DISTRIBUTION SHEET

To Distribution	From D. T. Lott	Page 1 of 1			
		Date 5/16/95			
Project Title/Work Order W-369, Watch List Tank Hydrogen Monitoring, Standard Hydrogen Monitoring System Acceptance Test Report For ATP 090		EDT No. 601748			
		ECN No. N/A			
Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
D. T. Lott	R3-49	X			
R. W. Reed	R1-51		X		
Central Files (2)	L8-04	X			
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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

601748

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) General Support Projects	4. Related EDT No.: N/A
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1	WHC-SD-WM-ATR-090	ALL	0	Standard-B Auto Grab Sampler Hydrogen Monitoring System	Q	2		

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

(G)	(H)	17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)								(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
2	1	Cog.Eng.D. T. Lott		5/10/95							
2	1	Cog. Mgr.J. B. Witt		5-9-95							
2	1	QA H. M. Chafin		5-16-95							
		Safety									
		Env.									

18. D. T. Lott Signature of EDT Originator Date 5/10/95	19. Authorized Representative for Receiving Organization Date	20. J. B. Witt Cognizant Manager Date 5-9-95	21. DOE APPROVAL (if required) Ctrl. No. ☒ Approved ☒ Approved w/comments ☐ Disapproved w/comments
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2. Title

Standard-B Auto Grab Sampler Hydrogen Monitoring System, Acceptance Test Report

3. Number

WHC-SD-WM-ATR-090

4. Rev No.

0

5. Key Words

Standard Hydrogen Monitor System, SHMS, Acceptance Test Report, ATR,

6. Author

Name: D. T. Lott

D.T. Lott
Signature

Organization/Charge Code 8K510/N3BA1

7. Abstract

The following is the Acceptance Test Report for the testing of the Standard Hydrogen Monitoring System.

DISCLAIMER

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OFFICIAL RELEASE
BY WHC

DATE

MAY 18 1995

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WHC-SD-WM-ATR-090
Rev. 0
1

**STANDARD-B AUTO GRAB SAMPLER
HYDROGEN MONITORING SYSTEM**

ACCEPTANCE TEST REPORT

WHC-SD-WM-ATR-090

REV. 0

APPROVAL DESIGNATOR Q

Issued by
General Support Projects
May 1995

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1.0 INTRODUCTION

Project W-369, Watch List Tank Hydrogen Monitors, installed a Standard-C Hydrogen Monitoring System (SHMS) on the Flammable gas waste tank AN-104. General Support Projects (8K510) was support by Test Engineering (7CH30) in the performance of the Acceptance Test Procedures (ATP) to qualify the SHMS cabinets on the waste tank. The ATP's performance was controlled by Tank Farm work package. This completed ATP is transmitted by EDT-601748 as an Acceptance Test Report (ATR) in accordance with WHC-6-1, EP 4.2 and EP 1.12.

2.0 DESCRIPTION OF TEST

The performance of WHC-SD-WM-ATP-096 was used to qualify the SHMS installed on the waste tank. The ATP was used to assure that the system's wiring and components were properly installed and labeled. Electrical and pneumatic tests were also performed to assure system integrity.

3.0 TEST METHOD AND TEST EQUIPMENT

The test verified that the cabinets were constructed and installed per the appropriate design assemble and installation drawings. The test checked the electrical and pneumatic connections to verify functional correctness, but did not perform formal operation testing to qualify the system for data collection. The operational calibrations were subsequently performed under approved maintenance procedures.

4.0 TEST RESULTS AND CONCLUSIONS

The tests were performed and noted without exceptions as indicated within the Test Log for the monitor.

5.0 DISPOSITION OF TEST ITEMS

The equipment inspected and tested by WHC-SD-WM-ATP-096 performed as expected, and is accepted for field operation.

6.0 APPENDIXES

The original completed WHC-SD-WM-ATP-096 is included as Appendixes A to this test report.

SHMS STANDARD-B ATP LIST				
DATE	TANK	SHMS UNIT	WORK PACKAGE	EXCEPTIONS
5/4/95	101-AW	VTP-PNL-205A	2E-94-580	NO
5/4/95	103-AN	VTP-PNL-105C	2E-94-582	NO
5/4/95	105-AN	VTP-PNL-105E	2E-94-579	NO
5/4/95	101-A	VTP-PNL-805A	2E-94-1008	NO
5/4/95	101-AX	VTP-PNL-905A	2E-94-1009	NO
5/4/95	103-AX	VTP-PNL-905C	2E-94-1010	NO
5/4/95	102-S	VTP-PNL-3305B	2W-94-946	NO
5/4/95	111-S	VTP-PNL-3305K	2W-94-946	NO
5/4/95	112-S	VTP-PNL-3305L	2W-94-946	NO
5/4/95	101-SX	VTP-PNL-3405A	2W-94-914	NO
5/4/95	102-SX	VTP-PNL-3305B	2W-94-914	NO
5/4/95	103-SX	VTP-PNL-3305C	2W-94-914	NO
5/4/95	104-SX	VTP-PNL-3305D	2W-94-914	NO
5/4/95	105-SX	VTP-PNL-3305E	2W-94-914	NO
5/4/95	106-SX	VTP-PNL-3305F	2W-94-914	NO
5/4/95	109-SX	VTP-PNL-3305I	2W-94-914	NO
5/4/95	103-U	VTP-PNL-3805C	2W-94-991	NO
5/4/95	105-U	VTP-PNL-3805E	2W-94-991	NO
5/4/95	107-U	VTP-PNL-3805G	2W-94-991	YES
5/4/95	108-U	VTP-PNL-3805H	2W-94-991	NO
5/4/95	109-U	VTP-PNL-3805I	2W-94-991	NO
5/4/95	110-T	VTP-PNL-3705J	2W-94-989	NO

APPENDIX A
TANK 101-AW

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TEST EXECUTION SHEET

Date: <u>8/15/94</u>		Document Number: WHC-SD-WM-ATR-090 REV 0	
SHMS Unit Number: <u>VTP-PNL-205A</u>			
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>J.A. HURLEY</u> TEST DIRECTOR: <u>G.D. FELTNER</u>			
RECORDER: <u>HURLEY, J.</u> FL. SNYDER WITNESSES: <u>TOM SCHNEIDER</u>			
TEST EXECUTION			
<u>Joe Strachan</u> Installation Contractor	<u>8-15-94</u> Date	<u>[Signature]</u> Recorder	<u>8/15/94</u> Date
<u>G.D. Feltner</u> Test Director	<u>8/15/94</u> Date		
TEST WITNESS			
<u>[Signature]</u> Witness	<u>8/15/94</u> Date	<u>[Signature]</u> Witness	<u>8/15/94</u> Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>Mal D. Day</u> Field Engineering	<u>8-15-94</u> Date	<u>[Signature]</u> Project Engineer	<u>8/15/94</u> Date
<u>Terry L. Osterman</u> 9-21-94			
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>[Signature]</u> Plant Operations	<u>9/21/94</u> Date	<u>[Signature]</u> Quality Assurance	<u>9-21-94</u> Date
<u>[Signature]</u> Safety	<u>9/19/94</u> Date	<u>[Signature]</u> Project Engineer	<u>9/6/94</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance.

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- 8/1/94 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- 8/12/94 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- 8/21/94 8.1.3 Leak tests on the pneumatic systems have been performed.
- 8/19/94 8.1.4 The following circuit breakers and fuses are open
 - 1 CB-1 through CB-7
 - 1 FU-1 through FU-13

8/12/94 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

8/12/94 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

8/12/94 8.1.7

The following sample lines/valves are CAPPED/CLOSED.

✓ MV-*-1-1 through MV-*-1-4
✓ MV-*-3-3
✓ MV-*-4-3 through MV-*-4-4
✓ MV-*-5-1 through MV-*-5-6
✓ MV-*-7-3 through MV-*-7-4
✓ Sample and exhaust line ends are capped.

8/12/94 8.1.8

The following sample line valves are OPEN

✓ FCV-*-1-1
✓ FI-*-3-1
✓ MV-*-4-1 through MV-*-4-2
✓ FI-*-5-1
✓ MV-*-7-1 through MV-*-7-2
✓ MV-*-8-1.

Check that all prerequisites have been met.

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

8/12/94 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

8/12/44 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

8/12/44 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

8/12/44 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

8/12/44 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

8/12/44 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

8/12/44 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

8/12/44 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

8/12/44 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

8/12/44 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

8/12/44 9.2.1.8 Verify heater operates.

8/12/44 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

8/12/44 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

8/12/44 9.2.1.11 Adjust Heater temperature control to 70°F.

8/12/44 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

9/2/94 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

9/2/94 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

9/2/94 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

9/2/94 9.2.2.3 Verify pump turns ON.

9/2/94 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

9/2/94 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

9/2/94 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

9/2/94 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

9/2/94 9.2.3.3 Verify cabinet light is ON.

9/2/94 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

9/2/94 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

9/2/94 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

9/2/94 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

9/2/94 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

9/2/94 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

9/2/94 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

1 8/2/94 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

1 8/2/94 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

1 8/2/94 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

1 8/2/94 9.2.4.3.3 Visually verify instruments are operating:
1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.

1 8/2/94 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

1 8/2/94 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

1 8/2/94 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

1 8/2/94 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

1 8/2/94 9.2.4.4.2 Visually verify instrument displays are operating:
1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.

1 8/2/94 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

1 8/2/94 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

1 8/2/94 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

1 8/2/94 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

1 8/2/94 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

- 1 8/12/94 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 8/12/94 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 8/12/94 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 8/12/94 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing.. Record initial temperature and increased temperature of nominally 10 degrees.
- 1 8/12/94 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 8/12/94 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 8/12/94 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 8/12/94 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test..

- 1 8/12/94 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 1 8/12/94 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 1 8/12/94 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 8/12/94 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 8/12/94 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 8/12/94 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

1 8/12/14 9.2.4.6.7

Adjust set point 2 to 20 degrees below indicated temperature.

1 8/12/14 9.2.4.6.8

Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

1 8/12/14 9.2.4.6.9

Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

1 8/12/14 9.2.4.6.10

Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

1 8/12/14 9.2.4.7.1

Set fused switch FU-8 to the CLOSED position.

1 8/12/14 9.2.4.7.2

Visually verify temperature indicator TI-*-16-1 display is operating.

1 8/12/14 9.2.4.7.3

Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

1 8/12/14 9.2.4.7.4

Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

1 8/12/14 9.2.4.7.5

Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

1 8/12/14 9.2.4.7.6

Adjust set point 2 to 10 degrees above indicated temperature.

1 8/12/14 9.2.4.7.7

Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

1 8/12/14 9.2.4.7.8

Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

1 8/12/14 9.2.4.7.9

Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

1 8/12/14 9.2.4.7.10

Adjust set point 1 to 10 degrees below indicated temperature.

1 8/12/14 9.2.4.7.11

Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

8/12/94 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

8/12/94 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Svstems

8/12/94 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

8/12/94 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

1 Horn, YAH-*-9-1, is ON.

1 High Hydrogen Beacon YAL-*-10-2 is ON.

1 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

1 Trouble Beacon YAL-*-18-1 is ON.

1 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

1 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

8/12/94 9.2.4.8.4 Release Alarm Test push button.

8/12/94 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

8/12/94 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

8/12/94 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

8/12/94 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

8/12/94 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

1 The Grab Sample push button light HSL-*-22-1 is illuminated.

1 The Reset Sample push button light HSL-*-23-1 is illuminated.

1 The Reset Sample light YAL-*-23-1 is illuminated.

1 8/12/94 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

1 8/12/94 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

1 8/12/94 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

1 8/12/94 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

1 8/12/94 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

1 8/12/94 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

1 8/12/94 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 8/2/94 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 1 8/2/94 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- ✓ MV-*-1-1 through MV-*-1-4
 - ✓ MV-*-3-3
 - ✓ MV-*-4-3 through MV-*-4-4
 - ✓ MV-*-5-1 through MV-*-5-6
 - ✓ MV-*-7-3 through MV-*-7-4
 - ✓ Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- ✓ FCV-*-1-1
 - ✓ FI-*-3-1
 - ✓ MV-*-4-1 through MV-*-4-2
 - ✓ FI-*-5-1
 - ✓ MV-*-7-1 through MV-*-7-2
 - ✓ MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 8/2/94 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 1 8/2/94 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

~~/~~ MV-*-1-1
~~/~~ MV-*-1-2
~~/~~ MV-*-1-3
~~/~~ MV-*-1-4

- 1 8/12/44 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 2 5/12/44 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 1 9/12/44 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 1 8/12/44 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 1 8/12/44 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
~~/~~ MV-*-3-3
~~/~~ Gas Sample Assembly Valves
- 1 2/12/44 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 1 3/12/44 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 1 3/12/44 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 1 9/12/44 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 1 3/12/44 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 1 3/12/44 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 1 8/12/44 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
~~/~~ MV-*-5-4

1 MV-*-5-51 8/12/84 10.4.3

Adjust to nominally 2.0 cfh flow through FI-*-5-1.

1 8/12/84 10.4.4

CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5

OPEN valves:

1 MV-*-5-4
1 MV-*-5-61 8/12/84 10.4.6

Adjust to nominally 2.0 cfh flow through FI-*-5-1.

1 8/12/84 10.4.7

CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

1 8/12/84 10.4.8

Switch circuit breaker CB-3 to the OPEN position.

10.4.9

CLOSE the following sample line valves.

1 MV-*-1-1 through MV-*-1-4
1 MV-*-3-3
1 MV-*-4-1 through MV-*-4-4
1 MV-*-5-1 through MV-*-5-6
1 MV-*-7-1 through MV-*-7-4
1 MV-*-8-11 8/12/84 10.4.10

Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

1 8/12/84 10.4.11

Open the following circuit breakers and fuses:

1 CB-1 through CB-7
1 FU-1 through FU-131 8/12/84 10.4.12Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 8/12/94		SHMS Unit Number: VTP-PNL-205A			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 53460349			
Test Performed By: R SHAFF					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.3	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	L1 116 L2 116 N 0	L1,L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LTI	ON	Light ON	A	
9.2.3.4	RCPT: H N	115.8 0	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0	H: 0V N: 0V	A	
9.2.4.1:2	XFMR1: Primary Secondary	116 119.2	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 8/12/94		SHMS Unit Number: VTP-PNL-205A			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 53460349			
Test Performed By: R SHAFF					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	118.9 24.78	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	118.4 118.4	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	93 103	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	118.9	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 8/12/94		SHMS Unit Number: VTP-PNL-205A			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 53460349			
Test Performed By: R SHAFF					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	110 120	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	118.2	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	119.0	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	118.9	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0	0V	A	

TEST DATA SHEET

Date: 8/12/94		SHMS Unit Number: VTP-PNL-205A			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUX 53460349			
Test Performed By: R SHAFF					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1	ON	ON	A	
	YAL-*-10-2	ON	ON		
	BY-*-10-1	OPEN	Infinite Resistance Between TB2-21 and TB2-22.		
	YAL-*-18-1	ON	ON		
	BY-*-18-1	OPEN	Infinite Resistance Between TB2-23 and TB2-24.		
	YAL-*-14/15-1	ON	ON		
	YAL-*-16-1	ON	ON		
	YAL-*-7-1	ON	ON		
	YAL-*-10-1	ON	ON		
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1	ON	ON	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.4	HSL-*-22-1	OFF	OFF	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1	OFF	OFF	A	
	YAL-*-23-1	OFF	OFF		
9.3.1	Nameplates	YES	Near IS Devices.	A	

TEST DATA SHEET

Date:			SHMS Unit Number:		
Title of Test: Electrical Systems			Equipment Serial Number(s): FLUKE 53460 349		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	DONE	Proper Labeling.	A	
9.3.3	Resistance	.1	< 1 Ohm	A	

Test Witnesses:

Paul D. Faltine
Test Director

8/15/94
Date

Richard Singh
Recorder

8/15/94
Date

Richard Singh
Quality Assurance

8/15/94
Date

W. R. Rana

9/2/94

TEST DATA SHEET

Date: <u>8/12/94</u>			SHMS Unit Number: <u>JTP-PNL-205A</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s):		
Test Performed By: <u>DAN PHILLIPS</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>+15'</u>	> 15 Feet	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>10' 6"</u>	> 10 Feet	<u>A</u>	
10.1.3	Sample Line Valves	<u>yes</u>	CLOSED	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>yes</u>	Air going in through Intake, leaving through Exhaust	<u>A</u>	
10.2.7	PDI-*-4-1	<u>28"</u>	< 40" H ₂ O	<u>A</u>	
10.3.3	FI-*-3-1	<u>yes</u>	Indicates Flow	<u>A</u>	
10.3.6	FI-*-3-1	<u>no flow</u>	Indicates No Flow	<u>A</u>	
10.4.4	FI-*-5-1	<u>0</u>	Zero Flow	<u>A</u>	
10.4.7	FI-*-5-1	<u>0</u>	Zero Flow	<u>A</u>	

Test Witnesses:

Dan Phillips
Test Director

8/12/94
Date

Charles Snyder
Recorder

8/12/94
Date

Charles Snyder
Quality Assurance

8/12/94
Date
9/21/94

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APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Numbers:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX B
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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

103-AN

TEST EXECUTION SHEET

Date: 9-19-94		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: VTP-PNL-105C		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER:		TEST DIRECTOR: GD Foltner WHC	
RECORDER: D.O. Wallace KEH		WITNESSES: JA Hurley WHC	
TEST EXECUTION			
<u>John R. Strickland</u> 10-25-94 Installation Contractor Date		<u>D.O. Wallace</u> 9-23-94 Recorder Date	
<u>David Foltner</u> 4 Oct 94 Test Director Date			
TEST WITNESS			
<u>JA Hurley</u> 10/5/94 Witness Date		_____ Witness Date	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
<u>NA</u> Field Engineering Date		<u>Tom L. Osterman</u> 10-18-94 Project Engineer Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
<u>Gudith Burton</u> 3/2/95 Plant Operations Date		<u>RL Taylor</u> 4/3/95 Quality Assurance Date	
<u>Stu Bhl</u> 10/31/94 Safety Date		<u>JA Hurley</u> 10/27/94 Project Engineer Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE.

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance.

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

9.19.94 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

9.19.94 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

9.22.94 8.1.3 Leak tests on the pneumatic systems have been performed.

9.19.94 8.1.4 The following circuit breakers and fuses are open

9.19.94 CB-1 through CB-7
9.19.94 FU-1 through FU-13

000
9-19-94 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

000
9-19-94 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

000
9-19-94 8.1.7

The following sample lines/valves are CAPPED/CLOSED.

000 MV-*-1-1 through MV-*-1-4
000 MV-*-3-3
000 MV-*-4-3 through MV-*-4-4
000 MV-*-5-1 through MV-*-5-6
000 MV-*-7-3 through MV-*-7-4
000 Sample and exhaust line ends are capped.

000
9-19-94 8.1.8

The following sample line valves are OPEN

000 FCV-*-1-1
000 FI-*-3-1
000 MV-*-4-1 through MV-*-4-2
000 FI-*-5-1
000 MV-*-7-1 through MV-*-7-2
000 MV-*-8-1.

Check that all prerequisites have been met.

D.O. Warner 9-22-94

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

000
9-19-94 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

00W
9-19-94 9.1.2

Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

00W
9-19-94 9.1.3

Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

00W
9-19-94 9.2.1.1

Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

00W
9-19-94 9.2.1.2

Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

00W
9-19-94 9.2.1.3

Switch circuit breaker CB-1 to the CLOSED position.

00W
9-19-94 9.2.1.4

Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

00W
9-19-94 9.2.1.5

Adjust air conditioner temperature control to a value above ambient temperature.

00W
9-19-94 9.2.1.6

Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

00W
9-19-94 9.2.1.7

Adjust Heater temperature control to a value above ambient temperature.

00W
9-19-94 9.2.1.8

Verify heater operates.

00W
9-19-94 9.2.1.9

Adjust Air Conditioner temperature control to a value below ambient temperature.

00W
9-19-94 9.2.1.10

Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

00W
9-19-94 9.2.1.11

Adjust Heater temperature control to 70°F.

00W
9-19-94 9.2.1.12

Adjust Air Conditioner temperature control to 80°F.

00W
~~9-19-94~~ 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

00W
~~9-19-94~~ 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

00W
~~9-19-94~~ 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

00W
~~9-19-94~~ 9.2.2.3 Verify pump turns ON.

00W
~~9-19-94~~ 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

00W
~~9-19-94~~ 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

00W
~~9-19-94~~ 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

00W
~~9-19-94~~ 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

00W
~~9-19-94~~ 9.2.3.3 Verify cabinet light is ON.

00W
~~9-19-94~~ 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

00W
~~9-19-94~~ 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

00W
~~9-19-94~~ 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

00W
~~9-19-94~~ 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

00W
~~9-19-94~~ 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

00W
~~9-19-94~~ 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

00W
~~9-19-94~~ 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

000
9-19-94 9.2.4.2.2 Verify power is being supplied to the DC power source PWR*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

000
9-19-94 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

000
9-19-94 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

000
9-19-94 9.2.4.3.3 Visually verify instruments are operating:
~~000~~ Transmitter FIT-*-7-1,
~~000~~ Flow Alarm FASL-*-7-1.

000
9-19-94 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

000
9-19-94 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

000
9-19-94 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

000
9-19-94 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

000
9-19-94 9.2.4.4.2 Visually verify instrument displays are operating:

~~000~~ Transmitter NIT-*-6-1,
~~000~~ Transmitter NIT-*-12-1,
~~000~~ Recorder NR-*-6/12-1.

000
9-19-94 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

000
9-19-94 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

000
9-19-94 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

000
9-19-94 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

000
9-19-94 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

00W
9-19-94 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

00W
9-19-94 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.

00W
9-19-94 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.

00W
9-19-94 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.

00W
9-19-94 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.

00W
9-19-94 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.

00W
9-19-94 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

00W
9-19-94 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

00W
9-19-94 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.

00W
9-19-94 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.

00W
9-19-94 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

00W
9-19-94 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.

00W
9-19-94 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

00W
9-19-94 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

00W

9-19-94 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.

00W

9-19-94 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

00W

9-19-94 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

00W

9-19-94 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

00W

9-19-94 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.

00W

9-19-94 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.

00W

9-19-94 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

00W

9-19-94 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

00W

9-19-94 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W

9-19-94 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.

00W

9-19-94 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W

9-19-94 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

00W

9-19-94 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W

9-19-94 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.

00W

9-19-94 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

- 00W
9-19-94 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.
- 00W
9-19-94 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.
- 9.2.4.8 Alarm Systems
- 00W
9-19-94 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.
- 00W
9-19-94 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)
- 9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:
- 00W
9-19-94 Horn, YAH-*-9-1, is ON.
- 00W
9-19-94 High Hydrogen Beacon YAL-*-10-2 is ON.
- 00W
9-19-94 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.
- 00W
9-19-94 Trouble Beacon YAL-*-18-1 is ON.
- 00W
9-19-94 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.
- 00W
9-19-94 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.
- 00W
9-19-94 9.2.4.8.4 Release Alarm Test push button.
- 00W
9-19-94 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.
- 00W
9-19-94 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.
- 9.2.4.9 Auto Sampler System
- 00W
9-19-94 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.
- 00W
9-19-94 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.
- 00W
9-19-94 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

000
9.19.94 The Grab Sample push button light HSL-*-22-1 is illuminated.

000
9.19.94 The Reset Sample push button light HSL-*-23-1 is illuminated.

000
9.19.94 The Reset Sample light YAL-*-23-1 is illuminated.

000
9.19.94 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

000
9.19.94 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

000
9.19.94 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

000
9.19.94 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

000
9.19.94 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

000
9.19.94 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

000
9.19.94 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

D.O. Wallace 9-19-94

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

DOW
9-19-94

10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.

DOW
9-19-94

10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.

10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

DOW MV-*-1-1 through MV-*-1-4

DOW MV-*-3-3

DOW MV-*-4-3 through MV-*-4-4

DOW MV-*-5-1 through MV-*-5-6

DOW MV-*-7-3 through MV-*-7-4

DOW Sample and exhaust line ends are capped.

9-19-94

10.1.4 Verify the following sample line valves are OPEN

DOW FCV-*-1-1

DOW FI-*-3-1

DOW MV-*-4-1 through MV-*-4-2

DOW FI-*-5-1

DOW MV-*-7-1 through MV-*-7-2

DOW MV-*-8-1.

9-19-94

10.2 SAMPLE MAIN FLOW LOOP

DOW

9-19-94

DOW

9-19-94

10.2.1 Set fused switch FU-13 to the CLOSED position.

10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.

10.2.3 OPEN valves:

~~000~~ MV-*-1-1
~~000~~ MV-*-1-2
~~000~~ MV-*-1-3
~~000~~ MV-*-1-4

~~000~~

~~9-19-94~~ 10.2.4

Switch circuit breaker CB-3 to the CLOSED position.

~~000~~

~~9-19-94~~ 10.2.5

Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.

~~000~~

~~9-19-94~~ 10.2.6

Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.

~~000~~

~~9-19-94~~ 10.2.7

Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

~~000~~

~~9-19-94~~ 10.3.1

Set fused switch FU-10 to the CLOSED position.

10.3.2

OPEN valves:

~~000~~ MV-*-3-3

~~000~~ Gas Sample Assembly Valves

~~000~~

~~9-19-94~~ 10.3.3

Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.

~~000~~

~~9-19-94~~ 10.3.4

Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.

~~000~~

~~9-19-94~~ 10.3.5

CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.

~~000~~

~~9-19-94~~ 10.3.6

OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.

~~000~~

~~9-19-94~~ 10.3.7

Depress the Reset Sample push button HS-*-23-1.

~~000~~

~~9-19-94~~ 10.3.8

Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

~~000~~

~~9-19-94~~ 10.4.1

Remove plug to atmosphere upstream of F-*-5-1.

10.4.2

OPEN valves:

~~000~~ MV-*-5-4

- 00W
9-19-94 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 00W
9-19-94 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.
- 10.4.5 OPEN valves:
- 00W MV-*-5-4
00W MV-*-5-6
- 00W
9-19-94 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 00W
9-19-94 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.
- 00W
9-19-94 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- 00W MV-*-1-1 through MV-*-1-4
00W MV-*-3-3
00W MV-*-4-1 through MV-*-4-4
00W MV-*-5-1 through MV-*-5-6
00W MV-*-7-1 through MV-*-7-4
00W MV-*-8-1
- 00W
9-19-94 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.
- 00W
9-19-94 10.4.11 Open the following circuit breakers and fuses:
- 00W CB-1 through CB-7
00W FU-1 through FU-13
- 00W
9-19-94 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

D.O. Wallace 9-19-94

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 9.19.94			SHMS Unit Number: VFO-PNL-105C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 23 0053 01-05-95		
Test Performed By: Ed Jaffs KEH					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	0 Ω	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	120.7 120.9 101	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	120.4 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	.6 0	H: 0V N: 0V	A	
9.2.4.1:2	XFMR1: Primary Secondary	120.6 123.6	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 9-19-94		SHWS Unit Number: VTR-PWL-105C	
Title of Test: Electrical Systems		Equipment Serial Number(s): Figure 23 0053 01-05-95	
Test Performed By: Ed Jagers			
Procedure Number	Item	Value	Range (A/R)
9.2.4.2.2	PWR-*01: AC In DC Out	123.6 24.	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%
9.2.4.3.3	Visual: FIT-*7-1 FASL-*7-1	07 07	Power Indication Lights ON
9.2.4.3.4	YYC-*01 In #2 Voltage:	0	0V
9.2.4.4.2	NIT-*6-1 NIT-*12-1 NR-* 6/12-1	07 07 07	Displays powered ON.
9.2.4.4.3	YYC-*01 In #0 In #1 Voltage:	123. 123. 123.	120V $\pm$ 5%
9.2.4.5.3	TIC-*14-1	07	Display powered ON.
9.2.4.5.6	YYC-*01 In #5 Voltage:	04	0V
9.2.4.5.7	HT-*14-1: Initial Temp. Final Temp.	89° 100°	Final Temp. = Initial Temp. + 10°F.
9.2.4.5.9	YYC-*01 In #5 Voltage:	123.5	120V $\pm$ 5%

TEST DATA SHEET

Date: 9-19-94			SHMS Unit Number: VTP-PNL-105C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 23 0053 01-05-95		
Test Performed By: Ed Seffo					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	.03	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	106° 116°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	123.3	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	123.2	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	.04	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	123.4	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	.03	0V	A	

TEST DATA SHEET

Date: 9-19-94			SHMS Unit Number: VTR-PNL-105C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 23 0053 01-05-95		
Test Performed By: Ed Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON ON ON ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 9-19-94			SHMS Unit Number: VTP-PNL-105 C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 23 0053 01-05-95		
Test Performed By: Ed Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	< 1 Ω	< 1 Ohm	A	

Test Witnesses:

Samuel J. Fulton
Test Director

O.O. Warrick
Recorder

W. H. Hays
Quality Assurance

9/18/94
Date

9-19-94
Date

4/3/95
Date

TEST DATA SHEET

Date: 9-19-95			SHMS Unit Number: VTP-PNL-105C		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: AS Fleminging KEH					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	28"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	Flow	Indicates Flow	A	
10.3.6	FI-*-3-1	NO Flow	Indicates No Flow	A	
10.4.4	FI-*-5-1	NO Flow	Zero Flow	A	
10.4.7	FI-*-5-1	NO Flow	Zero Flow	A	

Test Witnesses:

J. Gary D. Fisher
Test Director

19 Sept 94
Date

D. O. Wallace
Recorder

9-19-94
Date

W. L. Wright
Quality Assurance

4/3/95
Date

APPENDIX B

TEST EXCEPTION SHEETS

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

Date

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REV 0

APPENDIX C

TEST LOG SHEET

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APPENDIX C
TANK 105-AN

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

105-AN

TEST EXECUTION SHEET

Date: 9-20-94		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: VTP-PNL-105E		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER:		TEST DIRECTOR: GD Feltnor WHC	
RECORDER: D.O. Wallace KEH		WITNESSES: JA Hueley WHC	
TEST EXECUTION			
J.R. Studer 10-25-94 Installation Contractor Date		D.O. Wallace 9-23-94 Recorder Date	
GD Feltnor 4 Oct 94 Test Director Date			
TEST WITNESS			
JA Hueley 10/5/94 Witness Date			
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
NA Field Engineering Date		Terry L. Osterlander 4-3-95 Project Engineer Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
3/2/95 MDH Judith Burton 3/2/95 Plant Operations Date		4/3/95 Quality Assurance Date	
10/31/94 Safety Date		10/27/94 Project Engineer Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
 - 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
 - 3.2.4 Approve field changes to the ATP.
 - 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
 - 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
 - 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
 - 3.2.8 Sign Test Execution Sheet when ATP has been performed.
 - 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
 - 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.
- 3.3 WITNESSES (Provided by Participating Organizations)
- 3.3.1 Witness the tests.
 - 3.3.2 Evaluate results of testing.
 - 3.3.3 Assist the Test Director when requested.
 - 3.3.4 Sign Test Exception Sheet as a witness.
 - 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.
- 3.4 RECORDER (Provided by KEH)
- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
 - 3.4.2 Observe tests, record test data and maintain test log.
 - 3.4.3 Sign the Test Exception Sheet as the recorder.
 - 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance.

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

00W
9-20-94 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

00W
9-20-94 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

00W
9-22-94 8.1.3 Leak tests on the pneumatic systems have been performed.

00W
9-20-94 8.1.4 The following circuit breakers and fuses are open

00W CB-1 through CB-7
00W FU-1 through FU-13

00W
9-20-94 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

00W
9-20-94 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

00W
9-20-94 8.1.7

The following sample lines/valves are CAPPED/CLOSED.

00W MV-*-1-1 through MV-*-1-4
00W MV-*-3-3
00W MV-*-4-3 through MV-*-4-4
00W MV-*-5-1 through MV-*-5-6
00W MV-*-7-3 through MV-*-7-4
00W Sample and exhaust line ends are capped.

00W
9-20-94 8.1.8

The following sample line valves are OPEN

00W FCV-*-1-1
00W FI-*-3-1
00W MV-*-4-1 through MV-*-4-2
00W FI-*-5-1
00W MV-*-7-1 through MV-*-7-2
00W MV-*-8-1.

Check that all prerequisites have been met.

D.O. Wallace 9-22-94

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

00W
9-20-94 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

ODW 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

ODW 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

ODW 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

ODW 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

ODW 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

ODW 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: -If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

ODW 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

ODW 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

ODW 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

ODW 9.2.1.8 Verify heater operates.

ODW 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

ODW 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

ODW 9.2.1.11 Adjust Heater temperature control to 70°F.

ODW 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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ODW 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

ODW 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

ODW 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

ODW 9.2.2.3 Verify pump turns ON.

ODW 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

ODW 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

ODW 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

ODW 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

ODW 9.2.3.3 Verify cabinet light is ON.

ODW 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

ODW 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

ODW 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

ODW 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

ODW 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

ODW 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

ODW 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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ODW 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

ODW 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

ODW 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

ODW 9.2.4.3.3 Visually verify instruments are operating:
ODW Transmitter FIT-*-7-1,
ODW Flow Alarm FASL-*-7-1.

ODW 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

ODW 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

ODW 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

ODW 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

ODW 9.2.4.4.2 Visually verify instrument displays are operating:

ODW Transmitter NIT-*-6-1,
ODW Transmitter NIT-*-12-1,
ODW Recorder NR-*-6/12-1.

ODW 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

ODW 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

ODW 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

ODW 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

ODW 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- ODW 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ODW 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ODW 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ODW 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ODW 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ODW 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ODW 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ODW 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ODW 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ODW 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ODW 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ODW 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ODW 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ODW 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

DDW 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.

DDW 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

DDW 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

DDW 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

DDW 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.

DDW 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.

DDW 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

DDW 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

DDW 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

DDW 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.

DDW 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

DDW 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

DDW 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

DDW 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.

DDW 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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OW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

OW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

OW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

OW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

OW Horn, YAH-*-9-1, is ON.

OW High Hydrogen Beacon YAL-*-10-2 is ON.

OW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

OW Trouble Beacon YAL-*-18-1 is ON.

OW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

OW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

OW 9.2.4.8.4 Release Alarm Test push button.

OW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

OW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

OW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

OW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

OW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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DDW The Grab Sample push button light HSL-*-22-1 is illuminated.

DDW The Reset Sample push button light HSL-*-23-1 is illuminated.

DDW The Reset Sample light YAL-*-23-1 is illuminated.

DDW 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

DDW 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

DDW 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

DDW 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

DDW 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

DDW 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

DDW 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.
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9.4 REVIEW

Check that all steps have been completed.

D.O. Warner 9-20-94

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- ODW 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- ODW 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- ODW MV-*-1-1 through MV-*-1-4
 - ODW MV-*-3-3
 - ODW MV-*-4-3 through MV-*-4-4
 - ODW MV-*-5-1 through MV-*-5-6
 - ODW MV-*-7-3 through MV-*-7-4
 - ODW Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- ODW FCV-*-1-1
 - ODW FI-*-3-1
 - ODW MV-*-4-1 through MV-*-4-2
 - ODW FI-*-5-1
 - ODW MV-*-7-1 through MV-*-7-2
 - ODW MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- ODW 10.2.1 Set fused switch FU-13 to the CLOSED position.
- ODW 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 9-20-94
- 10.2.3 OPEN valves:

000 MV-*-1-1
000 MV-*-1-2
000 MV-*-1-3
000 MV-*-1-4

- 000 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 000 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 000 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 000 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 000 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
000 MV-*-3-3
000 Gas Sample Assembly Valves
- 000 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 000 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 000 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 000 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 000 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 000 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 000 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 9-20-94 10.4.2 OPEN valves:
000 MV-*-5-4

ODW MV-*-5-5

ODW 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

ODW 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

ODW MV-*-5-4

ODW MV-*-5-6

ODW 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

ODW 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

ODW 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

ODW MV-*-1-1 through MV-*-1-4

ODW MV-*-3-3

ODW MV-*-4-1 through MV-*-4-4

ODW MV-*-5-1 through MV-*-5-6

ODW MV-*-7-1 through MV-*-7-4

ODW MV-*-8-1

ODW 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

ODW 10.4.11 Open the following circuit breakers and fuses:

ODW CB-1 through CB-7

ODW FU-1 through FU-13

ODW 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

9-20-94

10.5 REVIEW

Check that all steps have been completed.

D. C. Wallace 9-20-94

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 9-20-94			SHMS Unit Number: VTP-PNL-105E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 23 0053 01-05-95		
Test Performed By: Ed Juffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	0Ω	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	122.6 123.0 .01	L1,L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	122.6 106	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	1.2 106	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	122.5 125.7	Primary, Secondary: 120V ± 5%	A	

TEST DATA SHEET

Date: 9-20-94		SHMS Unit Number: VTP-PNL-105E			
Title of Test: Electrical Systems		Equipment Serial Number(s): Fluke 23 0053 01-05-95			
Test Performed By: Ed. Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125.8 24.	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	.06	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125.1 125.0	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	.07	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	73° 83°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125.2	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 9-20-94			SHMS Unit Number: VTR-PNL-105E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 23 0053 01-05-95		
Test Performed By: Ed Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	.08	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	76°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	124.6	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125.	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	.08	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	124.9	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	.09	0V	A	

TEST DATA SHEET

Date: 9-20-94			SHMS Unit Number: VTP-0WL-105E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 23 0053 01-05-95		
Test Performed By: Ed Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on on on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 9.20-94			SHMS Unit Number: VTP-PNL-105E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 23 0053 01.05-95		
Test Performed By: Ed Jeffs					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.1	< 1 Ohm	A	

Test Witnesses:

Sam J. Feltner
Test Director

20 Sept 94
Date

Dorinda O. Wallace
Recorder

9.23.94
Date

Alleyton
Quality Assurance

1/3/95
Date

TEST DATA SHEET

Date: 9.20.94			SHMS Unit Number: VTR-PNL-105E		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: RJ Fleming KEH					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	>15	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	>10	> 10 Feet	A	
10.1.3	Sample Line Valves	closed	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	29"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	Flow	Indicates Flow	A	
10.3.6	FI-*-3-1	no Flow	Indicates No Flow	A	
10.4.4	FI-*-5-1	no Flow	Zero Flow	A	
10.4.7	FI-*-5-1	no Flow	Zero Flow	A	

Test Witnesses:

Sam Q. Feltner
Test Director

20 Sept 94
Date

D.O. Wallace
Recorder

9.20.94
Date

Ally
Quality Assurance

4/3/95
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

WHC-SD-WM-ATR-090
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REV 0

APPENDIX C
TEST LOG SHEET

[illegible]

APPENDIX D

TANK 101-A

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

TEST EXECUTION SHEET

Date: 3-16-95		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: VTP-PNL-805A (OISA)		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: D.T. Lott		TEST DIRECTOR: TC Schneider WHC	
RECORDER: D.O. Wallace WHC		WITNESSES: R.M. Bender WHC	
TEST EXECUTION			
Bill E. Winter 3-16-95		D.O. Wallace 3-16-95	
Installation Contractor Date		Recorder Date	
BE Winter		D.O. Wallace RCF KH	
TC Schneider 3-16-95		Date	
Test Director		TC Schneider WHC	
TEST WITNESS			
R.M. Bender 3-16-95		D.T. Lott 3-16-95	
Witness Date		Witness Date	
R.M. Bender WHC		D.T. Lott WHC	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
NA		Terry L. Osterman 3-31-95	
Field Engineering Date		Project Engineer Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
Morgan D. Handberg 4-28-95		Frank M. Chulgin 5-8-95	
Plant Operations Date		Quality Assurance Date	
M.D. in Jahn 4/19/95		D.T. Lott 4/5/95	
Safety Date		Project Engineer Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. — *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

000
3-16-95 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

000
3-16-95 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

000
3-16-95 8.1.3 Leak tests on the pneumatic systems have been performed.

000
3-16-95 8.1.4 The following circuit breakers and fuses are open

000 CB-1 through CB-7
000 FU-1 through FU-13

00w
3-16-95 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

00w
3-16-95 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

00w
3-16-95 8.1.7

The following sample lines/valves are CAPPED/CLOSED.

00w MV-*-1-1 through MV-*-1-4
00w MV-*-3-3
00w MV-*-4-3 through MV-*-4-4
00w MV-*-5-1 through MV-*-5-6
00w MV-*-7-3 through MV-*-7-4
00w Sample and exhaust line ends are capped.

00w
3-16-95 8.1.8

The following sample line valves are OPEN

00w FCV-*-1-1
00w FI-*-3-1
00w MV-*-4-1 through MV-*-4-2
00w FI-*-5-1
00w MV-*-7-1 through MV-*-7-2
00w MV-*-8-1.

Check that all prerequisites have been met.

D. O. Wallace 3-16-95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

00w
3-16-95 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

00W
3-16-95 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

00W
3-16-95 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

00W
3-16-95 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

00W
3-16-95 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

00W
3-16-95 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

00W
3-16-95 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

00W
3-16-95 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

00W
3-16-95 9.2.1.8 Verify heater operates.

00W
3-16-95 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the KI-*-01 relay.

Note: Heat may still radiate from Heater.

00W
3-16-95 9.2.1.11 Adjust Heater temperature control to 70°F.

00W
3-16-95 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

00W
3-16-95 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

00W
3-16-95 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

00W
3-16-95 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

00W
3-16-95 9.2.2.3 Verify pump turns ON.

00W
3-16-95 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

00W
3-16-95 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

00W
3-16-95 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

00W
3-16-95 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

00W
3-16-95 9.2.3.3 Verify cabinet light is ON.

00W
3-16-95 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

00W
3-16-95 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

00W
3-16-95 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

00W
3-16-95 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

00W
3-16-95 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

00W
3-16-95 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

00W
3-16-95 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

00W
3-16-95 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

00W 9.2.4.3 Flow Alarm System

3-16-95 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

00W
3-16-95 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

00W
3-16-95 9.2.4.3.3 Visually verify instruments are operating:
00W Transmitter FIT-*-7-1,
00W Flow Alarm FASL-*-7-1.

00W
3-16-95 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

00W
3-16-95 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

00W
3-16-95 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

00W
3-16-95 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

00W
3-16-95 9.2.4.4.2 Visually verify instrument displays are operating:

00W Transmitter NIT-*-6-1,
00W Transmitter NIT-*-12-1,
00W Recorder NR-*-6/12-1.

00W
3-16-95 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

00W
3-16-95 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

00W
3-16-95 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

00W
3-16-95 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

00W
3-16-95 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

- 00W
3-16-95 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W
3-16-95 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 00W
3-16-95 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 00W
3-16-95 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 00W
3-16-95 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 00W
3-16-95 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 00W
3-16-95 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 00W
3-16-95 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 00W
3-16-95 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 00W
3-16-95 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 00W
3-16-95 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W
3-16-95 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 00W
3-16-95 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 00W
3-16-95 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

00W
3-16-95 9.2.4.6.7

Adjust set point 2 to 20 degrees below indicated temperature.

00W
3-16-95 9.2.4.6.8

Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

00W
3-16-95 9.2.4.6.9

Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

00W
3-16-95 9.2.4.6.10

Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

00W
3-16-95 9.2.4.7.1

Set fused switch FU-8 to the CLOSED position.

00W
3-16-95 9.2.4.7.2

Visually verify temperature indicator TI-*-16-1 display is operating.

00W
3-16-95 9.2.4.7.3

Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

00W
3-16-95 9.2.4.7.4

Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

00W
3-16-95 9.2.4.7.5

Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W
3-16-95 9.2.4.7.6

Adjust set point 2 to 10 degrees above indicated temperature.

00W
3-16-95 9.2.4.7.7

Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W
3-16-95 9.2.4.7.8

Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

00W
3-16-95 9.2.4.7.9

Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W
3-16-95 9.2.4.7.10

Adjust set point 1 to 10 degrees below indicated temperature.

00W
3-16-95 9.2.4.7.11

Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W
3-16-95 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

00W
3-16-95 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

00W
3-16-95 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

00W
3-16-95 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

00W
3-16-95 Horn, YAH-*-9-1, is ON.

00W
3-16-95 High Hydrogen Beacon YAL-*-10-2 is ON.

00W
3-16-95 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

00W
3-16-95 Trouble Beacon YAL-*-18-1 is ON.

00W
3-16-95 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

00W
3-16-95 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

00W
3-16-95 9.2.4.8.4 Release Alarm Test push button.

00W
3-16-95 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

00W
3-16-95 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

00W
3-16-95 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

00W
3-16-95 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

00W
3-16-95 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

00W
3-16-95 The Grab Sample push button light HSL-*-22-1 is illuminated.

00W
3-16-95 The Reset Sample push button light HSL-*-23-1 is illuminated.

00W
3-16-95 The Reset Sample light YAL-*-23-1 is illuminated.

00W
3-16-95 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

00W
3-16-95 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

00W
3-16-95 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

00W
3-16-95 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

00W
3-16-95 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

00W
3-16-95 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

00W
3-16-95 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

DD. Wallace 3-16-95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

DD
3-16-95 10.1.1

Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.

DD
3-16-95 10.1.2

Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.

10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

DD MV-*-1-1 through MV-*-1-4
DD MV-*-3-3
DD MV-*-4-3 through MV-*-4-4
DD MV-*-5-1 through MV-*-5-6
DD MV-*-7-3 through MV-*-7-4
DD Sample and exhaust line ends are capped.

10.1.4 Verify the following sample line valves are OPEN

DD FCV-*-1-1
DD FI-*-3-1
DD MV-*-4-1 through MV-*-4-2
DD FI-*-5-1
DD MV-*-7-1 through MV-*-7-2
DD MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

DD
3-16-95 10.2.1

Set fused switch FU-13 to the CLOSED position.

DD
3-16-95 10.2.2

Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.

10.2.3 OPEN valves:

00W MV-*-1-1
00W MV-*-1-2
00W MV-*-1-3
00W MV-*-1-4

00W

3.16.95 10.2.4

Switch circuit breaker CB-3 to the CLOSED position.

00W

3.16.95 10.2.5

Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.

00W

3.16.95 10.2.6

Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.

00W

3.16.95 10.2.7

Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

00W

3.16.95 10.3.1

Set fused switch FU-10 to the CLOSED position.

10.3.2

OPEN valves:

00W MV-*-3-3

00W Gas Sample Assembly Valves

00W

3.16.95 10.3.3

Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.

00W

3.16.95 10.3.4

Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.

00W

3.16.95 10.3.5

CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.

00W

3.16.95 10.3.6

OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.

00W

3.16.95 10.3.7

Depress the Reset Sample push button HS-*-23-1.

00W

3.16.95 10.3.8

Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

00W

3.16.95 10.4.1

Remove plug to atmosphere upstream of F-*-5-1.

10.4.2

OPEN valves:

00W MV-*-5-4

- 00W
3-16-95 10.4.3 ~~00W~~ MV-*-5-5
Adjust to nominally 2.0 cfh flow through
FI-*-5-1.
- 00W
3-16-95 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.
- 10.4.5 OPEN valves:
- 00W
3-16-95 10.4.6 ~~00W~~ MV-*-5-4
~~00W~~ MV-*-5-6
Adjust to nominally 2.0 cfh flow through
FI-*-5-1.
- 00W
3-16-95 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.
- 00W
3-16-95 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- 00W
3-16-95 10.4.10 ~~00W~~ MV-*-1-1 through MV-*-1-4
~~00W~~ MV-*-3-3
~~00W~~ MV-*-4-1 through MV-*-4-4
~~00W~~ MV-*-5-1 through MV-*-5-6
~~00W~~ MV-*-7-1 through MV-*-7-4
~~00W~~ MV-*-8-1
Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.
- 00W
3-16-95 10.4.11 Open the following circuit breakers and fuses:
- 00W
3-16-95 10.4.12 ~~00W~~ CB-1 through CB-7
~~00W~~ FU-1 through FU-13
Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

D.O. Wallace 3-16-95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP PNL-805A (013A)		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 29 MTE 0840 5-20-95		
Test Performed By: Bee Winters					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	121.4 121.4 .0	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	121.4 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1:2	XFMR1: Primary Secondary	121.3 124.3	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: JTP-PNL-805A		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: BE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	123.9 24.6	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	123.8 123.7	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	49° 59°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	124.5	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3.16.95			SHMS Unit Number: VTR PNL-805A		
Title of Test: Electrical Systems			Equipment Serial Number(s): FIGURE 29 MTE 0840 5-20-95		
Test Performed By: DE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	53° 63°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	124.3	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	124.0	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	124.0	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTA-PNL-805A		
Title of Test: Electrical Systems			Equipment Serial Number(s): F1442 29 MTE 0840 5-20-95		
Test Performed By: BE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON ON ON ON ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3-16-95		SHMS Unit Number: JTP-PNL-805A			
Title of Test: Electrical Systems		Equipment Serial Number(s): Fluke 29 MTE 0840 3-20-95			
Test Performed By: BE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.1	< 1 Ohm	A	

Test Witnesses:

J. C. Smith
Test Director

3-16-95
Date

D. O. Wallace
Recorder

3-16-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: JTP-PNL-805A		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: JW Gurtisen					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	710'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	38"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

J. S. Smith
Test Director

3-16-95
Date

D. C. Wallace
Recorder

3-16-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX E
TANK 101-AX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TEST EXECUTION SHEET

Date: <u>3-16-95</u>		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: <u>VTD-PNL-905A (OISAX)</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>DT Lott</u>		TEST DIRECTOR: <u>TC Schneider</u>	
RECORDER: <u>O.O. Wallace</u>		WITNESSES: <u>Rm Bender</u>	
TEST EXECUTION			
<u>Bill Winter</u> Installation Contractor	<u>3-16-95</u> Date	<u>O.O. Wallace</u> Recorder	<u>3-16-95</u> Date
<u>J.C. Schneider</u> Test Director	<u>3-16-95</u> Date		
TEST WITNESS			
<u>Rm Bender</u> Witness	<u>3-15-95</u> Date	<u>DT Lott</u> Witness	<u>3-16-95</u> Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u> Field Engineering	<u> </u> Date	<u>Timothy K. Osterlander</u> Project Engineer	<u>3-31-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>Morgan D. Harding</u> Plant Operations	<u>4-28-95</u> Date	<u>Frank M. Chapin</u> Quality Assurance	<u>4/26/95</u> Date
<u>m. J. in Taha</u> Safety	<u>4/19/95</u> Date	<u>DT Lott</u> Project Engineer	<u>4/5/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance - *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- 00W
3-16-95 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- 00W
3-16-95 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- 00W
3-16-95 8.1.3 Leak tests on the pneumatic systems have been performed.
- 00W
3-16-95 8.1.4 The following circuit breakers and fuses are open
- 00W CB-1 through CB-7
00W FU-1 through FU-13

000
3-16-95 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

000
3-16-95 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

000
3-16-95 8.1.7

The following sample lines/valves are CAPPED/CLOSED.

000 MV-*-1-1 through MV-*-1-4
000 MV-*-3-3
000 MV-*-4-3 through MV-*-4-4
000 MV-*-5-1 through MV-*-5-6
000 MV-*-7-3 through MV-*-7-4
000 Sample and exhaust line ends are capped.

000
3-16-95 8.1.8

The following sample line valves are OPEN

000 FCV-*-1-1
000 FI-*-3-1
000 MV-*-4-1 through MV-*-4-2
000 FI-*-5-1
000 MV-*-7-1 through MV-*-7-2
000 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

000
3-16-95 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

00W
3-16-95 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

00W
3-16-95 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

00W
3-16-95 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

00W
3-16-95 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

00W
3-16-95 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

00W
3-16-95 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

00W
3-16-95 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

00W
3-16-95 9.2.1.8 Verify heater operates.

00W
3-16-95 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

00W
3-16-95 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

00W
3-16-95 9.2.1.11 Adjust Heater temperature control to 70°F.

00W
3-16-95 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

00W
3-16-95 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

00W
3-16-95 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

00W
3-16-95 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

00W
3-16-95 9.2.2.3 Verify pump turns ON.

00W
3-16-95 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

00W
3-16-95 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

00W
3-16-95 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

00W
3-16-95 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

00W
3-16-95 9.2.3.3 Verify cabinet light is ON.

00W
3-16-95 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

00W
3-16-95 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

00W
3-16-95 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

00W
3-16-95 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

00W
3-16-95 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

00W
3-16-95 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

00W
3-16-95 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

00W

- 3-16-95 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

00W

- 3-16-95 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

00W

- 3-16-95 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

00W

- 3-16-95 9.2.4.3.3 Visually verify instruments are operating:

~~00W~~ Transmitter FIT-*-7-1,

~~00W~~ Flow Alarm FASL-*-7-1.

00W

- 3-16-95 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

00W

- 3-16-95 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

00W

- 3-16-95 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

00W

- 3-16-95 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

00W

- 3-16-95 9.2.4.4.2 Visually verify instrument displays are operating:

~~00W~~ Transmitter NIT-*-6-1,

~~00W~~ Transmitter NIT-*-12-1,

~~00W~~ Recorder NR-*-6/12-1.

00W

- 3-16-95 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

00W

- 3-16-95 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

00W

- 3-16-95 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

00W

- 3-16-95 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

00W

- 3-16-95 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

- 00W
3-16-95 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W
3-16-95 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 00W
3-16-95 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 00W
3-16-95 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 00W
3-16-95 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 00W
3-16-95 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 00W
3-16-95 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 00W
3-16-95 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 00W
3-16-95 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 00W
3-16-95 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 00W
3-16-95 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W
3-16-95 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 00W
3-16-95 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 00W
3-16-95 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 00W
3-16-95 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 00W
3-16-95 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 00W
3-16-95 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 00W
3-16-95 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.
- 9.2.4.7 Cabinet Temperature
- 00W
3-16-95 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 00W
3-16-95 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 00W
3-16-95 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W
3-16-95 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 00W
3-16-95 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W
3-16-95 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 00W
3-16-95 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W
3-16-95 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 00W
3-16-95 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W
3-16-95 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 00W
3-16-95 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

00W
3-16-95 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

00W
3-16-95 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

00W
3-16-95 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

00W
3-16-95 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

00W
3-16-95 Horn, YAH-*-9-1, is ON.

00W
3-16-95 High Hydrogen Beacon YAL-*-10-2 is ON.

00W
3-16-95 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

00W
3-16-95 Trouble Beacon YAL-*-18-1 is ON.

00W
3-16-95 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

00W
3-16-95 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

00W
3-16-95 9.2.4.8.4 Release Alarm Test push button.

00W
3-16-95 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

00W
3-16-95 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

00W
3-16-95 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

00W
3-16-95 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

00W
3-16-95 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

00W
3.16.95 The Grab Sample push button light HSL-*-22-1 is illuminated.

00W
3.16.95 The Reset Sample push button light HSL-*-23-1 is illuminated.

00W
3.16.95 The Reset Sample light YAL-*-23-1 is illuminated.

00W
3.16.95 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

00W
3.16.95 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

00W
3.16.95 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

00W
3.16.95 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

00W
3.16.95 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

00W
3.16.95 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

00W
3.16.95 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

DOO
3-16-95 10.1.1

Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.

DOO
3-16-95 10.1.2

Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.

10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

DOO MV-*-1-1 through MV-*-1-4
DOO MV-*-3-3
DOO MV-*-4-3 through MV-*-4-4
DOO MV-*-5-1 through MV-*-5-6
DOO MV-*-7-3 through MV-*-7-4
DOO Sample and exhaust line ends are capped.

10.1.4 Verify the following sample line valves are OPEN

DOO FCV-*-1-1
DOO FI-*-3-1
DOO MV-*-4-1 through MV-*-4-2
DOO FI-*-5-1
DOO MV-*-7-1 through MV-*-7-2
DOO MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

DOO
3-16-95 10.2.1

Set fused switch FU-13 to the CLOSED position.

DOO
3-16-95 10.2.2

Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.

10.2.3 OPEN valves:

~~000~~ MV-*-1-1
~~000~~ MV-*-1-2
~~000~~ MV-*-1-3
~~000~~ MV-*-1-4

~~000~~
3-16-95 10.2.4

Switch circuit breaker CB-3 to the CLOSED position.

~~000~~
3-16-95 10.2.5

Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.

~~000~~
3-16-95 10.2.6

Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.

~~000~~
3-16-95 10.2.7

Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

~~000~~
3-16-95 10.3.1

Set fused switch FU-10 to the CLOSED position.

10.3.2

OPEN valves:

~~000~~ MV-*-3-3
~~000~~ Gas Sample Assembly Valves

~~000~~
3-16-95 10.3.3

Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.

~~000~~
3-16-95 10.3.4

Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.

~~000~~
3-16-95 10.3.5

CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.

~~000~~
3-16-95 10.3.6

OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.

~~000~~
3-16-95 10.3.7

Depress the Reset Sample push button HS-*-23-1.

~~000~~
3-16-95 10.3.8

Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

~~000~~
3-16-95 10.4.1

Remove plug to atmosphere upstream of F-*-5-1.

10.4.2

OPEN valves:

~~000~~ MV-*-5-4

- 00W
3-16-95 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.
- 00W
3-16-95 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.
- 10.4.5 OPEN valves:
- 00W
3-16-95 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.
- 00W
3-16-95 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.
- 00W
3-16-95 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- 00W MV-*-1-1 through MV-*-1-4
00W MV-*-3-3
00W MV-*-4-1 through MV-*-4-4
00W MV-*-5-1 through MV-*-5-6
00W MV-*-7-1 through MV-*-7-4
00W MV-*-8-1
- 00W
3-16-95 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.
- 00W
3-16-95 10.4.11 Open the following circuit breakers and fuses:
- 00W CB-1 through CB-7
00W FU-1 through FU-13
- 00W
3-16-95 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905A (013AX)		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 29 MTE, 0840 5-20-95		
Test Performed By: DE Winters					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.3	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	124.2 120.5 0V	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	124.2 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A A	
9.2.4.1:2	XFMR1: Primary Secondary	120.3 123.5	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: JTP-POL-905A		
Title of Test: Electrical Systems			Equipment Serial Number(s): F1WXP 29 MTE 0840 5-20-95		
Test Performed By: B E Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	123.2 24.0	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	122.7 122.7	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	51° 61°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	123.5	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905A		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: GE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	47° 57°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	123.4	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	123.2	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	123.2	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PWL-905A		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: D E Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on ∞ on ∞ on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL 905 A		
Title of Test: Electrical Systems			Equipment Serial Number(s): FLUX 29 MTE 0840 5-20-95		
Test Performed By: DE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	0.2	< 1 Ohm	A	

Test Witnesses:

J. B. Schneider
Test Director3-16-95
DateD. O. Wallace
Recorder3-16-95
DateN/A
Quality AssuranceN/A
Date

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTR-PNL-905A		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: JW Burton					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	38"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

J. C. Schneider
Test Director

3-16-95
Date

D. O. Wallace
Recorder

3-16-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

WHC-SD-WM-ATR-090

REV 0

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX F

TANK 103-AX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRs Safety Programs Engineering Support
July 27, 1994**

TEST EXECUTION SHEET

Date: <u>3-16-95</u>		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: <u>VT P-PNL-905C (033AX)</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>OT Lott</u>		TEST DIRECTOR: <u>RM Bender</u>	
RECORDER: <u>D.O. Wallace</u>		WITNESSES: <u>TC Schneider</u>	
TEST EXECUTION			
<u>Bill E. Winter</u>	<u>3-16-95</u>	<u>D.O. Wallace</u>	<u>3-16-95</u>
Installation Contractor	Date	Recorder	Date
<u>RM Bender</u>	<u>3-16-95</u>		
Test Director	Date		
TEST WITNESS			
<u>TC Schneider</u>	<u>3-16-95</u>	<u>OT Lott</u>	<u>3-16-95</u>
Witness	Date	Witness	Date
<u>TC Schneider</u>		<u>OT Lott</u>	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u>		<u>Ray L. Osterman</u>	<u>3-31-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>Morgan D. Harding</u>	<u>4-20-95</u>	<u>Hank M. Chapin</u>	<u>4/26/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. D. on Taken</u>	<u>4/19/95</u>	<u>OT Lott</u>	<u>4/5/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Exception Sheet prior to the performance of any part of this ATP.

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- OW 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- OW 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- OW 8.1.3 Leak tests on the pneumatic systems have been performed.
- OW 8.1.4 The following circuit breakers and fuses are open
 - OW CB-1 through CB-7
 - OW FU-1 through FU-13

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ODW 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

ODW 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

ODW 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

ODW MV-*-1-1 through MV-*-1-4
ODW MV-*-3-3
ODW MV-*-4-3 through MV-*-4-4
ODW MV-*-5-1 through MV-*-5-6
ODW MV-*-7-3 through MV-*-7-4
ODW Sample and exhaust line ends are capped.

ODW 8.1.8 The following sample line valves are OPEN

ODW FCV-*-1-1
ODW FI-*-3-1
ODW MV-*-4-1 through MV-*-4-2
ODW FI-*-5-1
ODW MV-*-7-1 through MV-*-7-2
ODW MV-*-8-1.

Check that all prerequisites have been met.

D.O. Wanner 3-16-95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

ODW 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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QOW 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

QOW 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

QOW 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

QOW 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

QOW 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

QOW 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

QOW 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

QOW 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

QOW 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

QOW 9.2.1.8 Verify heater operates.

QOW 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

QOW 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

QOW 9.2.1.11 Adjust Heater temperature control to 70°F.

QOW 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

DDW 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

DDW 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

DDW 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

DDW 9.2.2.3 Verify pump turns ON.

DDW 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

DDW 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

DDW 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

DDW 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

DDW 9.2.3.3 Verify cabinet light is ON.

DDW 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

DDW 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

DDW 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

DDW 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

DDW 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

DDW 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

DDW 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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000 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

000 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

000 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

000 9.2.4.3.3 Visually verify instruments are operating:
000 Transmitter FIT-*-7-1,
000 Flow Alarm FASL-*-7-1.

000 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

000 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

000 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

000 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

000 9.2.4.4.2 Visually verify instrument displays are operating:

000 Transmitter NIT-*-6-1,
000 Transmitter NIT-*-12-1,
000 Recorder NR-*-6/12-1.

000 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

000 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

000 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

000 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

000 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

- QOW 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- QOW 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- QOW 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- QOW 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing.. Record initial temperature and increased temperature of nominally 10 degrees.
- QOW 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- QOW 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- QOW 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- QOW 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- QOW 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- QOW 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- QOW 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- QOW 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- QOW 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- QOW 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- OW 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- OW 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- OW 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- OW 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- OW 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- OW 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- OW 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- OW 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- OW 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- OW 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- OW 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- OW 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

ODW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

ODW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

ODW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

ODW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

ODW Horn, YAH-*-9-1, is ON.

ODW High Hydrogen Beacon YAL-*-10-2 is ON.

ODW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

ODW Trouble Beacon YAL-*-18-1 is ON.

ODW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

ODW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

ODW 9.2.4.8.4 Release Alarm Test push button.

ODW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

ODW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

ODW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

ODW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

ODW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

3-16-95

ODW The Grab Sample push button light HSL-*-22-1 is illuminated.

ODW The Reset Sample push button light HSL-*-23-1 is illuminated.

ODW The Reset Sample light YAL-*-23-1 is illuminated.

ODW 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

ODW 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

ODW 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

ODW 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

ODW 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

ODW 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

ODW 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

3.16.95

9.4 REVIEW

Check that all steps have been completed.

D.O. Wallace 3-16-95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- oo 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- oo 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

oo MV-*-1-1 through MV-*-1-4
oo MV-*-3-3
oo MV-*-4-3 through MV-*-4-4
oo MV-*-5-1 through MV-*-5-6
oo MV-*-7-3 through MV-*-7-4
oo Sample and exhaust line ends are capped.

- 10.1.4 Verify the following sample line valves are OPEN

oo FCV-*-1-1
oo FI-*-3-1
oo MV-*-4-1 through MV-*-4-2
oo FI-*-5-1
oo MV-*-7-1 through MV-*-7-2
oo MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- oo 10.2.1 Set fused switch FU-13 to the CLOSED position.
- oo 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.

- 10.2.3 OPEN valves:

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000 MV-*-1-1
000 MV-*-1-2
000 MV-*-1-3
000 MV-*-1-4

- 000 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 000 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 000 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 000 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 000 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- 000 MV-*-3-3
000 Gas Sample Assembly Valves
- 000 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 000 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 000 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 000 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 000 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 000 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 000 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

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000 MV-*-5-4

OW MV-*-5-5

OW 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

OW 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

OW MV-*-5-4

OW MV-*-5-6

OW 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

OW 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

OW 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

OW MV-*-1-1 through MV-*-1-4

OW MV-*-3-3

OW MV-*-4-1 through MV-*-4-4

OW MV-*-5-1 through MV-*-5-6

OW MV-*-7-1 through MV-*-7-4

OW MV-*-8-1

OW 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

OW 10.4.11 Open the following circuit breakers and fuses:

OW CB-1 through CB-7

OW FU-1 through FU-13

OW 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

3-16-95

10.5 REVIEW

Check that all steps have been completed.

Do. Walker 3-16-95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905C (03JAX)		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: B E Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.4	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	124.2 120.5 .3	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	124.4 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	120.4 123.7	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: G E Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	123.4 24.0	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*12-1 NR-* 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	122.9 122.9	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	58° 68°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	123.7	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PWL-905C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MIE 0840 5-20-95		
Test Performed By: BE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	66° 78°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	120.5	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	123.3	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	123.4	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905C		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: BE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on on on on on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTP-PNL-905C (033AX)		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 29 MTE 0840 5-20-95		
Test Performed By: DE Winter					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

R M Rubin 3-16-95
Test Director

3-16-95
Date

G.O. Wallace
Recorder

3-16-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-16-95			SHMS Unit Number: VTA-PNL-905C		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: JW Gurtisen					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	38"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

JM Peltier
Test Director

3-16-95
Date

D.O. Wallace
Recorder

3-16-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

TEST LOG

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APPENDIX G

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TEST EXECUTION SHEET

Date: <u>3/24/95</u>		Document Number: <u>WHC-SD-WM-ATR-090</u>	
SHMS Unit Number: <u>VTP-PNL-33058</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>D LOTT</u>		TEST DIRECTOR: <u>ROY BENDON</u>	
RECORDER: <u>F.L. Snyoon</u>		WITNESSES:	
TEST EXECUTION			
<u>[Signature]</u> Installation Contractor	<u>3-27-95</u> Date	<u>[Signature]</u> Recorder	<u>3/24/95</u> Date
<u>[Signature]</u> Test Director	<u>3-29-95</u> Date		
TEST WITNESS			
<u>N/A</u> Witness	 Date	 Witness	 Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
<u>X</u> Without Exception	 With Exception/Resolved	 With Exception/Outstanding	
<u>NA</u> Field Engineering	 Date	<u>[Signature]</u> Project Engineer	<u>3-31-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
<u>X</u> Without Exception	 With Exception/Resolved	 With Exception/Outstanding	
<u>[Signature]</u> Plant Operations	<u>4-26-95</u> Date	<u>[Signature]</u> Quality Assurance	<u>4/27/95</u> Date
<u>[Signature]</u> Safety	<u>4/19/95</u> Date	<u>[Signature]</u> Project Engineer	<u>4/5/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste
Tank Safety Assurance. ~~Waste~~ TWRS - Safety

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- 3/24/95
J 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- 3/24/95
J 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- 3/24/95
J 8.1.3 Leak tests on the pneumatic systems have been performed.
- 3/24/95
J 8.1.4 The following circuit breakers and fuses are open
- J CB-1 through CB-7
J FU-1 through FU-13

3/24/95
1 8.1.5

All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

3/24/95
1 8.1.6

Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

3/24/95
1 8.1.7

The following sample lines/valves are **CAPPED/CLOSED**.

- 1 MV-*-1-1 through MV-*-1-4
- 1 MV-*-3-3
- 1 MV-*-4-3 through MV-*-4-4
- 1 MV-*-5-1 through MV-*-5-6
- 1 MV-*-7-3 through MV-*-7-4
- 1 Sample and exhaust line ends are capped.

3/24/95
1 8.1.8

The following sample line valves are **OPEN**

- 1 FCV-*-1-1
- 1 FI-*-3-1
- 1 MV-*-4-1 through MV-*-4-2
- 1 FI-*-5-1
- 1 MV-*-7-1 through MV-*-7-2
- 1 MV-*-8-1.

Check that all prerequisites have been met.

Shayd Singh 3/24/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

3/24/95
1 9.1.1

Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

3/24/95
1/ 9.1.2

Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

3/24/95
1/ 9.1.3

Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

3/24/95
1/ 9.2.1.1

Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

3/24/95
1/ 9.2.1.2

Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

3/24/95
1/ 9.2.1.3

Switch circuit breaker CB-1 to the CLOSED position.

3/24/95
1/ 9.2.1.4

Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

3/24/95
1/ 9.2.1.5

Adjust air conditioner temperature control to a value above ambient temperature.

3/24/95
1/ 9.2.1.6

Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

3/24/95
1/ 9.2.1.7

Adjust Heater temperature control to a value above ambient temperature.

3/24/95
1/ 9.2.1.8

Verify heater operates.

3/24/95
1/ 9.2.1.9

Adjust Air Conditioner temperature control to a value below ambient temperature.

3/24/95
1/ 9.2.1.10

Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

3/24/95
1/ 9.2.1.11

Adjust Heater temperature control to 70°F.

3/24/95
1/ 9.2.1.12

Adjust Air Conditioner temperature control to 80°F.

3/24/95

1 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

3/24/95

1 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

3/24/95

1 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

3/24/95

1 9.2.2.3 Verify pump turns ON.

3/24/95

1 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

3/24/95

1 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

3/24/95

1 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

3/24/95

1 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

3/24/95

1 9.2.3.3 Verify cabinet light is ON.

3/24/95

1 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

3/24/95

1 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

3/24/95

1 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

3/24/95

1 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation9.2.4.1 Isolation Transformer

3/24/95

1 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

3/24/95

1 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

3/24/95

9.2.4.2 DC Power

1

9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

3/24/95

- 1 9.2.4.2.2 Verify power is being supplied to the DC power source PWR*-01. Record AC input and DC output voltages.

3/24/95

1 9.2.4.3 Flow Alarm System

3/24/95

- 1 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

3/24/95

- 1 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

3/24/95

- 1 9.2.4.3.3 Visually verify instruments are operating:

3/24/95

- 1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.

3/24/95

- 1 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

3/24/95

- 1 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

3/24/95

- 1 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

3/24/95

1 9.2.4.4 Hydrogen Sensors

3/24/95

- 1 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

3/24/95

- 1 9.2.4.4.2 Visually verify instrument displays are operating:

3/24/95

- 1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.

3/24/95

- 1 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

3/24/95

- 1 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

3/24/95

- 1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

3/24/95

- 1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

3/24/95

- 1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

3/24/95

1 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

3/24/95

1 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.

3/24/95

1 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.

3/24/95

1 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.

3/24/95

1 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.

3/24/95

1 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.

3/24/95

1 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

3/24/95

1 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

3/24/95

1 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.

3/24/95

1 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.

3/24/95

1 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

3/24/95

1 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.

3/24/95

1 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

3/24/95

1 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

3/24/95

1 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.

3/24/95

1 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

3/24/95

1 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

3/24/95

1 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

3/24/95 9.2.4.7 Cabinet Temperature

1 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.

3/24/95

1 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.

3/24/95

1 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

3/24/95

1 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

3/24/95

1 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

3/24/95

1 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.

3/24/95

1 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

3/24/95

1 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

3/24/95

1 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

3/24/95

1 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.

3/24/95

1 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

3/24/95
1 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

3/24/95
1 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

3/24/95
1 9.2.4.8 Alarm Systems

3/24/95
1 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

3/24/95
1 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

1 Horn, YAH-*-9-1, is ON.

1 High Hydrogen Beacon YAL-*-10-2 is ON.

1 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

1 Trouble Beacon YAL-*-18-1 is ON.

1 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

1 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

3/24/95
1 9.2.4.8.4 Release Alarm Test push button.

3/24/95
1 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

3/24/95
1 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

3/24/95
1 9.2.4.9 Auto Sampler System

3/24/95
1 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

3/24/95
1 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

3/24/95
1 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

1 The Grab Sample push button light HSL-*-22-1 is illuminated.

1 The Reset Sample push button light HSL-*-23-1 is illuminated.

1 The Reset Sample light YAL-*-23-1 is illuminated.

3/24/95

1 9.2.4.9.4

After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

3/24/95

1 9.2.4.9.5

Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

3/24/95

1 9.2.4.9.6

Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

3/24/95

1 9.2.4.9.7

Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

3/24/95

1 9.3.1

Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

3/24/95

1 9.3.2

Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

3/24/95

1 9.3.3

Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

Shayla Singh 3/24/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

3/24/95

1 10.1.1

Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.

3/24/95

1 10.1.2

Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.

10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

1 MV-*-1-1 through MV-*-1-4

1 MV-*-3-3

1 MV-*-4-3 through MV-*-4-4

1 MV-*-5-1 through MV-*-5-6

1 MV-*-7-3 through MV-*-7-4

1 Sample and exhaust line ends are capped.

10.1.4 Verify the following sample line valves are OPEN

1 FCV-*-1-1

1 FI-*-3-1

1 MV-*-4-1 through MV-*-4-2

1 FI-*-5-1

1 MV-*-7-1 through MV-*-7-2

1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

3/24/95

1 10.2.1

Set fused switch FU-13 to the CLOSED position.

3/24/95

1 10.2.2

Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.

10.2.3 OPEN valves:

1 MV-*-1-1
1 MV-*-1-2
1 MV-*-1-3
1 MV-*-1-4

3/24/95

1 10.2.4

Switch circuit breaker CB-3 to the CLOSED position.

3/24/95

1 10.2.5

Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.

3/24/95

1 10.2.6

Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.

3/24/95

1 10.2.7

Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

3/24/95

1 10.3.1

Set fused switch FU-10 to the CLOSED position.

10.3.2

OPEN valves:

1 MV-*-3-3

1 Gas Sample Assembly Valves

3/24/95

1 10.3.3

Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.

3/24/95

1 10.3.4

Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.

3/24/95

1 10.3.5

CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.

3/24/95

1 10.3.6

OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.

3/24/95

1 10.3.7

Depress the Reset Sample push button HS-*-23-1.

3/24/95

1 10.3.8

Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

3/24/95

1 10.4.1

Remove plug to atmosphere upstream of F-*-5-1.

10.4.2

OPEN valves:

1 MV-*-5-4

- 3/24/95
✓ 10.4.3 1 MV--5-5 Adjust to nominally 2.0 cfh flow through FI--5-1.
- 3/24/95
✓ 10.4.4 CLOSE valves MV--5-4 and MV--5-5. Verify that FI--5-1 indicates zero flow.
- 10.4.5 OPEN valves:
✓ MV--5-4
✓ MV--5-6
- 3/24/95
✓ 10.4.6 Adjust to nominally 2.0 cfh flow through FI--5-1.
- 3/24/95
✓ 10.4.7 CLOSE valves MV--5-4 and MV--5-6. Verify that FI--5-1 indicates zero flow.
- 3/24/95
✓ 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
✓ MV--1-1 through MV--1-4
✓ MV--3-3
✓ MV--4-1 through MV--4-4
✓ MV--5-1 through MV--5-6
✓ MV--7-1 through MV--7-4
✓ MV--8-1
- 3/24/95
✓ 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F--5-1.
- 3/24/95
✓ 10.4.11 Open the following circuit breakers and fuses:
✓ CB-1 through CB-7
✓ FU-1 through FU-13
- 3/24/95
✓ 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

Shayel Singh 3/24/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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REV 0

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APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP - PNL - 330SB		
Title of Test: Electrical Systems			Equipment Serial Number(s): FLUKE 27 0026 12/22/95		
Test Performed By: PETE BASCHKE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	122 122 0	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	122 /	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	ϕ ϕ	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 125	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95		SHMS Unit Number: VTP-PNL-3305B			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 27 0024 12/22/95			
Test Performed By: PETE BASCHKE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	121V 24V	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	124V 125V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	39 50	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	126	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95		SHMS Unit Number: VTP-PNL-33053			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 27			
Test Performed By: PETE BASCH		6026 12/22/95			
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	Ø	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	39° 49°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125V	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	Ø	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	126	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	Ø	0V	A	

Date:	3/24/95	SHMS Unit Number: VTP-PNL - 3305 B			
Title of Test: Electrical Systems	Equipment Serial Number(s): FLUKE 27 0026 12/22/95				
Test Performed By: PETE BASCHE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3/24/95		SHMS Unit Number: VTP - PNL - 330SB			
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKE 27 0026 12/22/95			
Test Performed By: PETE BASCHKE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.4	< 1 Ohm	A	

Test Witnesses:

Gm Rudy
Test Director

3-25-95
Date

Hayel Snyder
Recorder

3/24/95
Date

Hayel Snyder N/A
Quality Assurance

N/A
Date

3/24/95 HMC 4/27/95

TEST DATA SHEET

Date: 3/24/95		SHMS Unit Number: VTP - PNL - 330513			
Title of Test: Pneumatic Systems		Equipment Serial Number(s):			
Test Performed By: RANDY WALLI		NA			
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	< 40	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	Flow	Indicates Flow	A	
10.3.6	FI-*-3-1	No Flow	Indicates No Flow	A	
10.4.4	FI-*-5-1	No Flow	Zero Flow	A	
10.4.7	FI-*-5-1	No Flow	Zero Flow	A	

Test Witnesses:

 Test Director

 3-25-95
 Date

 Recorder

 3/24/95
 Date

 N/A
 Quality Assurance

 N/A
 Date

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APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

[illegible]

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APPENDIX H

TANK 111-S

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

111-5

TEST EXECUTION SHEET

Date: 3-23-95		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: VTP-PNL-3305K		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: O. Lott		TEST DIRECTOR: Randy Bunch	
RECORDER: D.O. Wallace		WITNESSES: NA	
TEST EXECUTION			
J. L. Rust 3-24-95 Installation Contractor Date		D.O. Wallace 3-24-95 Recorder Date	
Randy Bunch 3-27-95 Test Director Date			
TEST WITNESS			
NA Witness		D.T. Lott 3/24/95 Witness Date	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
NA Field Engineering		Terry K. Osterman 3-30-95 Project Engineer Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
J. J. Miller 4-26-95 Plant Operations Date		Hank M. Chapin 4/27/95 Quality Assurance Date	
M. J. Taten 4/19/95 Safety Date		D.T. Lott 4-3-95 Project Engineer Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
 - 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
 - 3.2.4 Approve field changes to the ATP.
 - 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
 - 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
 - 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
 - 3.2.8 Sign Test Execution Sheet when ATP has been performed.
 - 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
 - 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.
- 3.3 WITNESSES (Provided by Participating Organizations)
- 3.3.1 Witness the tests.
 - 3.3.2 Evaluate results of testing.
 - 3.3.3 Assist the Test Director when requested.
 - 3.3.4 Sign Test Exception Sheet as a witness.
 - 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.
- 3.4 RECORDER (Provided by KEH)
- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
 - 3.4.2 Observe tests, record test data and maintain test log.
 - 3.4.3 Sign the Test Exception Sheet as the recorder.
 - 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

5.3.2 Sign and date Test Execution Sheet in the spaces provided.

5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.

6.2.2 Enter name and organization of objecting party for each exception.

6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.

6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.

6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:

- Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
- Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

 8.1.3 Leak tests on the pneumatic systems have been performed.

 8.1.4 The following circuit breakers and fuses are open

3-23-95

 CB-1 through CB-7

 FU-1 through FU-13

8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

 MV-*-1-1 through MV-*-1-4

 MV-*-3-3

 MV-*-4-3 through MV-*-4-4

 MV-*-5-1 through MV-*-5-6

 MV-*-7-3 through MV-*-7-4

 Sample and exhaust line ends are capped.

 8.1.8 The following sample line valves are OPEN

 FCV-*-1-1

 FI-*-3-1

 MV-*-4-1 through MV-*-4-2

 FI-*-5-1

 MV-*-7-1 through MV-*-7-2

 MV-*-8-1.

Check that all prerequisites have been met.

D. O. Wallace 3-23-95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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ODW 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

ODW 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

ODW 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

ODW 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

ODW 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

ODW 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

ODW 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

ODW 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

ODW 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

ODW 9.2.1.8 Verify heater operates.

ODW 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

ODW 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

ODW 9.2.1.11 Adjust Heater temperature control to 70°F.

ODW 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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OW 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

OW 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

OW 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

OW 9.2.2.3 Verify pump turns ON.

OW 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

OW 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

OW 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

OW 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

OW 9.2.3.3 Verify cabinet light is ON.

OW 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

OW 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

OW 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

OW 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

OW 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

OW 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

OW 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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- ODW 9.2.4.2.2 Verify power is being supplied to the DC power source PWR*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

- ODW 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

- ODW 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

- ODW 9.2.4.3.3 Visually verify instruments are operating:
ODW Transmitter FIT*-7-1,
ODW Flow Alarm FASL*-7-1.

- ODW 9.2.4.3.4 Verify zero voltage between PLC YYC*-01 Input Number 2 and PLC 120V Common.

- ODW 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

- ODW 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

- ODW 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

- ODW 9.2.4.4.2 Visually verify instrument displays are operating:

ODW Transmitter NIT*-6-1,
ODW Transmitter NIT*-12-1,
ODW Recorder NR*-6/12-1.

- ODW 9.2.4.4.3 Verify 120V present between PLC YYC*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

- ODW 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ODW 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

- ODW 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

- ODW 9.2.4.5.3 Visually verify controller TIC*-14-1 display is operating.

- DDW 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- DDW 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- DDW 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- DDW 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- DDW 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- DDW 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- DDW 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- DDW 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- DDW 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- DDW 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- DDW 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- DDW 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- DDW 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- DDW 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

OW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

OW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

OW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

OW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

OW Horn, YAH-*-9-1, is ON.

OW High Hydrogen Beacon YAL-*-10-2 is ON.

OW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

OW Trouble Beacon YAL-*-18-1 is ON.

OW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

OW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

OW 9.2.4.8.4 Release Alarm Test push button.

OW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

OW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

OW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

OW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

OW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist: *

QOW The Grab Sample push button light HSL-*-22-1 is illuminated.

QOW The Reset Sample push button light HSL-*-23-1 is illuminated.

QOW The Reset Sample light YAL-*-23-1 is illuminated.

QOW 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

QOW 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

QOW 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

QOW 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

QOW 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

QOW 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

QOW 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

D.O. Wallace 3-24-95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- DDW 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- DDW 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- DDW MV-*-1-1 through MV-*-1-4
 - DDW MV-*-3-3
 - DDW MV-*-4-3 through MV-*-4-4
 - DDW MV-*-5-1 through MV-*-5-6
 - DDW MV-*-7-3 through MV-*-7-4
 - DDW Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- DDW FCV-*-1-1
 - DDW FI-*-3-1
 - DDW MV-*-4-1 through MV-*-4-2
 - DDW FI-*-5-1
 - DDW MV-*-7-1 through MV-*-7-2
 - DDW MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- DDW 10.2.1 Set fused switch FU-13 to the CLOSED position.
- DDW 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 3-24-95
- 10.2.3 OPEN valves:

000 MV-*-1-1
000 MV-*-1-2
000 MV-*-1-3
000 MV-*-1-4

- 000 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 000 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 000 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 000 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 000 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- 000 MV-*-3-3
000 Gas Sample Assembly Valves
- 000 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 000 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 000 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 000 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 000 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 000 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 000 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

000 MV-*-5-4

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ODW MV-*-5-5

ODW 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

ODW 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

ODW MV-*-5-4
ODW MV-*-5-6

ODW 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

ODW 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

ODW 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

ODW MV-*-1-1 through MV-*-1-4
ODW MV-*-3-3
ODW MV-*-4-1 through MV-*-4-4
ODW MV-*-5-1 through MV-*-5-6
ODW MV-*-7-1 through MV-*-7-4
ODW MV-*-8-1

ODW 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

ODW 10.4.11 Open the following circuit breakers and fuses:

ODW CB-1 through CB-7
ODW FU-1 through FU-13

ODW 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.
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10.5 REVIEW

Check that all steps have been completed.

ODW 3-24-95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3-28-95			SHMS Unit Number: UTP-PNL-3305 K		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson MTE 0033 12-1-95		
Test Performed By: Rm Murphy					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125 125 0V	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	124 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1:2	XFMR1: Primary Secondary	124 125	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-23-95			SHMS Unit Number: JTP-PNL-3305K		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson m-TE 0033 12-1-95		
Test Performed By: RM Murphy					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125 24 25	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125 125	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	59° 69°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-23-95			SHMS Unit Number: VTP PNL-3303K		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson MTE 0033 12-1-95		
Test Performed By: Am Murphy					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	61° 73°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-24-95			SHMS Unit Number: VTP-PWL-3305K		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson MATE 0033 12-1-95		
Test Performed By: AW Almquist					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on ∞ on ∞ on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3.24-95		SHMS Unit Number: VTP-PNL-3305K			
Title of Test: Electrical Systems		Equipment Serial Number(s): Simpson NOTE 0033 12-1-95			
Test Performed By: AW Almquist					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	< 1	< 1 Ohm	A	

Test Witnesses:

J.R. Bunch
Test Director

3-24-95
Date

D.D. Wallace
Recorder

3-24-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-24-95			SHMS Unit Number: VTR PNL-3305 K		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: S. W. O'Leary					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	710'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	24"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

J. R. Duneck
Test Director

3-24-95
Date

S. W. O'Leary
Recorder

3-24-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX I

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TEST EXECUTION SHEET

Date: <u>3-23-95</u>		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: <u>VTA PNL-3305 L</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>OT Lott</u>		TEST DIRECTOR: <u>Rm Bender</u>	
RECORDER: <u>F.L. SNYDER</u> <u>D.O. Wallace</u>		WITNESSES: <u>OT Lott</u>	
TEST EXECUTION			
<u>LE Kent</u> <u>AW Almquist</u>	<u>3-27-95</u>	<u>Shayd Singh</u>	<u>3/23/95</u>
Installation Contractor	Date	Recorder	Date
<u>Rm Bender</u>	<u>3-25-95</u>		
Test Director	Date		
TEST WITNESS			
<u>OT Lott</u>	<u>3-25-95</u>		
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u>	<u>3-31-95</u>	<u>Henry R. Osterman</u>	<u>3-31-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>James J. Kline</u>	<u>4-26-95</u>	<u>Frank M. Chapin</u>	<u>4/26/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. k. Taha</u>	<u>4/19/95</u>	<u>OT Lott</u>	<u>4/5/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS safety.*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

1 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

1 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

1 8.1.3 Leak tests on the pneumatic systems have been performed.

1 8.1.4 The following circuit breakers and fuses are open

1 CB-1 through CB-7
1 FU-1 through FU-13

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- 1 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- 1 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- 1 8.1.7 The following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 1 8.1.8 The following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- 1 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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1 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

4 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

1 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

4 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

1 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

1 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

4 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

4 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

4 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

4 9.2.1.8 Verify heater operates.

4 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

4 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the KI-*-01 relay.

Note: Heat may still radiate from Heater.

4 9.2.1.11 Adjust Heater temperature control to 70°F.

1 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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1 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

4 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

4 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

4 9.2.2.3 Verify pump turns ON.

4 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

4 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

4 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

4 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

4 9.2.3.3 Verify cabinet light is ON.

4 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

4 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

4 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

4 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

4 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

4 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

4 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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4 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

4 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

4 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

4 9.2.4.3.3 Visually verify instruments are operating:
4 Transmitter FIT-*-7-1,
4 Flow Alarm FASL-*-7-1.

4 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

4 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

4 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

4 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

4 9.2.4.4.2 Visually verify instrument displays are operating:

4 Transmitter NIT-*-6-1,
4 Transmitter NIT-*-12-1,
4 Recorder NR-*-6/12-1.

4 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

4 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

4 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

4 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

4 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- ✓ 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing.. Record initial temperature and increased temperature of nominally 10 degrees.
- ✓ 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ✓ 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ✓ 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ✓ 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ✓ 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ✓ 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ✓ 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 4 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 4 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 4 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 4 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.
- 9.2.4.7 Cabinet Temperature
- 4 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 4 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 4 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 4 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 4 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 4 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 4 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 4 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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4 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

4 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

4 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

4 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

4 Horn, YAH-*-9-1, is ON.

4 High Hydrogen Beacon YAL-*-10-2 is ON.

4 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

4 Trouble Beacon YAL-*-18-1 is ON.

4 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

4 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

4 9.2.4.8.4 Release Alarm Test push button.

4 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

4 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

4 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

4 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

4 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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✓ The Grab Sample push button light HSL-*-22-1 is illuminated.

✓ The Reset Sample push button light HSL-*-23-1 is illuminated.

✓ The Reset Sample light YAL-*-23-1 is illuminated.

✓ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

✓ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

✓ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

✓ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

✓ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

✓ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

✓ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 4 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 4 MV-*-1-1 through MV-*-1-4
 - 4 MV-*-3-3
 - 4 MV-*-4-3 through MV-*-4-4
 - 4 MV-*-5-1 through MV-*-5-6
 - 4 MV-*-7-3 through MV-*-7-4
 - 4 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 4 FCV-*-1-1
 - 4 FI-*-3-1
 - 4 MV-*-4-1 through MV-*-4-2
 - 4 FI-*-5-1
 - 4 MV-*-7-1 through MV-*-7-2
 - 4 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 1 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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✓ MV-*-1-1
✓ MV-*-1-2
✓ MV-*-1-3
✓ MV-*-1-4

- ✓ 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- ✓ 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- ✓ 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- ✓ 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- ✓ 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
✓ MV-*-3-3
✓ Gas Sample Assembly Valves
- ✓ 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- ✓ 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- ✓ 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- ✓ 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- ✓ 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- ✓ 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- ✓ 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
✓ MV-*-5-4

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4 MV-*-5-5

4 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

4 MV-*-5-4
4 MV-*-5-6

4 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

4 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

4 MV-*-1-1 through MV-*-1-4
4 MV-*-3-3
4 MV-*-4-1 through MV-*-4-4
4 MV-*-5-1 through MV-*-5-6
4 MV-*-7-1 through MV-*-7-4
4 MV-*-8-1

4 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

4 10.4.11 Open the following circuit breakers and fuses:

4 CB-1 through CB-7
4 FU-1 through FU-13

4 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/23/95			SHMS Unit Number: VTP-PNL-3305L		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: A.W. ALMQUIST					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm		
9.1.3	Line Voltages: L1 L2 N	125V 125V 0	L1, L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	OK	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OK	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	OK	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	OK	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	OK	Pump ON	A	
9.2.3.3	LT1	OK	Light ON	A	
9.2.3.4	RCPT: H N	120V 0	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	0 0	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	120V 0	Primary, Secondary: 120V ± 5%.	A	

TEST DATA SHEET

Date: 3/23/95			SHMS Unit Number: VTP-PNL-3705 L		
Title of Test: Electrical Systems			Equipment Serial Number(s): FLUKE 27 0026 12/22/95		
Test Performed By: AWL ALMQUIST					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	120V 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125V 125V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	55° 65°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/23/95			SHMS Unit Number: VTP-PNL-3305L		
Title of Test: Electrical Systems			Equipment Serial Number(s): FLUR2 27 0026 12/22/95		
Test Performed By: A.W. ALMQUIST					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	Ø	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	60° 70°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125V	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	Ø	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	Ø	0V	A	

TEST DATA SHEET

Date: 3/23/95		SHMS Unit Number: VTP-PAL - 3305L	
Title of Test: Electrical Systems		Equipment Serial Number(s): FLUKA 27 0026 12/22/95	
Test Performed By: A.W. ALMQUIST			
Procedure Number	Item	Value	Range (A/R)
9.2.4.8.3	YAH*-9-1 YAL*-10-2 BY*-10-1 YAL*-18-1 BY*-18-1 YAL*-16-1 YAL*-7-1 YAL*-10-1	ON ON ON OK ON ON ON ON	Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON
9.2.4.8.5	Inactive Alarms	OK	OFF
9.2.4.9.3	HSL*-22-1 HSL*-23-1 YAL*-23-1	ON ON ON	ON ON ON
9.2.4.9.4	HSL*-22-1 HSL*-23-1 YAL*-23-1	OFF ON ON	OFF ON ON
9.2.4.9.5	HSL*-22-1	OFF	OFF
9.2.4.9.6	HSL*-23-1 YAL*-23-1	OFF OFF	OFF OFF
9.3.1	Namesplates	OK	Near IS Devices.

TEST DATA SHEET

Date: 3/23/95			SHMS Unit Number: VTP-PNL-3305 L		
Title of Test: Electrical Systems			Equipment Serial Number(s):		
Test Performed By: A.W. ALMQUIST					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

Test Director
RecorderN/A
Quality Assurance3-25-95
Date3/23/95
DateN/A
Date

TEST DATA SHEET

Date: 3-23-95			SHMS Unit Number: VTP-PNL-3303 L		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): NA		
Test Performed By: Randy Wallig					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	>15	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	>10	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED		
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust		
10.2.7	PDI-*-4-1	<40	< 40" H ₂ O		
10.3.3	FI-*-3-1	Flow	Indicates Flow		
10.3.6	FI-*-3-1	NO FLOW	Indicates No Flow		
10.4.4	FI-*-5-1	NO FLOW	Zero Flow		
10.4.7	FI-*-5-1	NO FLOW	Zero Flow		

Test Witnesses:

Test Director

Recorder

Quality Assurance

Date

Date

Date

3.25.95

3/23/95

N/A

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX J

TANK 101-SX

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REV 0

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TK# 101

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REV 0

TEST EXECUTION SHEET

Date: <u>3/25/95</u>		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: <u>YTP-PNL-3405A</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>DARREN LOTT</u>		TEST DIRECTOR: <u>DARREN LOTT</u>	
RECORDER: <u>KIRK KOHLER</u>		WITNESSES: <u>KIRK KOHLER</u>	
TEST EXECUTION			
<u>LE Grant</u>	<u>3-27-95</u>	<u>Kirk Kohler</u>	<u>3/25/95</u>
Installation Contractor	Date	Recorder	Date
<u>DT Lott</u>	<u>3/25/95</u>		
Test Director	Date		
TEST WITNESS			
<u>Kirk Kohler</u>	<u>3/25/95</u>		
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u>	<u>3-31-95</u>	<u>Ray L. O'Connell</u>	<u>3-31-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>James J. Thos</u>	<u>4-26-95</u>	<u>Frank M. Chafin</u>	<u>4/26/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. O. an Taha</u>	<u>4/19/95</u>	<u>D.T. Lott</u>	<u>4/5/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TURs Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- ~~11~~ 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- ~~11~~ 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- ~~11~~ 8.1.3 Leak tests on the pneumatic systems have been performed.
- ~~11~~ 8.1.4 The following circuit breakers and fuses are open
 - ~~11~~ CB-1 through CB-7
 - ~~11~~ FU-1 through FU-13

~~11~~ 3/25/95

- KK 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- KK 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

- KK 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

KK MV-*-1-1 through MV-*-1-4
KK MV-*-3-3
KK MV-*-4-3 through MV-*-4-4
KK MV-*-5-1 through MV-*-5-6
KK MV-*-7-3 through MV-*-7-4
KK Sample and exhaust line ends are capped.

- KK 8.1.8 The following sample line valves are OPEN

KK FCV-*-1-1
KK FI-*-3-1
KK MV-*-4-1 through MV-*-4-2
KK FI-*-5-1
KK MV-*-7-1 through MV-*-7-2
KK MV-*-8-1.

Check that all prerequisites have been met.

KK *K. J. Jolly* 3/25/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- KK 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

KK 3/25/95

~~AK~~ 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

~~AK~~ 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

~~AK~~ 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

~~AK~~ 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

~~AK~~ 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

~~AK~~ 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

~~AK~~ 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

~~AK~~ 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

~~AK~~ 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

~~AK~~ 9.2.1.8 Verify heater operates.

~~AK~~ 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

~~AK~~ 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

~~AK~~ 9.2.1.11 Adjust Heater temperature control to 70°F.

~~AK~~ 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

~~AK~~ 3/25/95

~~NA~~ 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

~~NA~~ 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

~~NA~~ 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

~~NA~~ 9.2.2.3 Verify pump turns ON.

~~NA~~ 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

~~NA~~ 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

~~NA~~ 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

~~NA~~ 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

~~NA~~ 9.2.3.3 Verify cabinet light is ON.

~~NA~~ 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

~~NA~~ 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

~~NA~~ 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

~~NA~~ 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

~~NA~~ 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

~~NA~~ 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

~~NA~~ 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

~~NA~~ 3/25/95

~~KK~~ 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

~~KK~~ 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

~~KK~~ 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

~~KK~~ 9.2.4.3.3 Visually verify instruments are operating:
~~KK~~ Transmitter FIT-*-7-1,
~~KK~~ Flow Alarm FASL-*-7-1.

~~KK~~ 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

~~KK~~ 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

~~KK~~ 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

~~KK~~ 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

~~KK~~ 9.2.4.4.2 Visually verify instrument displays are operating:

~~KK~~ Transmitter NIT-*-6-1,
~~KK~~ Transmitter NIT-*-12-1,
~~KK~~ Recorder NR-*-6/12-1.

~~KK~~ 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

~~KK~~ 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

~~KK~~ 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

~~KK~~ 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

~~KK~~ 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

~~KK~~ 3/25/95

- ~~KK~~ 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~KK~~ 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ~~KK~~ 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ~~KK~~ 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ~~KK~~ 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ~~KK~~ 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ~~KK~~ 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

- ~~KK~~ 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ~~KK~~ 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ~~KK~~ 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ~~KK~~ 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~KK~~ 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ~~KK~~ 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ~~KK~~ 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

~~KK~~ 3/25/95

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- ~~KK~~ 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- ~~KK~~ 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ~~KK~~ 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ~~KK~~ 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- ~~KK~~ 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- ~~KK~~ 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- ~~KK~~ 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~KK~~ 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ~~KK~~ 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~KK~~ 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- ~~KK~~ 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~KK~~ 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ~~KK~~ 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~KK~~ 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- ~~KK~~ 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

~~KK~~ 3/25/95

~~NA~~ 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

~~NA~~ 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

~~NA~~ 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

~~NA~~ 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

~~NA~~ Horn, YAH-*-9-1, is ON.

~~NA~~ High Hydrogen Beacon YAL-*-10-2 is ON.

~~NA~~ Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

~~NA~~ Trouble Beacon YAL-*-18-1 is ON.

~~NA~~ Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

~~NA~~ All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

~~NA~~ 9.2.4.8.4 Release Alarm Test push button.

~~NA~~ 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

~~NA~~ 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

~~NA~~ 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

~~NA~~ 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

~~NA~~ 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

~~NA~~ 3/25/25

~~14~~ The Grab Sample push button light HSL-*-22-1 is illuminated.

~~14~~ The Reset Sample push button light HSL-*-23-1 is illuminated.

~~14~~ The Reset Sample light YAL-*-23-1 is illuminated.

~~14~~ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

~~14~~ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

~~14~~ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

~~14~~ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

~~14~~ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

~~14~~ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

~~14~~ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

14 3/25/95

9.4 REVIEW

Check that all steps have been completed.

[Signature] 3/25/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- [Initials]* 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- [Initials]* 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

[Initials] MV-*-1-1 through MV-*-1-4
[Initials] MV-*-3-3
[Initials] MV-*-4-3 through MV-*-4-4
[Initials] MV-*-5-1 through MV-*-5-6
[Initials] MV-*-7-3 through MV-*-7-4
[Initials] Sample and exhaust line ends are capped.

- 10.1.4 Verify the following sample line valves are OPEN

[Initials] FCV-*-1-1
[Initials] FI-*-3-1
[Initials] MV-*-4-1 through MV-*-4-2
[Initials] FI-*-5-1
[Initials] MV-*-7-1 through MV-*-7-2
[Initials] MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- [Initials]* 10.2.1 Set fused switch FU-13 to the CLOSED position.
- [Initials]* 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

[Initials] 3/25/95

~~1X~~ MV-*-1-1
~~1X~~ MV-*-1-2
~~1X~~ MV-*-1-3
~~1X~~ MV-*-1-4

- ~~1X~~ 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- ~~1X~~ 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- ~~1X~~ 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- ~~1X~~ 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- ~~1X~~ 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- ~~1X~~ MV-*-3-3
~~1X~~ Gas Sample Assembly Valves
- ~~1X~~ 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- ~~1X~~ 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- ~~1X~~ 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- ~~1X~~ 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- ~~1X~~ 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- ~~1X~~ 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- ~~1X~~ 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
- ~~1X~~ MV-*-5-4

~~1X~~ 3/25/95

~~KK~~ MV-*-5-5

~~KK~~ 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

~~KK~~ 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

~~KK~~ MV-*-5-4
~~KK~~ MV-*-5-6

~~KK~~ 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

~~KK~~ 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

~~KK~~ 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

~~KK~~ MV-*-1-1 through MV-*-1-4
~~KK~~ MV-*-3-3
~~KK~~ MV-*-4-1 through MV-*-4-4
~~KK~~ MV-*-5-1 through MV-*-5-6
~~KK~~ MV-*-7-1 through MV-*-7-4
~~KK~~ MV-*-8-1

~~KK~~ 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

~~KK~~ 10.4.11 Open the following circuit breakers and fuses:

~~KK~~ CB-1 through CB-7
~~KK~~ FU-1 through FU-13

~~KK~~ 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

~~KK~~ *[Signature]* 3/25/95

~~KK~~ 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: JTP-ANL-3405A		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 260		
Test Performed By: PETE BASCHE			950-43-60-017 CAL. DUE 7/15/95		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1 Ω	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125 VAC 125 " 0 VAC	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	AC ON HTR OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	HTR, ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	AC ON HTR OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	PUMP ON	Pump ON	A	
9.2.3.3	LTI	ON	Light ON	A	
9.2.3.4	RCPT: H N	125 HP N	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0 VOLTAGE 0 "	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 VOLTS AC 125.5 VAC	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VTP-PNL-3045A</u>		
Title of Test: Electrical Systems			Equipment Serial Number(s): <u>SEMPSON 260</u> <u>950-43-60-017</u> <u>CAL. DUE 7/1/95</u>		
Test Performed By: <u>PRTE. BASCHER</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	<u>125.5 VAR</u> <u>24 VDC</u>	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	<u>A</u>	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	<u>ON</u>	Power Indication Lights ON	<u>A</u>	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	<u>0 VOLTS</u>	0V	<u>A</u>	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	<u>ON</u>	Displays powered ON.	<u>A</u>	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	<u>125 VAR</u>	120V $\pm$ 5%	<u>A</u>	
9.2.4.5.3	TIC-*-14-1	<u>125 VAR</u> <u>ON</u>	Display powered ON.	<u>A</u>	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	<u>0 VOLTS</u>	0V	<u>A</u>	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	<u>60°F INIT.</u> <u>70°F</u>	Final Temp. = Initial Temp. + 10°F	<u>A</u>	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	<u>125.5 VAR.</u>	120V $\pm$ 5%	<u>A</u>	

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VTP-PNL-3405</u>		
Title of Test: Electrical Systems			Equipment Serial Number(s): <u>SEMPSON 260</u>		
Test Performed By: <u>PETE BASCHE</u>			<u>950-45-60-017</u> <u>CAL. DUE 7/15/95</u>		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0 VOLTS	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	60 °F Ambient 70 °F	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125 VAC	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125VAC	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0 VOLTS	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125 VAC	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0 VAC	0V	A	

Date: 3/25/95		SHMS Unit Number: VTP-PNL-3405A			
Title of Test: Electrical Systems		Equipment Serial Number(s):			
Test Performed By: SCOTT BRUNKDGE		N/A			
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1	ON	ON	A	
	YAL-*-10-2	ON	ON		
	BY-*-10-1	INFINITE	Infinite Resistance Between TB2-21 and TB2-22.		
	YAL-*-18-1	ON	ON		
	BY-*-18-1	INFINITE	Infinite Resistance Between TB2-23 and TB2-24.		
9.2.4.8.3	YAL-*-14/15-1	ON	ON		
	YAL-*-16-1	ON	ON		
	YAL-*-7-1	ON	ON		
	YAL-*-10-1	ON	ON		
9.2.4.8.5	Inactive Alarms	INACTIVE	OFF	A	
9.2.4.9.3	HSL-*-22-1	ON	ON	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.4	HSL-*-22-1	OFF	OFF	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1	OFF	OFF	A	
	YAL-*-23-1	OFF	OFF		
9.3.1	Nameplates	YES INT. SAFE	Near IS Devices..	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VTP-PNL-3405A		
Title of Test: Electrical Systems			Equipment Serial Number(s): N/A		
Test Performed By: SCOTT BRUNEDGE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	INT. SAFE	Proper Labeling.	A	
9.3.3	Resistance	< 1 Ω	< 1 Ohm	A	

Test Witnesses:

DT LT
Test Director

K. K. K. K.
Recorder

N/A
Quality Assurance

3/25/95
Date

3/25/95
Date

N/A
Date

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VTP-AM-3405A</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): <u>N/A</u>		
Test Performed By: <u>SCOTT BRUNDRIDGE</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>>15'</u>	> 15 Feet	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>>10'</u>	> 10 Feet	<u>A</u>	
10.1.3	Sample Line Valves	<u>CLOSED</u>	CLOSED	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>CORRECT</u>	Air going in through Intake, leaving through Exhaust	<u>A</u>	
10.2.7	PDI-*-4-1	<u>29" H₂O</u>	< 40" H ₂ O	<u>A</u>	
10.3.3	FI-*-3-1	<u>10%</u>	Indicates Flow	<u>A</u>	
10.3.6	FI-*-3-1	<u>0 FLOW</u>	Indicates No Flow	<u>A</u>	
10.4.4	FI-*-5-1	<u>NO FLOW</u>	Zero Flow	<u>A</u>	
10.4.7	FI-*-5-1	<u>NO FLOW</u>	Zero Flow	<u>A</u>	

Test Witnesses:

Dan Liff

Test Director

Kub Kihly

Recorder

N/A

Quality Assurance

3/25/95
Date

3/25/95
Date

N/A

Date

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APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX K

TANK 102-SX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

102-SX

TEST EXECUTION SHEET

Date: 3-25-95		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: UTP-PNL-3405B (0238X)		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: OT Lott		TEST DIRECTOR: Rm Bender WHC	
RECORDER: O.O. Wallace		WITNESSES: OT Lott WHC	
TEST EXECUTION			
<u>LE Yant</u>	<u>3-27-95</u>	<u>O.O. Wallace</u>	<u>3-25-95</u>
Installation Contractor	Date	Recorder	Date
<u>Rm Rln</u>	<u>3-25-95</u>		
Test Director	Date		
TEST WITNESS			
<u>OT Lott</u>	<u>3/25/95</u>		
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
<u>X</u> Without Exception	____ With Exception/Resolved	____ With Exception/Outstanding	
<u>NA</u>	<u>3-30-95</u>	<u>Terry L. Osterman</u>	<u>3-30-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
<u>X</u> Without Exception	____ With Exception/Resolved	____ With Exception/Outstanding	
<u>Joe J. Rln</u>	<u>4-26-95</u>	<u>Frank M. Chapin</u>	<u>4/27/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. d. m. Tolen</u>	<u>4/19/95</u>	<u>OT Lott</u>	<u>4-3-95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance.

TWRS Safety

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- OW 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- OW 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- OW 8.1.3 Leak tests on the pneumatic systems have been performed.
- OW 8.1.4 The following circuit breakers and fuses are open

OW CB-1 through CB-7
OW FU-1 through FU-13

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- DDW 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- DDW 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

- DDW 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

DDW MV-*-1-1 through MV-*-1-4
DDW MV-*-3-3
DDW MV-*-4-3 through MV-*-4-4
DDW MV-*-5-1 through MV-*-5-6
DDW MV-*-7-3 through MV-*-7-4
DDW Sample and exhaust line ends are capped.

- DDW 8.1.8 The following sample line valves are OPEN

DDW FCV-*-1-1
DDW FI-*-3-1
DDW MV-*-4-1 through MV-*-4-2
DDW FI-*-5-1
DDW MV-*-7-1 through MV-*-7-2
DDW MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- DDW 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

9.2.1.8 Verify heater operates.

9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

9.2.1.11 Adjust Heater temperature control to 70°F.

9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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QOW 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

QOW 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

QOW 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

QOW 9.2.2.3 Verify pump turns ON.

QOW 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

QOW 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

QOW 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

QOW 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

QOW 9.2.3.3 Verify cabinet light is ON.

QOW 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

QOW 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

QOW 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

QOW 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

QOW 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

QOW 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

QOW 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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QOL 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

QOL 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

QOL 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

QOL 9.2.4.3.3 Visually verify instruments are operating:
QOL Transmitter FIT-*-7-1,
QOL Flow Alarm FASL-*-7-1.

QOL 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

QOL 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

QOL 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

QOL 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

QOL 9.2.4.4.2 Visually verify instrument displays are operating:

QOL Transmitter NIT-*-6-1,
QOL Transmitter NIT-*-12-1,
QOL Recorder NR-*-6/12-1.

QOL 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

QOL 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

QOL 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

QOL 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

QOL 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- ODW 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ODW 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ODW 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ODW 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ODW 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ODW 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ODW 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ODW 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ODW 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ODW 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ODW 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ODW 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ODW 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ODW 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- ODW 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- ODW 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ODW 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ODW 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- ODW 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- ODW 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- ODW 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ODW 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ODW 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ODW 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- ODW 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ODW 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ODW 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ODW 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- ODW 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

QOW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

QOW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

QOW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

QOW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

QOW Horn, YAH-*-9-1, is ON.

QOW High Hydrogen Beacon YAL-*-10-2 is ON.

QOW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

QOW Trouble Beacon YAL-*-18-1 is ON.

QOW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

QOW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

QOW 9.2.4.8.4 Release Alarm Test push button.

QOW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

QOW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

QOW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

QOW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

QOW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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000 The Grab Sample push button light HSL-*-22-1 is illuminated.

000 The Reset Sample push button light HSL-*-23-1 is illuminated.

000 The Reset Sample light YAL-*-23-1 is illuminated.

000 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

000 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

000 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

000 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

000 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

000 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

000 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.
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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- OW 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- OW 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are **CAPPED/CLOSED**.
- OW MV-*-1-1 through MV-*-1-4
 - OW MV-*-3-3
 - OW MV-*-4-3 through MV-*-4-4
 - OW MV-*-5-1 through MV-*-5-6
 - OW MV-*-7-3 through MV-*-7-4
 - OW Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are **OPEN**
- OW FCV-*-1-1
 - OW FI-*-3-1
 - OW MV-*-4-1 through MV-*-4-2
 - OW FI-*-5-1
 - OW MV-*-7-1 through MV-*-7-2
 - OW MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- OW 10.2.1 Set fused switch FU-13 to the **CLOSED** position.
- OW 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
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- 10.2.3 OPEN valves:

~~000~~ MV-*-1-1~~000~~ MV-*-1-2~~000~~ MV-*-1-3~~000~~ MV-*-1-4

- ~~000~~ 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- ~~000~~ 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- ~~000~~ 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- ~~000~~ 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- ~~000~~ 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- ~~000~~ MV-*-3-3
- ~~000~~ Gas Sample Assembly Valves
- ~~000~~ 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- ~~000~~ 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- ~~000~~ 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- ~~000~~ 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- ~~000~~ 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- ~~000~~ 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- ~~000~~ 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

~~000~~ MV-*-5-4

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DO MV-*-5-5

DO 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

DO 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

DO MV-*-5-4

DO MV-*-5-6

DO 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

DO 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

DO 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

DO MV-*-1-1 through MV-*-1-4

DO MV-*-3-3

DO MV-*-4-1 through MV-*-4-4

DO MV-*-5-1 through MV-*-5-6

DO MV-*-7-1 through MV-*-7-4

DO MV-*-8-1

DO 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

DO 10.4.11 Open the following circuit breakers and fuses:

DO CB-1 through CB-7

DO FU-1 through FU-13

DO 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3-25-95		SHMS Unit Number: VTR PML-3405B			
Title of Test: Electrical Systems		Equipment Serial Number(s): Flux 21 6026 12-22-95			
Test Performed By: OK Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.2	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	124 124 0V	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LTI	on	Light ON	A	
9.2.3.4	RCPT: H N	124 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	124. 127.4	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTA PNL-3405 B		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27		
Test Performed By: OA Thompson			0026 12-22-95		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	127. 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	126.6 126.6	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	68° 78°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	127.	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: JTP-PNL-3405 B		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27		
Test Performed By: DA Thompson			0026 12-22-95		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	72° 82°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	127.	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	127	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	127	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405B		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 21 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on on on on on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405B		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27 0026 12-22-95		
Test Performed By: OA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

[Signature]
Test Director

3-25-95
Date

D.O. Wallace
Recorder

3-25-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP PNL-3405B		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: W. Cutlip					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	710'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	24"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

Test Director

3-25-95

Date

Recorder

3-25-95

Date

Quality Assurance

N/A

Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:		Title of Test:	
EXCEPTIONS			
CORRECTION APPROVAL		Initials/Date	
Procedure Number	Date	Description	Project Engineer Test Director Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer _____ Date _____
 Recorder _____ Date _____
 Witness _____ Date _____

WHC-SD-WM-ATR-090

REV 0

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APPENDIX C

TEST LOG SHEET

REV 0

REV 0

TEST LOG

[illegible]

APPENDIX L

TANK 103-SX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

103-SX

TEST EXECUTION SHEET

Date: 3/25/95		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: VPT-PNL-3405C		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: D.T. LOTT		TEST DIRECTOR: GARY FELTNER	
RECORDER: F.L. SUNDOL		WITNESSES:	
TEST EXECUTION			
<u>ZEYant</u>	<u>3-27-95</u>	<u>[Signature]</u>	<u>3/25/95</u>
Installation Contractor	Date	Recorder	Date
<u>David. Feltner</u>	<u>3/25/95</u>		
Test Director	Date		
TEST WITNESS			
<u>DT Lott</u>	<u>3-25-95</u>		
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u>	<u>3-30-95</u>	<u>[Signature]</u>	<u>3-30-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>[Signature]</u>	<u>4-26-95</u>	<u>Harold M. Chapin</u>	<u>4/27/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. d. [Signature]</u>	<u>4/19/95</u>	<u>DT Lott</u>	<u>4/3/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste
Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- 1 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- 1 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- 1 8.1.3 Leak tests on the pneumatic systems have been performed.
- 1 8.1.4 The following circuit breakers and fuses are open
 - 1 CB-1 through CB-7
 - 1 FU-1 through FU-13

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- 1 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- 4 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- 1 8.1.7 The following sample lines/valves are CAPPED/CLOSED.
- 4 MV-*-1-1 through MV-*-1-4
 - 4 MV-*-3-3
 - 4 MV-*-4-3 through MV-*-4-4
 - 4 MV-*-5-1 through MV-*-5-6
 - 4 MV-*-7-3 through MV-*-7-4
 - 4 Sample and exhaust line ends are capped.
- 4 8.1.8 The following sample line valves are OPEN
- 4 FCV-*-1-1
 - 4 FI-*-3-1
 - 4 MV-*-4-1 through MV-*-4-2
 - 4 FI-*-5-1
 - 4 MV-*-7-1 through MV-*-7-2
 - 4 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- 4 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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4 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

4 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

1 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

1 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

4 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

4 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

4 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

4 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

4 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

4 9.2.1.8 Verify heater operates.

4 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

4 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

1 9.2.1.11 Adjust Heater temperature control to 70°F.

1 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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1 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

1 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

1 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

1 9.2.2.3 Verify pump turns ON.

1 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

1 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

1 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

1 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

1 9.2.3.3 Verify cabinet light is ON.

1 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

1 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

1 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

1 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

1 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

1 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

1 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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- 1 9.2.4.2.2 Verify power is being supplied to the DC power source PWR*-01. Record AC input and DC output voltages.
- 9.2.4.3 Flow Alarm Svstem
- 1 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.
- 1 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.
- 1 9.2.4.3.3 Visually verify instruments are operating:
1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.
- 1 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.
- 1 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.
- 1 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.
- 9.2.4.4 Hydrogen Sensors
- 1 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.
- 1 9.2.4.4.2 Visually verify instrument displays are operating:
1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.
- 1 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.
- 1 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.
- 9.2.4.5 Sample Gas Heat Trace
- Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.
- 1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.
- 1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.
- 1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- 1 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 1 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 1 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 1 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 1 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 1 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- 1 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 1 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 1 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 1 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 1 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 1 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 1 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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1 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

1 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

4 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

4 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

1 Horn, YAH-*-9-1, is ON.

1 High Hydrogen Beacon YAL-*-10-2 is ON.

1 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

1 Trouble Beacon YAL-*-18-1 is ON.

1 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

1 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

1 9.2.4.8.4 Release Alarm Test push button.

1 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

1 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

1 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

1 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

1 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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1 The Grab Sample push button light HSL-*-22-1 is illuminated.

1 The Reset Sample push button light HSL-*-23-1 is illuminated.

1 The Reset Sample light YAL-*-23-1 is illuminated.

1 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

1 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

1 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

1 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

1 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

1 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

1 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

D Lloyd Smith 3/25/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 4 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 4 FCV-*-1-1
 - 1 FI-*-3-1
 - 4 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 4 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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1 MV-*-1-1
1 MV-*-1-2
1 MV-*-1-3
1 MV-*-1-4

- 9 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 4 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 1 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 4 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 4 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
4 MV-*-3-3
4 Gas Sample Assembly Valves
- 4 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 1 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 2 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 1 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 4 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 4 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 4 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
3/25/95 4 MV-*-5-4

4 MV-*-5-5

4 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

4 MV-*-5-4
4 MV-*-5-6

4 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

4 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

4 MV-*-1-1 through MV-*-1-4
4 MV-*-3-3
4 MV-*-4-1 through MV-*-4-4
4 MV-*-5-1 through MV-*-5-6
4 MV-*-7-1 through MV-*-7-4
4 MV-*-8-1

4 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

4 10.4.11 Open the following circuit breakers and fuses:

4 CB-1 through CB-7
4 FU-1 through FU-13

4 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

4 *Stephenson* 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/25/95		SHMS Unit Number: VPT-PNL-3405C			
Title of Test: Electrical Systems		Equipment Serial Number(s): SIMASOY 0073 4/9/96			
Test Performed By: FIDEL RIVANA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	<1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125V 125V 0	L1,L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	125V 0	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0 0	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125V 125V	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3405C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/95		
Test Performed By: FIDEL RIVANA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125 V 24 V	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125 V 125 V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	55 65	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125 V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3405C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/7/90 1/9/96		
Test Performed By: FIDEL RIVEROA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	φ	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	63 73	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125 V	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125 V	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	φ	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125 V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	φ	0V	A	

TEST DATA SHEET

Date: 3/25/95		SHMS Unit Number: VPT-PNL-3405C			
Title of Test: Electrical Systems		Equipment Serial Number(s): SIMPSON 0073 1/1/95			
Test Performed By: FIDEL RIVORA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1	ON	ON	A	
	YAL-*-10-2	ON	ON		
	BY-*-10-1		Infinite Resistance Between TB2-21 and TB2-22.		
		OK			
	YAL-*-18-1	ON	ON		
	BY-*-18-1		Infinite Resistance Between TB2-23 and TB2-24.		
		OK			
	YAL-*-14/15-1	ON	ON		
	YAL-*-16-1	ON	ON		
	YAL-*-7-1	ON	ON		
	YAL-*-10-1	ON	ON		
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1	ON	ON	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.4	HSL-*-22-1	OFF	OFF	A	
	HSL-*-23-1	ON	ON		
	YAL-*-23-1	ON	ON		
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1	off	OFF	A	
	YAL-*-23-1	off	OFF		
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-340SC		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON		
Test Performed By: FIDEL RIVONA			0073 1/9/96		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

David Furman
Test Director

Lloyd Snyder
Recorder

N/A
Quality Assurance

3/25/95
Date

3/25/95
Date

N/A
Date

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VPT-PNL-3405C</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): <u>NA</u>		
Test Performed By: <u>RJ WALLI</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>> 15</u>	<u>> 15 Feet</u>	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>> 10</u>	<u>> 10 Feet</u>	<u>A</u>	
10.1.3	Sample Line Valves	<u>OK</u>	<u>CLOSED</u>	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>OK</u>	<u>Air going in through Intake, leaving through Exhaust</u>	<u>A</u>	
10.2.7	PDI-*-4-1	<u>< 40</u>	<u>< 40" H₂O</u>	<u>A</u>	
10.3.3	FI-*-3-1	<u>flow</u>	<u>Indicates Flow</u>	<u>A</u>	
10.3.6	FI-*-3-1	<u>no flow</u>	<u>Indicates No Flow</u>	<u>A</u>	
10.4.4	FI-*-5-1	<u>no flow</u>	<u>Zero Flow</u>	<u>A</u>	
10.4.7	FI-*-5-1	<u>no flow</u>	<u>Zero Flow</u>	<u>A</u>	

Test Witnesses:

Sam D. Fisher
 Test Director

3/25/95
 Date

Lloyd Single
 Recorder

3/25/95
 Date

N/A
 Quality Assurance

N/A
 Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX M

TANK 104-SX

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STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE

APPROVAL DESIGNATOR SQ

Issued by
TWRS Safety Programs Engineering Support
July 27, 1994

104-SX

TEST EXECUTION SHEET

Date: <u>3/25/95</u>		Document Number: WHC-SD-WM-ATP-090 REV 0	
SHMS Unit Number: <u>VPT-PNL-340SD</u>			
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>D LOTT</u>		TEST DIRECTOR: <u>GARY FELTON</u>	
RECORDER: <u>F.L. SUNDON</u>		WITNESSES:	
TEST EXECUTION			
<u>[Signature]</u> Installation Contractor	<u>3-27-95</u> Date	<u>[Signature]</u> Recorder	<u>3/25/95</u> Date
<u>[Signature]</u> Test Director	<u>3/25/95</u> Date		
TEST WITNESS			
<u>N/A</u> Witness	<u></u> Date	<u></u> Witness	<u></u> Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA.</u> Field Engineering	<u></u> Date	<u>[Signature]</u> Project Engineer	<u>3-28-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>[Signature]</u> Plant Operations	<u>4-26-95</u> Date	<u>[Signature]</u> Quality Assurance	<u>4/27/95</u> Date
<u>[Signature]</u> Safety	<u>4/19/95</u> Date	<u>[Signature]</u> Project Engineer	<u>4/3/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *FWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- 1 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- 1 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- 1 8.1.3 Leak tests on the pneumatic systems have been performed.
- 1 8.1.4 The following circuit breakers and fuses are open
 - 1 CB-1 through CB-7
 - 1 FU-1 through FU-13

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✓ 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

✓ 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

✓ 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

- ✓ MV-*-1-1 through MV-*-1-4
- ✓ MV-*-3-3
- ✓ MV-*-4-3 through MV-*-4-4
- ✓ MV-*-5-1 through MV-*-5-6
- ✓ MV-*-7-3 through MV-*-7-4
- ✓ Sample and exhaust line ends are capped.

✓ 8.1.8 The following sample line valves are OPEN

- ✓ FCV-*-1-1
- ✓ FI-*-3-1
- ✓ MV-*-4-1 through MV-*-4-2
- ✓ FI-*-5-1
- ✓ MV-*-7-1 through MV-*-7-2
- ✓ MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

✓ 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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1 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

1 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

1 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

1 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

1 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

1 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

1 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

1 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

1 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

1 9.2.1.8 Verify heater operates.

1 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

1 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the KI-*-01 relay.

Note: Heat may still radiate from Heater.

1 9.2.1.11 Adjust Heater temperature control to 70°F.

1 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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/ 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

/ 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

/ 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

/ 9.2.2.3 Verify pump turns ON.

/ 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

/ 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

/ 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

/ 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

/ 9.2.3.3 Verify cabinet light is ON.

/ 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

/ 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

/ 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

/ 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

/ 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

/ 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

/ 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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- 1 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.
- 9.2.4.3 Flow Alarm System
- 1 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.
- 1 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.
- 1 9.2.4.3.3 Visually verify instruments are operating:
1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.
- 1 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.
- 1 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.
- 1 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.
- 9.2.4.4 Hydrogen Sensors
- 1 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.
- 1 9.2.4.4.2 Visually verify instrument displays are operating:
1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.
- 1 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.
- 1 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.
- 9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.
- 1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.
- 1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- ✓ 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ✓ 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ✓ 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ✓ 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ✓ 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ✓ 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ✓ 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ✓ 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 4 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 4 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 4 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

4 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

~~9.2.4.7 Cabinet Temperature~~

- 4 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 4 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 4 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 4 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 4 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 4 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 4 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 4 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 4 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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/ 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

/ 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

/ 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

/ 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

/ Horn, YAH-*-9-1, is ON.

/ High Hydrogen Beacon YAL-*-10-2 is ON.

/ Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

/ Trouble Beacon YAL-*-18-1 is ON.

/ Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

/ All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

/ 9.2.4.8.4 Release Alarm Test push button.

/ 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

/ 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

/ 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

/ 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

/ 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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/ The Grab Sample push button light HSL-*-22-1 is illuminated.

/ The Reset Sample push button light HSL-*-23-1 is illuminated.

/ The Reset Sample light YAL-*-23-1 is illuminated.

/ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

/ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

/ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

/ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

/ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

/ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

/ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 1 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 1 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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1 MV-*-1-1
4 MV-*-1-2
4 MV-*-1-3
4 MV-*-1-4

- 4 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 4 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 4 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 1 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 1 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
4 MV-*-3-3
4 Gas Sample Assembly Valves
- 4 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 1 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 1 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 4 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 4 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 4 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 1 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
1 MV-*-5-4

1 MV-*-5-5

4 10.4.3

Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.4

CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5

OPEN valves:

1 MV-*-5-4

4 MV-*-5-6

4 10.4.6

Adjust to nominally 2.0 cfh flow through FI-*-5-1.

4 10.4.7

CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

4 10.4.8

Switch circuit breaker CB-3 to the OPEN position.

10.4.9

CLOSE the following sample line valves.

4 MV-*-1-1 through MV-*-1-4

4 MV-*-3-3

4 MV-*-4-1 through MV-*-4-4

4 MV-*-5-1 through MV-*-5-6

4 MV-*-7-1 through MV-*-7-4

4 MV-*-8-1

1 10.4.10

Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

4 10.4.11

Open the following circuit breakers and fuses:

4 CB-1 through CB-7

1 FU-1 through FU-13

4 10.4.12

Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

Stephen Singh 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT. PNL-34050		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/96		
Test Performed By: FIDEL RIVONA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125V 125V Ø	L1, L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	125V Ø	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	Ø Ø	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 125	Primary, Secondary: 120V ± 5%	A	

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VPT-PNL-3405D</u>		
Title of Test: <u>Electrical Systems</u>			Equipment Serial Number(s): <u>SIMPSON</u>		
Test Performed By: <u>FIDEL RIVONA</u>			<u>0073</u> <u>1/9/96</u>		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	<u>125V</u> <u>24V</u>	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	<u>A</u>	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	<u>ON</u> <u>ON</u>	Power Indication Lights ON	<u>A</u>	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	<u>Ø</u>	0V	<u>A</u>	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	<u>ON</u> <u>ON</u> <u>ON</u>	Displays powered ON.	<u>A</u>	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	<u>125V</u> <u>125V</u>	120V $\pm$ 5%	<u>A</u>	
9.2.4.5.3	TIC-*-14-1	<u>ON</u>	Display powered ON.	<u>A</u>	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	<u>Ø</u>	0V	<u>A</u>	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	<u>51</u> <u>61</u>	Final Temp. = Initial Temp. + 10°F	<u>A</u>	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	<u>125V</u>	120V $\pm$ 5%	<u>A</u>	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: UPT-PNL-3405D		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/96		
Test Performed By: FIDEL RIVON A					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	Ø	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	57 67	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125V	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	Ø	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	Ø	0V	A	

TEST DATA SHEET

Date: 3/25/95		SHMS Unit Number: VPT-PNL-3405D			
Title of Test: Electrical Systems		Equipment Serial Number(s): SIMPSON			
Test Performed By: FIDEL RIVUNA		0073 1/9/96			
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3405D		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/98		
Test Performed By: FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

Mary R. Feltman
Test Director

3/25/95
Date

Lloyd Smyth
Recorder

3/25/95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VPT-PNL-3405D</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): <u>NA</u>		
Test Performed By: <u>RJ WALLI</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>> 15</u>	> 15 Feet	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>> 10</u>	> 10 Feet	<u>A</u>	
10.1.3	Sample Line Valves	<u>OK</u>	CLOSED	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>OK</u>	Air going in through Intake, leaving through Exhaust	<u>A</u>	
10.2.7	PDI-*-4-1	<u>< 40</u>	< 40" H ₂ O	<u>A</u>	
10.3.3	FI-*-3-1	<u>Flow</u>	Indicates Flow	<u>A</u>	
10.3.6	FI-*-3-1	<u>NO FLOW</u>	Indicates No Flow		
10.4.4	FI-*-5-1	<u>NO FLOW</u>	Zero Flow		
10.4.7	FI-*-5-1	<u>NO FLOW</u>	Zero Flow		

Test Witnesses:

Gary D. Fulton
Test Director

3/25/95
Date

Shayla Singh
Recorder

3/25/95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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REV 0

APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX N
TANK 105-SX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

105-JX

TEST EXECUTION SHEET

Date: 3-25-95		Document Number: WHC-SD-WM-ATR-090 REV 0	
SHMS Unit Number: VTP-PNL-3405E (05JX)			
TEST PERSONNEL			
WHC PROJECT ENGINEER: OT Lott		TEST DIRECTOR: Rm Bender	
RECORDER: D.O. Wallace		WITNESSES:	
TEST EXECUTION			
<u>284</u> Installation Contractor	<u>3-27-95</u> Date	<u>D.O. Wallace</u> Recorder	<u>3-25-95</u> Date
<u>Rm Bender</u> Test Director	<u>3-25-95</u> Date		
TEST WITNESS:			
<u>N/A</u> Witness	<u>3-27-95</u> Date	<u>OT Lott</u> Witness	<u>3/25/95</u> Date
TEST ACCEPTANCE:			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u> Field Engineering	<u>3-27-95</u> Date	<u>Tony L. Coleman</u> Project Engineer	<u>3-30-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>James J. Ellis</u> Plant Operations	<u>4-26-95</u> Date	<u>Harold M. Chapin</u> Quality Assurance	<u>4/27/95</u> Date
<u>m. d. m. Jalen</u> Safety	<u>4/19/95</u> Date	<u>OT Lott</u> Project Engineer	<u>4-3-95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- DDW 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- DDW 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- DDW 8.1.3 Leak tests on the pneumatic systems have been performed.
- DDW 8.1.4 The following circuit breakers and fuses are open

DDW CB-1 through CB-7
DDW FU-1 through FU-13

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- DDW 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- DDW 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- DDW 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

DDW MV-*-1-1 through MV-*-1-4
DDW MV-*-3-3
DDW MV-*-4-3 through MV-*-4-4
DDW MV-*-5-1 through MV-*-5-6
DDW MV-*-7-3 through MV-*-7-4
DDW Sample and exhaust line ends are capped.

- DDW 8.1.8 The following sample line valves are OPEN

DDW FCV-*-1-1
DDW FI-*-3-1
DDW MV-*-4-1 through MV-*-4-2
DDW FI-*-5-1
DDW MV-*-7-1 through MV-*-7-2
DDW MV-*-8-1.

Check that all prerequisites have been met.

D.O. Wallace 3-25-95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- DDW 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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OW 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

OW 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

OW 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

OW 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

OW 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

OW 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

OW 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

OW 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

OW 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

OW 9.2.1.8 Verify heater operates.

OW 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

OW 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

OW 9.2.1.11 Adjust Heater temperature control to 70°F.

OW 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

now 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

now 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

now 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

now 9.2.2.3 Verify pump turns ON.

now 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

now 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

now 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

now 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

now 9.2.3.3 Verify cabinet light is ON.

now 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

now 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

now 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

now 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

now 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

now 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

now 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

 9.2.4.3.3 Visually verify instruments are operating:

 Transmitter FIT-*-7-1,

 Flow Alarm FASL-*-7-1.

 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

 9.2.4.4.2 Visually verify instrument displays are operating:

 Transmitter NIT-*-6-1,

 Transmitter NIT-*-12-1,

 Recorder NR-*-6/12-1.

 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- DOU 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- DOU 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- DOU 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- DOU 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- DOU 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- DOU 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- DOU 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- DOU 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- DOU 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- DOU 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- DOU 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- DOU 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- DOU 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- DOU 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 00W 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 00W 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 00W 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 00W 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- 00W 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 00W 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 00W 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 00W 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 00W 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 00W 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 00W 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 00W 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 00W 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

QOW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

QOW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

QOW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

QOW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

QOW Horn, YAH-*-9-1, is ON.

QOW High Hydrogen Beacon YAL-*-10-2 is ON.

QOW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

QOW Trouble Beacon YAL-*-18-1 is ON.

QOW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

QOW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

QOW 9.2.4.8.4 Release Alarm Test push button.

QOW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

QOW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

QOW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

QOW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

QOW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

3-25-95

The Grab Sample push button light HSL-*-22-1 is illuminated.

 The Reset Sample push button light HSL-*-23-1 is illuminated.

 The Reset Sample light YAL-*-23-1 is illuminated.

 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.
3-25-95

9.4 REVIEW

Check that all steps have been completed.

D.O. Wallace 3-25-95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- OW 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- OW 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- OW MV-*-1-1 through MV-*-1-4
 - OW MV-*-3-3
 - OW MV-*-4-3 through MV-*-4-4
 - OW MV-*-5-1 through MV-*-5-6
 - OW MV-*-7-3 through MV-*-7-4
 - OW Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- OW FCV-*-1-1
 - OW FI-*-3-1
 - OW MV-*-4-1 through MV-*-4-2
 - OW FI-*-5-1
 - OW MV-*-7-1 through MV-*-7-2
 - OW MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- OW 10.2.1 Set fused switch FU-13 to the CLOSED position.
- OW 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 3-25-95
- 10.2.3 OPEN valves:

MV-*-1-1
 MV-*-1-2
 MV-*-1-3
 MV-*-1-4

- 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- MV-*-3-3
 Gas Sample Assembly Valves
- 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow..
- 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

 MV-*-5-4

000 MV-*-5-5

000 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

000 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

000 MV-*-5-4

000 MV-*-5-6

000 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

000 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

000 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

000 MV-*-1-1 through MV-*-1-4

000 MV-*-3-3

000 MV-*-4-1 through MV-*-4-4

000 MV-*-5-1 through MV-*-5-6

000 MV-*-7-1 through MV-*-7-4

000 MV-*-8-1

000 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

000 10.4.11 Open the following circuit breakers and fuses:

000 CB-1 through CB-7

000 FU-1 through FU-13

000 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

D.O. Waller 3-25-95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 27 MATE 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	<1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	123.7 123.7 0V	L1,L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	123.7 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H:0V N:0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	124, 127.1	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3.25-95			SHMS Unit Number: VTA PNL-3405E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 27 MATE 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	126.8 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	126.4 126.4	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	55° 67°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	126.7	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: UTP-PNL-3405 E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 27 MATE 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	62° 73°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	126.8	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	126.6	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	126.8	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 27 MATE 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on ∞ on ∞ on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-2405 E		
Title of Test: Electrical Systems			Equipment Serial Number(s): Flux 27 M-TE 0024 12-22-95		
Test Performed By: OK Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

B. M. Ruler
Test Director

3-25-95
Date

D. O. Wallace
Recorder

3-25-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405E		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: W. Cutlip					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	24"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

R m Rm
Test Director

3-25-95
Date

D.O. Wallace
Recorder

3-25-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

Date

Date

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX 0

TANK 106-SX

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**STANDARD-8 AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

106-SX

TEST EXECUTION SHEET

Date: 3-25-95		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: VTP-PNL-3405F		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: OT Lott		TEST DIRECTOR: TC Schneider WHC	
RECORDER: D.O. Wallace WHC		WITNESSES:	
TEST EXECUTION			
<u>LE Grant</u>	<u>3-27-95</u>	<u>D.O. Wallace</u>	<u>3-25-95</u>
Installation Contractor	Date	Recorder	Date
<u>TC Schneider</u>	<u>3-25-95</u>		
Test Director	Date		
TEST WITNESS			
<u>N/A</u>			
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
<u>X</u> Without Exception	With Exception/Resolved	With Exception/Outstanding	
<u>NA</u>		<u>Terry L. Coltrane</u>	<u>3-30-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
<u>X</u> Without Exception	With Exception/Resolved	With Exception/Outstanding	
<u>James J. Dwyer</u>	<u>4-26-95</u>	<u>Frank M. Chapin</u>	<u>4/27/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. d. in Teller</u>	<u>4/19/95</u>	<u>OT Lott</u>	<u>4-27-95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. —TWRS Safety

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- DDW 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- DDW 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- DDW 8.1.3 Leak tests on the pneumatic systems have been performed.
- DDW 8.1.4 The following circuit breakers and fuses are open

DDW CB-1 through CB-7
DDW FU-1 through FU-13

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- OW 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- OW 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- OW 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

OW MV-*-1-1 through MV-*-1-4
OW MV-*-3-3
OW MV-*-4-3 through MV-*-4-4
OW MV-*-5-1 through MV-*-5-6
OW MV-*-7-3 through MV-*-7-4
OW Sample and exhaust line ends are capped.

- OW 8.1.8 The following sample line valves are OPEN

OW FCV-*-1-1
OW FI-*-3-1
OW MV-*-4-1 through MV-*-4-2
OW FI-*-5-1
OW MV-*-7-1 through MV-*-7-2
OW MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- OW 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

9.2.1.8 Verify heater operates.

9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

9.2.1.11 Adjust Heater temperature control to 70°F.

9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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000 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

000 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

000 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

000 9.2.2.3 Verify pump turns ON.

000 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

000 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

000 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

000 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

000 9.2.3.3 Verify cabinet light is ON.

000 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

000 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

000 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

000 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

000 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

000 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

000 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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ODW 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

ODW 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

ODW 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

ODW 9.2.4.3.3 Visually verify instruments are operating:
ODW Transmitter FIT-*-7-1,
ODW Flow Alarm FASL-*-7-1.

ODW 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

ODW 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

ODW 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

ODW 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

ODW 9.2.4.4.2 Visually verify instrument displays are operating:

ODW Transmitter NIT-*-6-1,
ODW Transmitter NIT-*-12-1,
ODW Recorder NR-*-6/12-1.

ODW 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

ODW 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

ODW 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

ODW 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

ODW 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

- oow 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- oow 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- oow 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- oow 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- oow 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- oow 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- oow 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- oow 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- oow 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
 - oow 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
 - oow 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
 - oow 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
 - oow 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
 - oow 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin
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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

OW 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.

OW 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.

OW 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

OW 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

OW 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.

OW 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.

OW 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.

OW 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

OW 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

OW 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.

OW 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

OW 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.

OW 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.

OW 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.

OW 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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oow 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

oow 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

oow 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

oow 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

oow Horn, YAH-*-9-1, is ON.

oow High Hydrogen Beacon YAL-*-10-2 is ON.

oow Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

oow Trouble Beacon YAL-*-18-1 is ON.

oow Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

oow All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

oow 9.2.4.8.4 Release Alarm Test push button.

oow 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

oow 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

oow 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

oow 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

oow 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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DDW The Grab Sample push button light HSL-*-22-1 is illuminated.

DDW The Reset Sample push button light HSL-*-23-1 is illuminated.

DDW The Reset Sample light YAL-*-23-1 is illuminated.

DDW 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

DDW 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

DDW 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

DDW 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

DDW 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

DDW 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

DDW 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.
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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- OW 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- OW 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- OW MV-*-1-1 through MV-*-1-4
 - OW MV-*-3-3
 - OW MV-*-4-3 through MV-*-4-4
 - OW MV-*-5-1 through MV-*-5-6
 - OW MV-*-7-3 through MV-*-7-4
 - OW Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- OW FCV-*-1-1
 - OW FI-*-3-1
 - OW MV-*-4-1 through MV-*-4-2
 - OW FI-*-5-1
 - OW MV-*-7-1 through MV-*-7-2
 - OW MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- OW 10.2.1 Set fused switch FU-13 to the CLOSED position.
- OW 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
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- 10.2.3 OPEN valves:

MV-*-1-1
 MV-*-1-2
 MV-*-1-3
 MV-*-1-4

- 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- MV-*-3-3
 Gas Sample Assembly Valves
- 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

 MV-*-5-4

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000 MV-*-5-5

000 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

000 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

000 MV-*-5-4

000 MV-*-5-6

000 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

000 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

000 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

000 MV-*-1-1 through MV-*-1-4

000 MV-*-3-3

000 MV-*-4-1 through MV-*-4-4

000 MV-*-5-1 through MV-*-5-6

000 MV-*-7-1 through MV-*-7-4

000 MV-*-8-1

000 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

000 10.4.11 Open the following circuit breakers and fuses:

000 CB-1 through CB-7

000 FU-1 through FU-13

000 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTA PNL-3405F		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27 Mate 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	.2	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	124 124 0V	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	on	Pump ON	A	
9.2.3.3	LT1	on	Light ON	A	
9.2.3.4	RCPT: H N	124 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	123.8 127.1	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405F		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27 MATE 0024 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	126.8 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	126.5 126.4	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	on	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0V	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	44° 54°	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	126.7	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3.25.95			SHMS Unit Number: VTP-PIN-3405F		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 27 MTE 0026 12.22.95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	46° 56°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	126.6	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	126.7	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	126.7	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTA-P10L-3405 F		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 0026 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on on on on on on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3405F		
Title of Test: Electrical Systems			Equipment Serial Number(s): Fluke 0024 12-22-95		
Test Performed By: DA Thompson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

J. Schneider
Test Director

3-25-95
Date

D.O. Wallace
Recorder

3-25-95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-25-95			SHMS Unit Number: VTP-PNL-3403E		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: W. Cutlip					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	715	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10	> 10 Feet.	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	28"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

J. C. Schneider
 Test Director

3-25-95
 Date

D. O. Wallace
 Recorder

3-25-95
 Date

N/A
 Quality Assurance

N/A
 Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX P

TANK 109-SX

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TK # SX109

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REV 0

TEST EXECUTION SHEET

Date: <u>3/25/95</u> VTP-PNL-34051		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: <u>H-2-817853</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>DARREN LOTT</u>		TEST DIRECTOR: <u>DARREN LOTT</u>	
RECORDER: <u>KIRK KOHLER</u>		WITNESSES: <u>KIRK KOHLER</u>	
TEST EXECUTION			
<u>LE Yarn</u> Installation Contractor	<u>3-27-95</u> Date	<u>Kirk Kohler</u> Recorder	<u>3/25/95</u> Date
<u>DT Lott</u> Test Director	<u>3/25/95</u> Date		
TEST WITNESS			
<u>Kirk Kohler</u> Witness	<u>3/25/95</u> Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u> Field Engineering	Date	<u>Timothy T. Ostrander</u> Project Engineer	<u>3-31-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>James J. Kloos</u> Plant Operations	<u>4-26-95</u> Date	<u>Frank M. Chapin</u> Quality Assurance	<u>4/27/95</u> Date
<u>m. J. T. J. J. J.</u> Safety	<u>4/19/95</u> Date	<u>DT Lott</u> Project Engineer	<u>4/5/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance.

TWRS Safety

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

~~NA~~ 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

~~NA~~ 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

~~NA~~ 8.1.3 Leak tests on the pneumatic systems have been performed.

~~NA~~ 8.1.4 The following circuit breakers and fuses are open

~~NA~~ CB-1 through CB-7
~~NA~~ FU-1 through FU-13

~~NA~~ 3/25/95

- ~~NA~~ 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- ~~NA~~ 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- ~~NA~~ 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

~~NA~~ MV-*-1-1 through MV-*-1-4
~~NA~~ MV-*-3-3
~~NA~~ MV-*-4-3 through MV-*-4-4
~~NA~~ MV-*-5-1 through MV-*-5-6
~~NA~~ MV-*-7-3 through MV-*-7-4
~~NA~~ Sample and exhaust line ends are capped.

- ~~NA~~ 8.1.8 The following sample line valves are OPEN

~~NA~~ FCV-*-1-1
~~NA~~ FI-*-3-1
~~NA~~ MV-*-4-1 through MV-*-4-2
~~NA~~ FI-*-5-1
~~NA~~ MV-*-7-1 through MV-*-7-2
~~NA~~ MV-*-8-1.

Check that all prerequisites have been met.

~~NA~~ 3/25/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- ~~NA~~ 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

~~NA~~ 3/25/95

~~KK~~ 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

~~KK~~ 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

~~KK~~ 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

~~KK~~ 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

~~KK~~ 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

~~KK~~ 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

~~KK~~ 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

~~KK~~ 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

~~KK~~ 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

~~KK~~ 9.2.1.8 Verify heater operates.

~~KK~~ 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

~~KK~~ 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

~~KK~~ 9.2.1.11 Adjust Heater temperature control to 70°F.

~~KK~~ 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

KK 3/25/95

~~KK~~ 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

~~KK~~ 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

~~KK~~ 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

~~KK~~ 9.2.2.3 Verify pump turns ON.

~~KK~~ 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

~~KK~~ 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

~~KK~~ 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

~~KK~~ 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

~~KK~~ 9.2.3.3 Verify cabinet light is ON.

~~KK~~ 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

~~KK~~ 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

~~KK~~ 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

~~KK~~ 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

~~KK~~ 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

~~KK~~ 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

~~KK~~ 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

~~KK~~ 3/25/95

~~KL~~ 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

~~KL~~ 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

~~KL~~ 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

~~KL~~ 9.2.4.3.3 Visually verify instruments are operating:
~~KL~~ Transmitter FIT-*-7-1,
~~KL~~ Flow Alarm FASL-*-7-1.

~~KL~~ 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

~~KL~~ 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

~~KL~~ 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

~~KL~~ 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

~~KL~~ 9.2.4.4.2 Visually verify instrument displays are operating:

~~KL~~ Transmitter NIT-*-6-1,
~~KL~~ Transmitter NIT-*-12-1,
~~KL~~ Recorder NR-*-6/12-1.

~~KL~~ 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

~~KL~~ 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

~~KL~~ 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

~~KL~~ 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

~~KL~~ 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

KL 3/25/95

- ~~NA~~ 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~NA~~ 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ~~NA~~ 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ~~NA~~ 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ~~NA~~ 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ~~NA~~ 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ~~NA~~ 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ~~NA~~ 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ~~NA~~ 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ~~NA~~ 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ~~NA~~ 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~NA~~ 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ~~NA~~ 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ~~NA~~ 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

~~NA~~ 3/25/15

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- ~~NA~~ 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- ~~NA~~ 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ~~NA~~ 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ~~NA~~ 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- ~~NA~~ 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- ~~NA~~ 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- ~~NA~~ 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ~~NA~~ 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ~~NA~~ 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~NA~~ 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- ~~NA~~ 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~NA~~ 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ~~NA~~ 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ~~NA~~ 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- ~~NA~~ 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

~~NA~~ 3/25/95

~~KK~~ 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

~~KK~~ 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

~~KK~~ 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

~~KK~~ 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

~~KK~~ Horn, YAH-*-9-1, is ON.

~~KK~~ High Hydrogen Beacon YAL-*-10-2 is ON.

~~KK~~ Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

~~KK~~ Trouble Beacon YAL-*-18-1 is ON.

~~KK~~ Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

~~KK~~ All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

~~KK~~ 9.2.4.8.4 Release Alarm Test push button.

~~KK~~ 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

~~KK~~ 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

~~KK~~ 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

~~KK~~ 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

~~KK~~ 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

~~11~~ The Grab Sample push button light HSL-*-22-1 is illuminated.

~~11~~ The Reset Sample push button light HSL-*-23-1 is illuminated.

~~11~~ The Reset Sample light YAL-*-23-1 is illuminated.

~~11~~ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

~~11~~ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

~~11~~ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

~~11~~ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

~~11~~ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

~~11~~ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

~~11~~ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

~~11~~ 3/2/95

9.4 REVIEW

Check that all steps have been completed.

Kirk Sahly *3/25/95*

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- ~~NA~~ 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- ~~NA~~ 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
 - ~~NA~~ MV-*-1-1 through MV-*-1-4
 - ~~NA~~ MV-*-3-3
 - ~~NA~~ MV-*-4-3 through MV-*-4-4
 - ~~NA~~ MV-*-5-1 through MV-*-5-6
 - ~~NA~~ MV-*-7-3 through MV-*-7-4
 - ~~NA~~ Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
 - ~~NA~~ FCV-*-1-1
 - ~~NA~~ FI-*-3-1
 - ~~NA~~ MV-*-4-1 through MV-*-4-2
 - ~~NA~~ FI-*-5-1
 - ~~NA~~ MV-*-7-1 through MV-*-7-2
 - ~~NA~~ MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- ~~NA~~ 10.2.1 Set fused switch FU-13 to the CLOSED position.
- ~~NA~~ 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

NA 3/25/95

~~KK~~ MV-*-1-1
~~KK~~ MV-*-1-2
~~KK~~ MV-*-1-3
~~KK~~ MV-*-1-4

- ~~KK~~ 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- ~~KK~~ 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- ~~KK~~ 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- ~~KK~~ 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- ~~KK~~ 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
~~KK~~ MV-*-3-3
~~KK~~ Gas Sample Assembly Valves
- ~~KK~~ 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- ~~KK~~ 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- ~~KK~~ 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- ~~KK~~ 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- ~~KK~~ 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- ~~KK~~ 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- ~~KK~~ 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
~~KK~~ MV-*-5-4

KK 3/25/95

~~NA~~ MV-*-5-5

~~NA~~ 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

~~NA~~ 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

~~NA~~ MV-*-5-4
~~NA~~ MV-*-5-6

~~NA~~ 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

~~NA~~ 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

~~NA~~ 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

~~NA~~ MV-*-1-1 through MV-*-1-4
~~NA~~ MV-*-3-3
~~NA~~ MV-*-4-1 through MV-*-4-4
~~NA~~ MV-*-5-1 through MV-*-5-6
~~NA~~ MV-*-7-1 through MV-*-7-4
~~NA~~ MV-*-8-1

~~NA~~ 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

~~NA~~ 10.4.11 Open the following circuit breakers and fuses:

~~NA~~ CB-1 through CB-7
~~NA~~ FU-1 through FU-13

~~NA~~ 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

~~NA~~ 3/25/95

~~NA~~ 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VTP-AOL-34051		
Title of Test: Electrical Systems			Equipment Serial Number(s): SEMPSON 260 450-45-60-017 0173 EAL AVE 7/15/95		
Test Performed By: PETE BASH BASCHE					
Procedure Number	Item	Value	Range	A/R VALUE	Comment
9.1.1	Resistance	A	< 1 Ohm	< 1.0	
9.1.3	Line Voltages: L1 L2 N	A	L1, L2: 120V $\pm$ 5% N: 0V	125 125 0	
9.2.1.4	ACU-*-01 & HTR-*-01	A	A/C Compressor ON, Heater OFF	OK	HTR. OFF
9.2.1.6	ACU-*-01	A	A/C Compressor OFF	OK	COMPRESSOR OFF
9.2.1.8	HTR-*-01	A	Heater ON	OK	HTR. ON
9.2.1.10	ACU-*-01 & HTR-*-01	A	A/C Compressor ON, Heater OFF	OK	COMPRESSOR ON HTR. OFF
9.2.2.3	P-*-01	A	Pump ON	OK	PUMP ON
9.2.3.3	LT1	A	Light ON	OK	LIGHT ON
9.2.3.4	RCPT: H N	A	H: 120V $\pm$ 5% N: 0V	125 V 0 ON NEUTRAL TO GROUND	
9.2.3.5	RCPT: H N	A	H: 0V N: 0V	0 VOLTAGE	
9.2.4.1.2	XFMR1: Primary Secondary	A	Primary, Secondary: 120V $\pm$ 5%	125.5 VAC PRI SECONDARY 125. SEC PRI	

TEST DATA SHEET

Date: <u>3/25/95</u>		SHMS Unit Number: <u>VTP-PNL-34051</u>			
Title of Test: Electrical Systems		Equipment Serial Number(s): <u>SIMPSON 260</u>			
Test Performed By: <u>PETE BASCHE</u>		<u>A/R</u> <u>950-45-60-017</u> <u>CHK. OUT 7/15/95</u> <u>VALUE</u>			
Procedure Number	Item	Value	Range	ATTN	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	<u>A</u>	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	<u>125.5</u> <u>24.0</u>	<u>AC IN</u> <u>VDC</u>
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	<u>A</u>	Power Indication Lights ON	<u>OK</u>	<u>LIGHTS ON</u>
9.2.4.3.4	YYC-*-01 In #2 Voltage:	<u>A</u>	0V	<u>OK</u>	<u>NO VOLTAGE</u>
9.2.4.4.2	NIT-*-6-1 NIT-*12-1 NR-*- 6/12-1	<u>A</u>	Displays powered ON.	<u>OK</u>	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	<u>A</u>	120V $\pm$ 5%	<u>125.5</u> <u>125.5</u>	<u>VAC</u> <u>VAC</u>
9.2.4.5.3	TIC-*-14-1	<u>A</u>	Display powered ON.	<u>OK</u>	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	<u>A</u>	0V	<u>OK</u>	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	<u>A</u>	Final Temp. = Initial Temp. + 10°F	<u>50</u> <u>54°F</u>	<u>AMBIENT</u>
9.2.4.5.9	YYC-*-01 In #5 Voltage:	<u>A</u>	120V $\pm$ 5%	<u>125.5</u>	<u>VAC</u>

TEST DATA SHEET

Date: <u>3/23/95</u>			SHMS Unit Number: <u>VTP-PNL-34051</u>		
Title of Test: Electrical Systems			Equipment Serial Number(s): <u>SEMPSON 260</u> <u>450-43-60-017</u> <u>CHK. DUE 7/15/95</u> <u>VALID</u>		
Test Performed By: <u>PETE BASCHE</u>			<u>A/R</u>		
Procedure Number	Item	Value	Range	(ATTR)	Comment
9.2.4.6.2	TIC-*-15-1	<u>A</u>	Display powered ON.	<u>AK</u>	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	<u>A</u>	0V	<u>0 VAC</u>	<u>AK</u>
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	<u>A</u>	Final Temp. = Initial Temp + 10°F	<u>47°F</u>	<u>AMBIENT</u> <u>57°F</u>
9.2.4.6.8	YYC-*-01 In #4 Voltage:	<u>A</u>	120V ± 5%	<u>15.5 VAC</u>	
9.2.4.7.2	TI-*-16-1	<u>A</u>	Display powered ON.	<u>AK</u>	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	<u>A</u>	120V ± 5%	<u>125.5 VAC</u>	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	<u>A</u>	0V	<u>0 VAC</u>	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	<u>A</u>	120V ± 5%	<u>125.5 VAC</u>	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	<u>A</u>	0V	<u>0 VAC</u>	

Date:	3/25/95	SHMS Unit Number:	VTP-PNL-34051		
Title of Test: Electrical Systems	Equipment Serial Number(s): SEMPSON 260 N/A 450-43-60-017 CAL. DUE 7/15/95				
Test Performed By: SCOTT BRUNDREDE					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON INFINITE ON INFINITE ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A A 	
9.2.4.8.5	Inactive Alarms	NAL	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	NAL	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	GTY. 3.	Near IS Devices.	A	

TEST DATA SHEET

Date: <u>3/25/95</u>		SHMS Unit Number: <u>VTP-PNL-34051</u>			
Title of Test: Electrical Systems		Equipment Serial Number(s): N/A			
Test Performed By: <u>SCOTT BRUNDAGE</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK ← + 5	Proper Labeling.	A	
9.3.3	Resistance	< 1 Ω	< 1 Ohm	A	

Test Witnesses:

DT
Test Director

Kickahly
Recorder

N/A
Quality Assurance

3/25/95
Date

3/25/95
Date

N/A
Date

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VTP-PNL-34051</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): <u>N/A</u>		
Test Performed By: <u>SCOTT BRUNDRIDGE</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>> 15'</u>	<u>> 15 Feet</u>	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>> 10'</u>	<u>> 10 Feet</u>	<u>A</u>	
10.1.3	Sample Line Valves	<u>CLOSED</u>	<u>CLOSED</u>	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>CORRECT</u>	<u>Air going in through Intake, leaving through Exhaust</u>	<u>A</u>	
10.2.7	PDI-*-4-1	<u>29" H₂O</u>	<u>< 40" H₂O</u>	<u>A</u>	
10.3.3	FI-*-3-1	<u>FLOW</u>	<u>Indicates Flow</u>	<u>A</u>	
10.3.6	FI-*-3-1	<u>NO FLOW</u>	<u>Indicates No Flow</u>	<u>A</u>	
10.4.4	FI-*-5-1	<u>NO FLOW</u>	<u>Zero Flow</u>	<u>A</u>	
10.4.7	FI-*-5-1	<u>NO FLOW</u>	<u>Zero Flow</u>	<u>A</u>	

Test Witnesses: DARREN LOTT

Test Director

Recorder

Quality Assurance

Date

Date

Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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REV 0

APPENDIX C

TEST LOG SHEET

TEST LOG

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APPENDIX Q

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WHC-SD-WM-ATR-090

REV 0

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TEST EXECUTION SHEET

Date: <u>3/25/95</u>		Document Number: <u>WHC-SD-WM-ATP-090</u>	
SHMS Unit Number: <u>VPT-PNL-3805 C</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>L.T. LOTT</u>		TEST DIRECTOR: <u>GARY FULTNER</u>	
RECORDER: <u>F.L. Snyder</u>		WITNESSES:	
TEST EXECUTION			
<u>ZE Grant</u>	<u>3-27-95</u>	<u>Floyd Snyder</u>	
Installation Contractor	Date	Recorder	Date
<u>Gary Fultner</u>	<u>3/29/95</u>		
Test Director	Date		
TEST WITNESS			
<u>N/A</u>			
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
<u>X</u> Without Exception	_____ With Exception/Resolved	_____ With Exception/Outstanding	
<u>NA</u>		<u>Terry K. Osterman</u>	<u>3-31-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
<u>X</u> Without Exception	_____ With Exception/Resolved	_____ With Exception/Outstanding	
<u>James J. Alvar</u>	<u>4-26-95</u>	<u>Hank M. Chapin</u>	<u>4/27/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. o. m. Jalen</u>	<u>4/19/95</u>	<u>D.T. Lott</u>	<u>4/5/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- h 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- h 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- h 8.1.3 Leak tests on the pneumatic systems have been performed.
- h 8.1.4 The following circuit breakers and fuses are open
 - h CB-1 through CB-7
 - h FU-1 through FU-13

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- 1 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- 1 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- 1 8.1.7 The following sample lines/valves are **CAPPED/CLOSED**.
1 MV-*-1-1 through MV-*-1-4
1 MV-*-3-3
1 MV-*-4-3 through MV-*-4-4
1 MV-*-5-1 through MV-*-5-6
1 MV-*-7-3 through MV-*-7-4
1 Sample and exhaust line ends are capped.
- 1 8.1.8 The following sample line valves are **OPEN**
1 FCV-*-1-1
1 FI-*-3-1
1 MV-*-4-1 through MV-*-4-2
1 FI-*-5-1
1 MV-*-7-1 through MV-*-7-2
1 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- 1 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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1 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

4 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

W 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

4 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

1 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

1 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

1 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

1 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

4 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

4 9.2.1.8 Verify heater operates.

4 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

1 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

1 9.2.1.11 Adjust Heater temperature control to 70°F.

1 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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1 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

1 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

1 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

1 9.2.2.3 Verify pump turns ON.

1 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

1 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

1 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

1 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

1 9.2.3.3 Verify cabinet light is ON.

1 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

1 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

1 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

1 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

1 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

1 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

1 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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- 1 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.
- 9.2.4.3 Flow Alarm System
- 1 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.
- 1 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.
- 1 9.2.4.3.3 Visually verify instruments are operating:
1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.
- 1 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.
- 1 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.
- 1 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.
- 9.2.4.4 Hydrogen Sensors
- 1 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.
- 1 9.2.4.4.2 Visually verify instrument displays are operating:
1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.
- 1 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.
- 1 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.
- 9.2.4.5 Sample Gas Heat Trace
- Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.
- 1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.
- 1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.
- 1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- 1 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 1 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 1 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 1 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 1 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- ✓ 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- ✓ 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ✓ 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ✓ 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- ✓ 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- ✓ 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- ✓ 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ✓ 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- ✓ 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ✓ 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- ✓ 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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1 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

1 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

4 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

1 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

1 Horn, YAH-*-9-1, is ON.

4 High Hydrogen Beacon YAL-*-10-2 is ON.

1 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

4 Trouble Beacon YAL-*-18-1 is ON.

4 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

1 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

1 9.2.4.8.4 Release Alarm Test push button.

1 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

1 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

4 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

1 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

1 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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✓ The Grab Sample push button light HSL-*-22-1 is illuminated.

✓ The Reset Sample push button light HSL-*-23-1 is illuminated.

✓ The Reset Sample light YAL-*-23-1 is illuminated.

✓ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

✓ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

✓ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

✓ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

✓ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

✓ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

✓ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

[Signature] 3/25/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 1 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 1 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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~~/~~ MV-*-1-1
~~/~~ MV-*-1-2
~~/~~ MV-*-1-3
~~/~~ MV-*-1-4

- 4 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 1 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 1 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 1 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 1 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
~~/~~ MV-*-3-3
~~/~~ Gas Sample Assembly Valves
- 1 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 1 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 1 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 1 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 1 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 1 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 1 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

1 MV-*-5-4

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1 MV-*-5-5

1 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

1 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

1 MV-*-5-4
1 MV-*-5-6

1 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

1 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

1 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

1 MV-*-1-1 through MV-*-1-4
1 MV-*-3-3
1 MV-*-4-1 through MV-*-4-4
1 MV-*-5-1 through MV-*-5-6
1 MV-*-7-1 through MV-*-7-4
1 MV-*-8-1

1 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

1 10.4.11 Open the following circuit breakers and fuses:

1 CB-1 through CB-7
1 FU-1 through FU-13

1 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

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10.5 REVIEW

Check that all steps have been completed.

1 *[Signature]* 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

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APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3805C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 12/1/95		
Test Performed By: FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125V 125V Ø	L1, L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	125V Ø	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	Ø Ø	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125V 125V	Primary, Secondary: 120V ± 5%	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VFT-PNL-3805C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: FIDEL RIVORA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125V 24V	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125V 125V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	49 53	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VTP-PNL-3805C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0077 12/1/95		
Test Performed By: FIOREL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	45 55	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125V	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0	0V	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3805C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	 A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VPT-PNL-3805C		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	2	< 1 Ohm	A	

Test Witnesses:

Gary R. Fulton
Test Director

3/28/95
Date

Mayer Singh
Recorder

3/25/95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: <u>3/25/95</u>			SHMS Unit Number: <u>VPT-PNL-3805C</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: <u>R. WALLI</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>715</u>	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	<u>710</u>	> 10 Feet	A	
10.1.3	Sample Line Valves	<u>OK</u>	CLOSED	A	
10.2.6	Sample Intake & Exhaust	<u>OK</u>	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	<u>< 40</u>	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	<u>Flow</u>	Indicates Flow	A	
10.3.6	FI-*-3-1	<u>ON Flow</u>	Indicates No Flow	A	
10.4.4	FI-*-5-1	<u>no flow</u>	Zero Flow	A	
10.4.7	FI-*-5-1	<u>no flow</u>	Zero Flow	A	

Test Witnesses:

Gary D. Feltner

Test Director

[Signature]

Recorder

N/A

Quality Assurance

3/28/95

Date

3/25/95

Date

N/A

Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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REV 0

APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX R

TANK 105-U

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

TEST EXECUTION SHEET

Date: <u>3/24/95</u>		Document Number: WHC-SD-WM-ATR-090 REV 0	
SHMS Unit Number: <u>VPT-PNL-3805E</u>			
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>LT. LOTT</u> <u>FL SNYDER</u>		TEST DIRECTOR: <u>ROY BENDER</u>	
RECORDER: <u>E.F. ENLOE</u>		WITNESSES:	
TEST EXECUTION			
<u>LE 4/10/95</u> Installation Contractor	<u>3-27-95</u> Date	<u>E.F. Enloe Jr</u> Recorder	<u>3/24/95</u> Date
<u>FL Snyder</u> Test Director	<u>3-22-95</u> Date		
TEST WITNESS			
<u>N/A</u> Witness	<u>N/A</u> Date	<u>N/A</u> Witness	<u>N/A</u> Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>N/A</u> Field Engineering	<u>N/A</u> Date	<u>Tony L. Osterman</u> Project Engineer	<u>3-31-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>James J. [Signature]</u> Plant Operations	<u>4-26-95</u> Date	<u>Hank M. Chapin</u> Quality Assurance	<u>4/26/95</u> Date
<u>M. [Signature]</u> Safety	<u>4/19/95</u> Date	<u>O.T. [Signature]</u> Project Engineer	<u>4/5/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste
Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- JE 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- JE 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- JE 8.1.3 Leak tests on the pneumatic systems have been performed.
- JE 8.1.4 The following circuit breakers and fuses are open

JE CB-1 through CB-7
JE FU-1 through FU-13

3/24/95

- JE 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- JE 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- JE 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

~~JE~~ MV-*-1-1 through MV-*-1-4
~~JE~~ MV-*-3-3
~~JE~~ MV-*-4-3 through MV-*-4-4
~~JE~~ MV-*-5-1 through MV-*-5-6
~~JE~~ MV-*-7-3 through MV-*-7-4
~~JE~~ Sample and exhaust line ends are capped.

- JE 8.1.8 The following sample line valves are OPEN

~~JE~~ FCV-*-1-1
~~JE~~ FI-*-3-1
~~JE~~ MV-*-4-1 through MV-*-4-2
~~JE~~ FI-*-5-1
~~JE~~ MV-*-7-1 through MV-*-7-2
~~JE~~ MV-*-8-1.

Check that all prerequisites have been met.

JE Enloe 3/24/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- JE 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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SE 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

SE 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

SE 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

SE 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

SE 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

SE 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

SE 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

SE 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

SE 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

SE 9.2.1.8 Verify heater operates.

SE 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

SE 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

SE 9.2.1.11 Adjust Heater temperature control to 70°F.

SE 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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SE 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

SE 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

SE 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

SE 9.2.2.3 Verify pump turns ON.

SE 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

SE 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

SE 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

SE 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

SE 9.2.3.3 Verify cabinet light is ON.

SE 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

SE 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

SE 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

SE 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

SE 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

SE 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

SE 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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SE 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

SE 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

SE 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

SE 9.2.4.3.3 Visually verify instruments are operating:
SE Transmitter FIT-*-7-1,
SE Flow Alarm FASL-*-7-1.

SE 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

SE 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

SE 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

SE 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

SE 9.2.4.4.2 Visually verify instrument displays are operating:

SE Transmitter NIT-*-6-1,
SE Transmitter NIT-*-12-1,
SE Recorder NR-*-6/12-1.

SE 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

SE 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

SE 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

SE 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

SE 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- JE
3/24/95
- 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- JE 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- JE 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- JE 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- JE 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- JE 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- JE 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- JE 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- JE 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- JE 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- JE 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- JE 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- JE 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- JE 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- JE 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- JE 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- JE 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.

- JE 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

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9.2.4.7 Cabinet Temperature

- A 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- A 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- A 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- A 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- A 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- A 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- A 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- A 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- A 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- A 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- A 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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- 1 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.
- 4 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.
- 9.2.4.8 Alarm Systems
- 4 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.
- 4 9.2.4.8.2 Depress Alarm Reset HS-*20-1 followed by the Horn Acknowledge push button HS-*19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)
- 9.2.4.8.3 Depress and hold Alarm Test push button HS-*21-1. Verify the following conditions exist:
- 1 Horn, YAH-*9-1, is ON.
- 4 High Hydrogen Beacon YAL-*10-2 is ON.
- 4 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.
- 4 Trouble Beacon YAL-*18-1 is ON.
- 4 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.
- 4 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.
- 4 9.2.4.8.4 Release Alarm Test push button.
- 4 9.2.4.8.5 Depress Alarm Reset push button HS-*20-1 followed by the Horn Acknowledge push button HS-*19-1. Verify all inactive alarms are reset.
- 4 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.
- 9.2.4.9 Auto Sampler System
- 4 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.
- 1 9.2.4.9.2 Depress the Reset Sampler push button HS-*23-1 located inside the enclosure.
- 1 9.2.4.9.3 Depress the Grab Sample push button HS-*22-1 located inside the enclosure. Verify the following conditions exist:

1 The Grab Sample push button light HSL-*-22-1 is illuminated.

1 The Reset Sample push button light HSL-*-23-1 is illuminated.

1 The Reset Sample light YAL-*-23-1 is illuminated.

1 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

1 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

1 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

1 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

1 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

1 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

1 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

Elroy L. Smith 3/25/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 1 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are **CAPPED/CLOSED**.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are **OPEN**
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the **CLOSED** position.
- 1 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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/ MV-*-1-1
/ MV-*-1-2
/ MV-*-1-3
/ MV-*-1-4

- / 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- / 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- / 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- / 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- / 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- / MV-*-3-3
/ Gas Sample Assembly Valves
- / 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- / 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- / 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- / 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- / 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- / 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- / 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

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/ MV-*-5-4

1 MV-*-5-5

- 4 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 4 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.
- 10.4.5 OPEN valves:
- 4 MV-*-5-4
4 MV-*-5-6
- 4 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 4 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.
- 4 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- 4 MV-*-1-1 through MV-*-1-4
4 MV-*-3-3
4 MV-*-4-1 through MV-*-4-4
4 MV-*-5-1 through MV-*-5-6
4 MV-*-7-1 through MV-*-7-4
4 MV-*-8-1
- 4 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.
- 4 10.4.11 Open the following circuit breakers and fuses:
- 4 CB-1 through CB-7
4 FU-1 through FU-13
- 4 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

W. J. Smith 3/25/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary)...
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-3805E		
Title of Test: Electrical Systems			Equipment Serial Number(s): NOTE 0173		
Test Performed By: Doug Anderson			SIMPSON		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	L 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125 125 0	L1,L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	120 125 0	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 125	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VPT-PNL-3805E		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0173		
Test Performed By: DOUG ANDERSON					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125 125	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	48 58	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	120	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 12/24/95 / 12/25/95			SHMS Unit Number: VTP-PNL-3805E		
Title of Test: Electrical Systems			Equipment Serial Number(s): 12/24/95 SIMPSON 0073 / 12/25/95 SIMPSON 0173		
Test Performed By: DOUG ANDERSON / F.T. RIVERA			12/1/95		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	41 54	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	120	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0	0V	A	

12/24/95
→
12/25/95

TEST DATA SHEET

Date: 3/26/95			SHMS Unit Number: VTP-PNL-3805E		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 12/1/95		
Test Performed By: FIDEL FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices.	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VPT-PNL-3805E		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: F.T. RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

Test Director

Recorder

Quality Assurance

Date

Date

Date

3-25-85

3/24/95

3/25/95

N/A

TEST DATA SHEET

Date: 3/25/95			SHMS Unit Number: VTP-PNL-3805E		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): NA		
Test Performed By: R. WALLI FIDEL RIVERA					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	< 40	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	Flow	Indicates Flow	A	
10.3.6	FI-*-3-1	NO FLOW	Indicates No Flow	A	
10.4.4	FI-*-5-1	NO FLOW	Zero Flow	A	
10.4.7	FI-*-5-1	NO FLOW	Zero Flow	A	

Test Witnesses:

Bon Blair
Test Director

3-25-95
Date

[Signature]
Recorder

3/25/95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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APPENDIX C

TEST LOG SHEET

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APPENDIX S

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

107-U

TEST EXECUTION SHEET

Date: 3-24-95		Document Number: WHC-SD-WM-ATR-090 REV 0	
SHMS Unit Number: VTP-PNL-3805G			
TEST PERSONNEL			
WHC PROJECT ENGINEER: D.T. LOTT		TEST DIRECTOR: G.D. Feltner WHC	
RECORDER: F.L. Snyder D.D. Wallace		WITNESSES: D.T. LOTT	
TEST EXECUTION			
LE4/rmt 3-27-95		D.D. Wallace 3-24-95	
Installation Contractor		Recorder	
G.D. Feltner 3/25/95		3/25/95	
Test Director		Date	
TEST WITNESS			
D.T. Lott 3/25/95		Witness	
Witness		Date	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
Without Exception		With Exception/Resolved	
X		With Exception/Outstanding	
NA		Randy L. Osterman 3-30-95	
Field Engineering		Project Engineer	
Date		Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
Without Exception		With Exception/Resolved	
X		With Exception/Outstanding	
Joe J. [Signature] 4-26-95		Frank M. Chapin 4/27/95	
Plant Operations		Quality Assurance	
Date		Date	
M.B. [Signature] 4/19/95		D.T. Lott 4-3-95	
Safety		Project Engineer	
Date		Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste
Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- ow 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- ow 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- ow 8.1.3 Leak tests on the pneumatic systems have been performed.
- ow 8.1.4 The following circuit breakers and fuses are open

ow CB-1 through CB-7
ow FU-1 through FU-13

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000 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.

000 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.

000 8.1.7 The following sample lines/valves are CAPPED/CLOSED.

000 MV-*-1-1 through MV-*-1-4

000 MV-*-3-3

000 MV-*-4-3 through MV-*-4-4

000 MV-*-5-1 through MV-*-5-6

000 MV-*-7-3 through MV-*-7-4

000 Sample and exhaust line ends are capped.

000 8.1.8 The following sample line valves are OPEN

000 FCV-*-1-1

000 FI-*-3-1

000 MV-*-4-1 through MV-*-4-2

000 FI-*-5-1

000 MV-*-7-1 through MV-*-7-2

000 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

000 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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OW 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

OW 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

OW 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

OW 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

OW 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

OW 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

OW 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

OW 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

OW 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

OW 9.2.1.8 Verify heater operates.

OW 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

OW 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

OW 9.2.1.11 Adjust Heater temperature control to 70°F.

OW 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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OW 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

OW 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

OW 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

OW 9.2.2.3 Verify pump turns ON.

OW 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

OW 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

OW 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

OW 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

OW 9.2.3.3 Verify cabinet light is ON.

OW 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

OW 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

OW 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

OW 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

OW 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

OW 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

OW 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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oow 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

oow 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

oow 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

oow 9.2.4.3.3 Visually verify instruments are operating:
oow Transmitter FIT-*-7-1,
oow Flow Alarm FASL-*-7-1.

oow 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

oow 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

oow 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

oow 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

oow 9.2.4.4.2 Visually verify instrument displays are operating:

oow Transmitter NIT-*-6-1,
oow Transmitter NIT-*-12-1,
oow Recorder NR-*-6/12-1.

oow 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

oow 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- 4 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 4 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 4 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 4 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 4 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 4 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

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Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ow 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ow 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ow 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ow 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ow 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ow 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- OW 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- OW 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- OW 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- OW 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- OW 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- OW 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- OW 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- OW 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- OW 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- OW 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- OW 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- OW 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- OW 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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OW 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

OW 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

OW 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

OW 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

OW Horn, YAH-*-9-1, is ON.

3/2/95 OW High Hydrogen Beacon YAL-*-10-2 is ON.

OW Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

OW Trouble Beacon YAL-*-18-1 is ON.

OW Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

OW All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

OW 9.2.4.8.4 Release Alarm Test push button.

OW 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

OW 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

OW 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

OW 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

OW 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:
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QW The Grab Sample push button light HSL-*-22-1 is illuminated.

QW The Reset Sample push button light HSL-*-23-1 is illuminated.

QW The Reset Sample light YAL-*-23-1 is illuminated.

QW 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

QW 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

QW 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

QW 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

QW 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

QW 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

QW 9.3.3
3-24-95 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- MV-*-1-1 through MV-*-1-4
 - MV-*-3-3
 - MV-*-4-3 through MV-*-4-4
 - MV-*-5-1 through MV-*-5-6
 - MV-*-7-3 through MV-*-7-4
 - Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- FCV-*-1-1
 - FI-*-3-1
 - MV-*-4-1 through MV-*-4-2
 - FI-*-5-1
 - MV-*-7-1 through MV-*-7-2
 - MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
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- 10.2.3 OPEN valves:

OO MV-*-1-1
OO MV-*-1-2
OO MV-*-1-3
OO MV-*-1-4

- OO 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- OO 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- OO 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- OO 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- OO 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- OO MV-*-3-3
OO Gas Sample Assembly Valves
- OO 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- OO 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- OO 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- OO 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- OO 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- OO 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- OO 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

OO MV-*-5-4

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OO MV-*-5-5

- OO 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- OO 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.
- 10.4.5 OPEN valves:
- OO MV-*-5-4
OO MV-*-5-6
- OO 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- OO 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.
- OO 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- OO MV-*-1-1 through MV-*-1-4
OO MV-*-3-3
OO MV-*-4-1 through MV-*-4-4
OO MV-*-5-1 through MV-*-5-6
OO MV-*-7-1 through MV-*-7-4
OO MV-*-8-1
- OO 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.
- OO 10.4.11 Open the following circuit breakers and fuses:
- OO CB-1 through CB-7
OO FU-1 through FU-13
- OO 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3-24-95		SHMS Unit Number: JTD-PNL-38056			
Title of Test: Electrical Systems		Equipment Serial Number(s): Simpson MATE 0033 12-1-95			
Test Performed By: FT Rivera					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	< 1	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	124 124 0V	L1, L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	off	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	on	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	on off	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	125 0V	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0V 0V	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 125	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-24-95			SHMS Unit Number: VTF-PNL-38056		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson M-TE 0033 12-1-95		
Test Performed By: FT Rivera					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	on on	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0V	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	on on on	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125 125	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	59 69	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3-24-95			SHMS Unit Number: VTA ANL-3805G		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson M+TE 0033 12-1-95		
Test Performed By: FT Rivera					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	on	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0V	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	51° 63°	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	on	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0V	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0V	0V	A	

TEST DATA SHEET

Date:			SHMS Unit Number: VTP-PNL-3805 G		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson MATE 0033 12-1-95		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1' YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	on off ON 3/25/95 on on on on on	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	on on on	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	off on on	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	off	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	off off	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date:			SHMS Unit Number: <u>VTR PNL-3805 C</u>		
Title of Test: Electrical Systems			Equipment Serial Number(s):		
Test Performed By:					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.4	< 1 Ohm	A	

Test Witnesses:

Harry D. Feltman
Test Director

3/28/95
Date

David S. Smith
Recorder

3/25/95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3-24-95			SHMS Unit Number: VTA PNL-3805G		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): N/A		
Test Performed By: SW O'Leary					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15'	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10'	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	28"	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	OK	Indicates Flow	A	
10.3.6	FI-*-3-1	OK	Indicates No Flow	A	
10.4.4	FI-*-5-1	OK	Zero Flow	A	
10.4.7	FI-*-5-1	OK	Zero Flow	A	

Test Witnesses:

Harry E. Feltner
Test Director

3/24/95
Date

DO. W. Danner
Recorder

3-24-95
Date

N/A
Quality Assurance

N/A
Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number: VPR- PNL- 3805G			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses
9.2.4.5.2 9.2.4.5.11	3-24-95	Direct short on Sample Line Heat Trace.	Q 3/25/95	PS 3/25/95	
9.2.4.8.3	3-24-95	High Hydrogen Decon YAL-10-2 Did not come on.	DT 3/25/95	PS 3/25/95	

TEST APPROVED WITH EXCEPTIONS

DT Lm
WHC Project Engineer

[Signature]
Recorder

N/A
Witness

3/25/95
Date

3/25/95
Date

N/A
Date

WHC-SD-WM-ATR-090

REV 0

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX T

TANK 108-U

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE.**

APPROVAL DESIGNATOR SQ

Issued by

TWRS Safety Programs Engineering Support

July 27, 1994

TEST EXECUTION SHEET

Date: <u>3/24/95</u>		Document Number: WHC-SD-WM-ATR-090 REV 0	
SHMS Unit Number: <u>VTP-PNL-3805H</u>			
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>D.T. LOTT</u>		TEST DIRECTOR: <u>ROY BENDER</u>	
RECORDER: <u>E.F. ENLOE</u>		WITNESSES:	
TEST EXECUTION			
<u>J E Gurnea</u> Installation Contractor	<u>3-27-95</u> Date	<u>E F Enloe</u> Recorder	<u>3/24/95</u> Date
<u>B m Bahr</u> Test Director	<u>3-25-95</u> Date		
TEST WITNESS			
<u>N/A</u> Witness	<u> </u> Date	<u>N/A</u> Witness	<u> </u> Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>NA</u> Field Engineering	<u> </u> Date	<u>Ken H. Osterman</u> Project Engineer	<u>3-31-95</u> Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception	☐ With Exception/Resolved	☐ With Exception/Outstanding	
<u>Jim J. B.</u> Plant Operations	<u>4-26-95</u> Date	<u>Hank M. Chapin</u> Quality Assurance	<u>4/26/95</u> Date
<u>m. B. in Tulsa</u> Safety	<u>4/19/95</u> Date	<u>OT. Lott</u> Project Engineer	<u>4/5/95</u> Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. — *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- JE 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- JE 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- JE 8.1.3 Leak tests on the pneumatic systems have been performed.
- JE 8.1.4 The following circuit breakers and fuses are open

JE CB-1 through CB-7
JE FU-1 through FU-13

3/24/95

- DE 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- DE 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- DE 8.1.7 The following sample lines/valves are CAPPED/CLOSED.
- DE MV-*-1-1 through MV-*-1-4
 - DE MV-*-3-3
 - DE MV-*-4-3 through MV-*-4-4
 - DE MV-*-5-1 through MV-*-5-6
 - DE MV-*-7-3 through MV-*-7-4
 - DE Sample and exhaust line ends are capped.
- DE 8.1.8 The following sample line valves are OPEN
- DE FCV-*-1-1
 - DE FI-*-3-1
 - DE MV-*-4-1 through MV-*-4-2
 - DE FI-*-5-1
 - DE MV-*-7-1 through MV-*-7-2
 - DE MV-*-8-1.

Check that all prerequisites have been met.

J. Enloe 3/24/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- DE 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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JE 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

JE 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

JE 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

JE 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

JE 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

JE 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

JE 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature:

JE 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

JE 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

JE 9.2.1.8 Verify heater operates.

JE 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

JE 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

JE 9.2.1.11 Adjust Heater temperature control to 70°F.

JE 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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JE 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

JE 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

JE 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

JE 9.2.2.3 Verify pump turns ON.

JE 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

JE 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

JE 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

JE 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

JE 9.2.3.3 Verify cabinet light is ON.

JE 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

JE 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

JE 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

JE 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

JE 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

JE 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

JE 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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OK 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

OK 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

OK 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

OK 9.2.4.3.3 Visually verify instruments are operating:
OK Transmitter FIT-*-7-1,
OK Flow Alarm FASL-*-7-1.

OK 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

OK 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

OK 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

OK 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

OK 9.2.4.4.2 Visually verify instrument displays are operating:

OK Transmitter NIT-*-6-1,
OK Transmitter NIT-*-12-1,
OK Recorder NR-*-6/12-1.

OK 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

OK 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

OK 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

OK 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

OK 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- JE 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- JE 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- JE 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- JE 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- JE 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- JE 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- JE 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- JE 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- JE 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- JE 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- JE 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- JE 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- JE 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- JE 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- SE 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- SE 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- SE 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- SE 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.

9.2.4.7 Cabinet Temperature

- SE 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- SE 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- SE 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- SE 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- SE 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- SE 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- SE 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- SE 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- SE 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- SE 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- SE 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

OK 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

OK 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

OK 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

OK 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

OK Horn, YAH-*-9-1, is ON.

OK High Hydrogen Beacon YAL-*-10-2 is ON.

OK Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

OK Trouble Beacon YAL-*-18-1 is ON.

OK Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

OK All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

OK 9.2.4.8.4 Release Alarm Test push button.

OK 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

OK 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

OK 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

OK 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

OK 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

JE The Grab Sample push button light HSL-*-22-1 is illuminated.

JE The Reset Sample push button light HSL-*-23-1 is illuminated.

JE The Reset Sample light YAL-*-23-1 is illuminated.

JE 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

JE 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

JE 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

JE 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

JE 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

JE 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

JE 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- JE 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- JE 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.

JE MV-*-1-1 through MV-*-1-4
JE MV-*-3-3
JE MV-*-4-3 through MV-*-4-4
JE MV-*-5-1 through MV-*-5-6
JE MV-*-7-3 through MV-*-7-4
JE Sample and exhaust line ends are capped.

- 10.1.4 Verify the following sample line valves are OPEN

JE FCV-*-1-1
JE FI-*-3-1
JE MV-*-4-1 through MV-*-4-2
JE FI-*-5-1
JE MV-*-7-1 through MV-*-7-2
JE MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- JE 10.2.1 Set fused switch FU-13 to the CLOSED position.
- JE 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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OK MV-*-1-1
OK MV-*-1-2
OK MV-*-1-3
OK MV-*-1-4

- OK 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- OK 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- OK 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- OK 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- OK 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
- OK MV-*-3-3
OK Gas Sample Assembly Valves
- OK 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- OK 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- OK 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- OK 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- OK 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- OK 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- OK 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

OK MV-*-5-4

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DE MV-*-5-5

DE 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

DE 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.

10.4.5 OPEN valves:

DE MV-*-5-4

DE MV-*-5-6

DE 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.

DE 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.

DE 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

DE MV-*-1-1 through MV-*-1-4

DE MV-*-3-3

DE MV-*-4-1 through MV-*-4-4

DE MV-*-5-1 through MV-*-5-6

DE MV-*-7-1 through MV-*-7-4

DE MV-*-8-1

DE 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.

DE 10.4.11 Open the following circuit breakers and fuses:

DE CB-1 through CB-7

DE FU-1 through FU-13

DE 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-8 Hydrogen Monitoring System One Line & Elementary Diagrams.

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10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

(0854)

Date: 3-24-95			SHMS Unit Number: UTP-PNL-3805H		
Title of Test: Electrical Systems			Equipment Serial Number(s): MATE 0173 SIMPSON		
Test Performed By: DOUG ANDERSON					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	LESS THAN	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125 125 0	L1,L2: 120V $\pm$ 5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	120	H: 120V $\pm$ 5% N: 0V	A	
9.2.3.5	RCPT: H N	0	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 125	Primary, Secondary: 120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-3BOSH		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0173		
Test Performed By: DOUG ANDERSON					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125 24	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	120 120	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	46 56	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	120 56	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL - 3805H		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0173		
Test Performed By: Doug Anderson					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	44 54	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	120	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	120	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	120	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0	0V	A	

TEST DATA SHEET

Date: <u>3/24/95</u>			SHMS Unit Number: <u>VPT-PNL-3805H</u>		
Title of Test: Electrical Systems			Equipment Serial Number(s): <u>SIMPSON</u> <u>0173</u>		
Test Performed By: <u>DOUG ANDERSON</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	<u>ON</u> <u>ON</u> <u>ON</u> <u>ON</u> <u>ON</u> <u>ON</u> <u>ON</u> <u>ON</u>	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	<u>A</u>	
9.2.4.8.5	Inactive Alarms	<u>OFF</u>	OFF	<u>A</u>	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	<u>ON</u> <u>ON</u> <u>ON</u>	ON ON ON	<u>A</u>	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	<u>OFF</u> <u>ON</u> <u>ON</u>	OFF ON ON	<u>A</u>	
9.2.4.9.5	HSL-*-22-1	<u>OFF</u>	OFF	<u>A</u>	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	<u>OFF</u> <u>OFF</u>	OFF OFF	<u>A</u>	
9.3.1	Nameplates	<u>OK</u>	Near IS Devices.	<u>A</u>	

TEST DATA SHEET

Date: 3/24/95		SHMS Unit Number: VTP - PNL - 3805H			
Title of Test: Electrical Systems		Equipment Serial Number(s): SIMPSON 0173			
Test Performed By: DOUG ANDERSON					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	YES	Proper Labeling.	A	
9.3.3	Resistance	LESS THAN	< 1 Ohm	A	

Test Witnesses:

[Signature]
Test Director

3/24/95
Date

[Signature]
Recorder

3/24/95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date:			SHMS Unit Number:		
Title of Test: Pneumatic Systems			Equipment Serial Number(s):		
Test Performed By: RANDY WALLI					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	GREATER	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	>	> 10 Feet	A	
10.1.3	Sample Line Valves	CLOSED	CLOSED	A	
10.2.6	Sample Intake & Exhaust	YES	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	< 40	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	FLOW	Indicates Flow	A	
10.3.6	FI-*-3-1	NO FLOW	Indicates No Flow	A	
10.4.4	FI-*-5-1	0	Zero Flow	A	
10.4.7	FI-*-5-1	0	Zero Flow	A	

Test Witnesses:

 Test Director

 Recorder

 Quality Assurance

 Date

 Date

 Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

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REV 0

APPENDIX C

TEST LOG SHEET

REV 0

REV 0

TEST LOG

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APPENDIX U

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

109-U

TEST EXECUTION SHEET

Date: <u>3/24/95</u>		Document Number: WHC-SD-WM-ATR-090	
SHMS Unit Number: <u>VTP-PNL-38951</u>		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: <u>LT. LOTT</u>		TEST DIRECTOR: <u>RANDY BUNCH</u>	
RECORDER: <u>F.L. Snyder</u>		WITNESSES:	
TEST EXECUTION			
<u>LEFrost</u>	<u>3-27-95</u>	<u>[Signature]</u>	<u>3/24/95</u>
Installation Contractor	Date	Recorder	Date
<u>[Signature]</u>	<u>3-27-95</u>		
Test Director	Date		
TEST WITNESS			
<u>NA</u>			
Witness	Date	Witness	Date
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
<u>X</u> Without Exception	_____ With Exception/Resolved	_____ With Exception/Outstanding	
<u>NA</u>		<u>[Signature]</u>	<u>3-30-95</u>
Field Engineering	Date	Project Engineer	Date
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
<u>X</u> Without Exception	_____ With Exception/Resolved	_____ With Exception/Outstanding	
<u>[Signature]</u>	<u>4-26-95</u>	<u>[Signature]</u>	<u>4/27/95</u>
Plant Operations	Date	Quality Assurance	Date
<u>m. [Signature]</u>	<u>4/19/95</u>	<u>[Signature]</u>	<u>4/3/95</u>
Safety	Date	Project Engineer	Date

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP. :
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste Tank Safety Assurance. *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

- A 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.
- A 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.
- A 8.1.3 Leak tests on the pneumatic systems have been performed.
- A 8.1.4 The following circuit breakers and fuses are open
 - A CB-1 through CB-7
 - A FU-1 through FU-13

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- 1 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- 1 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- 1 8.1.7 The following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 1 8.1.8 The following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

Check that all prerequisites have been met.

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8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- 1 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.
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✓ 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

✓ 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

✓ 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

✓ 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

✓ 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

✓ 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

✓ 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

✓ 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

✓ 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

✓ 9.2.1.8 Verify heater operates.

✓ 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

✓ 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the KI-*-01 relay.

Note: Heat may still radiate from Heater.

✓ 9.2.1.11 Adjust Heater temperature control to 70°F.

✓ 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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✓ 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

✓ 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

✓ 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

✓ 9.2.2.3 Verify pump turns ON.

✓ 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

✓ 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

✓ 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

✓ 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

✓ 9.2.3.3 Verify cabinet light is ON.

✓ 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

✓ 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

✓ 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

✓ 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

✓ 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

✓ 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

✓ 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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1 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm System

1 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

1 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

1 9.2.4.3.3 Visually verify instruments are operating:
1 Transmitter FIT-*-7-1,
1 Flow Alarm FASL-*-7-1.

1 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

1 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

1 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

1 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

1 9.2.4.4.2 Visually verify instrument displays are operating:

1 Transmitter NIT-*-6-1,
1 Transmitter NIT-*-12-1,
1 Recorder NR-*-6/12-1.

1 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

1 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

1 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

1 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

1 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

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- ✓ 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- ✓ 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- ✓ 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- ✓ 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ✓ 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- ✓ 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- ✓ 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- ✓ 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- ✓ 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ✓ 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

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increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- ✓ 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- ✓ 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- ✓ 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- ✓ 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.
- 9.2.4.7 Cabinet Temperature
- ✓ 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- ✓ 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- ✓ 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- ✓ 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ✓ 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- ✓ 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- ✓ 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- ✓ 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- ✓ 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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U 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.

U 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.

9.2.4.8 Alarm Systems

U 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.

U 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)

9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:

U Horn, YAH-*-9-1, is ON.

U High Hydrogen Beacon YAL-*-10-2 is ON.

U Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.

U Trouble Beacon YAL-*-18-1 is ON.

U Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.

U All Indicating Lights EXCEPT the RESET SAMPLER light are ON.

U 9.2.4.8.4 Release Alarm Test push button.

U 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.

U 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.

9.2.4.9 Auto Sampler System

U 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.

U 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.

U 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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4 The Grab Sample push button light HSL-*-22-1 is illuminated.

4 The Reset Sample push button light HSL-*-23-1 is illuminated.

4 The Reset Sample light YAL-*-23-1 is illuminated.

4 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

4 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

4 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

4 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

4 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

4 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

4 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

Joseph Snyd 3/24/95

10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 4 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 4 MV-*-4-3 through MV-*-4-4
 - 4 MV-*-5-1 through MV-*-5-6
 - 4 MV-*-7-3 through MV-*-7-4
 - 4 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.
- #### 10.2 SAMPLE MAIN FLOW LOOP
- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 4 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

1 MV-*-1-1
4 MV-*-1-2
1 MV-*-1-3
4 MV-*-1-4

- 1 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- 4 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- 1 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- 1 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- 4 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
4 MV-*-3-3
~~1~~ Gas Sample Assembly Valves
- 4 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- 4 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- 4 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- 4 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- 4 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- 1 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- 1 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:

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4 MV-*-5-5

4 10.4.3 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

4 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1
indicates zero flow.

10.4.5 OPEN valves:

4 MV-*-5-4
4 MV-*-5-6

4 10.4.6 Adjust to nominally 2.0 cfh flow through
FI-*-5-1.

4 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1
indicates zero flow.

4 10.4.8 Switch circuit breaker CB-3 to the OPEN position.

10.4.9 CLOSE the following sample line valves.

4 MV-*-1-1 through MV-*-1-4
4 MV-*-3-3
4 MV-*-4-1 through MV-*-4-4
4 MV-*-5-1 through MV-*-5-6
4 MV-*-7-1 through MV-*-7-4
4 MV-*-8-1

4 10.4.10 Replace end caps on sample inlet and outlet lines. Replace
plug upstream of F-*-5-1.

4 10.4.11 Open the following circuit breakers and fuses:

4 CB-1 through CB-7
4 FU-1 through FU-13

4 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring
System. Refer to H-2-817852, Standard-B Hydrogen Monitoring
System One Line & Elementary Diagrams.

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10.5 REVIEW

Check that all steps have been completed.

Philip Snyder 3/24/95

11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A
TEST DATA SHEETS

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-38051		
Title of Test: Electrical Systems			Equipment Serial Number(s): Simpson 0073 1/9/96		
Test Performed By: JOHN LEONARD					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	0	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125 V 125 V Ø	L1, L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	125 Ø	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	Ø Ø	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125 V 125 V	Primary, Secondary: 120V ± 5%	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-38051		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/96		
Test Performed By: JOHN LEONARD					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125V 24V	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125V 125V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	46 56	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-38051		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 4/9/96 1/9/96		
Test Performed By: JOHN LEONARD					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC-*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC-*-01 In #4 Voltage:	0	0V	A	
9.2.4.6.6	HT-*-15-1: Initial Temp. Final Temp.	46 56	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC-*-01 In #4 Voltage:	125	120V ± 5%	A	
9.2.4.7.2	TI-*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC-*-01 In #3 Voltage:	125	120V ± 5%	A	
9.2.4.7.7	YYC-*-01 In #3 Voltage:	0	0V	A	
9.2.4.7.9	YYC-*-01 In #3 Voltage:	125V	120V ± 5%	A	
9.2.4.7.11	YYC-*-01 In #3 Voltage:	0	0V	A	

TEST DATA SHEET

Date: 3/24/96			SHMS Unit Number: VTP-PNL-38051		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0073 1/9/96		
Test Performed By: JOHN LEONARD					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	A	
9.2.4.8.5	Inactive Alarms	off	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP VTP-PNL-38051		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON		
Test Performed By: JOHN LEONARD			0073 1/9/96		
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.2	< 1 Ohm	A	

Test Witnesses:

[Signature]
Test Director

3/24/95
Date

[Signature]
Recorder

3/27/95
Date

N/A
Quality Assurance

N/A
Date

TEST DATA SHEET

Date: 3/24/95			SHMS Unit Number: VTP-PNL-38051		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): NA		
Test Performed By: WILLIAM CUTLIP					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	> 15	> 15 Feet	A	
10.1.2	Calibration Line Heat Trace Length	> 10	> 10 Feet	A	
10.1.3	Sample Line Valves	OK	CLOSED	A	
10.2.6	Sample Intake & Exhaust	OK	Air going in through Intake, leaving through Exhaust	A	
10.2.7	PDI-*-4-1	< 40	< 40" H ₂ O	A	
10.3.3	FI-*-3-1	Flow	Indicates Flow	A	
10.3.6	FI-*-3-1	No Flow	Indicates No Flow	A	
10.4.4	FI-*-5-1	No Flow	Zero Flow	A	
10.4.7	FI-*-5-1	No Flow	Zero Flow	A	

Test Witnesses:

 Test Director

 Recorder

 Quality Assurance

 3-27-95
 Date

 3/24/95
 Date

 N/A
 Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Number:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

WHC-SD-WM-ATR-090

REV 0

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APPENDIX C

TEST LOG SHEET

[illegible]

APPENDIX V

TANK 110-T

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**STANDARD-B AUTO GRAB SAMPLER HYDROGEN MONITORING SYSTEM
ACCEPTANCE TEST PROCEDURE**

APPROVAL DESIGNATOR SQ

**Issued by
TWRS Safety Programs Engineering Support
July 27, 1994**

110-T

TEST EXECUTION SHEET

Date: 3/21/95		Document Number: WHC-SD-WM-ATP-090	
SHMS Unit Number: VTP-PNL-3705J		REV 0	
TEST PERSONNEL			
WHC PROJECT ENGINEER: D. LOTT		TEST DIRECTOR: ROY BENDER	
RECORDER: F.L. SNYDER		WITNESSES: D. LOTT	
TEST EXECUTION			
<u>LEFrost</u> 3.21.95		<u>Floyd Snyder</u> 3/21/95	
Installation Contractor		Recorder	
<u>Bm Ruler</u> 3/21/95			
Test Director		Date	
TEST WITNESS			
<u>James Lott</u> 3/21/95			
Witness		Date	
TEST ACCEPTANCE			
Kaiser Engineers Hanford			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
<u>NA</u>		<u>Ther L. Osterman</u> 3-30-95	
Field Engineering		Project Engineer	
Date		Date	
TEST APPROVAL AND ACCEPTANCE			
Westinghouse Hanford Company			
☒ Without Exception ☐ With Exception/Resolved ☐ With Exception/Outstanding			
<u>James J. [Signature]</u> 4-26-95		<u>Harold M. Chapin</u> 4/27/95	
Plant Operations		Quality Assurance	
Date		Date	
<u>m. [Signature]</u> 4/19/95		<u>DT [Signature]</u> 4/3/95	
Safety		Project Engineer	
Date		Date	

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STANDARD HYDROGEN MONITORING SYSTEM ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE

The purpose of this document is to demonstrate that the standard hydrogen monitoring system is constructed as intended by design.

2.0 REFERENCES

2.1 DRAWINGS

- H-2-817851, Standard-B Hydrogen Monitoring System Piping & Instrumentation Diagram.
- H-2-817852 Standard-B Hydrogen Monitoring System One-Line, Elementary Diagrams.
- H-2-817853, Standard-B Hydrogen Monitoring System Cabinet Assembly.
- H-2-817854, Standard-B Hydrogen Monitoring System Wiring Diagram.
- H-2-817855, Standard-B Hydrogen Monitoring System Interior Panels & Brackets.
- H-2-817859, Standard-B Hydrogen Monitoring System Instrument Panel Assembly.
- H-2-817860, Standard-B Hydrogen Monitoring System Loop Diagrams.
- H-2-817861, Standard-B Hydrogen Monitoring System Cabinet Modifications.
- H-2-818213, Standard-B Hydrogen Monitoring System PLC Ladder Diagram.
- H-2-818214 Standard-B Hydrogen Monitoring System Gas Bottle Rack
- H-2-818215, Standard-B Hydrogen Monitoring System Equipment Arrangement.
- H-2-818220, Standard-B Hydrogen Monitoring System Sample Pump Stand Assembly.

2.2 PROCEDURES

- WHC-CM-4-3, Volume 1, Program E-2, Electrical Safety Practices.

3.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the recorder for listing on the recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

3.1 WHC PROJECT ENGINEER

- 3.1.1 Designate a test director.
- 3.1.2 Coordinate testing with facility management.
- 3.1.3 Act as liaison between the participants in acceptance testing.
- 3.1.4 Distribute the approved testing schedule as soon as possible, but at least two days prior to testing.
- 3.1.5 Ensure field testing and inspection has been completed.
- 3.1.6 Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- 3.1.7 Notify the persons performing and witnessing the test prior to the start of testing.
- 3.1.8 Notify all concerned parties when a change is made in the testing schedule.
- 3.1.9 Sign Test Execution Sheet when ATP is approved and accepted.
- 3.1.10 Take necessary action to clear exceptions to the ATP.
- 3.1.11 Sign Exception Sheet when exception has been resolved.
- 3.1.12 Provide a distribution list for the approved and accepted ATP.

3.2 TEST DIRECTOR

- 3.2.1 Coordinate all acceptance testing.

- 3.2.2 Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- 3.2.3 Stop any test which may cause damage to the system until the test procedure has been revised.
- 3.2.4 Approve field changes to the ATP.
- 3.2.5 Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- 3.2.6 Evaluate recorded data, discrepancies, and exceptions.
- 3.2.7 Obtain from the WHC project engineer, any information or changes necessary to clear or resolve objections.
- 3.2.8 Sign Test Execution Sheet when ATP has been performed.
- 3.2.9 Sign Test Exception Sheet when retest has been executed and accepted.
- 3.2.10 Obtain required signatures on the ATP master prior to reproduction and distribution.

3.3 WITNESSES (Provided by Participating Organizations)

- 3.3.1 Witness the tests.
- 3.3.2 Evaluate results of testing.
- 3.3.3 Assist the Test Director when requested.
- 3.3.4 Sign Test Exception Sheet as a witness.
- 3.3.5 Sign Test Exception Sheet as a witness when retest has been executed and accepted.

3.4 RECORDER (Provided by KEH)

- 3.4.1 Record names of all designated personnel on recorder's copy of ATP prior to start of testing.
- 3.4.2 Observe tests, record test data and maintain test log.
- 3.4.3 Sign the Test Exception Sheet as the recorder.
- 3.4.4 Initial and date every test step on the recorder's copy as it is completed, next to the step number or on a table, when provided. On

tables where there is not room for both the initial and date, date may be entered in space provided at bottom of column.

- 3.4.5 Record authorized field changes to the ATP.
- 3.4.6 Record exceptions and test steps that are not performed on the Test Exception Sheet. Have the information transferred in ink or typed to the Master Exception Sheet(s). Additional Exception Sheets are to be added as needed.
- 3.4.7 Orally notify the test director at time the objection is made.
- 3.4.8 Assign page number to Data Sheets and Exception Sheets after ATP is complete. Record Page numbers for these items and make corrections, as necessary, to page numbers shown for these pages in the index.
- 3.4.9 Transfer the final test results with recorder's signature and dates for each step to the master in ink or type. Submit the completed master to the Test Director for approval signatures and distribution. Retain the recorder's copy and a copy of the master in the field project files.

3.5 CONSTRUCTION CONTRACTOR

- 3.5.1 Organize and perform this acceptance test under coordination of the Test Director.
- 3.5.2 Confirm that all equipment required for performing this test (as listed in Section 8.2) will be available at start of testing.
- 3.5.3 Provide equipment required for performing this acceptance test, which has not been designated as being provided by others.
- 3.5.4 Request in writing from the project engineer those services, materials, or equipment that have been designated as being supplied by the Department of Energy (DOE) or others.

3.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves, others, and the equipment from undue hazards and to prevent damage to property and environment. Facility line managers shall assure the safety of all activities within their areas to prevent injury, property damage, or interruption of operation. Performance of test activities shall always include safety and health aspects as delineated in the Operations Manuals and as directed by the WHC project engineer. Any hazard identified

during the performance of the ATP shall be reported to the manager of Waste
Tank Safety Assurance *TWRS Safety*

4.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing is to be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with Section 3.2 and with approved change control procedures.

5.0 TEST EXECUTION

The acceptance test procedures detailed in Sections 9.0 and 10.0 shall be performed in sequential steps starting with Section 9.0. As required by Section 3.4, the recorder will initial and date every test step in the space provided on the recorder's copy of the ATP as each step is completed. Any step that requires verification must also be recorded on the Test Data Sheet.

5.1 WITHOUT EXCEPTION

- 5.1.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed and no exceptions have been recorded.
- 5.1.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.1.3 Distribute requisite copies and send master of ATP to the client.

5.2 WITH EXCEPTION/RESOLVED

- 5.2.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded and resolved.
- 5.2.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.2.3 Distribute requisite copies and send master of ATP to the client.

5.3 WITH EXCEPTION/OUTSTANDING

- 5.3.1 Check applicable space on Test Execution Sheet to show that the ATP has been performed with exceptions recorded, part or all of which are presently outstanding, unresolved.

- 5.3.2 Sign and date Test Execution Sheet in the spaces provided.
- 5.3.3 Distribute requisite copies and send master of ATP to the client.

6.0 RECORDING AND RESOLVING EXCEPTIONS

6.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

6.2 RECORDING

- 6.2.1 Number each exception sequentially as it occurs and record it on an Exception Sheet.
- 6.2.2 Enter name and organization of objecting party for each exception.
- 6.2.3 Enter planned action to resolve each exception when such determination is made.

6.3 RETEST/RESOLUTION

- 6.3.1 Record the action taken to resolve each exception. Action taken may not be the same as planned action.
- 6.3.2 When action taken results in an acceptable retest, sign and date Retest Execution and Acceptance section of the Exception Sheet.
- 6.3.3 When action taken does not involve an acceptable retest, strike out the Retest Execution and Acceptance section of the Exception Sheet. Resolve exception as shown under 6.4 below.

6.4 APPROVAL AND ACCEPTANCE

- 6.4.1 The project engineer provides final approval and acceptance of exception by checking one of the following on Exception Sheet:
 - Retest Approved and Accepted: Applicable when Retest Execution and Acceptance section is completed.
 - Exception Accepted-As-Is: Requires detailed explanation.

- Other: Requires detailed explanation.

6.4.2 The project engineer signs and dates the Exception Sheet and obtains other internal approval, if required.

6.5 DISTRIBUTION

Distribute requisite copies of completed Exception Sheets to the client.

7.0 SYSTEM DESCRIPTION

The primary function of the standard hydrogen monitoring system is to monitor specifically for hydrogen in the waste tank atmosphere which may also contain (but not be limited to) unknown quantities of air, nitrous oxide, ammonia, water vapor, carbon dioxide, carbon monoxide, and other gaseous constituents.

The SHMS will consist of hydrogen specific monitors, a grab sampler to collect samples for laboratory analysis, and the gas sample collection system necessary to support the operation of the instrumentation. This system will be located in a cabinet placed at the tank of interest.

8.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

8.1 TEST CONDITIONS

The following conditions shall exist at the start of the acceptance testing.

1 8.1.1 Systems being tested have been inspected for workmanship and for compliance with design.

1 8.1.2 Continuity and megger tests have been performed on portions of the electrical and instrument systems being tested, as required.

1 8.1.3 Leak tests on the pneumatic systems have been performed.

1 8.1.4 The following circuit breakers and fuses are open

1 CB-1 through CB-7
1 FU-1 through FU-13

11 3/21/95

- 1 8.1.5 All test instruments have a currently valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- 1 8.1.6 Personnel responsible for directing and witnessing the performance of the tests described in this ATP have read and understand appropriate certified vendor information (CVI) pertaining to the operation of the equipment to be tested.
- 1 8.1.7 The following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 1 8.1.8 The following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

Check that all prerequisites have been met.

1 *[Signature]* 3/21/95

8.2 EQUIPMENT REQUIRED

The contractor shall supply all test equipment unless otherwise noted.

9.0 ELECTRICAL SYSTEMS

This procedure will demonstrate that all electrical devices function properly.

9.1 SHMS POWER SUPPLY

- 1 9.1.1 Verify resistance between system ground and cabinet enclosure is less than one (1) ohm.

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1 9.1.2 Energize power source to the Standard-B Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

1 9.1.3 Verify line voltages, L1, L2, and N, at terminal block.

9.2 ELECTRICAL DEVICES

9.2.1 Heating and Air Conditioning

1 9.2.1.1 Adjust Air Conditioner (ACU-*-01) temperature control to a value below ambient temperature.

1 9.2.1.2 Adjust Heater (HTR-*-01) temperature control to a value below ambient temperature.

1 9.2.1.3 Switch circuit breaker CB-1 to the CLOSED position.

1 9.2.1.4 Verify Air Conditioner is operating and Heater is off.

Note: If ambient temperature is below Air Conditioner's minimum setting, a heat gun may be used to heat the A/C's temperature probe.

1 9.2.1.5 Adjust air conditioner temperature control to a value above ambient temperature.

1 9.2.1.6 Verify air conditioner compressor turns OFF.

Note: Air conditioner fan may still operate.

1 9.2.1.7 Adjust Heater temperature control to a value above ambient temperature.

1 9.2.1.8 Verify heater operates.

1 9.2.1.9 Adjust Air Conditioner temperature control to a value below ambient temperature.

1 9.2.1.10 Verify Air Conditioner compressor turns ON and Heater power is removed by the K1-*-01 relay.

Note: Heat may still radiate from Heater.

1 9.2.1.11 Adjust Heater temperature control to 70°F.

1 9.2.1.12 Adjust Air Conditioner temperature control to 80°F.

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1 9.2.1.13 Switch circuit breaker CB-1 to the OPEN position.

9.2.2 Sample Pump

1 9.2.2.1 Disconnect sample line outlet from sample pump P-*-01 at the closest convenient Swagelok fitting.

1 9.2.2.2 Switch circuit breaker CB-3 to the CLOSED position.

1 9.2.2.3 Verify pump turns ON.

1 9.2.2.4 Switch circuit breaker CB-3 to the OPEN position.

1 9.2.2.5 Reconnect sample line outlet to sample pump per manufacturer's guidance.

9.2.3 Panel Power Supply

1 9.2.3.1 Switch circuit breaker CB-6 to the CLOSED position.

1 9.2.3.2 Turn cabinet light switch HS-*-01 to the ON position.

1 9.2.3.3 Verify cabinet light is ON.

1 9.2.3.4 Verify power is being supplied to the cabinet receptacle RCPT-*-01 and record voltage readings.

1 9.2.3.5 Test GFI capability by depressing "TEST" button on receptacle. Verify zero voltage across receptacle hot and neutral. Reset GFI receptacle.

1 9.2.3.6 Turn cabinet light switch HS-*-01 to the OFF position.

1 9.2.3.7 Switch circuit breaker CB-6 to the OPEN position.

9.2.4 Cabinet Instrumentation

9.2.4.1 Isolation Transformer

1 9.2.4.1.1 Switch circuit breaker CB-7 to the CLOSED position.

1 9.2.4.1.2 Verify power is being supplied to the isolation transformer ISO XFMR. Record primary and secondary voltages.

9.2.4.2 DC Power

1 9.2.4.2.1 Set fused switch FU-1 to the CLOSED position.

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/ 9.2.4.2.2 Verify power is being supplied to the DC power source PWR-*-01. Record AC input and DC output voltages.

9.2.4.3 Flow Alarm Svstem

/ 9.2.4.3.1 Set fused switch FU-13 to the CLOSED position.

/ 9.2.4.3.2 Set fused switch FU-3 to the CLOSED position.

/ 9.2.4.3.3 Visually verify instruments are operating:
/ Transmitter FIT-*-7-1,
/ Flow Alarm FASL-*-7-1.

/ 9.2.4.3.4 Verify zero voltage between PLC YYC-*-01 Input Number 2 and PLC 120V Common.

/ 9.2.4.3.5 Set fused switch FU-3 to the OPEN position.

/ 9.2.4.3.6 Set fused switch FU-13 to the OPEN position.

9.2.4.4 Hydrogen Sensors

/ 9.2.4.4.1 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the CLOSED position.

/ 9.2.4.4.2 Visually verify instrument displays are operating:
/ Transmitter NIT-*-6-1,
/ Transmitter NIT-*-12-1,
/ Recorder NR-*-6/12-1.

/ 9.2.4.4.3 Verify 120V present between PLC YYC-*-01 Input Number 0 and PLC 120V Common and Input Number 1 and PLC 120V Common.

/ 9.2.4.4.4 Set fused switches FU-2, FU-4, FU-5, and FU-10 to the OPEN position.

9.2.4.5 Sample Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the sample gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

/ 9.2.4.5.1 Set fused switch FU-6 to the CLOSED position.

/ 9.2.4.5.2 Set circuit breaker CB-5 to the CLOSED position.

/ 9.2.4.5.3 Visually verify controller TIC-*-14-1 display is operating.

/ 3/24/90

- 1 9.2.4.5.4 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.5.5 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.5.6 Verify no AC voltage present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.7 Visually verify operation of heat trace HT-*-14-1 circuit. Temperature value of sample gas should begin increasing. Record initial temperature and increased temperature of nominally 10 degrees.
- 1 9.2.4.5.8 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 9.2.4.5.9 Verify 120V present between PLC YYC-*-01 Input Number 5 and PLC 120V Common.
- 1 9.2.4.5.10 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 9.2.4.5.11 Set fused switch FU-6 to the OPEN position.

9.2.4.6 Calibration Gas Heat Trace

Note: These steps must be done in an expedited manner. The Heat Trace circuit may cause the calibration gas temperature to rise at a fast rate. Adjust set points accordingly in order to prolong the test.

- 1 9.2.4.6.1 Set fused switch FU-7 to the CLOSED position.
- 1 9.2.4.6.2 Visually verify controller TIC-*-15-1 display is operating.
- 1 9.2.4.6.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.6.4 Adjust controller temperature set point number 2 to a value 5 degrees less than set point number 1.
- 1 9.2.4.6.5 Verify no AC voltage present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 9.2.4.6.6 Visually verify operation of heat trace HT-*-15-1 circuit. Temperature value of calibration gas should begin

1 3/21/95

increasing. Record initial temperature and increased temperature of nominally 10 degrees.

- 1 9.2.4.6.7 Adjust set point 2 to 20 degrees below indicated temperature.
- 1 9.2.4.6.8 Verify 120V present between PLC YYC-*-01 Input Number 4 and PLC 120V Common.
- 1 9.2.4.6.9 Reset controller temperature set point 1 to 85°F and set point 2 to 65°F.
- 1 9.2.4.6.10 Set fused switch FU-7 and circuit breaker CB-5 to the OPEN position.
- 9.2.4.7 Cabinet Temperature
- 1 9.2.4.7.1 Set fused switch FU-8 to the CLOSED position.
- 1 9.2.4.7.2 Visually verify temperature indicator TI-*-16-1 display is operating.
- 1 9.2.4.7.3 Adjust controller temperature set point number 1 to a value at least 20 degrees above ambient temperature as indicated by the controller.
- 1 9.2.4.7.4 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 1 9.2.4.7.5 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.6 Adjust set point 2 to 10 degrees above indicated temperature.
- 1 9.2.4.7.7 Verify zero voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.8 Adjust controller temperature set point number 2 to a value 20 degrees less than the indicated ambient temperature.
- 1 9.2.4.7.9 Verify 120V AC voltage present between PLC YYC-*-01 Input Number 3 and PLC 120V Common.
- 1 9.2.4.7.10 Adjust set point 1 to 10 degrees below indicated temperature.
- 1 9.2.4.7.11 Verify zero voltage present at PLC YYC-*-01 Input Number 3 and PLC 120V Common.

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- 1 9.2.4.7.12 Reset controller temperature set point 1 to 85°F and set point 2 to 60°F.
- 1 9.2.4.7.13 Set fused switch FU-8 to the OPEN position.
- 9.2.4.8 Alarm Systems
- 1 9.2.4.8.1 Set fused switch FU-9 and FU-10 to the CLOSED position.
- 1 9.2.4.8.2 Depress Alarm Reset HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. (Due to lack of operating inputs the PLC may interpret alarm conditions exist.)
- 9.2.4.8.3 Depress and hold Alarm Test push button HS-*-21-1. Verify the following conditions exist:
- 1 Horn, YAH-*-9-1, is ON.
- 1 High Hydrogen Beacon YAL-*-10-2 is ON.
- 1 Open contacts between High Hydrogen Remote terminals TB2-21 and TB2-22.
- 1 Trouble Beacon YAL-*-18-1 is ON.
- 1 Open contacts between Cabinet Trouble Remote terminals TB2-23 and TB2-24.
- 1 All Indicating Lights EXCEPT the RESET SAMPLER light are ON.
- 1 9.2.4.8.4 Release Alarm Test push button.
- 1 9.2.4.8.5 Depress Alarm Reset push button HS-*-20-1 followed by the Horn Acknowledge push button HS-*-19-1. Verify all inactive alarms are reset.
- 1 9.2.4.8.6 Set fused switch FU-9 and FU-10 to the OPEN position.
- 9.2.4.9 Auto Sampler System
- 1 9.2.4.9.1 Set fused switch FU-10 to the CLOSED position.
- 1 9.2.4.9.2 Depress the Reset Sampler push button HS-*-23-1 located inside the enclosure.
- 1 9.2.4.9.3 Depress the Grab Sample push button HS-*-22-1 located inside the enclosure. Verify the following conditions exist:

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/ The Grab Sample push button light HSL-*-22-1 is illuminated.

/ The Reset Sample push button light HSL-*-23-1 is illuminated.

/ The Reset Sample light YAL-*-23-1 is illuminated.

/ 9.2.4.9.4 After five minutes verify that the Grab Sample push button light HSL-*-22-1 goes out and both the Reset Sample lights YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 remain on.

/ 9.2.4.9.5 Depress the Grab Sample push button HS-*-22-1 and verify that the Grab Sample push button light remains out.

/ 9.2.4.9.6 Depress the Reset Sample push button HS-*-23-1 and verify that both the Reset Sample light YAL-*-23-1 and the Reset Sample push button light HSL-*-23-1 go out.

/ 9.2.4.9.7 Set fused switch FU-10 to the OPEN position.

9.3 INTRINSIC SAFETY CIRCUITS

/ 9.3.1 Verify INTRINSIC SAFETY APPARATUS nameplates are located near intrinsic safety devices.

Intrinsic Safety Devices:

NE-*-6-1 EB-*-6-1 NIT-*-6-1
NE-*-12-1 EB-*-12-1 NIT-*-12-1

/ 9.3.2 Verify intrinsic safety wiring is labeled per NFPA-70 Section 504-80 and ISA RP 12.6.

Intrinsic Safety Wiring: (Wiring between the following devices)

EB-*-6-1 / NE-*-6-1
EB-*-12-1 / NE-*-12-1

/ 9.3.3 Verify resistance between intrinsic safety single point field ground and intrinsic safety device ground is less than one ohm. Record value.

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9.4 REVIEW

Check that all steps have been completed.

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10.0 PNEUMATIC SYSTEMS

This procedure will demonstrate that all process lines and devices function properly.

10.1 PIPING

- 1 10.1.1 Verify sample line heat trace from sample source to the cabinet is at least 15 feet in length.
- 1 10.1.2 Verify calibration line heat trace from calibration gas tank to the cabinet is at least 10 feet in length.
- 10.1.3 Verify the following sample lines/valves are CAPPED/CLOSED.
- 1 MV-*-1-1 through MV-*-1-4
 - 1 MV-*-3-3
 - 1 MV-*-4-3 through MV-*-4-4
 - 1 MV-*-5-1 through MV-*-5-6
 - 1 MV-*-7-3 through MV-*-7-4
 - 1 Sample and exhaust line ends are capped.
- 10.1.4 Verify the following sample line valves are OPEN
- 1 FCV-*-1-1
 - 1 FI-*-3-1
 - 1 MV-*-4-1 through MV-*-4-2
 - 1 FI-*-5-1
 - 1 MV-*-7-1 through MV-*-7-2
 - 1 MV-*-8-1.

10.2 SAMPLE MAIN FLOW LOOP

- 1 10.2.1 Set fused switch FU-13 to the CLOSED position.
- 1 10.2.2 Remove end caps from sample inlet and outlet lines. Take care in not allowing foreign objects to enter lines.
- 10.2.3 OPEN valves:

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~~/~~ MV-*-1-1
~~/~~ MV-*-1-2
~~/~~ MV-*-1-3
~~/~~ MV-*-1-4

- ~~/~~ 10.2.4 Switch circuit breaker CB-3 to the CLOSED position.
- ~~/~~ 10.2.5 Adjust flow control valve FCV-*-1-1 to nominally 5" H₂O as indicated on FIT-*-7-1.
- ~~/~~ 10.2.6 Verify air is being extracted from the sample inlet line and air is being exhausted through the sample outlet line.
- ~~/~~ 10.2.7 Verify the pressure differential indicator PDI-*-4-1 indicates an upscale reading of less than 40" H₂O.

10.3 AUTO GRAB SAMPLING LOOP

- ~~/~~ 10.3.1 Set fused switch FU-10 to the CLOSED position.
- 10.3.2 OPEN valves:
~~/~~ MV-*-3-3
~~/~~ Gas Sample Assembly Valves
- ~~/~~ 10.3.3 Depress the Grab Sample push button HS-*-22-1. Verify that FI-*-3-1 indicates flow.
- ~~/~~ 10.3.4 Adjust FCV-*-3-1 to nominally 10% flow through FI-*-3-1.
- ~~/~~ 10.3.5 CLOSE valves MV-*-1-4 and MV-*-1-3. Verify that FI-*-3-1 still indicates flow.
- ~~/~~ 10.3.6 OPEN valves MV-*-1-3 and MV-*-1-4. CLOSE valves MV-*-3-3. Verify that FI-*-3-1 indicates no flow.
- ~~/~~ 10.3.7 Depress the Reset Sample push button HS-*-23-1.
- ~~/~~ 10.3.8 Set fused switch FU-10 to the OPEN position.

10.4 CALIBRATION LOOP

- ~~/~~ 10.4.1 Remove plug to atmosphere upstream of F-*-5-1.
- 10.4.2 OPEN valves:
~~/~~ MV-*-5-4

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- 1 1 MV-*-5-5
- 1 10.4.3 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 1 10.4.4 CLOSE valves MV-*-5-4 and MV-*-5-5. Verify that FI-*-5-1 indicates zero flow.
- 10.4.5 OPEN valves:
- 1 MV-*-5-4
- 1 MV-*-5-6
- 1 10.4.6 Adjust to nominally 2.0 cfh flow through FI-*-5-1.
- 1 10.4.7 CLOSE valves MV-*-5-4 and MV-*-5-6. Verify that FI-*-5-1 indicates zero flow.
- 1 10.4.8 Switch circuit breaker CB-3 to the OPEN position.
- 10.4.9 CLOSE the following sample line valves.
- 1 MV-*-1-1 through MV-*-1-4
- 1 MV-*-3-3
- 1 MV-*-4-1 through MV-*-4-4
- 1 MV-*-5-1 through MV-*-5-6
- 1 MV-*-7-1 through MV-*-7-4
- 1 MV-*-8-1
- 1 10.4.10 Replace end caps on sample inlet and outlet lines. Replace plug upstream of F-*-5-1.
- 1 10.4.11 Open the following circuit breakers and fuses:
- 1 CB-1 through CB-7
- 1 FU-1 through FU-13
- 1 10.4.12 Deenergize power source to the Standard Hydrogen Monitoring System. Refer to H-2-817852, Standard-B Hydrogen Monitoring System One Line & Elementary Diagrams.

10.5 REVIEW

Check that all steps have been completed.

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11.0 DATA SHEETS

11.1 TEST DATA SHEETS

The Test Data Sheets are used to document any procedure step requiring verification. A description of the data sheet format follows.

1. Date--Record the date the test is performed.
2. Title Of Test--There are two tests being performed by this procedure, the Electrical Systems test and the Pneumatic Systems test.
3. SHMS Unit Number--Record the unit number of the Standard Hydrogen Monitoring System, e.g. NAN-101-J.
4. Equipment Serial Number(s)--Record the serial numbers of any device used during the tests.
5. Test Performed By--Print the name of the craftsman performing the test.
6. Procedure Number--This column contains the test steps requiring verification.
7. Item--This column contains the item being verified, e.g., Pump, Air Conditioner, Heater, etc.
8. Value--This column contains the quantitative or qualitative measure of the item being verified, i.e. a line voltage may have a value of 120V, whereas a pump may have a value of ON or OFF.
9. Range--This column indicates the anticipated value of the item being measured.
10. Accept/Reject--Indicate whether the value obtained is acceptable in comparison with the Range.
11. Comment--If the value is rejected, give a justification for denial.

Test Data Sheets are included in Appendix A.

11.2 TEST EXCEPTION SHEET

Exception Data Sheets are used to document exceptions to the test procedure. Actions taken regarding disposition are noted on the exception sheet. Typical dispositions are:

1. Test approved with exception (i.e. rerun of the acceptance test unnecessary).
2. Entire acceptance test to be repeated after the discrepancy has been corrected.
3. Acceptance Test Procedure step(s) affected to be repeated after the discrepancy has been corrected.

Test Exception Sheets are included in Appendix B.

11.3 TEST LOG SHEET

Test Log Sheets are used to document test start and stop times and to document any other notes concerning the execution of the Acceptance Test Procedure.

Test Log Sheets are included in Appendix C.

APPENDIX A

TEST DATA SHEETS

TEST DATA SHEET

Date: 3/21/95			SHMS Unit Number: VTP-PNL-3705J		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: R.J. YOUNG					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.1.1	Resistance	Ø	< 1 Ohm	A	
9.1.3	Line Voltages: L1 L2 N	125V 125V Ø	L1, L2: 120V ±5% N: 0V	A	
9.2.1.4	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.1.6	ACU-*-01	OFF	A/C Compressor OFF	A	
9.2.1.8	HTR-*-01	ON	Heater ON	A	
9.2.1.10	ACU-*-01 & HTR-*-01	ON OFF	A/C Compressor ON, Heater OFF	A	
9.2.2.3	P-*-01	ON	Pump ON	A	
9.2.3.3	LT1	ON	Light ON	A	
9.2.3.4	RCPT: H N	120 Ø	H: 120V ± 5% N: 0V	A	
9.2.3.5	RCPT: H N	Ø Ø	H: 0V N: 0V	A	
9.2.4.1.2	XFMR1: Primary Secondary	125V 125V	Primary, Secondary: 120V ± 5%	A	

TEST DATA SHEET

Date: 3/21/95			SHMS Unit Number: VTP-PNL-3705J		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: RJ YOUNG					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.2.2	PWR-*-01: AC In DC Out	125V 24V	Incoming AC: 120V $\pm$ 5% Outgoing DC: 24V $\pm$ 5%	A	
9.2.4.3.3	Visual: FIT-*-7-1 FASL-*-7-1	ON ON	Power Indication Lights ON	A	
9.2.4.3.4	YYC-*-01 In #2 Voltage:	0	0V	A	
9.2.4.4.2	NIT-*-6-1 NIT-*-12-1 NR-*- 6/12-1	ON ON	Displays powered ON.	A	
9.2.4.4.3	YYC-*-01 In #0 In #1 Voltage:	125V 125V	120V $\pm$ 5%	A	
9.2.4.5.3	TIC-*-14-1	ON	Display powered ON.	A	
9.2.4.5.6	YYC-*-01 In #5 Voltage:	0	0V	A	
9.2.4.5.7	HT-*-14-1: Initial Temp. Final Temp.	40 50	Final Temp. = Initial Temp. + 10°F	A	
9.2.4.5.9	YYC-*-01 In #5 Voltage:	125V	120V $\pm$ 5%	A	

TEST DATA SHEET

Date: 3/21/95			SHMS Unit Number: VTP-PNL-3705J		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: RJ Young					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.6.2	TIC*-15-1	ON	Display powered ON.	A	
9.2.4.6.5	YYC*-01 In #4 Voltage:	Ø	0V	A	
9.2.4.6.6	HT*-15-1: Initial Temp. Final Temp.	44 54	Final Temp. = Initial Temp + 10°F	A	
9.2.4.6.8	YYC*-01 In #4 Voltage:	120V	120V ± 5%	A	
9.2.4.7.2	TI*-16-1	ON	Display powered ON.	A	
9.2.4.7.5	YYC*-01 In #3 Voltage:	120V	120V ± 5%	A	
9.2.4.7.7	YYC*-01 In #3 Voltage:	Ø	0V	A	
9.2.4.7.9	YYC*-01 In #3 Voltage:	120V	120V ± 5%	A	
9.2.4.7.11	YYC*-01 In #3 Voltage:	Ø	0V	A	

TEST DATA SHEET

Date: 3/21/95			SHMS Unit Number: VTP-PNL-3705J		
Title of Test: Electrical Systems			Equipment Serial Number(s): SIMPSON 0033 12/1/95		
Test Performed By: RJ YOUNG					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.2.4.8.3	YAH-*-9-1 YAL-*-10-2 BY-*-10-1 YAL-*-18-1 BY-*-18-1 YAL-*-14/15-1 YAL-*-16-1 YAL-*-7-1 YAL-*-10-1	ON ON OK ON OK ON ON ON ON	ON ON Infinite Resistance Between TB2-21 and TB2-22. ON Infinite Resistance Between TB2-23 and TB2-24. ON ON ON ON	 A 	
9.2.4.8.5	Inactive Alarms	OFF	OFF	A	
9.2.4.9.3	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	ON ON ON	ON ON ON	A	
9.2.4.9.4	HSL-*-22-1 HSL-*-23-1 YAL-*-23-1	OFF ON ON	OFF ON ON	A	
9.2.4.9.5	HSL-*-22-1	OFF	OFF	A	
9.2.4.9.6	HSL-*-23-1 YAL-*-23-1	OFF OFF	OFF OFF	A	
9.3.1	Nameplates	OK	Near IS Devices..	A	

TEST DATA SHEET

Date: 3/21/95		SHMS Unit Number: VTP-PNL-3705J			
Title of Test: Electrical Systems		Equipment Serial Number(s): SIMPSON 0033 12/1/95			
Test Performed By: RJ YOUNG					
Procedure Number	Item	Value	Range	(A/R)	Comment
9.3.2	Wiring	OK	Proper Labeling.	A	
9.3.3	Resistance	.6	< 1 Ohm	A	

Test Witnesses:

B. m. Mln
Test Director

3/21/95
Date

J. L. S. S. S.
Recorder

3/21/95
Date

J. L. S. S. S.
Quality Assurance

3/21/95
Date

TEST DATA SHEET

Date: <u>3/21/95</u>			SHMS Unit Number: <u>VTP - PNL - 3705J</u>		
Title of Test: Pneumatic Systems			Equipment Serial Number(s): <u>NA</u>		
Test Performed By: <u>RJ Young</u>					
Procedure Number	Item	Value	Range	(A/R)	Comment
10.1.1	Sample Line Heat Trace Length	<u>> 15</u>	> 15 Feet	<u>A</u>	
10.1.2	Calibration Line Heat Trace Length	<u>> 10</u>	> 10 Feet	<u>A</u>	
10.1.3	Sample Line Valves	<u>OK</u>	CLOSED	<u>A</u>	
10.2.6	Sample Intake & Exhaust	<u>OK</u>	Air going in through Intake, leaving through Exhaust	<u>A</u>	
10.2.7	PDI-*-4-1	<u>< 40</u>	< 40" H ₂ O	<u>A</u>	
10.3.3	FI-*-3-1	<u>Flow</u>	Indicates Flow	<u>A</u>	
10.3.6	FI-*-3-1	<u>No flow</u>	Indicates No Flow	<u>A</u>	
10.4.4	FI-*-5-1	<u>φ flow</u>	Zero Flow	<u>A</u>	
10.4.7	FI-*-5-1	<u>φ flow</u>	Zero Flow	<u>A</u>	

Test Witnesses:

Test Director

Recorder

Quality Assurance

Date

Date

Date

APPENDIX B

TEST EXCEPTION SHEETS

TEST EXCEPTION SHEET

SHMS Unit Numbers:			Title of Test:		
EXCEPTIONS			CORRECTION APPROVAL		
Procedure Number	Date	Description	Initials/Date		
			Project Engineer	Test Director	Witnesses

TEST APPROVED WITH EXCEPTIONS

WHC Project Engineer

Date

Recorder

Date

Witness

Date

WHC-SD-WM-ATR-090

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APPENDIX C

TEST LOG SHEET

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