

FEB 17 1998

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Page 1 of 1  
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16. KEY

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2	1	Design Authority	MF Hackworth	2/9/98	T4-51						
2	1	Cog. Eng.	MF Hackworth	2/9/98	T4-51						
2	1	Cog. Mgr.	JR Weidert	2-9-98	T4-52						
2	1	QA	WR Thackaberry	2-9-98	T4-52						
2	1	Operations Manager	RJ Bottenus	2/9/98	T4-51						
2	1	Safety	RJ Koll	2/9/98	T4-51						
2	1	Rad Control	RB Swallow	2/9/98	T4-51						

18. Signature of EDT Originator JK Kersten 2/9/98		19. Authorized Representative Date for Receiving Organization		20. Signature Date JR Weidert 2-9-98		21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments	
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# W-026, HEALTH PHYSICS INSTRUMENTATION OPERATIONAL TEST REPORT

MF Hackworth

Waste Management Federal Services of Hanford, Richland, WA 99352  
U.S. Department of Energy Contract DE-AC06-96RL13200

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Monitor, Radiation, PCS

Abstract: This Operational Test Report demonstrates the operability of  
the Health Physics Instrumentation which interfaces with the  
Plant Control System (PCS).

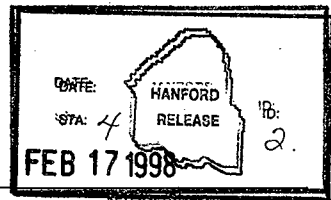
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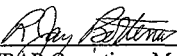
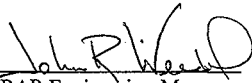




Approved for Public Release

Project W-026, WRAP

Operational Test Report - HEALTH PHYSICS INSTRUMENTATION (Phase II &amp; III)

## OPERATIONAL TEST REPORT APPROVAL

 _____ WRAP Cognizant Engineer	<u>2/6/98</u> Date	 _____ WRAP Safety	<u>2/9/98</u> Date
 _____ WRAP Operations Manager	<u>2/9/98</u> Date	 _____ WRAP Engineering Manager	<u>2-8-98</u> Date
 _____ WRAP RadCon Manager	<u>2/9/98</u> Date	 _____ WRAP Quality Assurance	<u>2-9-98</u> Date

Abstract

This report documents the testing of the Health Physics Instrumentation associated with phase II & III start-up of Project W-026, WRAP.

The Health Physics Instrumentation includes: Alpha and Beta Continuous Air Monitors (CAMs), Personnel Contamination Monitors (PCMs), Gamma Area Radiation Monitors (ARMs), Criticality Monitors, Alpha and Beta Smear Sample Counters, Portable Friskers, and Operator Breathing Zone Air Samplers. This OTR will cover only the Health Physics Instrumentation that was tested under the Operational Test Plan for Health Physics Instrumentation (Phase II & III). That instrumentation included: Alpha CAMs, Beta CAMs and ARMs located in rooms 107 and 113 of 2336-W (WRAP). The remaining Health Physics Instrumentation that will be used for phase II & III start-up is tested during calibrations. These calibrations are outside the scope of the Operational Test Plan.

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- 2.0 DESCRIPTION OF TEST, TEST METHOD AND TEST EQUIPMENT
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## 1.0 INTRODUCTION

### 1.1 Organizations

#### 1.1.1 Radiological Control

#### 1.1.2 Operations

### 1.2 Testing Dates

1.2.1 Testing was performed on 07/21/97. Re-testing of exceptions was performed on 02/06/98.

## 2.0 DESCRIPTION OF TEST, TEST METHOD AND TEST EQUIPMENT

There were six tests performed for the Health Physics Instrumentation. These tests were: Air sample concentration on the CAM and PCS, Gamma radiation level on the ARM and PCS, High Airborne alarm activates PCS alarm and entry warning system, High gamma alarm activates PCS alarm and entry warning system, Trouble CAM alarm is activated for local and PCS, and trouble gamma alarm is activated for local and PCS. No test equipment was necessary for the test except for radioactive sources.

## 3.0 TEST RESULTS

The air sample concentration test was performed by placing the CAMs into service and witnessing the radiation level on the display and record that against that displayed on the Real-Time Applications Platform (RTAP) in the control room for that particular instrument. One exception was found with this test. The alpha CAMs did not report the appropriate level to RTAP. Trouble shooting of the problem indicated that the program for the conversion of output from the alpha CAMs to RTAP was faulty. Once the conversion program was updated and reloaded, the test steps were re-performed. Radiation levels at various levels were consistent between the local display and the RTAP.

The gamma radiation level test was performed by initiating the check source for the ARMs and witnessing the radiation level on the display and record that against that displayed on the RTAP level information for that instrument. One exception was found for this test. Again the readouts in the RTAP was not correct for the instruments. Once calibration of the output from the RMS II instruments was performed the test steps were re-performed. Response was found between the ambient levels and the check source.

The high alarm tests for both the CAMs and ARMs were performed by placing a source (check source for the ARMs) on the instruments. Verification of all the remove alarms, beacons, and RTAP alarms were performed. No exceptions were found for these two tests.

The trouble alarm tests for both the CAMs and ARMs were performed by placing the instrument into a trouble condition locally. Verification of all of the trouble alarms were performed. No exceptions were found for these two tests.

200  
2-8-98

All test exceptions have been disposition and accepted.

#### **4.0 CONCLUSION AND RECOMMENDATIONS**

The Health Physics Instruments performed as expected. Alarms actuated by the local instrument relayed that condition virtually instantly to remote systems. All of the warning systems to workers functioned as designed.

#### **5.0 REFERENCES**

Operational Test Plan - HEALTH PHYSICS INSTRUMENTATION (Phase II & III)

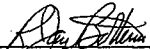
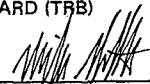

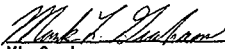
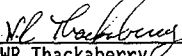
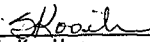


#### **6.0 APPENDIX**

Operational Test Plan - HEALTH PHYSICS INSTRUMENTATION (Phase II & III)

Author/Cognizant Engineer  
**M. F. Hackworth**  
Print Name/Signature

APPROVAL DESIGNATOR S.Q.R

PROCEDURE APPROVAL BY TEST REVIEW BOARD (TRB)

 RJ Bottenus WRAP 1 Startup Manager	<u>6/11/97</u> Date	 MF Hackworth WRAP 1 Cognizant Engineer	<u>6-11-97</u> Date
 RJ Bottenus WRAP 1 Engineering Manager	<u>6/11/97</u> Date	 ML Graham WRAP 1 Industrial Safety	<u>6-11-97</u> Date
 WR Thackaberry WRAP 1 Quality Assurance	<u>6-11-97</u> Date	 SL Kooiker WRAP 1 Operations Engineer	<u>6-11-97</u> Date
 RB Swallow WRAP 1 Rad. Control Manager	<u>6-11-97</u> Date	 JG Riddelle WRAP 1 Operations Manager	<u>6/11/97</u> Date

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### 3.0 RECORDS

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#### APPENDICES:

- Appendix A-1 - Operation Test Exception Log
- Appendix A-2 - Operation Test Exception Report

#### ATTACHMENTS:

- Attachment SR - Signature Record
- Attachment 5.1 - Operation Test Plan



## 1.0 PURPOSE

- 1.1 This procedure has been prepared to verify that Health Physics Instrumentation operates in accordance with system design and specifications.

## 2.0 INFORMATION

### 2.1 Scope

- 2.1.1 This procedure will demonstrate the operability of the Health Physics Instrumentation that interfaces with the Plant Control System.

### 2.2 Terms and Definitions

- 2.2.1 CAM - Continuous Air Monitor
- 2.2.2 OTP - Operational Test Plan
- 2.2.3 PCS - Plant Control System
- 2.2.4 RCT - Radiological Control Technician
- 2.2.5 WHC - Westinghouse Hanford Company
- 2.2.6 S/U - Start-up
- 2.2.7 ATP - Acceptance Test Plan

## 2.3 Responsibilities

### 2.3.1 Test Director (TD) responsibilities:

- Provides the support equipment necessary requested in OTP Sections 4.0 and 5.0.
- Records OTP equipment status and data.
- Test scheduling/rescheduling as required.
- Recording Data Exceptions and support OTP notes as required on the OTP Test Exception Log (Appendix A-1) and Test Exception Report (Appendix A-2).

### 2.3.2 Test Engineer (TE) responsibilities:

- Providing technical support during testing.
- Conducts pre-job planning meetings - as necessary.
- Conducts pre-job system walkdown - as necessary.
- Verify power supply system functions correctly.

### 2.3.3 Maintenance Craft (MC) personnel are responsible for:

- Providing assistance during OTP activities.

### 2.3.4 Radiological Control Technicians (RCTs) responsibilities:

- Performing manipulations on Health Physics Instrumentation.
- Starting, stopping and operating equipment related to OTP.

## 2.4 Change Control

- 2.4.1 Test procedure administrative or editorial changes required during testing may be modified as redline exceptions in the test plan, if these changes do not affect operating facility function, performance or safety that could compromise or influence OTP data results. The OTP changes to acceptance criteria, requirement changes, or changes to Caution, Danger, Special Precautions - or any other safety items and environmental instructions in the OTP shall be prepared as attached supporting documents, which must be revised using Engineering Change Notice Procedures or the Test Exceptions Log/Report.

2.5 Exceptions

2.5.1 See Appendix A-1 - "TEST EXCEPTIONS LOG" Form.

2.5.2 See Appendix A-2 - "TEST EXCEPTIONS REPORT" Form.

2.6 References

• WHC-CM-5-34, Solid Waste Disposal Operations  
Administration, Section 3.14 Log and Tag

• WHC-CM-5-36, SWD Internal Requirements, Chapter 1-10,  
Safety Manual

• WMH-200, Section 2.11 Log keeping  
• HNF-PRO-074 Safety Responsibilities <sup>THB</sup> 2/9/98

2.7 SAFETY

WARNING

In addition to construction and/or chemical/electrical/oil contamination hazards, personnel should be aware of the possibility of coming into contact with poisonous snakes and spiders.

2.8 RADIATION - CONTAMINATION CONTROL - THE WRAP I IS A NEW FACILITY, NO RADIATION/CONTAMINATION CONCERNS ARE EXPECTED DURING OTP ACTIVITIES.

2.9 QUALITY ASSURANCE

2.9.1 No Quality Assurance witness, holdpoints or verifications are required in this OTP procedure.

2.10 GENERAL INFORMATION

2.10.1 During performance of this OTP and the operating procedures, redlines may be made by the cognizant engineer for minor (non-technical) corrections. The appropriate one-line, initial and date will be completed by the cognizant engineer.

## 2.11 LIMITS AND PRECAUTIONS

- 2.11.1 If during performance of this procedure, any of the following conditions are found, immediately notify the assigned TD and TE:
- Any equipment malfunction which could prevent fulfillment of it's functional requirements.
  - Personnel error or procedural inadequacy which could prevent fulfillment concerning OTP procedural requirements.
- 2.11.2 The TD and TE shall stop work and place equipment in a safe condition.
- 2.11.3 Contact TD and TE for additional instructions if changing plant conditions affect work or delays in work extending beyond (testing) shift.
- 2.11.4 If any waste is generated during performance of this OTP, consult Environmental Compliance Officer for specific instructions to ensure compliance with WHC and DOE environmental standards, as applicable, for correct disposal.
- 2.11.5 Comply with lock and tag or over-tagging per WHC-CM-5-34 Solid Waste Disposal Operations Administration, section 3.14 Lock and Tag.
- 2.11.6 Timing measurements shall be made with commercially available timing devices.
- 2.11.7 The TD (TE - backup) has overall control concerning testing process and change record authorization for this OTP. The TD (TE - backup) is responsible for conducting the test, data collection, and ensuring compliance with all OTP requirements.
- 2.11.8 All test data readings are to be taken and recorded for each location where the capability exists.

## 3.0 RECORDS

- 3.1 This Health Physics Instrumentation OTP as well as all completed attachments/appendices will be filed as a permanent test record in accordance with WHC-CM-5-36, SWD Internal Requirements Chapter 3-5, *Document Control and Record Management* Section 12.7.

#### 4.0 PREREQUISITES

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

- 4.1 Perform a pretest briefing for all testing personnel involved in performing the OTP.  
Test Engineer [Signature] Date 7/21/97
- 4.2 Perform a system walkdown inspection to be tested by this OTP.  
Test Engineer [Signature] Date 7/21/97
- 4.3 Verify two way portable radio communication (when necessary) between the testing and equipment locations.  
Test Engineer [Signature] Date 7/21/97
- 4.4 The official OTP document and any other OTP photocopies that will be used during testing have been verified to be the latest approved document revision.  
Test Engineer [Signature] Date 7/21/97
- 4.5 The TE has determined appropriate interface support from other departments/organizations (Fluor Daniel Northwest - Construction Forces, etc.) and that the necessary support personnel/equipment is available.  
Test Engineer [Signature] Date 7/21/97
- 4.6 Personnel training and qualifications, involved in the OTP performance, have been documented and reviewed.  
Lead S/U Engineer [Signature] Date 7/21/97
- 4.7 All open (ATP/FTP) items have been evaluated and verified to not affect the OTP performance (Nonconformance Reports <NCRs>, Construction Punch Lists, outstanding Engineering Change Notices <ECNs>, Startup-originated Design Change Requests <CRs>, Test Deficiency Reports, and Master System Punch List items).  
Cog. Engr [Signature] Date 7/21/97

4.8 All personnel who will be involved with this OTP procedure have provided the required signature verification information in Attachment SR - Signature Record of Understanding OTP Duties.  
Test Engineer *[Signature]* Date 7/21/97

4.9 EQUIPMENT/INSTRUMENTS

4.9.1 See Section 5.0 procedures concerning each individual OTP activity, and the necessary testing support equipment.

4.10 Request Duty Operations Supervisor/Control Room Operator make a facility announcement of alarm testing in the process and process HVAC areas.

5.0 PROCEDURES

5.1 Health Physics Instrumentation testing activities shall be performed using "Attachment 5.1 - Operation Test".

6.0 ACCEPTANCE CRITERIA

6.1 The acceptance criteria, evaluating component and system performance, is witnessing the expected action/reading within the step in question.



APPENDIX A-2

HEALTH PHYSICS INSTRUMENTATION TEST EXCEPTION REPORT			
TEST PROCEDURE NO. & SECTION: Attachments.1 5.1.2		TEST NAME: Air sample concentration	T.E. NUMBER: 1
DESCRIPTION OF PROBLEM: The RTAP screen does NOT reflect the air sample concentration that the field instrument displays.			
ORIGINATOR: MF Hackworth		IMPACT ON TESTING: <input type="checkbox"/> HOLD FOR RESOLUTION <input checked="" type="checkbox"/> CONTINUE	
ORG: Radcon	DATE: 7/21/97	PIC MF Hackworth	DATE 7/21/97
DISPOSITION: Trouble shoot computer interface from Alpha CAMS and RTAP.			
DISPOSITION AND RETEST REQUIREMENTS BY: MF Hackworth Retest procedure steps. <i>[Signature]</i> DATE 2/6/98		DISPOSITION ACTIONS COMPLETE: Yes Field readings and RTAP agree. Verified By: MF Hackworth <i>[Signature]</i> DATE 2/6/98	
QAE CONCURRENCE WITH DISPOSITION (if required): N/A DATE		RETEST COMPLETE: Yes PIC MF Hackworth <i>[Signature]</i> DATE 2/6/98	



APPENDIX A-2

HEALTH PHYSICS INSTRUMENTATION TEST EXCEPTION REPORT			
TEST PROCEDURE NO. & SECTION: Attachment 5.1 5.2.4		TEST NAME: Gamma Radiation Level	T.E. NUMBER: 2
DESCRIPTION OF PROBLEM: The RTAP screen does not reflect the gamma radiation level that the field instrument displays.			
ORIGINATOR: MF Hackworth		IMPACT ON TESTING: <input type="checkbox"/> HOLD FOR RESOLUTION <input checked="" type="checkbox"/> CONTINUE	
ORG: Radcon	DATE: 7/21/98	PIC MF Hackworth	DATE 7/21/98
DISPOSITION: Re-calibrate signal system to RTAP.			
DISPOSITION AND RETEST REQUIREMENTS BY: MF Hackworth Retest procedure steps <i>[Signature]</i> DATE 2/16/98		DISPOSITION ACTIONS COMPLETE: Yes Field readings correspond to RTAP display <i>[Signature]</i> Verified By: MF Hackworth DATE 2/16/98	
QAE CONCURRENCE WITH DISPOSITION (if required): N/A DATE		RETEST COMPLETE: Yes <i>[Signature]</i> PIC MF Hackworth DATE 2/16/98	



## ATTACHMENT 5.1

### HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST PLAN

#### 1.0 INITIAL CONDITIONS

- 1.1 Operational Test will demonstrate Health Physics Instrumentation performance. The Health Physics Instrumentation includes: Alpha and Beta Continuous Air Monitors (CAMs), Personnel Contamination Monitors (PCMs), Gamma Area Radiation Monitors (ARMs), Criticality Monitors, Alpha and Beta Smear Sample Counters, Portable Friskers, and Operator Breathing Zone Air Samplers. This OTP will cover only the Health Physics Instrumentation that interfaces with the Plant Control System (PCS) for phase II & III startup. Those instruments include the following: Alpha and Beta CAMs and ARMs. The OTP sequence shall be executed locally, with the exception of applying check sources for the ARMs.

#### 2.0 MATERIALS

- 2.1 Calibrated Alpha disk source, 47mm  
Calibrated Beta disk source, 47mm

- 3.0 CONFIRM the appropriate breaker(s) are closed activating the system power.

#### 4.0 OPERATIONAL CHECK LIST

NOTE - Previous approved testing activities (ATP) will be indicated in the OTP signature block using an initial/date and past test document references.

- 4.1 VERIFY power to cabinet 119-CAB-12-500 in Rm 120. Power is indicated by a illuminated green light on each of the Radiation Monitoring Systems (RMS II).

S/U Signature: \_\_\_\_\_

COG Signature: \_\_\_\_\_

N/A \* 7/21/97

Date: \_\_\_\_\_

Date: \_\_\_\_\_

7/21/97

### ATTACHMENT 5.1

#### HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

- 4.2 **CONFIRM** vacuum pumps for the continuous air monitors are operational.
- 4.3 **CONFIRM** operability of the Plant Control System (PCS).
- 4.4 **CONFIRM** calibrated sources are available.

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.0 OPERATION TEST

5.1 VERIFY THE AIR SAMPLE CONCENTRATION INDICATED LOCALLY BY THE CAM IS CONSISTENT WITH THE PCS READ OUT

Test: PCS SAMPLE CONCENTRATION  
Test Number: D.1.1  
Test Name: Communication Test  
Resources Required: System start up and PCS

Document References:

- \* Alpha-6A-1 Alpha Air Monitor Technical Manual, Eberline January 1993
- \* Model AMS-3A Beta Air Monitor Technical Manual, Eberline December 1987
- \* H-2-131808 WRAP Module 1 HP Instrumentation Cable Block Diagram Sheet 2 & 3

5.1.1 Establish a physical link between the CAM(s) and PCS.

5.1.2 RECORD the Plutonium air concentration reading on the Alpha CAM(s) and the indicated reading on the appropriate PCS terminal. Acceptance criteria is the PCS readout is within  $\pm 20\%$  of the CAM reading.

12-RITA-509 PROCESS AREA (SOUTH)  
12-RITA-512 PROCESS HVAC AREA  
12-RITA-545 PROCESS AREA (NORTH)

CAM:	<u>751</u>	PCS:	<u>1</u>
CAM:	<u>700</u>	PCS:	<u>1</u>
CAM:	<u>700</u>	PCS:	<u>1</u>

See page 10a for disposition.

S/U Signature:

COG Signature:

[Signature] N/A

Date:

2/16/98

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.1.3 RECORD the Beta air concentration reading on the Beta CAM(s) and the indicated reading on the appropriate PCS terminal. Acceptance criteria is the PCS readout is within  $\pm 20\%$  of the CAM reading.

12-RITA-513 PROCESS AREA (NORTH)	CAM: 11,000	PCS: 11430.362	9384.375
12-RITA-516 PROCESS HVAC AREA	CAM: 4,000	PCS: 10430.737	7/21/97
12-RITA-544 PROCESS AREA (SOUTH)	CAM: 11,000	PCS: 10,430.737	

S/U Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
COG Signature: \_\_\_\_\_ Date: 7/21/97

5.2 VERIFY THE GAMMA AREA RADIATION LEVEL INDICATED LOCALLY IS CONSISTENT WITH THE PCS READ OUT

Test: PCS GAMMA AREA RADIATION LEVEL

Test Number: D.1.2

Test Name: Communication Test

Resources Required: System start up and PCS

Document References:

\* H-2-131808 WRAP Module 1 HP Instrumentation Cable Block Diagram Sheet 1

5.2.1 Establish a physical link between the gamma radiation indicators and PCS.

5.2.2 INITIATE the check source for 12-RE-505 by pressing the green normal light on 12-RIT-505 on cabinet 119-CAB-12-500 in room 120.

5.2.3 RECORD the gamma radiation level reading on each of the area gamma radiation indicators and the indicated reading on the appropriate PCS terminal.

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.2.4 REPEAT steps 5.2.2 & 5.2.3 for 12-RE-508 with corresponding indicator 12-RITA-508. Acceptance criteria is the PCS readout is within  $\pm 20\%$  of the instrument reading.

12-RITA-505 reading: 3.5 PCS: .02  
12-RITA-508 reading: 3.5 PCS: .009

See Page 10b for disposition

S/U Signature: *[Signature]* Date:           
COG Signature: *[Signature]* Date: 2/6/96

5.3 VERIFY THE CAM HIGH RADIATION ALARM ACTIVATES LOCAL AREA ALARMS, PCS ALARM, AND ENTRY WARNING BEACONS

Test: CAM HIGH RADIATION

Test Number: D.1.3

Test Name: Alarm Test

Resources Required: System start up and PCS

Document References:

- \* Alpha-6A-1 Alpha Air Monitor Technical Manual, Eberline January 1993
- \* Model AMS-3A Beta Air Monitor Technical Manual, Eberline December 1987
- \* H-2-13180B WRAP Module 1 HP Instrumentation Cable Block Diagram Sheet 2 & 3

5.3.1 Establish a physical link between the CAM(s) and PCS.





ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.3.3 VERIFY the local audible and visual alarm for each Beta CAM correlates with the appropriate PCS alarm, area alarms and entry warning beacon(s). Indicate the alarm with a check mark.

11438.362

12-RITA-544	PROCESS AREA (SOUTH)	LOCAL:	<input checked="" type="checkbox"/>	PCS:	<input checked="" type="checkbox"/>
12-UA-561	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-560	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-570	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-571	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-582	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-583	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-RITA-516	PROCESS HVAC AREA	LOCAL:	<input checked="" type="checkbox"/>	PCS:	<input checked="" type="checkbox"/>
12-UA-566	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-567	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-580	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-RITA-513	PROCESS AREA (NORTH)	LOCAL:	<input checked="" type="checkbox"/>	PCS:	<input checked="" type="checkbox"/>
12-UA-561	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-560	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-570	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-571	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-582	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-583	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		

S/U Signature: \_\_\_\_\_  
 COG Signature: \_\_\_\_\_

N/A  
 Date: 7/21/97  
 Date: 7/21/97

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.4 VERIFY THE GAMMA HIGH RADIATION ALARMS ACTIVATES LOCAL AREA ALARMS, PCS ALARM, AND ENTRY WARNING BEACONS

Test: GAMMA HIGH RADIATION

Test Number: D.1.4

Test Name: Alarm Test

Resources Required: System start up and PCS

Document References:

\* H-2-131808 WRAP Module 1 HP Instrumentation Cable Block Diagram Sheet 1

5.4.1 Establish a physical link between the ARMs and PCS.

5.4.2 VERIFY the local audible and visual alarm for each Gamma Area Radiation Monitor correlates with the appropriate PCS alarm, area alarms and entry warning beacon(s). Indicate the alarm with a check mark.

12-RITA-505	PROCESS AREA (SOUTH)	LOCAL:	<input checked="" type="checkbox"/>	PCS:	<input checked="" type="checkbox"/>
12-UA-561	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-560	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-570	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-571	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-582	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-583	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-RITA-508	PROCESS AREA (NORTH)	LOCAL:	<input checked="" type="checkbox"/>	PCS:	<input checked="" type="checkbox"/>
12-UA-561	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-560	AREA ALARM	VISUAL:	<input checked="" type="checkbox"/>	AUDIBLE:	<input checked="" type="checkbox"/>
12-UA-570	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-571	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-582	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		
12-UA-583	ENTRY WARNING BEACON	VISUAL:	<input checked="" type="checkbox"/>		

S/U Signature:

COG Signature:

N/A

Date:

Date:

4/21/97

7/21/97

**ATTACHMENT 5.1**

**HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST**

**Figure 6-1 FACILITY ALARM ANNUNCIATOR (201-UA-12-110)  
(Radiological Alarms and Positions)**

		RADIATION HIGH ALARM		
		RADIATION MONITORING SYSTEM TROUBLE		

**5.5 VERIFY THE TROUBLE ALARM LOCALLY BY THE CAM IS CONSISTENT WITH THE PCS READ OUT**

Test: CAM TROUBLE ALARM

Test Number: D.1.5

Test Name: Alarm Test

Resources Required: System start up and PCS

Document References:

- \* Alpha-6A-1 Alpha Air Monitor Technical Manual, Eberline  
January 1993
- \* Model AMS-3A Beta Air Monitor Technical Manual, Eberline  
December 1987
- \* H-2-131808 WRAP Module 1 HP Instrumentation Cable Block  
Diagram Sheet 2 & 3

**5.5.2 Establish a physical link between the CAM(s) and PCS.**

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.5.3 INITIATE a TROUBLE alarm by turning off the vacuum pump to the CAM(s).

5.5.4 VERIFY a TROUBLE alarm by the CAM(s) matches a PCS TROUBLE alarm for that CAM (check mark).

12-RITA-509 PROCESS AREA (SOUTH)	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>
12-RITA-512 PROCESS HVAC AREA	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>
12-RITA-545 PROCESS AREA (NORTH)	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>
12-RITA-513 PROCESS AREA (NORTH)	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>
12-RITA-516 PROCESS HVAC AREA	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>
12-RITA-544 PROCESS AREA (SOUTH)	CAM: <input checked="" type="checkbox"/>	PCS: <input checked="" type="checkbox"/>

S/U Signature: *[Signature]* N/A # 7/21/97 Date: \_\_\_\_\_  
COG Signature: *[Signature]* Date: 7/21/97

5.6 VERIFY THE GAMMA AREA RADIATION MONITOR TROUBLE WITH THE PCS READ OUT

Test: GAMMA AREA RADIATION TROUBLE ALARM

Test Number: D.1.6

Test Name: Alarm Test

Resources Required: System start up and PCS

Document References:

\* H-2-131808 WRAP Module 1 HP Instrumentation Cable Block Diagram Sheet 1

5.6.1 Establish a physical link between the gamma radiation indicators and PCS.

5.6.2 DISCONNECT 12-RE-505 & 508 by removing power cable to the detector(s).

ATTACHMENT 5.1

HEALTH PHYSICS INSTRUMENTATION - OPERATION TEST

5.6.3 VERIFY the gamma radiation TROUBLE alarm for each detector matches the appropriate PCS alarm. (check mark)

12-RITA-505:  PCS:

12-RITA-508:  PCS:

S/U Signature: ~~\_\_\_\_\_~~ N/A # 7/21/97 Date: \_\_\_\_\_  
COG Signature: ~~\_\_\_\_\_~~ Date: 7/21/97

6.0 VERIFY TEMPORARY TEST INSTRUMENTATION AND EQUIPMENT has been removed from the Health Physics Instrumentation.

S/U Signature: ~~\_\_\_\_\_~~ N/A # 7/21/97 Date: \_\_\_\_\_  
COG Signature: ~~\_\_\_\_\_~~ Date: 7/21/97

7.0 Review of recorded data has been performed by the cognizant engineer. Data is acceptable.

COG Signature: ~~\_\_\_\_\_~~ Date: 2/6/98

7.0 Health Physics Instrumentation OTP is considered closed.

S/U Signature: ~~\_\_\_\_\_~~ N/A Date: \_\_\_\_\_  
COG Signature: ~~\_\_\_\_\_~~ Date: 2/6/98