NOV 11 1999 **4** ENGINEERING DATA TRANSMITTAL
STA# 4

Page 1 of 1
1. EDT 628204

2. To: (Receiving Organization) INFORMATION RESOURCE MANAGEMENT				3. From: (Originating Organization) EQUIPMENT ENGINEERING				4. Related EDT No.: NA			
5. Proj./Prog./Dept./Div.: ACCEPTANCE TEST REPORT FOR AMS-4				6. Design Authority/Design Agent/Cog. Engr.: CC SCAIEF				7. Purchase Order No.: NA			
8. Originator Remarks: Acceptance Test Report for AMS-4 Continuous Air Monitor at 241-AN Exhausters. The completed Acceptance Test Procedure (ATP), TWR-4713, is attached and is part of this report.								9. Equip./Component No.: NA			
11. Receiver Remarks: NA								10. System/Bldg./Facility: 200G			
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1	TWR-4714	NA	0	ACCEPTANCE TEST REPORT				NA	1, 2		
				FOR THE AMS-4 CONTINUOUS							
				AIR MONITORS AT 241-AN							
				EXHAUSTERS							
16. KEY											
Approval Designator (F)		Reason for Transmittal (G)				Disposition (H) & (I)					
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17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority									
		Design Agent									
1	1	Cog. Eng. CC SCAIEF	<i>MS</i>	11/10/99							
1		Cog. Mgr. DB SMET	<i>DB Smet</i>	11-10-99							
		QA									
		Safety									
		Env.									
18. Signature of EDT Originator <i>Concepcion</i>				19. Authorized Representative for Receiving Organization <i>DB Smet</i>		20. Design Authority/Cognizant Manager <i>DB Smet</i>		21. DOE APPROVAL (if required) Ctrl No. _____ ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments			
Date 11/9/99				Date		Date 11-10-99					

S

ACCEPTANCE TEST REPORT FOR AMS-4 CONTINUOUS AIR MONITORS AT 241-AN EXHAUSTERS

O. Riojas

Lockheed Martin Hanford Co.

Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

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Key Words:

Acceptance Test Report, ATR, AMS-4 Continuous Air Monitor

Abstract:

This report provides the completed copy and test results of the Acceptance Test Procedure (TWR-4713). Test results were actually hand written in the ATP including redline changes. All acceptance criteria steps were completed satisfactorily without exceptions.

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Release Stamp

Approved For Public Release

ACCEPTANCE TEST REPORT FOR THE AMS-4 CONTINUOUS AIR MONITORS AT 241-AN EXHAUSTERS

Summary of testing -

This report provides the completed working copy of TWR-4713, the Acceptance Test Procedure (ATP), for the Continuous Air Monitors At 241-AN Exhausters. Prior to performing the ATP, red line changes were made in accordance with the requirements of Section 2.4. The changes were at the request of the Instrument Maintenance Technicians. The method for achieving a high radiation alarm in the CAM was changed to utilize the V-block source rather than a check source. This was deemed easier to perform by the technicians.

The ATP as written, incorrectly directs the test performance personnel to power the monitoring (CAM) vacuum pump from the unswitched AC outlet. Although this will not affect the performance of the ATP, it will leave the pump in the wrong outlet. The monitoring pump should be powered from the outlet labeled "Beta". This is also an unswitched outlet, however, it is on a different circuit than the outlet labeled "unswitched". This will ensure that the record sample pump and the monitor pump are powered from separate circuit breakers thereby preventing overload. This occurs in the ATP in Steps 5.1.3 and 5.2.3. The steps should state:

ENSURE vacuum pumps are plugged into the appropriate receptacle, -
Monitoring pump "Beta" and record sample pump "switched".

The ATP test results, including redline changes, were reviewed for compliance and satisfactorily accepted as complete as shown on the Acceptance Test Procedure Acceptance Record of the ATP.

The ATP tested the following systems:

Electrical and Instrument Systems

- Continuous air monitor flow
- K1 An-271 alarms
- K1 242A-A Remote Alarms
- K2 AN-271 Alarms
- K2 242-A Remote Alarms
- K2 Heater Controllers
- Record Sample Vacuum Pump Interlock
- Heater and Blower Test

At this time all the requirements of the ATP have been met. All acceptance criteria steps have been satisfactorily completed and exceptions resolved as verified by the signatures of the Test Director, Cognizant Engineer, and Quality Control individuals as shown on page 22 of the ATP. The ATP should be considered satisfactorily completed.

TANK FARM ACCEPTANCE TEST PROCEDURE

EQUIP. ENG.

ATP FOR 241-AN FARM K1/K2 CONTINUOUS AIR MONITOR
INSTALLATION

Last Full Revision: A-0

Release Date: 9/20/99

USQ Screening Number: TF-98-1012 Rev. 8

Approval Designator: Q

Current Modification: A-0

USQ Screening Number: TF-98-1012 Rev. 8

Approval Designator: Q

PCA Incorporated: N/A

POSITION/ORG	DELEGATE	DATE
Maint.	<u>R. Lee</u>	<u>09/14/99</u>
Mgr.	<u>D. Baide</u>	<u>09/20/99</u>
Q.A.	<u>W. Adams</u>	<u>09/20/99</u>
Eng	<u>R. D. Freeman</u>	<u>09/08/99</u>
Acceptance Review	<u>D. Scott</u>	<u>09/14/99</u>
Approval Authority	<u>C. C. Scaief</u>	<u>09/09/99</u>

Justification: Engineering request.

Summary of Changes:

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TANK FARM ACCEPTANCE TEST PROCEDURE

EQUIP. ENG.

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure provides instructions to demonstrate the functional capabilities of the continuous air monitors and the associated alarms in AN-271 and remote alarm at 242-A. As the AMS-3 is removed and the AMS-4 installed, this procedure will ensure the reconnected circuits between the existing and new unit are functioning, before continuing with the functional test procedure, TF-FT-229-005. The testing will be completed prior to completion of the work document.

1.2 SCOPE

The following systems associated with the K1/K2 continuous air monitors will be tested by this Acceptance Test Procedure:

Electrical and Instrument Systems

- Continuous air monitor Flow
- K1 AN-271 Alarms
- K1 242-A Remote Alarms
- K2 AN-271 Alarms
- K2 242-A Remote Alarms
- K2 Heater Controllers
- Record Sample Vacuum Pump Interlock
- Heater and Blower Test

2.0 INFORMATION

2.1 TERMS AND DEFINITIONS

- 2.1.1 CAM - Continuous Air Monitor
- 2.1.2 242-A - 242-A Evaporator Bldg.
- 2.1.3 AN-271 AN-271 Instrument Bldg.

2.2 RESPONSIBILITIES

- 2.2.1 Each company or organization participating in this procedure will designate personnel to assume the responsibilities and duties as defined herein for their respective roles.

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2.2 RESPONSIBILITIES (Cont.)

2.2.2 The Design Engineer from Equipment Engineering is responsible for designating and providing a Test Director.

2.2.3 The Cognizant Engineer is responsible for the following:

- Specifying required test sections for each assembly
- Provide technical support to Test Director during testing
- Resolving exceptions to the Acceptance Test
- Preparing and approving procedure changes required to support testing
- Approving acceptance test results

2.2.4 The Test Director is responsible for the following:

- Schedule pre-job, test date and resources required for acceptance testing
- Coordinate test date and testing changes with facility management and all involved parties
- Ensure test is executed in accordance with this procedure
- Ensure accuracy of recorded data, discrepancies, and exceptions
- Stop any test which may cause damage to the system until the test procedure has been revised
- Obtain revisions to the Acceptance Test Procedure, as necessary, to execute test
- Ensure test revisions are approved for use via the redline method before continuing test (see Section 2.4)
- Execution of the test, recording test data, maintaining record copy of test current, approving test results for each section, obtaining approvals for each section and overall test results

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2.2 RESPONSIBILITIES (Cont.)

2.2.5 Quality Assurance is responsible for the following:

- Verifying that the procedure sections were performed correctly by witnessing the procedure steps as they occur. Sign at the end of each designated section and the TEST EXCEPTION SHEET.
- Post-test review of test documentation

2.3 REFERENCES

2.3.1 AMS-4 Vendor Information File

2.3.2 IP-0842, RPP Administration

- Vol. I, Section 2.11, "Technical Procedure Control and Use"
- Vol. II, Section 4.9.1, "Lock and Tag Program"

2.3.3 All reference drawings are noted on ECN 646983.

2.4 GENERAL INFORMATION

2.4.1 This procedure is prepared to be used individually for each K1 and K2 AMS-4 installation. The two systems share common terminal boxes and have interlocks to the K1 and K2 exhausters and remote alarms.

2.4.2 Acceptance Criteria steps are noted by the word **VERIFY** and require a Test Director signature to ensure the step has been completed. Changes to this procedure that do not change Acceptance Criteria results can be made using the red-line method with the approval of the Test Director, Cognizant Engineer and Quality Assurance. Changes to Acceptance Criteria such as labeling and reference names on alarms and indicators can be made using this method. Changes to the Acceptance Criteria that result in a functional change will require an ECN. All changes will be incorporated in the test report.

2.4.3 Any non-conformance of the instrumentation or unexpected results during testing shall be logged in the TEST EXCEPTION SHEET, and thoroughly documented in the procedure at the affected step.

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2.4 GENERAL INFORMATION (Cont.)

- 2.4.4 The acceptance test steps detailed in Section 5.0 shall be performed sequentially. The major subsections may be performed out of sequence per the direction of the Test Director if the intent of the test is not compromised. Any step that requires verification of data must also be recorded on the "Working Copy" of this procedure.
- 2.4.5 Individual test sections will be performed as required to facilitate each AMS-4 installation.
- 2.4.6 Quality Assurance shall ensure that the test is performed according to procedure. Quality Assurance shall sign and date at the end of each section verifying the procedure steps have been performed correctly.

2.5 RECORDS

The completed "Working Copy" of this procedure, Test Exception Sheets, and Test Logs generated by the performance of this procedure will be kept as permanent records through the document release system in the Test Report, TWR-4714.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 PERSONNEL SAFETY

- 3.1.1 A daily pretest safety briefing will be held with all test participants and documented in the Test Log.
- 3.1.2 The primary safety concerns for the performance of this procedure are related to electrical hazards. Any hazard identified during the performance of the procedure shall be reported to the Test Director.
- 3.1.3 Any other hazards, along with identified personal protective equipment will be addressed in the Job Hazard Analysis and reviewed during the pre-job safety meeting.

3.2 RADIATION AND CONTAMINATION CONTROL

- 3.2.1 When this procedure is performed in a radiological area (except for buffer and underground areas) and the area is not a High Contamination, High Radiation, or Airborne Radioactivity Area, then this is low risk radiological work, and a general Radiation Work Permit must be assigned by Radiological Control Engineering and Technical Support.

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3.2 RADIATION AND CONTAMINATION CONTROL (Cont.)

- 3.2.2 When this procedure is performed in a High Contamination, High Radiation, Airborne Radioactivity Area or if a breach is made to a system or component containing radioactive material then an approved Job Control System package and a job specific Radiation Work Permit is required.

3.3 ENVIRONMENTAL COMPLIANCE

None

3.4 LIMITS

Performance of test activities shall always include safety and health aspects as delineated in the vendor manuals and as directed by the Test Director.

3.5 CABINET ALARMS

The high/low temperature light (DS8) and the white external strobe light will be illuminated/flashing whenever the cabinet temperature is high or low enough to turn on the fan or heater. This can occur on a very hot or cold day. Should this happen, these alarms will not clear. Note the alarm condition on the test exception sheet. Steps that require clearing of all alarms can be checked even though the cabinet alarm is not clear.

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4.0 PREREQUISITES

4.1 SPECIAL TOOLS, EQUIPMENT, AND SUPPLIES

- 4.1.1 The following supplies may be needed to perform this procedure and will be made available prior to steps where they are used:

NOTES - The organization accomplishing the test will supply all equipment necessary, unless otherwise noted. The following list is provided as an aid and is not intended to be an all-exhaustive list. Record pertinent information such as model number, serial number and calibration information as required below and in the Test Log.

- If item will not be used, N/A that piece of equipment.

- C. C. Saunders 9/29/99
with Adams 9/30/99*
- Assorted hand tools
 - *Beta-Gamma Radiation source that produces $\geq 10,000$ cpm in CAM*
 - ~~Sealed Beta check source for AMS-4, minimum 10,000dpm~~
 - Clamp-on Ammeter, 0-20 AC Amp minimum range, 10% accuracy or better
 - Heat gun and circuit cooler

4.2 CONDITIONS AND ACTIONS

The following conditions must be met before this procedure may commence:

- 4.2.1 A pre-job safety meeting has been held before performing this procedure in accordance with IP-0842, Vol V, Section 4.1, PRE-JOB SAFETY MEETING FORM.
- 4.2.2 Test Director **VERIFY** Section 4.0 has been completed by signing below.

C. C. Saunders
Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

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5.0 PROCEDURE

5.1 PERFORM K1 FUNCTIONAL TEST

PRETEST SETUP

- ✓ 5.1.1 OBTAIN permission from SOM to perform test.
- ✓ 5.1.2 ENSURE procedure 6-TF-077 has been completed on the K1 cabinet.
- ✓ 5.1.3 ENSURE vacuum pumps are plugged into the appropriate receptacle, - Monitoring pump "unswitched" and record sample pump "switched".
- ✓ 5.1.4 ENSURE continuous air monitor is plugged into AC power.
- ✓ 5.1.5 APPLY power to the continuous air monitor, AND PROCEED when the READY light turns on.
- ✓ 5.1.6 ENSURE K1 exhauster is not running.
- ✓ 5.1.7 ENSURE K1 CAM installation data sheet (ET-07245) from procedure 6-RM-168 has been completed.
- ✓ 5.1.8 ENSURE filter is installed in AMS-4.
- ✓ 5.1.9 CHECK Pretest setup is complete. ☒

TEST

- ✓ 5.1.10 ENSURE power is on to monitoring cabinet.
- 5.1.11 VERIFY record sample pump is off and monitor vacuum pump is running.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.1.12 VERIFY that "Stack Operating Light" on the cabinet Connection Box is not lit.

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Signature Printed Name Date
Test Director

- 5.1.13 APPLY temporary power from an unswitched outlet to the record sample vacuum pump, AND ENSURE the record sample pump is running.

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5.1 PERFORM K1 FUNCTIONAL TEST (Cont.)

- 5.1.14 VERIFY that the record sample flow can be adjusted, using the regulator, to 120 (+/-12) SCFH as indicated on the rotameter.

RECORD the flow value.

120 SCFH

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.1.15 VERIFY the monitor flow is set to 2.0 (+/-0.2) CFM as indicated on the continuous air monitor display. Adjust as required using the regulator.

RECORD the flow value.

2.0 CFM

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.1.16 IF the appropriate flow range CANNOT be achieved, STOP the test AND CONTACT Engineering before continuing.

RECORD SAMPLE PUMP LOW FLOW ALARM

- ✓ 5.1.17 ENSURE that the AN K1 Record Sample Pump fail alarm (Faceplate 68/Block 3) at the 242-A Evaporator Monitor and Control System is clear.

- ✓ 5.1.18 DISCONNECT power to the record sample vacuum pump.

- 5.1.19 VERIFY that "Low Record Flow" light at the Local Alarm Box is lit.

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Signature Printed Name Date
Test Director

- 5.1.20 VERIFY that AN K1 Record Sample Pump fail alarm (Faceplate 68/Block 3) at the 242-A Evaporator Monitor and Control System is activated.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- ✓ 5.1.21 RESTORE power to the record sample vacuum pump.

- ✓ 5.1.22 RESET local alarm box, AND ACKNOWLEDGE remote alarms.

- ✓ 5.1.23 CHECK that alarms and lights have cleared.

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5.1 PERFORM K1 FUNCTIONAL TEST (Cont.)**MONITOR SAMPLE PUMP LOW FLOW ALARM**

- ✓ 5.1.24 ENSURE that the AN K1 monitor sample pump fail alarm (Faceplate 68/Block 2) at the 242-A Evaporator Monitor and Control System is clear.
- ✓ 5.1.25 ENSURE that the AN Farm Tank Exh Rad Mon Fail (Faceplate 68/Block 1) is clear.
- ✓ 5.1.26 ENSURE that AN-271 ANN 103, Window 9 Primary Exh Stack CAM Failure is clear.
- 5.1.27 REMOVE power to the monitor sample vacuum pump.
- 5.1.28 VERIFY that "Low Beta Flow" light at the Local Alarm Box is lit.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.29 VERIFY that continuous air monitor malfunction light is lit with an indication of Low Flow (Response time may be delayed).

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.30 VERIFY all alarms noted in step 5.1.24, 5.1.25 and 5.1.26 are activated.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.31 RESTORE power to the monitor sample vacuum pump.
- 5.1.32 RESET local alarm box, ACKNOWLEDGE any CAM alarms, AND ACKNOWLEDGE remote alarms.
- 5.1.33 CHECK that alarms and lights have cleared and that CAM ready light is ON. ☒

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5.1 PERFORM K1 FUNCTIONAL TEST (Cont.)

HIGH RADIATION ALARMS

- 1.1.5.1.34 9/30/99
C. Adams 9-30-99*
- 5.1.34 ENSURE the CAM HI Rad Alarm on Annunciator 102 at AN-271 and the 242-A Evaporator Monitor and Control System (Faceplate 68, Block 0) are clear.
RECORD as-found "GAMMA SUBTRACT FACTOR" .81.
- 5.1.35 ~~ADJUST the continuous air monitor to a fixed flow value of 2 CFM and the beta alarm setpoint to 500 cpm.~~
~~SET "GAMMA SUBTRACT FACTOR" TO ZERO.~~
- 5.1.36 ~~REMOVE power from the monitor sample vacuum pump. (Low Beta Flow light on the local alarm box and the Evaporator flow alarm will actuate.)~~
PLACE AND HOLD gamma source (V-block) at Beta/gamma detector head.
- 5.1.37 ~~REMOVE the filter AND PLACE a minimum 10,000 dpm beta check source into the continuous air monitor chamber and allow the HI Radiation alarm to actuate.~~
AFTER CAM alarms, PRESS ACKNOWLEDGE pushbutton.
- 5.1.38 VERIFY that CAM HI Rad alarm on Annunciator 102 Window 10 at AN-271 and the 242-A Evaporator Monitor and Control System (Faceplate 68/Block 0) are activated.
- 1.1.5.1.39 9/30/99
C. Adams 9-30-99*
- 5.1.39 VERIFY that HI Beta Rad light on the local alarm box is lit.
- 1.1.5.1.40 9/30/99
C. Adams 9-30-99*
- 5.1.40 REMOVE the beta check source AND REPLACE the filter.
- 5.1.41 RESTORE power to the monitor sample vacuum pump.
"GAMMA SUBTRACT FACTOR" to as-found
- 5.1.42 RETURN continuous air monitor fixed flow value to normal setting.
RECORD as-left "GAMMA SUBTRACT FACTOR" .81.
- 5.1.43 RETURN continuous air monitor beta setpoint to 3000 cpm.
- 5.1.44 RESET local alarm box AND ACKNOWLEDGE remote and alarms.
Local
- 5.1.45 CHECK that alarms and lights have cleared. ☒

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

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5.1 PERFORM K1 FUNCTIONAL TEST (Cont.)

HEATER AND BLOWER TEST

NOTE - THE CABINET BLOWER THERMOSTAT (LEFT SIDE OF THERMOSTAT BOX) ACTIVATES AT 95 +/-5 DEGREES F AND DEACTIVATES AT 85 +/-5 DEGREES F. THE HEATER THERMOSTAT (RIGHT SIDE OF THERMOSTAT BOX) ACTIVATES AT 65 +/-5 DEGREES F AND DEACTIVATES AT 75 +/-5 DEGREES F.

- 5.1.46 APPLY heat or cold as required to cabinet blower thermostat and VERIFY cabinet blower turns on and off.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.47 APPLY heat or cold as required to heater thermostat and VERIFY heater turns on and off.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

EXHAUSTER RECORD SAMPLE PUMP INTERLOCK

- 5.1.48 ENSURE record sample vacuum pump is plugged into a switched outlet.

- 5.1.49 ENSURE record sample vacuum pump is not running.

- 5.1.50 OBTAIN permission from SOM to start exhauster.
314 19:50

NOTE - TEST DIRECTOR TO NOTIFY SOM THAT THE CAM INTERLOCK SYSTEM WILL NOT BE DECLARED OPERATIONAL UNTIL THE FUNCTIONAL TEST HAS BEEN PERFORMED. REFER TO THE WORK PACKAGE FOR THE MONITORING REQUIREMENTS DURING THIS PERIOD.

- 5.1.51 START K1 exhauster AND VERIFY that record sample vacuum pump starts.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.52 RESET the local alarm box AND VERIFY that "Stack Operating" light at the cabinet connection box is lit.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.1.53 CHECK that all local and remote alarms have cleared. ☒

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5.1 PERFORM K1 FUNCTIONAL TEST (Cont.)

- 5.1.54 Test Director **VERIFY** all steps in Section 5.1 have been completed by signing below.

Signature
Test Director

Printed Name Date 9-30-99

Quality Assurance **VERIFY** that Section 5.1 has been completed by signing below.

Signature
Quality Control

Printed Name Date 9-30-99

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5.2 PERFORM K2 FUNCTIONAL TESTPRETEST SETUP

- ✓5.2.1 OBTAIN permission from SOM to perform test.
- ✓5.2.2 ENSURE procedure 6-TF-077 has been completed on the K2 cabinet.
- ✓5.2.3 ENSURE vacuum pumps are plugged into the appropriate receptacle, - Monitoring pump "unswitched" and record sample pump "switched".
- ✓5.2.4 ENSURE continuous air monitor is plugged into AC power.
- ✓5.2.5 APPLY power to the continuous air monitor, AND PROCEED when the READY light turns on.
- ✓5.2.6 ENSURE K2 exhauster is not running.
- ✓5.2.7 ENSURE K2 CAM installation data sheet (ET-07244) from procedure 6-RM-168 has been completed.
- ✓5.2.8 ENSURE filter is installed in AMS-4.
- ✓5.2.9 CHECK Pretest setup is complete. ☑

TEST

- ✓5.2.10 SWITCH power on to monitoring cabinet.
- 5.2.11 VERIFY record sample pump is off and monitor vacuum pump is running.

Signature
Test Director -

Clyde Saunders 9-30-99
Printed Name Date

- 5.2.12 VERIFY that "Stack Operating Light" on the cabinet Connection Box is not lit.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.2.13 APPLY temporary power from an unswitched outlet to the record sample vacuum pump, AND ENSURE that record sample pump is running.

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5.2 PERFORM K2 FUNCTIONAL TEST (Cont.)

- 5.2.14 **VERIFY** that the record sample flow can be adjusted, using the regulator, to 120 (+/-12) SCFH as indicated on the rotameter.

RECORD the flow value.

120 SCFH

Signature

Clyde Saunders
Printed Name

9-30-99
Date

Test Director

- 5.2.15 **VERIFY** the monitor flow is set to 2.0 (+/-0.2) CFM as indicated on the continuous air monitor display. Adjust as required using the regulator.

RECORD the flow value.

2.01 CFM

Signature
Test Director

Clyde Saunders
Printed Name

9-30-99
Date

- 5.2.16 **IF** the appropriate flow range **CANNOT** be achieved, **STOP** the test **AND CONTACT** Engineering before continuing.

RECORD SAMPLE PUMP LOW FLOW ALARM

- ✓ 5.2.17 **ENSURE** that the AN K2 Record Sample Pump fail alarm (Faceplate 68/Block 7) at the 242-A Evaporator Monitor and Control System is clear.

- 5.2.18 **DISCONNECT** power to the record sample vacuum pump.

- 5.2.19 **VERIFY** that "Low Record Flow" light at the Local Alarm Box is lit.

Signature
Test Director

Clyde Saunders
Printed Name

9-30-99
Date

- 5.2.20 **VERIFY** that AN K2 Record Sample Pump fail alarm at the 242-A Evaporator Monitor and Control System (Faceplate 68/Block 7) is activated.

Signature
Test Director

Clyde Saunders
Printed Name

9-30-99
Date

- 5.2.21 **RESTORE** power to the record sample vacuum pump.

- 5.2.22 **RESET** local alarm box, **AND ACKNOWLEDGE** remote alarms.

- 5.2.23 **CHECK** alarms and lights have cleared.

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5.2 PERFORM K2 FUNCTIONAL TEST (Cont.)

MONITOR SAMPLE PUMP LOW FLOW ALARM

- 5.2.24 ENSURE that the AN K² monitor sample pump fail alarm (Faceplate 68/Block 6) at the 242-A Evaporator Monitor and Control System is clear.
- 5.2.25 ENSURE that the AN Farm Tank Exh Rad Mon Fail (Faceplate 68/Block 5) is clear.
- ✓ 5.2.26 ENSURE that AN-271 ANN 103, Window 8 Annulus Exh Stack CAM Failure is clear.
- 5.2.27 REMOVE power to the monitor sample vacuum pump.
- 5.2.28 VERIFY that "Low Beta Flow" light at the Local Alarm Box is lit.

Clyde Saunders
Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.2.29 VERIFY that continuous air monitor malfunction light is lit with an indication of Low Flow (Response time may be delayed).

Clyde Saunders
Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- 5.2.30 VERIFY all alarms noted in step 5.2.24, 5.2.25 and 5.2.26 are activated.

Clyde Saunders
Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

- ✓ 5.2.31 RESTORE power to the monitor sample vacuum pump.
- ✓ 5.2.32 RESET local alarm box, ACKNOWLEDGE any CAM alarms, AND ACKNOWLEDGE remote alarms.
- ✓ 5.2.33 CHECK that alarms and lights have cleared AND the CAM ready light is ON. ☒

HIGH RADIATION ALARMS

- 5.2.34 ENSURE the CAM HI Rad Alarm on Annunciator 102 Window 9 at AN-271 and the 242-A Evaporator Monitor and Control System (Faceplate 68/Block 4) are clear.

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5.2 PERFORM K2 FUNCTIONAL TEST (Cont.)

- 5.2.35 RECORD as found "GAMMA SUBTRACT FACTOR" 1.0.
ADJUST the continuous air monitor to a fixed flow value of 2 CFM and the beta alarm setpoint to 500 cpm.
SET "GAMMA SUBTRACT FACTOR" TO ZERO.
- 5.2.36 REMOVE power from the monitor sample vacuum pump. (Low Beta Flow light on the local alarm box and Evaporator flow alarm will actuate.)
PLACE AND HOLD gamma source (V-block) at Beta/gamma detector head.
- 5.2.37 REMOVE the filter AND PLACE a minimum 10,000 dpm beta check source into the continuous air monitor chamber and allow the HI Radiation alarm to actuate.
AFTER CAM ALARMS, PRESS ACKNOWLEDGE push button.
- 5.2.38 VERIFY that CAM HI Rad alarm on Annunciator 102 Window 9 at AN-271 and the 242-A Evaporator Monitor and Control System (Faceplate 68/Block 8) are activated.
- 5.2.39 VERIFY that HI Beta Rad light on the local alarm box is lit.
- 5.2.40 REMOVE the beta check source AND REPLACE the filter.
- 5.2.41 RESTORE power to the monitor sample vacuum pump.
- 5.2.42 RETURN continuous air monitor fixed flow value to normal setting.
RECORD as-left "GAMMA SUBTRACT FACTOR" 1.0.
- 5.2.43 RETURN continuous air monitor beta setpoint to 3000 cpm.
- 5.2.44 RESET local alarm box, AND ACKNOWLEDGE, remote alarms.
local and
- 5.2.45 CHECK that alarms and lights have cleared. ☒

HEATER AND BLOWER TEST

NOTE - THE CABINET BLOWER THERMOSTAT (LEFT SIDE OF THERMOSTAT BOX) ACTIVATES AT 95 +/-5 DEGREES F AND DEACTIVATES AT 85 +/-5 DEGREES F. THE HEATER THERMOSTAT (RIGHT SIDE OF THERMOSTAT BOX) ACTIVATES AT 65 +/-5 DEGREES F AND DEACTIVATES AT 75 +/-5 DEGREES F.

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5.2 PERFORM K2 FUNCTIONAL TEST (Cont.)

- 5.2.46 APPLY heat or cold as required to cabinet blower thermostat and VERIFY cabinet blower turns on and off.

Signature
Test Director

Printed Name
Date 9-30-99

- 5.2.47 APPLY heat or cold as required to heater thermostat and VERIFY heater turns on and off.

Signature
Test Director

Printed Name
Date 9-30-99

EXHAUSTER RECORD SAMPLE PUMP INTERLOCK

- 5.2.48 ENSURE record sample vacuum pump is plugged into switched outlet.

- 5.2.49 ENSURE record sample vacuum pump is not running.

- 5.2.50 OBTAIN permission from SOM to start exhauster.

NOTE - TEST DIRECTOR TO NOTIFY SOM THAT THE CAM INTERLOCK SYSTEM WILL NOT BE DECLARED OPERATIONAL UNTIL THE FUNCTIONAL TEST HAS BEEN PERFORMED. REFER TO THE WORK PACKAGE FOR THE MONITORING REQUIREMENTS DURING THIS PERIOD.

- 5.2.51 START K2 exhauster and VERIFY that record sample vacuum pump starts.

Signature
Test Director

Printed Name
Date 9-30-99

- 5.2.52 RESET the local alarm box AND VERIFY that "Stack Operating" light at the cabinet connection box is lit.

Signature
Test Director

Printed Name
Date 9-30-99

- 5.2.53 CHECK that all local and remote alarms have cleared. ☒

- 5.2.54 Test Director VERIFY all steps in Section 5.2 have been completed by signing below.

Signature
Test Director

Printed Name
Date 9-30-99

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5.3 TEST K2 HEATER CONTROLLERS

Quality Assurance **VERIFY** that Section 5.2 has been completed by signing below.

Paul A. Werner 9-30-99
Signature Printed Name Date
Quality Control

NOTES - The purpose of this test section is to check K2 heater controllers.

- In the A Exhaust Train the upper heater elements should be on whenever the fan is running. The lower heater elements are controlled by Differential Controller AN241-VTA-TDC-709. In the B Exhaust Train, the controller is not functioning and is jumpered out. Both the upper and lower elements are powered whenever the B train fan is running.

A EXHAUST TRAIN RUNNING

- 5.3.1 To test A Exhaust train, use a clamp-on ammeter and **VERIFY** that the Upper and Lower heating elements in the B Exhaust train are NOT powered.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.3.2 **VERIFY** that Upper heating elements in the A Exhaust train are powered.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.3.3 Using the clamp-on ammeter, **MEASURE** the current in one phase of the Lower heater in the A Exhaust train.

- 5.3.4 **VERIFY** that Differential Heater Controller setpoint can be changed to turn power on and off at the lower heater.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

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5.4 TEST K2 HEATER CONTROLLERS (Cont.)**B EXHAUST TRAIN RUNNING**

- 5.4.1 To test B Exhaust train, use a clamp-on ammeter and **VERIFY** that the Upper and Lower heating elements in the A Exhaust train are NOT powered.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.4.2 **VERIFY** that the Upper and Lower heating elements in the B Exhaust train are powered.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

- 5.4.3 Test Director **VERIFY** all steps in Section 5.3, 5.4 have been completed by signing below.

Clyde Saunders 9-30-99
Signature Printed Name Date
Test Director

Quality Assurance **VERIFY** that Section 5.3, 5.4 has been completed by signing below.

Paul A. Werner 9-30-99
Signature Printed Name Date
Quality Control

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5.5 ACCEPTANCE CRITERIA

- 5.5.1 VERIFY that all acceptance criteria steps have been completed satisfactorily and exceptions resolved.

Signature
Test Director

Clyde Saunders 9-30-99
Printed Name Date

Signature
Cognizant Engineer

P. C. Scaife III 9-30-99
Printed Name Date

Signature
Quality Control

Paul A. Werner 9-30-99
Printed Name Date

- 5.5.2 COMPLETE Acceptance Test Procedure Acceptance Record. ☒

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TEST EXCEPTION SHEET

Test Section:		
Exception Number:		ACCEPTANCE TEST
EXCEPTION (One per page)		
Procedure Step Number	Date	Problem
		NO EXCEPTIONS CRG 9-30-99
Procedure Step Number	Date	Resolution

EXCEPTION RESOLUTION COMPLETE

Signature _____
Test Director

Printed Name _____

Date _____

Signature _____
Cognizant Engineer

Printed Name _____

Date _____

Signature _____
Quality Assurance

Printed Name _____

Date _____

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TEST LOG

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ACCEPTANCE TEST PROCEDURE ACCEPTANCE RECORD

This Acceptance Test Procedure has been completed and the test results, including redline changes, exceptions, and exception resolutions, have been reviewed for compliance with the intent of the Purpose (Section 1.0). The test results are accepted by the undersigned:

C. C. Scarif III C. C. Scarif III 9-30-99
Cognizant Engineer (Signature) (Print Name) Date

W. E. Bryan W. E. BRYAN 11/5/99
Cognizant Manager (Signature) (Print Name) Date

Del Scott Del Scott 11/4/99
Tank Farms Operations (Signature) (Print Name) Date

W. L. Adams W. L. Adams 11/4/99
Quality Assurance (Signature) (Print Name) Date

Clyde Saunders Clyde Saunders 9-30-99
Test Director (Signature) (Print Name) Date

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All personnel who will be performing, initialing and signing the procedure shall enter their printed name, signature and initials below.

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PROCEDURE HISTORY SIGNATURE SHEET

Last Full Revision:

Release Date:

USQ Screening Number:

Approval Designator:

Current Modification:

USQ Screening Number:

Approval Designator:

PCA Incorporated:

POSITION/ORG	DELEGATE	DATE
Maint.	<u>R. Lee</u>	<u>09/14/99</u>
Mgr	<u>D. Baide</u>	<u>09/20/99</u>
QAE	<u>W. Adams</u>	<u>09/20/99</u>
Eng/TWRS Safety	<u>N/A</u>	<u> </u>
Eng	<u>R. D. Freeman</u>	<u>09/08/99</u>
Acceptance Review	<u>D. Scott</u>	<u>09/14/99</u>
Approval Authority	<u>C. C. Scaief</u>	<u>09/08/99</u>

Justification:

Summary of Changes:

Full Revision

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