°F)	Output (mA) (MICON) (°F)	Lo: (mA) (°F)	Hi: (mA) (°F)	As Found (mA) (°F) In/Out	As Left (mA) (°F)
(-20) 88.61	4.00 -20	3.68 (23.4)	4.32 (16.6)	3.98 (-20)	3.98 (-20)
(22.5) 97.92	8.00 22.5	7.68 (19.1)	8.32 (25.9)	7.97 (22)	7.97 (22)
(65) 107.14	12.00 65	11.68 (16.6)	12.32 (68.4)	11.96 (65)	11.96 (65)
(107.5) 116.29	16.00 107.5	15.68 (104.1)	16.32 (110.9)	15.96 (107)	15.96 (107)
(150) 125.36	20.00 150.0	19.68 (146.6)	20.32 (153.4)	19.98 (149)	19.98 (149)

(signoff) Calibrated By: FitzsimmonsDate: 4-28-97Location: Vent Bldg.

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA CALIBRATE PER VENDOR DATA.

	Input	Output (°F) (mA)	Lo (°F) (mA)	Hi (°F) (mA)	As found	In/Out	As left
Micon Hi/Hi Alarm: *		-110 (16.23)	106.99 (15.99)	113.01 (16.52)			
Micon Hi Alarm: *		90 (14.35)	86.99 (14.07)	93.01 (14.61)			
Micon Lo Alarm: *		-41.25 (200)	-44.25 (172)	-38.25 (228)			

* Adjust Decade box (input resistance) until alarm just trips at
MICON (readout)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 254

Tag: TI_702_K2_2 I/O Type: AI Description: E/iRmA Temp

Cntlr: 2 Chan No: 16 P&ID: H-2-131077 Logic:

Remarks: _____

Location: _____

Actuation Method: decide box

Sensor Calibration:

☒ 5 pt cal☐per procedure VI

(data attached)

L. Hill
(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 LCU1-19	Screen1 22BldTmp	Screen2 group 174	Screen3
Lo: -20.00	-23.01 - -16.99	<u>-20.2</u>	<u>-20</u>	<u>-20.15</u>	
Hi: 150.00	146.99 - 153.01	<u>149.12</u>	<u>149</u>	<u>149.16</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	1	110.00	106.99 - 113.01	<u>110.0 red</u>
Hi:	2	90.00	86.99 - 93.01	<u>90.0 yellow</u>
Lo:	<u>2</u>	<u>-9999.99</u>	<u>-38.25 - -44.25</u>	<u>41.22 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: L. HillDate: 7/8/96ADDED AND RETESTED LO ALARM OK 10/4/96

5/7/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 255

Tag: TT-A2702K2-2

P&ID: H-2-131077, SH 1

Loop: H-2-131310, SH 15

Manufacturer: RLFModel No.: 3800TSerial No: N/AMTE Instr. No: 817-63-02-010Due Date: 6-19-96Input Range 88.61 to 125.36
-20 to 150

Tolerance 2%

Units: (Degrees F) Ohms

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
(20) 88.61 Ω 4mA		3.6	4.4			4.00
(22.5) 97.92 Ω 8mA		7.6	8.4			8.00
(65) 107.14 Ω 12mA		11.6	12.4			12.00
(107.5) 116.29 Ω 16mA		15.6	16.4			16.00
(150) 125.36 Ω 20mA		19.6	20.4			20.00

(signoff) Calibrated By: REN / DSPDate: 5/8/96Location: Vent building

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA

4/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 256

Tag: TT-AZ702K2-2

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 15

Manufacturer: RdF Model No.: 2800 T Serial No: 2E-000-756MTE Instr. No: 817-63-02-003 Due Date: 5-13-97
817-45-08-044 2-12-98

Input Range -20 to 150		Tolerance 2%				
Units: Degrees (°) F						
(F) Input (°)	Output (ma) (MKN) (°F)	Lo: (ma) (°F)	Hi: (ma) (°F)	As Found (ma) (°F)	In/Out	As Left (ma) (°F)
(-20) 88.61	4.00 -20	3.68 (-23.4)	4.32 (46.6)	3.97 (-20)		3.97 (-20)
(22.5) 97.92	8.00 22.5	7.68 (49.1)	8.32 (85.9)	7.97 (22)		7.97 (22)
(65) 107.14	12.00 65	11.68 (61.6)	12.32 (88.4)	11.96 (65)		11.96 (65)
(107.5) 116.29	16.00 107.5	15.68 (104.1)	16.32 (110.9)	15.97 (107)		15.97 (107)
(150) 125.36	20.00 150	19.68 (146.6)	20.32 (153.4)	19.97 (150)		19.97 (150)

(signoff) Calibrated By: FitzsimmonsDate: 4-28-97Location: Vent Bldg.

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA CALIBRATE PER VENDOR DATA.

	Inputs	Output (ma)	Lo:	Hi:	As found	In/Out	As left
Micon Hi Hi Alarm *		110 (16.23)	106.99 (15.55)	113.01 (16.52)			
Micon Hi Alarm *		90 (14.35)	86.99 (14.07)	93.01 (14.64)			
Micon Lo Alarm *		-41.25 (200)	-44.25 (1.72)	-38.25 (2.28)			

Adjust Decade box (input resistance) until alarm just trips at MICON
(readout)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 257

Tag: TI_702_K2_3 I/O Type: AI Description: E/iRmB Temp

Cntlr: 13 Chan No: 15 P&ID: H-2-131077 Logic:

Remarks: _____

Location: _____

Actuation Method: decade box

Sensor Calibration:

☒ 5 pt cal per procedure NI (data attached) LJHill
☐ _____ (signoff)

 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: DEG F

Process Input	Readout Tolerance	LOI LCU2-17	Screen1 22BldTmp	Screen2 grp 174	Screen3
Lo: -20.00	-23.01 - -16.99	<u>-19.12</u>	<u>-19</u>	<u>-19.15</u>	
Hi: 150.00	146.99 - 153.01	<u>150.79</u>	<u>151</u>	<u>151.02</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	1	110.00	106.99 - 113.01	<u>110.06 red</u>
Hi:	2	90.00	86.99 - 93.01	<u>90.04 yellow</u>
Lo:	<u>82</u>	<u>-9999.99</u>	<u>-38.25 - 41.25</u>	<u>-41.22 yellow</u>
LoLo:	0	-9999.99		
Min:	0	-9999.99		

Other: _____

MTE Instr. No: 817-63-02-0002 Due Date: 6/19/96(signoff) Loop Complete: LJHill Date: 7/8/96ADDED AND RETESTED LO ALARM 9/14/96

5/7/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 258

Tag: TT-AZ702K2-3

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 16

Manufacturer: RdF Model No.: 2800T Serial No.: WAMTE Instr. No: 817-E3-02-010 Due Date: 6-19-96

Input Range ^{88.612 to 125.362} (20 to 150)		Tolerance 2%			
Units: (Degrees F) Ohms					
Input	Output	Lo:	Hi:	As Found	In/Out As Left
(-20°F) 88.612	4	3.6	4.4		4.00
(22.5°F) 88.612	8	7.6	8.4		8.01
(65°F) 107.14	12	11.6	12.4		12.01
(107.5°F) 125.362	16	15.6	16.4		16.01 mV
(150°F) 125.362	20	19.6	20.4		20.00 mV

(signoff) Calibrated By: RSH / OSP Date: 5/8/96Location: Vent Building

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA

4/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 259

Tag: TT-AZ702K2-3

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 16

Manufacturer: RdF Model No.: 2800T Serial No: 2E-000-757MTE Instr. No: 817-63-02-003 Due Date: 5-13-97
817-45-08-044 2-12-98

(88.61 Ω to 125.36 Ω)			
Input Range -20 to 150		Tolerance 2%	
Units: Degrees (ohms)			
F			
F Input(Ω)	Output(mA)	MICON($^{\circ}$ F)	Lo:(mA) $^{\circ}$ F Hi:(mA) $^{\circ}$ F As Found(mA) $^{\circ}$ F In/Out As Left(mA) $^{\circ}$ F
(-20) 88.61	4.00	-20	3.68(23.4) 4.32(16.6) 4.06 (-19) 4.06 (-19)
(22.5) 97.92	8.00	22.5	7.68(19.1) 8.32(25.9) 8.06 (23) 8.06 (23)
(65) 107.14	12.00	65	11.68(41.6) 12.32(68.4) 12.06 (66) 12.06 (66)
(107.5) 116.29	16.00	107.5	15.68(104.1) 16.32(110.9) 16.07 (108) 16.07 (108)
(150) 125.36	20.00	150	19.68(146.1) 20.32(153.4) 20.07 (151) 20.07 (151)

(signoff) Calibrated By: Fitzsimmons Date: 4-28-97Location: Vent Bldg.

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA CALIBRATE PER VENDOR DATA.

		INPUT(Ω)	OUTPUT(F)(mA)	Lo	Hi	As found	in/out	As left
MICON	Hi Hi Alarm:	*	110.00(46.23)	106.99 (1595)	113.01 (16.52)			
MICON	Hi Alarm:	*	90.00(44.35)	86.99 (14.07)	93.01 (14.64)			
MICON	LO Alarm:	*	-41.25(200)	-44.25 (1.72)	-38.25 (2.28)			

* Adjust Decade box (input resistance) until alarm just trips at
Micon (readout)

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 260

Tag: TI_702_K2_4 I/O Type: AI Description: FltrRmA Temp

Cntlr: 2 Chan No: 17 P&ID: H-2-131077 Logic:

Remarks: _____

Location: _____

Actuation Method: Leads box

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) SLD
☐ _____ (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 LCU1-19	Screen1 22BldTmp	Screen2 group174	Screen3
Lo: -20.00	-23.01 - -16.99	<u>-20.60</u>	<u>-20</u>	<u>-20.27</u>	
Hi: 150.00	146.99 - 153.01	<u>149.36</u>	<u>149</u>	<u>149.63</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	2	120.00	116.99 - 123.01	<u>120.09 yellow</u>
Lo:	<u>02</u>	<u>-9999.99</u> ^{-41.25}	<u>-38.25 - -44.25</u>	<u>-41.26 yellow</u>
LoLo:	0	-9999.99		
Min:	0	-9999.99	-	

Other: _____

MTE Instr. No: 817-63-02-002 Due Date: 6/19/96(signoff) Loop Complete: SLD Date: 7/8/96ADDED AND RETESTED LG ALARM SLD 10/19/96

5/7/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 261

Tag: TT-AZ702K2-4

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 16

Manufacturer: RLFModel No.: 2800TSerial No.: NAMTE Instr. No: 817-63-02-010Due Date: 6-19-96Input Range 88.61 to 125.36
(20 to 150)

Tolerance 2%

Units: (Degrees F) dms

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
(-20°) 88.612	4.00 mA	3.6	4.4			4.00
(22.5°) 97.922	8.00 mA	7.6	8.4			8.00
(65°) 107.14	12.00 mA	11.6	12.4			12.00
(107.5°) 116.29	16.00 mA	15.6	16.4			16.00
(150°) 125.362	20.00 mA	29.6	20.4			20.00

(signoff) Calibrated By: REH/DSPDate: 5/8/96Location: North Filter Room

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA

4/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 262

Tag: TT-AZ702K2-4

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 16

Manufacturer: RDF Model No.: 2800T Serial No: ZE-000-758MTE Instr. No: 817-43-02-003 Due Date: 5-13-97
817-45-08-044 2-12-98

Input Range -20 to 150		Tolerance 2%	
Units: Degrees (ohms)			
F Input(n)	Output(ma)	HICON(F)	Lo:(ma) Hi:(ma) As Found(ma) In/Out As Left(ma)
(-20) 88.61	4.00	-20	3.68(23.4) 4.32(16.6) 3.90(21) 3.90 (-21)
(22.5) 97.92	8.00	22.5	7.68(19.1) 8.32(25.5) 7.90(21) 7.90 (21)
(65) 107.14	12.00	65	11.68(61.6) 12.32(68.4) 11.98(64) 11.91 (64)
(107.5) 116.29	16.00	107.5	15.68(104.1) 16.32(110.9) 15.90(106) 15.90 (106)
(150) 125.36	20.00	150	19.68(146.6) 20.32(153.4) 19.92(149) 19.92 (149)

(signoff) Calibrated By: Fitzsimmons Date: 4-28-97Location: Filter Room 'A'

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER-
VENDOR DATA Calibrate per vendor data.

	Input(n)	Output(F)(ma)	Lo:	Hi:	As found	In/Out	As left
Micon High Alarm:	*	120.00(17.18)	116.99 (16.89)	123.01 (17.46)	120(17.18)	IN	120(17.18)
Micon Low Alarm:	*	-41.25(2.00)	-44.25 (1.72)	-38.25 (2.28)	-41(2.00)	IN	-41(2.00)

* Adjust Decade box (input resistance) until alarm just trips at micon. (readout).

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 263

Tag: TI_702_K2_5 I/O Type: AI Description: FltrRmB Temp

Cntlr: 13 Chan No: 16 P&ID: H-2-131077 Logic:

Remarks: _____

Location: _____

Actuation Method: decade box

Sensor Calibration:

☒ 5 pt calper procedure VI (data attached) L & L
(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 LCU2-17	Screen1 22BldTmp	Screen2 group 174	Screen3
Lo: -20.00	-23.01 - -16.99	<u>-20.01</u>	<u>-20</u>	<u>-19.99</u>	
Hi: 150.00	146.99 - 153.01	<u>149.96</u>	<u>150</u>	<u>150.07</u>	

Annunciator(s):	Priority	Setpoint	Tolerance	Trip Point
Max:	0	99999.99	-	
HiHi:	0	99999.99	-	
Hi:	2	120.00	116.99 - 123.01	<u>120.16 yellow</u>
Lo:	<u>2</u>	<u>-9999.99</u>	<u>-41.25 - 44.75</u>	<u>-41.19 YELLOW</u>
LoLo:	0	-9999.99	-	
Min:	0	-9999.99	-	

Other: _____

MTE Instr. No: 817+63-02-002 Due Date: 6/19/96(signoff) Loop Complete: L & L Date: 7/8/96ADDED AND RETESTED LO ALARM 2/2/96 10/14/96

5/7/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 264

Tag: TT-AZ702K2-5

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 17

Manufacturer: RdfModel No.: 2800TSerial No: N/AMTE Instr. No: 817-^{63 out}~~68~~-010Due Date: 6-19-96Input Range 88.61Ω to 125.36Ω
(20 to 150)

Tolerance 2%

Units: (Degrees F) Ohms

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
(20) 88.61Ω	4 mA	3.6	4.4			4.00
(22.5) 97.92Ω	8 mA	7.6	8.4			8.01
(65) 107.14Ω	12 mA	11.6	12.4			12.01
(107.5) 116.29Ω	16 mA	15.6	16.4			16.01
(150) 125.36Ω	20 mA	19.6	20.4			20.00

(signoff) Calibrated By: REA / OSPDate: 5/8/96Location: South Filter Room

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
VENDOR DATA

4/25/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 265

Tag: TT-AZ702K2-5

P&ID: H-2-131077, SH 1

LOOP: H-2-131310, SH 17

Manufacturer: RdF Model No.: 2800T Serial No: ZE-000-759MTE Instr. No: 817-43-02-003
817-45-08-049 Due Date: 5-13-97
2-12-98

(88.61A to 125.36A)			Tolerance 2%				
Input Range -20 to 150							
Units: Degrees (ohms)							
F							
Input (A)	Output (mA)	MICON (°F)	Lo: (mA/°F)	Hi: (mA/°F)	As Found (mA/°F)	In/Out	As Left (mA/°F)
(20) 88.61	4.00	-20	3.68 (23.4)	4.32 (16.6)	3.96 (-21)		3.96 (-21)
(22.5) 97.92	8.00	22.5	7.68 (19.1)	8.32 (25.9)	7.95 (22)		7.95 (22)
(65) 107.14	12.00	65	11.68 (11.6)	12.32 (68.4)	11.95 (64)		11.95 (64)
(107.5) 116.29	16.00	107.5	15.68 (104.1)	16.32 (110.9)	15.95 (107)		15.95 (107)
(150) 125.36	20.00	150	19.68 (146.6)	20.32 (153.4)	19.96 (149)		19.96 (149)

(signoff) Calibrated By: FitzsimmonsDate: 4-28-97Location: Filter Room 'B'

Comments

USING A CALIBRATED DECADE BOX ZERO AND SPAN TRANSMITTER PER
~~VENDOR DATA~~ CALIBRATE PER VENDOR DATA.

	Input (A)	Output (°F) (mA)	Lo	Hi:	As found	In/Out	As left
Micon Hi Alarm:	*	120.00 (17.18)	116.99 (16.89)	123.01 (17.46)	120 (17.18)	IN	120 (17.18)
Micon Lo Alarm:	*	-41.25 (2.00)	-44.25 (1.72)	-38.25 (2.28)	-41 (2.00)	IN	-41 (2.00)

* Adjust Decade box (input resistance) until alarm just trips at MICON (readout).

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 266Tag: TI_702_K3_3 I/O Type: AI Description: BvStk TempCntlr: 36 Chan No: 24 P&ID: H-2-131079 Logic:

Remarks: _____

Location: _____

Actuation Method: RTD simulator

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

SEE FIT#002-K23

(data attached)

LFA
(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: DEG F

Process Input Readout Tolerance

LOI

Screen1

Screen2

Screen3

LCU4-46

21BldMon

grp 191

Lo: 0.00 -2.01 -2.01

0.2300.08Hi: ~~100.00~~ ~~97.99~~ ~~102.01~~149.71150149.70150.00147.00 - 153.00

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: 817-28-09-003 Due Date: 1-12-97817-63-02-0026-14-97

(signoff)

Loop Complete:

LFA

Date:

7/24/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 267-----
Tag: YS_702_K26_1 I/O Type: DI Description: BVAcUnit^{ENABLE}Status

Cntlr: 39 Chan No: 1 P&ID: H-2-131073 Logic:

Remarks: -----

Location: -----

Actuation Method: start/stop AC unit
-----Sensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU4-32	Screen1 19BldSup	Screen2 02Main.v	Screen3 Group 161
Lo (0): OFF OFF	4	<u>state 2</u>	<u>empty</u>	<u>empty</u>	<u>OFF</u>
Hi (1): ON	7	<u>state 3</u>	<u>filled</u>	<u>filled</u>	<u>ON</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other:

_____MTE Instr. No: _____ Due Date: _____
-----(signoff) Loop Complete: J. HillDate: 10/15/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 268

Tag: YS_702_K26_1A1 I/O Type: DI Description: EVACUnitRemLoc

Cntlr: 39 Chan No: 2 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate LOCAL / REMOTE switch.Sensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): LOCAL	7	<u>LCU4-32</u>	<u>19BldSup</u>	<u>group 161</u>	<u>group 161</u>
Hi (1): REMOTE	2	<u>state 0</u>	<u>LOCAL</u>	_____	<u>LOCAL</u>
		<u>state 2</u>	<u>BLANK</u>	_____	<u>OFF</u>

Annunciator(s): Priority Alarm Color (actual)

Hi: 0

Lo: 3

white

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. HillDate: 10/15/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 269

Tag: YS_702_K35_1A1 I/O Type: DI Description: BldFanA RemLoc

Cntlr: 39 Chan No: 15 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate local/remote switch

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU4-39	Screen1 20BldExh	Screen2 GROUP 182	Screen3
Lo (0): LOCAL	7	<u>STATED</u>	<u>OFF</u> <u>LOCAL</u>	<u>LOCAL</u>	_____
Hi (1): REMOTE	2	<u>STATE 1</u>	<u>ON</u>	<u>READY</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 3 WHITE

Other:

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Doug Lick Date: 6/2/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 270

Tag: YS_702_K35_1B1 I/O Type: DI Description: BldFanB RemLoc

Cntlr: 39 Chan No: 16 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate Rem/Local switch

Sensor Calibration:

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI LCU4-41	Screen1 20BldExh	Screen2 ghrp/84	Screen3
Lo (0): LOCAL	7	<u>stzto</u>	<u>LOCAL</u>	<u>LOCAL</u>	_____
Hi (1): REMOTE	2	<u>stztl</u>	<u>No Local legend</u>	<u>READY</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 3 white

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: LJHillDate: 6/10/96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 271

Tag: ZI_702_K3_1 I/O Type: AI Description: CellDmprPosition

Cntlr: 36 Chan No: 8 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valve - observe travel

Sensor Calibration:

☒ 5 pt cal per procedure VI (data attached) D. J. Smith
☐ _____ (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: PERCENT

Process Input	Readout Tolerance	LOI LCU4-32	Screen1 19BldSup	Screen2 group 161	Screen3
Lo: 0.00	-2.01 - 2.01	<u>0.41</u>	<u>0</u>	<u>0.39</u>	_____
Hi: 100.00	97.99 - 102.01	<u>100.1</u>	<u>100</u>	<u>100.24</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: _____ Due Date: _____

(signoff)

Loop Complete: L. J. SmithDate: 10/17/96

12/5/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 272

Tag: ZT-AZ702K3-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 8

Manufacturer: Idelac Controls Model No.: ML40-15-25MP1- Serial No: 96A-0177-B
1VPTXMTE Instr. No: 817.45.08.090
817.13.55.023 Due Date: 3.5.97
3.26.97

Input Range 4-20		Tolerance ^{10.5%} 2% 4%		Note ①: see comments		
Units: ma						
Input (ma)	Output (ma)	Lo: (ma)	Hi: (ma)	As Found	In/Out	As Left
4.00	4.00	3.36	4.64	N/A	N/A	4.00 4.15 4.1
8.00	8.00	7.36	8.64			8.00 8.15 8.1
12.00	12.00	11.36	12.64			12.00 12.15 12.1
16.00	16.00	15.36	16.64			16.00 16.15 16.1
20.00	20.00	19.36	20.64			20.00 20.15 20.1

(signoff) Calibrated By: Paul M. ZylinskiDate: 12.5.96Location: Vent Bldg 'A'

Pri. Vent Cell press. control valve. Jumper 1:2 on, Jumper 3:4 off.
 Comments Note 1 Increase tolerance to 4% (2% input; 2% output)

CALIBRATE ACTUATOR 4-20mA INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
 VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20mA OUTPUT.

415

4(-)

5(+)

16.53

8/30/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 273

Tag: ZT-AZ702K3-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 8

Manufacturer: INDELAC Controls Model No.: ML4B-15-25MPL Serial No: 96A-0177-B
817.13.55.023 1VPTX 3.26.97
 MTE Instr. No: 817.45.08.040 Due Date: 2.5.97

Input Range 4-20		Tolerance 2%			
Units: ma					
Input (ma)	Output (ma)	Lo:	Hi:	As Found	In/Out As Left
4.00	4.00	3.68	4.32	N/A 4.00 ^{10.15%}	N/A 4.00
8.00	8.00	7.68	8.32	N/A	7.81
12.00	12.00	11.68	12.32		11.92
16.00	16.00	15.68	16.32		16.03
20.00	20.00	19.68	20.32	N/A 19.97 ^{10.15%}	20.06

SEE COMMENTS

(signoff) Calibrated By: [Signature]Date: 10-15-96Location: Vent Bldg 'A'

Comments Pri. Vent Cell Press. control Valve. JUMPER 1:2 on, JUMPER 3:4 off
 INCREASE TOLERANCE TO 4% (2% INPUT AND 2% OUTPUT.)
 CALIBRATE ACTUATOR 4-20mA INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
 VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20mA OUTPUT. 10-17-96

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 274

Tag: ZI_702_K24_1 I/O Type: AI Description: HepaDmPrPosition

Cntlr: 35 Chan No: 12 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: Operate valve from M³ Controller
(Visual Verification of valve verification)

Sensor Calibration:

☒ 5 pt cal☐

per procedure

VI

(data attached)

Day Lab
PCB
(signoff)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: PERCENT

Process Input	Readout Tolerance	LOI LCU4-33	Screen1 19BldSup	Screen2 GRF 162 GRF 162 -0.01	Screen3 GRF 162
Lo: 0.00	-2.01 - 2.01	-0.01	0	-0.01	
Hi: 100.00	97.99 - 102.01	99.66	100%	99.72	

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

Due Date: _____

(signoff)

Loop Complete:

L J Hill

Date: 10/17/96

10/21/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 275

Tag: ZT-AZ702K204-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 2

Manufacturer: INDELAC

Model No.:

Serial No: _____

MTE Instr. No: 817-13-55-023
817-45-09-055Due Date: 5-25-98
3-3-98

Input Range 4-20mA		Tolerance 5.00 %					
Units: MA		LCU MCS					
		+/- 0.80					
Input	Output	Lo:	Hi:	As Found	%	In/Out	%
4	4.00	3.20	4.80	4.09	75	1	4.09
8	8.00	7.20	8.80	7.90	24.1	24	7.90
12	12.00	11.20	12.80	12.12	51	51	12.12
16	16.00	15.20	16.80	16.38	77.4	78	16.38
20	20.00	19.20	20.80	19.82	99.1	99	19.82

(signoff) Calibrated By: RTY/MS/KGDate: 10-21-97

Location: PV FLTR RM A

Comments

CALIBRATE ACTUATOR 4-20mA INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20mA OUTPUT.

Graphic Panel on MCS 19 Bld Sup

ZI-AZ02 K204-1

LCU-4 GROUP 33

INPUT TO LCU4-35 179-80

OUTPUT TO LCU4-35 174-35

10/17/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 276

Tag: ZT-AZ702K204-1

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH2

Manufacturer: INDALCO CONTROLS Model No.: ML4B-15-25 MPI-1 VPTX Serial No.: 94F-3063
817-45-08-055 11-08-96
 MTE Instr. No.: 817-13-55-023 Due Date: 03-26-97

Input Range 4.20Tolerance 2% / 2% (4%)Units: mA

Input	Output	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	3.36	4.64	NEW N/A	NEW N/A	3.98
8.00	8.00	7.36	8.64			7.85
12.00	12.00	11.36	12.64			12.25
16.00	16.00	15.36	16.64			16.50
20.00	20.00	19.36	20.64			19.98

(signoff) Calibrated By: [Signature]Date: 10-17-96Location: VENT BUILDING "A"

Comments PRE-VENT CELL PRESS. CONTROL VALVE.
JUMPER 1/2 ON, 3/4 OFF.

CALIBRATE ACTUATOR 4-20mA INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
 VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20mA OUTPUT.

3/9/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 277

Tag: ZI_702_K24_2 I/O Type: AI Description: HepaDmprPosition

Cntlr: 35 Chan No: 13 P&ID: H-2-131073 Logic:

Remarks:

Location:

Actuation Method:

Operate valve from MCS controller
(Visual verification of valve position)

Sensor Calibration:

☒ 5 pt cal

per procedure

VI

(data attached)

PCR
(signoff)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: PERCENT

Process Input Readout Tolerance

LOI
LCU4-34Screen1
19BldSupScreen2
GRA 163

Screen3

Lo: 0.00 -2.01 -2.01
Hi: 100.00 97.99 -102.01-0.27%
98.6%0%
99%0%
100%

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

Due Date:

(signoff)

Loop Complete:

Doug Loh

Date:

8/5/96

4/29/97

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 278

Tag: ZT-AZ702K204-2

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 4

Manufacturer: Indelac Control Inc. Model No.: ML4B-15-25MP1 ^{1052NLB} Serial No: 94E-2315MTE Instr. No: 817-23-01-006
817-45-08-040Due Date: 6-10-97
2-28-98

Input Range 4-20			Tolerance 2%				
Units: ma			(micron)				
Input (ma)	Output (ma)	Valve Position	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	0	3.36 (2)	4.64 (2)	3.92 (0)	IN	3.97 (0)
8.00	8.00	25	7.36 (23)	8.64 (27)	7.69 (23)	IN	7.70 (23)
12.00	12.00	50	11.36 (48)	12.64 (52)	12.08 (51)	IN	12.03 (50)
16.00	16.00	75	15.36 (73)	16.64 (77)	16.47 (78)	OUT	16.36 (77)
20.00	20.00	100	19.36 (98)	20.64 (102)	19.93 (99)	IN	19.79 (99)

(signoff) Calibrated By:

Paul M. Zylinski

Date:

5-7-97

Location:

'B' Vent. filter room.Comments Jumper 1 and Jumper 2 ON, Jumpers 3,4 offCALIBRATE ACTUATOR 4-20ma INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20ma OUTPUT.Does Valve go to 0% open w/4ma signal inputted? Y/NDoes Valve go to 100% open w/20 ma signal inputted? Y/N

3/21/96

W-030 CALIBRATION DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 279Tag: ZT-AZ702K204-2
PDC-702KZ-3

P&ID: H-2-131073, SH 1

LOOP: H-2-131310, SH 4

Manufacturer: Indelac Control Inc. Model No.: ML4B-15-25MP1 ^{1652NKB} Serial No: 942-2315MTE Instr. No: 817-13-55-023 Due Date: 3-26-96 ⁹⁷

Input Range			Tolerance 2%/2% (4%)				
Units:							
Input	Output	Valve Position	Lo:	Hi:	As Found	In/Out	As Left
4.00	4.00	0	3.36	4.64	N/A	NA	4.00
8.00	8.00	25	7.36	8.64			7.85
12.00	12.00	50	11.36	12.64			12.23
16.00	16.00	75	15.36	16.64			16.60
20.00	20.00	100	19.36	20.64			19.97

(signoff) Calibrated By: Fitzsimmons/Peterson Date: 5-23-96

Location: _____

Comments Jumper 1 and Jumper 2 on, Jumpers 3, 4 offCALIBRATE ACTUATOR 4-20mA INPUT (MK) TO EQUAL 0 TO 100% OPEN ALSO
VERIFY THAT 0 TO 100% OPEN AT DAMPER (ZT) EQUALS 4 TO 20mA OUTPUT.

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 280

Tag: ZS_702_K2_6AA I/O Type: DI Description: StkRmIn DprOpnLS
Cntlr: 7 Chan No: 10 P&ID: H-2-131077 Logic: Y912

Remarks: _____

Location: _____

Actuation Method: OPEN AND CLOSE DAMPER FROM PCS & WAT.
VALVE IN FIELD OPEN AND CLOSE.

Sensor Calibration: SWITCHES SET TO OPERATE WITHIN 5% OF FULL OPEN/CLOSE.

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-17	Screen1 22BldTmp	Screen2 4RWP17L	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>CLOSED</u>	<u>NOT OPEN</u> <u>CLOSED</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: mz elwa Date: 6/6/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 281

Tag: ZS_702_K2_6AB I/O Type: DI Description: StkRmIn DprClsLS
Cntlr: 7 Chan No: 11 P&ID: H-2-131077 Logic: Y912

Remarks: _____

Location: _____

Actuation Method: Open + close Dampen From DCS + watch valve in
Field open + close

Sensor Calibration: Switches set to operate w/ 5% of Full ~~and~~ closed.

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-17	Screen1 22BldTmp	Screen2 (group 1?)	Screen3
Lo (0): NOT CLS	4	<u>ON OFF</u>	<u>open</u>	<u>Not closed</u>	_____
Hi (1): CLOSED	7	<u>OFF</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: MZ elatDate: 6/6/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 282

Tag: ZS_702_K2_6BA I/O Type: DI Description: StkRmOt DprOpnLS

Cntlr: 7 Chan No: 12 P&ID: H-2-131077 Logic: Y912

Remarks: _____

Location: _____

Actuation Method: Open + close Damper From DCS + watch valve
in field open + closeSensor Calibration: Switches set to operate w/ 5% of full open/~~close~~☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-17	Screen1 22BldTmp	Screen2 420P171	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: MZ E/awDate: 6/6/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 283

Tag: ZS_702_K2_6BB I/O Type: DI Description: StkRmOt DprClsLS
 Cntlr: 7 Chan No: 13 P&ID: H-2-131077 Logic: Y912

Remarks: _____

Location: _____

Actuation Method: Open + Close Damper From DCS + watch valve in
Field open + close

Sensor Calibration: Switches Set to operate w/ 5% of full ~~stroke~~ closed.

☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint: _____

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-17	Screen1 22BldTmp	Screen2 GenUp 171	Screen3
Lo (0): NOT CLS	4	<u>ON</u>	<u>open</u>	<u>Not Closed</u>	
Hi (1): CLOSED	7	<u>OFF</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: mz ~~etc~~ Date: 6/6/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 284

Tag: ZS_702_K2_7AA I/O Type: DI Description: E/IRMAInDprOpnLS

Cntl'r: 7 Chan No: 14 P&ID: H-2-131077 Logic: Y913

Remarks: _____

Location: _____

Actuation Method: operate damper via motorSensor Calibration: switches set to operate 5% from open☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-18	Screen1 22BldTmP	Screen2 Group 172	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: J. R. Hill Date: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 285

Tag: ZS_702_K2_7AB I/O Type: DI Description: E/IRmAlnDprClsLS

Cntlr: 7 Chan No: 15 P&ID: H-2-131077 Logic: Y913

Remarks: _____

Location: _____

Actuation Method: operate dumper via motorSensor Calibration: Switch set to operate 50% from closed☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-18	Screen1 22BldTmp	Screen2 6204772	Screen3 Givp172
Lo (0): NOT CLS	4	<u>ON</u>	<u>open</u> closed	closed	<u>NOT CLSD</u>
Hi (1): CLOSED	7	<u>OFF</u>	open <u>closed</u>	NOT CLSD	<u>CLOSED</u>

A JH

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: JHDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 286

Tag: ZS_702_K2_7BA I/O Type: DI Description: E/IRmAOtDprOpnLS

Cntlr: 7 Chan No: 16 P&ID: H-2-131077 Logic: Y913

Remarks: _____

Location: _____

Actuation Method: operate damper via motorSensor Calibration: switch set to operate 5% from open☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-18	Screen1 22BldTmp	Screen2 <u>Grp 172</u>	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: L. J. HillDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 287

Tag: ZS_702_K2_7BB I/O Type: DI Description: E/IRmAotDprClsLS

Cntlr: 7 Chan No: 17 P&ID: H-2-131077 Logic: Y913

Remarks: _____

Location: _____

Actuation Method: operate valve via motorSensor Calibration: set switch to open 50% from closed☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU1-18	Screen1 22BldTmp <u>open</u>	Screen2 Group 172 <u>open NOT CLSD</u>	Screen3
Lo (0): NOT CLS	4	<u>ON</u>	<u>closed</u>	<u>open</u>	
Hi (1): CLOSED	7	<u>OFF</u>	<u>open</u>	<u>CLOSED</u>	

↑ 177 ↑

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: Let LicoDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 288

Tag: ZS_702_K2_8AA I/O Type: DI Description: E/IRmBinDprOpnLS

Cntlr: 18 Chan No: 10 P&ID: H-2-131077 Logic: Y914

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM DCS & WATCH VALUE
IN FIELD OPEN & CLOSESensor Calibration: N/A SWITCHES SET TO OPERATE WITHIN 5% OF FULL OPEN☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-15	Screen1 22BldTmp	Screen2 914173	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>NOT 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 Baker Date: 6/5/94

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 289

Tag: ZS_702_K2_8AB I/O Type: DI Description: E/IRmBinDprClsLS
Cntlr: 18 Chan No: 11 P&ID: H-2-131077 Logic: Y914
Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM DCS & WATCH VALVE
IN FIELD OPEN & CLOSESensor Calibration: ~~NOT~~ SWITCHES SET TO OPERATE WITHIN 5% FULL CLOSED
☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-15	Screen1 22BldTmp	Screen2 group173	Screen3
Lo (0): NOT CLS	4	<u>ON</u>	<u>closed</u>	<u>CLOSED</u>	_____
Hi (1): CLOSED	7	<u>OFF</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: Dany LinkDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 290

Tag: ZS_702_K2_8BA I/O Type: DI Description: E/IRmBotDprOpnLS

Cntlr: 18 Chan No: 12 P&ID: H-2-131077 Logic: Y914

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM DCS & WATCH VALUE
IN FIELD OPEN & CLOSESensor Calibration: ~~NOT~~ SWITCHES SET TO OPERATE WITH $\pm 5\%$ OF FULL OPEN☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-15	Screen1 22BldTmp	Screen2 group173	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: Doug LinkDate: 6/5/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 291

Tag: ZS_702_K2_8BB I/O Type: DI Description: E/IRmBotDprCIsLS

Cntlr: 18 Chan No: 13 P&ID: H-2-131077 Logic: Y914

Remarks: _____

Location: _____

Actuation Method: OPEN & CLOSE DAMPER FROM D.C.S &
WATCH VALVE IN FIELD OPEN & CLOSE.Sensor Calibration: ~~1/4~~ SWITCHES SET TO OPERATE WITHIN 5% OFF FULL CLOSE☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU2-15	Screen1 22BldTmp	Screen2 grp173	Screen3
Lo (0): NOT CLS	4	<u>ON</u>	<u>closed</u>	<u>CLOSED</u>	_____
Hi (1): CLOSED	7	<u>OFF</u>	<u>OPEN</u>	<u>NOT CLOSED</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: Day 2/2 Date: 3/5/91

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 292

Tag: ZS_702_K3_2AA I/O Type: DI Description: BldExhA DprOpnLS

Cntlr: 39 Chan No: 20 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor 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 LCU4-38	Screen1 20BldExh	Screen2 group 131	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>closed</u>	<u>NOT OPEN (Blue)</u>	
Hi (1): OPEN	7	<u>ON</u>	<u>open</u>	<u>OPEN (white)</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: 8.3 sec to operate valve

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. SkillDate: 5/31/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 293

Tag: ZS_702_K3_2AB I/O Type: DI Description: BldExhA DprClsLS

Cntlr: 39 Chan No: 21 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor Calibration: N/A, switch adjusted to trip within 5% of closed☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

	Process State	Color	LOI LCU4-38	Screen1 20BldExh	Screen2 group 181	Screen3
Lo (0):	NOT CLS	4	<u>OFF</u>	<u>open</u>	<u>NOT CLS (BLUE)</u>	
Hi (1):	CLOSED	7	<u>ON</u>	<u>closed</u>	<u>CLOSED (WHITE)</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: L. HillDate: 5/31/96

3/28/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 294

Tag: ZS_702_K3_2BA I/O Type: DI Description: BldExhB DprOpnLS

Cntlr: 39 Chan No: 22 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor 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 LCU4-40	Screen1 20BldExh	Screen2 <u>group 183</u>	Screen3
Lo (0): NOT OPEN	4	<u>OFF</u>	<u>closed</u>	<u>NOT OPEN (BLUE)</u>	
Hi (1): OPEN	7	<u>ON</u>	<u>open</u>	<u>OPEN (WHITE)</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete: L. HillDate: 5/31/96

3/28/96

W-030 LOOP, TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 295

Tag: ZS_702_K3_2BB I/O Type: DI Description: BldExhB DprC1sLS

Cntlr: 39 Chan No: 23 P&ID: H-2-131073 Logic:

Remarks: _____

Location: _____

Actuation Method: operate valveSensor Calibration: N/A; switch adjusted to trip within 5% of closed.☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance: 5.0 %

Process State	Color	LOI LCU4-40	Screen1 20BldExh	Screen2 group 183	Screen3
Lo (0): NOT CLS	4	<u>OFF</u>	<u>open</u>	<u>NOT CLS (BLUE)</u>	
Hi (1): CLOSED	7	<u>ON</u>	<u>closed</u>	<u>CLOSED (WHITE)</u>	

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____

Lo: 0 _____

Other: _____

MTE Instr. No: _____ Due Date: _____

(signoff) Loop Complete: RTDDate: 5/31/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 296Tag: HS 702 K26_1A I/O Type: DO Description: BldgAc OnCntlr: 40 Chan No: 1 P&ID: H-Z-131073, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate starter on/off

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: J. HillDate: 10/15/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 297Tag: H-702 K26_1B I/O Type: DO Description: BldgAc OffCntlr: 40 Chan No: 2 P&ID: H-2-131673, SH.1 Logic:

Remarks: _____

Location: _____

Actuation Method: operate starter ON/OFF

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: J J LillDate: 6/15/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 298Tag: ~~W~~702 K35_1AB I/O Type: DO Description: BvFanA Stop

Cntlr: 40 Chan No: 6 P&ID: H-2-131073, SH-2 Logic:

Remarks: _____

Location: _____

Actuation Method: STOPPED 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: Darryl ClarkDate: 6/7/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 299

Tag: HS_702 K35_1AA I/O Type: DO Description: BvFanA Start

Cntrlr: 40 Chan No: 5 P&ID: H-2-131073, 5H.2 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: Day Del Date: 6/7/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNFDSD-W030-TD-007,
REV. 0, PAGE 300

Tag: W-702 K35_1BA I/O Type: DO Description: BvFanB Start

Cntlr: 40 Chan No: 7 P&ID: H-2-131073, SH-2 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	_____	<u>20.0106-544</u>	<u>47020 P&2</u>	_____
Hi (1): TRUE	7	_____	<u>START</u>	<u>START</u>	_____

Annunciator(s): Priority Alarm Color (actual)

Hi: 0 _____
Lo: 0 _____

Other:

MTE Instr. No: _____ Due Date: _____

(signoff)

Loop Complete:

Doug Lick
L. Hill

Date:

6/1/96
6/10/96

3/1/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 301Tag: HS_702 K35_1BB I/O Type: DO Description: BvFanB StopCntlr: 40 Chan No: 8 P&ID: H-2-131073, SH-2 Logic:

Remarks: _____

Location: _____

Actuation Method: stop fan bon 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: 2/2/96Date: 6/10/96

5/6/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 302

Tag: TMACS 702_9 I/O Type: DO Description: TkAz102 Press

Cntlr: 31 Chan No: 25 P&ID: Logic:

Remarks: _____

Location: _____

Actuation Method: CALIBRATED PRESSURE SOURCE WEST ABOVE
AND BELOW SET POINT.Sensor Calibration: N/A☐ _____ per procedure _____ (data attached) _____ (signoff)

Setpoint:

Loop Tolerance:

Process State	Color	LOI	Screen1	Screen2	Screen3
Lo (0): ALARM	4	_____	_____	_____	_____
Hi (1): NORMAL	7	_____	_____	_____	_____

Annunciator(s):	Priority	Alarm Color (actual)
Hi:	0	_____
Lo:	0	_____

Other:

2 ALARMS AT TMACS 1. <-0.5"WC
2. >3.5"WCMTE Instr. No: 817-35-40-018 Due Date: 7/21/96(signoff) Loop Complete: Don Hub Date: 5/6/96

5/6/96

W-030 LOOP TEST DATA SHEET

HNF-SD-W030-TD-007,
REV. 0, PAGE 303

Tag: TMACS 702 10 I/O Type: DO Description: PvStk Rad

Cntl: 31 Chan No: 26 P&ID: Logic:

Remarks:

Location: _____

Actuation Method: ~~CALIBRATED PRESSURE SOURCE~~

Switch PV CAM RAX & RAH outputs

Sensor Calibration: *N/A*

☐ _____ per procedure _____ (data attached) _____
(signoff)

Setpoint:

Loop Tolerance:

Process State		Color	Screen1	Screen2	Screen3
Lo (0):	ALARM	4	Alarm		
Hi (1):	NORMAL	7	No Alarm		

Annunciator(s) :	Priority	Alarm Color (actual)

Hi: 0

Lo: 0

Other:

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