

STA-2
MAY 25 2000

18 ENGINEERING DATA TRANSMITTAL

2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) WESF Engineering		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: 3N500		6. Design Authority/Design Agent/Cog. Engr.: S. J. Davis		7. Purchase Order No.: N/A	
8. Originator Remarks: For release of radiation detector dedication of components used in safety class systems.				9. Equip./Component No.: N/A	
11. Receiver Remarks:				10. System/Bldg./Facility: C96A/225B/2C	
11A. Design Baseline Document? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				12. Major Assem. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: N/A	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF-6204 6403 <i>27524-00</i>	1	0	Critical Characteristics	SQ	1	1	

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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1		Design Authority S. J. Davis	<i>S. J. Davis</i>	5/17/00	56-51						
		Design Agent									
1		Cog. Eng. J. L. Pennock	<i>J. L. Pennock</i>	5-18-00	56-51						
		Cog. Mgr.									
1	1	QA M. A. Hill	<i>M. A. Hill</i>	5/17/00							
1		Safety W. D. Pollard	<i>W. D. Pollard</i>	5/19/00							
1	1	<i>Steve Lent</i>	<i>Steve Lent</i>	5/22/00							

18. Signature of EDT Originator: <i>S. J. Davis</i> Date: 5/17/00		19. Authorized Representative for Receiving Organization: _____ Date: _____		20. Design Authority/Cognizant Manager: <i>J. L. Pennock</i> Date: 5-22-00		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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CRITICAL CHARACTERISTICS OF RADIATION DETECTION SYSTEM COMPONENTS TO BE DEDICATED FOR USE IN SAFETY CLASS/SAFETY SIGNIFICANT SYSTEM

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford

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Richland, Washington

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Date Published
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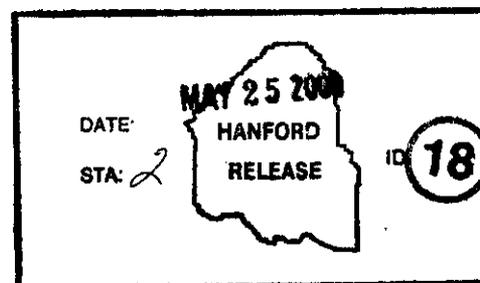
Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford

P.O. Box 1000
Richland, Washington


Release Approval

5/25/00
Date



Release Stamp

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**CRITICAL CHARACTERISTICS OF
RADIATION DETECTION SYSTEM COMPONENTS TO BE
DEDICATED FOR USE IN SAFETY CLASS/SAFETY
SIGNIFICANT SYSTEMS**

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Revision Status

<u>Change Number</u>	<u>Date</u>	<u>Change Document</u>	<u>Page(s)</u>	<u>Description</u>
Rev 0, Chg [0]	04/20/2000		All	New Supporting Document

1.0 PURPOSE AND SCOPE

This document identifies critical characteristics of components to be dedicated for use in Safety Class (SC) or Safety Significant (SS) Systems, Structures, or Components (SSCs).

This document identifies the requirements for the components of the common radiation area monitor alarm in the WESF pool cell. These are procured as Commercial Grade Items (CGI), with the qualification testing and formal dedication to be performed at the Waste Encapsulation Storage Facility (WESF), in safety class, safety significant systems. System modifications are to be performed in accordance with the instructions provided on ECN 658230. Components for this change are commercially available and interchangeable with the existing alarm configuration

This document focuses on the operational requirements for alarm, declaration of the safety classification, identification of critical characteristics, and interpretation of requirements for procurement. Critical characteristics are identified herein and must be verified, followed by formal dedication, prior to the components being used in safety related applications.

2.0 REFERENCES

HNF-SD-WM-SEL-009, Rev. 7, *Safety Equipment List*

HNF-PRO-268, Rev 5, *Control of Purchased Items and Services*

HNF-SD-BIO-002, Rev 0, "WESF Basis for Interim Operation"

HNF-SD-IOSR-001, Rev 0, "WESF Interim Operational Safety Requirements"

3.0 HISTORICAL INFORMATION

WESF is designed to receive, inspect, decontaminate, and store cesium (Cs) and strontium (Sr) capsules that were produced in past missions at WESF. The capsules were produced in WESF from 1974 to 1985 to reduce the quantity of ^{137}Cs and ^{90}Sr in liquid waste stored in underground tanks. The ^{137}Cs , in the form of cesium chloride, and the ^{90}Sr , in the form of strontium fluoride, were doubly encapsulated in WESF hot cells and stored under water in WESF pool cells. Some of the cesium capsules were leased to private enterprises for use as radiation sources; these capsules have been returned to WESF.



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4.0 SAFETY CLASSIFICATIONS

The Area Radiation Monitor (ARM) system for the Pool Cell Area consists of three detectors, with three remote alarm modules, and a common alarm light and horn. This alarm light and horn provides indication for the facility workers in the Pool Cell Area. Additional indicators are located on panel S-3 and on the WPMCS. The "WESF Safety Equipment List," HNF-SD-WM-SEL-008, Rev 7, identifies the components as Safety Class for the loss of pool cell water accident analysis and safety significant for the loss of capsule integrity accident analysis in the WESF BIO.

Procurement must be Safety Class to comply with the requirements established in HNF-PRO-268, *Control of Purchased Items and Services*, that states, "Services or processes affecting the SSC's functionality shall be classified with the same classification designation as the SSC. All CGI instruments must be qualified and dedicated for Safety Class application.

5.0 SEISMIC QUALIFICATION FOR THE ALARM MODIFICATION

The area of concern is the change in weight and the ability of the existing components to support the dead load.

The installation will be less than the current loading as a result of the removal of the un-necessary conduit and fittings. The weight of the alarm/horn assembly is 5.1 pounds. The conduit is anchored in three locations near the light/alarm attachment point. The minimum anchorage in tension for this load is rated at 125 for each ¼" anchor, providing a most conservative total tension weight of 375 lbs. The total dead load is less than 10 lbs (5.1 pounds plus conduit, fittings and a junction box). The alarm/horn assembly will be supported from the conduit connector and a 4-square box with four 10 x 32 screws. Each screw is capable of supporting the weight of 5.1 lbs (weight identified for the horn/alarm assembly). The weight for the alarm/horn assembly is less than the roof loading requirements (20 psf) identified in ROOF-98-028, "Results of the 225B Building Roof Inspection."

Failure of the supports will not create a condition that would damage the capsules and is of no consequence in a seismic event.

6.0 CRITICAL CHARACTERISTICS

6.1 OPERATIONAL REQUIREMENTS:

Pool cell radiation alarms receive alarm signals and provide visual and audible alarm locally and remotely. (SEL 2.1.3)

6.2 SAFETY FUNCTION OF THE COMPONENTS:

1. Alarms (Alarms and Horn) must operate when the alarm set points are exceeded.
2. Alarms must be audible above the background noise.

6.3 CONDITIONAL ACCEPTANCE CHARACTERISTICS FOR VERIFICATION BY AVS AT RECEIPT

1. Label identifying manufacturer and model/part number agrees with the purchase order.
2. No apparent damage has been done to the cable assemblies.
3. QAIP was used to document AVS inspection.

6.4 FORMAL COMPONENT DEDICATION

1. Acceptance is to be identified on the QAIP.
2. The Radiation Alarm unit must be tested for acceptance. Initiate an alarm from RE-AR-5, RE-AR-17, and RE-AR-18 verifying the alarm activates and the horn sounds.
3. During the testing performed in step 2, verify that the alarms on Panel S-3 and the WPMCS respond correctly.

When the testing is complete, the System Engineer and the Quality Assurance Engineer will evaluate the data and formally complete the dedication by documenting the acceptance of the items by their signatures in the work package.

