

~~XXXX~~ RMIS View/Print Document Cover Sheet ~~XXXX~~

This document was retrieved from the Boeing ISEARCH System.

Accession #: D196050011

Document #: SD-CP-DRD-002

Title/Desc:

CONCEPTUAL BASELINE DOCUMENT FOR THE NUCLEAR  
MATERIALS SAFEGUARDS SYSTEM

SEP 5 1995

Sta. #4

## ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 608536

2. To: (Receiving Organization) Engineering Configuration Management	3. From: (Originating Organization) Technical Security	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Technical Security/3B400	6. Cog. Engr.: R. A. Nelson	7. Purchase Order No.: N/A
8. Originator Remarks: The purpose of this EDT is to approve and release document WHC-SD-CP-DRD-002, the NMSS Conceptual Baseline Document.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: Nuclear Materials Safeguard System/2701-ZA/PFP
11. Receiver Remarks:		12. Major Assm. 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	WHC-SD-CP-DRD-002		0	Conceptual Baseline Document, Nuclear Materials Safeguards System	N/A	1	1	6

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	4. Review	1. Approved		4. Reviewed no/comment			
		2. Release	5. Post-Review	2. Approved w/comment		5. Reviewed w/comment			
		3. Information	6. Dist. (Receipt Acknow. Required)	3. Disapproved 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
1	1	Cog. Eng. GL Rippy	<i>[Signature]</i>	9/24/95	83-35	P.F. KLEAR	<i>[Signature]</i>	8/28/95	1
1	1	Cog. Mgr. DE Palmer	<i>[Signature]</i>	9/24/95	63-40	BR FITEPATRICK	<i>[Signature]</i>	8-24-95	1
		QA				SEGD LOG L.P. MORALES	<i>[Signature]</i>	9/24/95	1
1	1	Safety	<i>[Signature]</i>	9-25-95	TS-11				
		Env.							
1	1	TE Huber	<i>[Signature]</i>	9/29/95					
1	1	WF Russell Jr.	<i>[Signature]</i>	9/28/95	TS-51				

18. Signature of EDT Originator <i>[Signature]</i> Date: 9/24/95	19. Authorized Representative for Receiving Organization <i>[Signature]</i> Date:	20. Cognizant Manager <i>[Signature]</i> Date: 9/24/95	21. DOE APPROVAL (if required) Ctrl. No. N/A <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
--	---	--	---

## RELEASE AUTHORIZATION

**Document Number:** WHC-SD-CP-DRD-002, REV 0

**Document Title:** Conceptual Baseline Document for the Nuclear  
Materials Safeguards System

**Release Date:** 9/1/95

**This document was reviewed following the  
procedures described in WHC-CM-3-4 and is:**

**APPROVED FOR PUBLIC RELEASE**

**WHC Information Release Administration Specialist:**

  
Kara M. Broz

  
9/1/95

**TRADEMARK DISCLAIMER.** Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy. Available in paper copy. Printed in the United States of America. To obtain copies of this report, contact:

Westinghouse Hanford Company - Document Control Services  
P.O. Box 1970, Mailstop H6-08, Richland, WA 99352  
Telephone: (509) 372-2420; Fax: (509) 376-4989

**SUPPORTING DOCUMENT**1. Total Pages **31**

## 2. Title

**Conceptual Baseline Document for the Nuclear  
Materials Safeguards System**

## 3. Number

**WHC-SD-CP-DRD-002**

## 4. Rev No.

**0**

## 5. Key Words

**Nuclear Materials Safeguards System  
NMSS  
Conceptual Baseline Document  
PFP**

## 6. Author

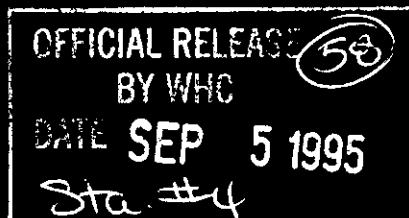
Name: **R. A. Nelson**Signature Organization/Charge Code **3B400**

## 7. Abstract

This document defines the baseline scope, schedule, and cost requirements of the Nuclear Materials Safeguards System (NMSS) replacement for the Plutonium Finishing Plant.

8.

RELEASE STAMP



WHC-SD-CP-DRD-002 Rev.0

CONCEPTUAL BASELINE DOCUMENT

The Nuclear Material Safeguards System Replacement

Issued By  
Safeguards And Security  
Technical Security

for the  
U.S. Department of Energy  
Richland Operations Office  
Richland, Washington

Prepared By  
Rob Nelson  
8/95

1.0	INTRODUCTION . . . . .	1
2.0	JUSTIFICATION . . . . .	4
3.0	DESCRIPTION OF SCOPE . . . . .	4
3.1	Software . . . . .	4
3.2	Computer System . . . . .	5
3.3	Data Conversion . . . . .	6
3.4	NMSS Contingency System . . . . .	6
3.5	System Cut Over . . . . .	7
3.6	System Acceptance . . . . .	7
4.0	METHODS OF PERFORMANCE . . . . .	7
4.1	Offsite Engineer Work . . . . .	7
4.2	Onsite Engineer Work . . . . .	7
4.3	Procurement Strategy . . . . .	7
4.4	Onsite Installation . . . . .	7
4.5	Plant Forces Work Review . . . . .	8
5.0	REQUIREMENTS AND ASSESSMENTS . . . . .	8
5.1	Decontamination and Decommissioning . . . . .	8
5.2	Maintenance and Operation Requirements . . . . .	8
5.3	Automatic Data Processing/Telecommunications Equipment . . . . .	9
5.4	Safety Classification . . . . .	9
5.5	Environmental Compliance . . . . .	10
6.0	REFERENCES . . . . .	10
	APPENDIX A COST ESTIMATE SUMMARY . . . . .	A-1
	APPENDIX B SCHEDULE . . . . .	B-1
	APPENDIX C PLANT FORCES WORK REVIEW . . . . .	C-1
	APPENDIX D SKETCHES AND DRAWINGS . . . . .	D-1
	APPENDIX E ASSUMPTIONS . . . . .	E-1

**LIST OF FIGURES**

Figure 1.	NMSS Replacement Software Architecture . . . . .	2
Figure 2.	NMSS Replacement Network . . . . .	3
Figure D-1.	2736Z & ZB Network Plan . . . . .	D-2
Figure D-2.	234-5Z Partial Network Plan . . . . .	D-3
Figure D-3.	2704Z Network Plan . . . . .	D-4
Figure D-4.	NMSS Equipment In Room 306A/234-5Z . . . . .	D-5
Figure D-5.	NMSS Network Hub Equipment Racks . . . . .	D-6

## 1.0 INTRODUCTION

The Nuclear Material Safeguards System (NMSS), operating in PFP, comprises data from several site safeguards systems that have been merged since 1987. NMSS was designed and implemented to the state of computer technology for the mid 1970's. Since implementation, the hardware vendor has stopped producing computer systems and the availability of personnel trained and willing to work with the technology has diminished. Maintenance has become expensive and reliability is a serious concern. This effort provides a replacement in kind of the NMSS, using modern, scalable, upgradable hardware and software to the same standards used for the Hanford Local Area Network (HLAN) system.

The NMSS Replacement is a Client/Server architecture designed on a Personal Computer based local area network (LAN) platform. The LAN is provided through an ethernet interface running the Transmission Control Protocol/Internet Protocol (TCP/IP). This architecture conforms to the HLAN standard, including the End System Operating Environment (ESOE). The Server runs the Microsoft Windows NT<sup>1</sup> Server operating system, Microsoft SQL Server<sup>2</sup> database management system, and application tools. Clients run Microsoft Windows<sup>3</sup> and application software provided as part of the system. The interface between the clients and the database is through Microsoft ODBC<sup>4</sup>. Figure 1 shows the NMSS Replacement software partitioned between the clients and server. Figure 2 describes the NMSS Replacement network topology.

---

<sup>1</sup> Microsoft Windows NT is a trademark of Microsoft Corp.

<sup>2</sup> Microsoft SQL Server is a trademark of Microsoft Corp.

<sup>3</sup> Microsoft Windows is a trademark of Microsoft Corp.

<sup>4</sup> Microsoft ODBC is a trademark of Microsoft Corp.

Figure 1. Nuclear Material Safeguards System Replacement Software Architecture

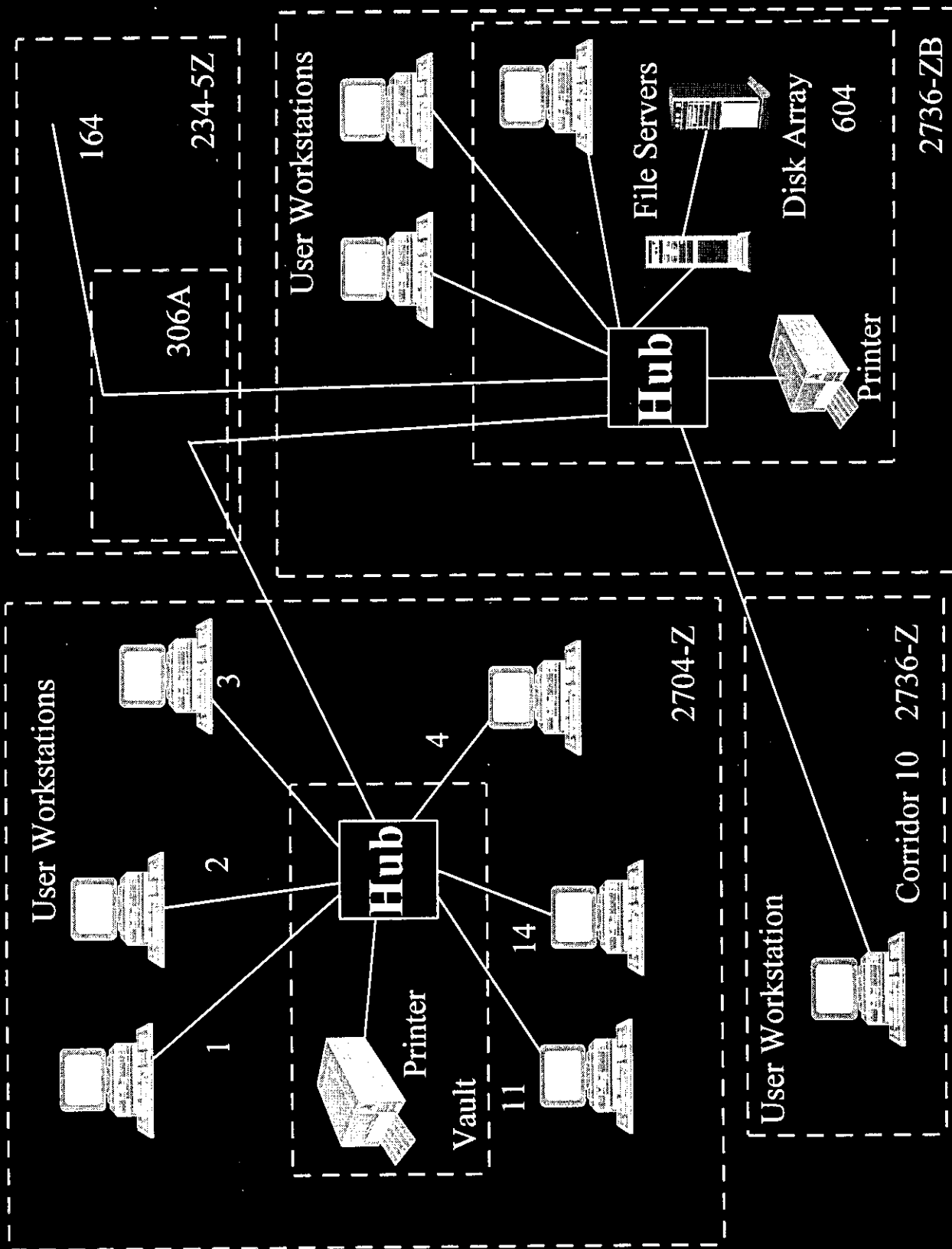
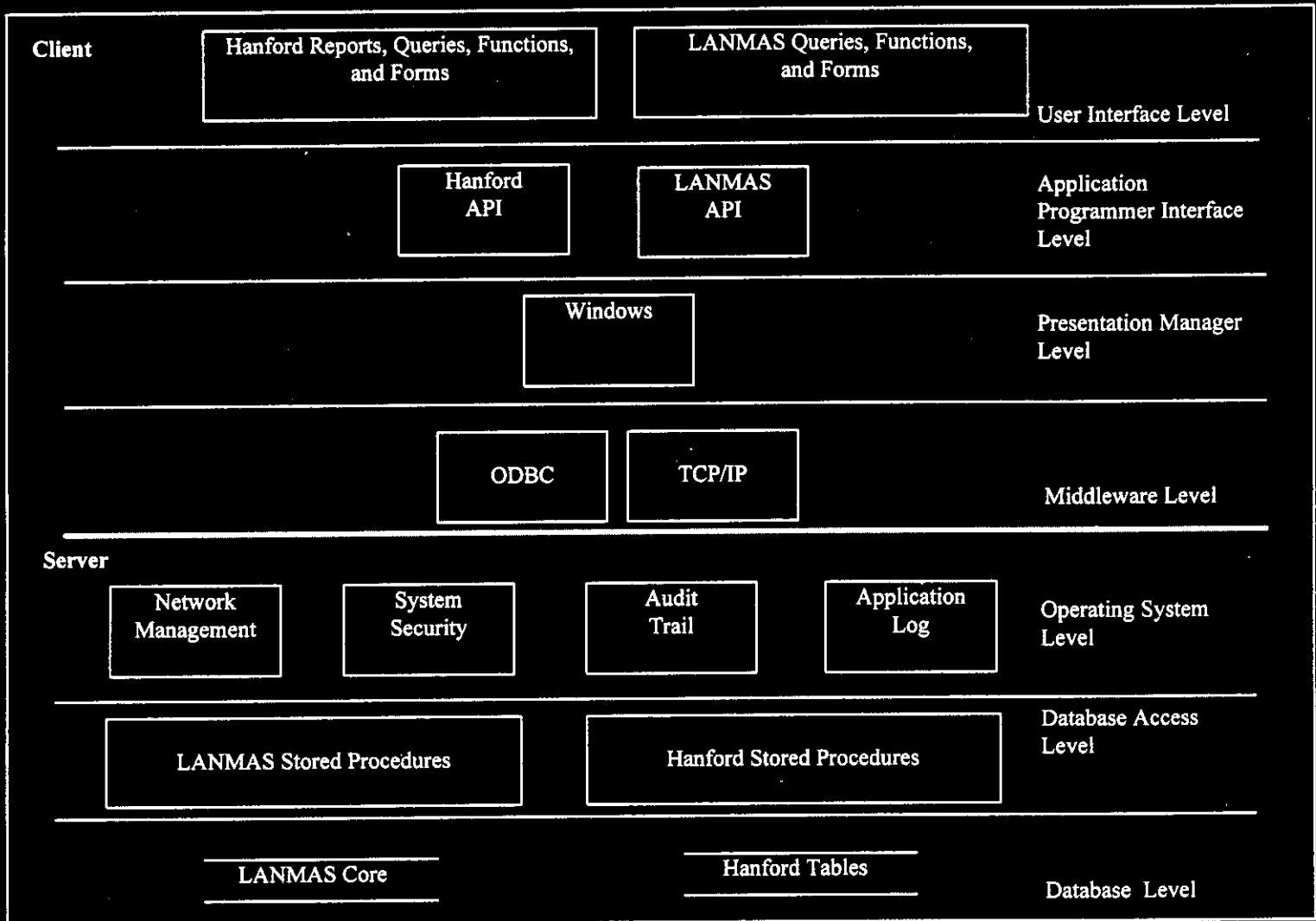




Figure 2. Nuclear Material Safeguards System Replacement Network.



Industry standard development tools will be used for system development. These include visual GUI development tools, libraries, a report writer, a source version control utility, database development tools, language compilers, and help authoring tools. Software development tools will be used when they can expedite development and reduce costs.

The accountability application software and database will be built around the LANMAS Core software, is being developed for DOE by the Los Alamos National Laboratory (LANL). The LANMAS Core is designed to provide basic nuclear material accounting functionality. It is the responsibility of sites, such as Hanford, to implement the system to meet site business requirements for data and reporting.

## 2.0 JUSTIFICATION

The NMSS provides the means for tracking and reporting of all WHC controlled nuclear material to the U.S. Department of Energy (DOE). The design life cycle of this system has passed and the system is in danger of failure within 3 to 5 years - based on a 1993 assessment.

The NMSS Replacement replaces the NMSS through integration of existing DOE technology and site standard products with site specific data requirements. NMSS Replacement will allow WHC to meet DOE material accounting and reporting requirements and meet changing requirements more efficiently than with the NMSS.

## 3.0 DESCRIPTION OF SCOPE

The work to be performed is replacement of the NMSS hardware and software and conversion of legacy data to the new system. The NMSS software is replaced through integration of Hanford developed software with the LANMAS Core software. The Hanford software development will comply with the intent of Westinghouse Software Practices, WHC-CM-3-10. The hardware will be replaced with an architecture that supports the new software. The data will be converted to the new system, integrated into the database or stored in text files. Major building and room modifications are not required to accommodate the replacement hardware.

### 3.1 Software

NMSS Replacement software requires the design and development of a database, a graphical user interface (GUI), the reports, and the functions that support the Hanford Mission. The NMSS Replacement will be designed and developed around the LANMAS Core software.

LANL designed and developed LANMAS as a core product to provide integration of general accounting functions with site specific business requirements. The NMSS Replacement software will combine

the LANMAS Core with Hanford software. The integration provides the reporting features, computational functions, and database structure that supports Hanford business requirements.

The LANMAS Core provides a database structure that supports generalized nuclear material accounting. This includes data access and data validation to the generalized data fields.

The NMSS Replacement will provide software functions that complete the business requirements for a nuclear material accounting system. These features are summarized as:

- Provide nuclear material tracking by account through a double entry accounting model
- Provide discretionary access control features and user audit trail
- Provide account tracking through adjustments, reporting, error detection, validation of material transformations, decays, and changes to project number, location, and containerization
- Track, report and provide support for procuring, issuing, retrieving, and verifying tamper indicating devices attached to containers, locations, groups, etc.
- Track, report, and provide capability for verifying source documents
- Provide material balance, inventory difference, detailed and summary inventory information, audit trail, item history, and concise note reports ordered by various data fields
- Calculate and report material quantities by location
- Provide material control support in the form of sampling plans, tracking Limit of Error, and calculating Limit of Error Inventory Differences
- Provide electronic data to material Custodians, Vault Technicians, U.S. Department Of Energy, Richland Operations Office (DOE-RL), and others
- Provide data files to the national database and reports to the International Atomic Energy Agency
- Provide Ad hoc queries and reporting with the capability to store these queries and reports
- Provide item identity and material codes by location to the Vault Safety and Inventory System
- Support Security, Data, and System Administration.

### 3.2 Computer System

The project involves replacement of a PRIME 9755 minicomputer system with a client/server architecture. This requires host system replacement by a file server, replacement of some terminals with modern workstations, addition of network drops, and the fiber

optic multiplexer system replacement by network hubs. The existing fiber optic cables will be used for NMSS Replacement.

New hardware will be installed to support NMSS Replacement. The hardware includes:

- File server, disk array, system terminal, tape backup, and uninterruptable power supply (UPS) in 2736ZB/604
- Network printer in 2704Z/Vault
- Network hubs and UPS in 2704Z/Vault and 2736ZB/604 with appropriate mounting hardware
- New client workstations in 2736ZB/611, 2736ZB/603, 2736Z/Corridor, 234-5Z and 2704/2
- Installation and mounting of equipment racks in the 2704Z/Vault and 2736ZB/604.

Cable runs will be installed or modified for support of NMSS Replacement. These are:

- Replacement of SMA connectors with ST connectors on all fiber optic lines
- Replacing RS-232 fiber modems in all key boxes with ethernet fiber optic transceivers
- Connection of fiber optic cables from file servers, work stations, and peripherals to network hubs
- Fusing the fiber optic cables between 2736ZB/604 and 234-5Z/306A to fiber optic running to 234-5Z/164
- Connecting the fiber optic cables between 2736ZB/604 and 234-5Z/306A to the fiber optic cable running to 2704Z, including installation of an appropriate junction box
- Network drops in 2736ZB/603 and 2736ZB/611, including key boxes, conduit and pulling fiber optic cable from 2736ZB/604.

Once NMSS Replacement is installed, the unused NMSS hardware will be removed. This includes the following equipment:

- PRIME 9755 computer and peripherals in 234-5Z/306A
- Data Products printer in 2704Z/Vault
- PRIME 9755 computer to intrusion detection system multiplexer connections
- Fiber optic multiplexers in 2704Z/Vault, 234-5Z/306A, and 2736ZB/604
- Termination of unused cables.

### **3.3 Data Conversion**

The NMSS contains 10-15 years' nuclear material holdings and transaction data. The requirement for nuclear material historical information and the amount of data that would be entered into the system, drives the need for automated data conversion.

### **3.4 NMSS Contingency System**

An initial data conversion during FY95 will be combined with the ability to generate some basic reporting and data input to provide a contingency system that covers the loss of service should the NMSS fail.

**3.5 System Cut Over**

The cut over from the NMSS to the NMSS Replacement requires transfer of all data stored on the NMSS to the NMSS Replacement, procedural changes, and physical connection of hardware.

**3.6 System Acceptance**

Technical Security will write a test procedure and test scripts based on testing criteria approved by Northern Security Programs. Northern Security Programs will execute the system test as an independent organization. Final approval of the system is at the discretion of Northern Security Programs.

**4.0 METHODS OF PERFORMANCE**

**4.1 Offsite Engineer Work**

LANL is responsible for design and development of the LANMAS Core.

**4.2 Onsite Engineer Work**

Network design and system engineering will be performed by WHC staff.

**4.3 Procurement Strategy**

All hardware and software will be procured through WHC.

**4.4 Onsite Installation**

*Communications*

Communications between the workstations, file servers, and peripherals will be through the isolated Protected Distribution System (PDS). A PDS exists between the buildings and rooms where this system will extend. Minor modifications may be made to the PDS when hardware is eliminated or workstations added to the system. Modifications (installation) to the PDS will be performed by plant personnel or site construction forces.

*Network Hubs*

Network hubs will be located in 2704Z/Vault and 2736ZB/604. These will be placed near existing fiber optic multiplexers.

*File Servers*

The file server and disk array will be located in 2736ZB/604. 604 is a vault type room suitable for open storage of classified material.

*Work Stations*

One workstation update from a 286 is required in 2704Z room 14. The existing fiber optic cables will be used to connect this work station to the network.

The 286 workstation in the 2736Z Corridor 10 will be updated. A new printer is included in this upgrade. The existing fiber optic cables will be used to connect this work station to the network.

Workstations will be located in 2736ZB, rooms 603, and 611 to provide access to the NMSS for vault operations. Network drops to rooms 603 and 611 are required. A system terminal will be installed in room 604 using existing cables.

#### *System Software*

Application and System software for the file servers and work stations will be managed from the file servers by the System Administrator.

#### **4.5 Plant Forces Work Review**

The Plant Forces Work Review (PFWR) Committee has reviewed this work scope and has determined it does not require a PFWR to be submitted.

### **5.0 REQUIREMENTS AND ASSESSMENTS**

#### **5.1 Decontamination and Decommissioning**

One work station, including printer, will be removed from the 2736Z Vault Corridor, which is a radiation zone. The equipment will be surveyed for radioactivity. All contaminated equipment will be delivered to an approved disposal site. Uncontaminated equipment will be declared surplus.

#### **5.2 Maintenance and Operation Requirements**

The equipment and software provided will be designed, procured, implemented, and installed to ensure that efficient, cost effective maintenance can be performed. Site standard hardware and software configurations will be used. Equipment installation and mounting will ease physical access, provide safe working conditions, and minimize exposure for maintenance activities. Special maintenance tools and software will be provided with the network equipment and files servers.

Maintenance of the hardware and physical network will be performed by site personnel skilled in the maintenance of Personal Computer hardware and local area network equipment.

Safeguards and Security will provide software maintenance personnel skilled in the Microsoft Visual Basic<sup>5</sup>, Windows NT, and SQL Server operating environment. The software maintenance personnel will perform system configurations, adjustments, and software modification using the tools provided with the production system.

The System Software will be kept current with version updates by the software vendors. This includes the operating system, database management, LANMAS Core, and middleware used in the system. These updates may require modifications to the NMSS Replacement application software and will be performed by site personnel.

Hardware updates should be performed as the technology and computer systems reach their design life cycle. The migration path used for these updates should follow the strategies used by the Hanford Site for update of the HLAN (which will face similar issues through its life cycle).

All maintenance on the production system and its components requires cleared individuals.

#### **5.3 Automatic Data Processing/Telecommunications Equipment**

Automatic Data Processing (ADP) equipment will be procured as stated in the ADP Acquisition Plan WHC-95-705710. The subject items in this acquisition will support established site standards for microcomputer systems. A list of software and hardware that will be procured is provided in the Appendix 7.1 "Cost Estimate Summary".

#### **5.4 Safety Classification**

A hazards analysis of the activities, as defined in this document, was performed to determine the hazards and assess the associated risks.

The work is limited to the replacement in kind. This involves craft personnel using common, off-the-shelf tools and components, and off-the-shelf equipment removal and installation.

The light industry work is similar to activities involving removal/installation of telephones and personal computers and related accessories. This work does not involve unique hazards, equipment tools or activities.

The general industry consensus standards as incorporated in the WHC manual, WHC-CM-4-3, provides the safety criteria for this

---

<sup>5</sup> Microsoft Visual Basic is a trademark of Microsoft Corp.

activity. The manual requires a job safety analysis and a pre-job meeting prior to work activities. Additionally, WHC procurement requirements identify unique environments that require additional controls for hazards elimination or risk reduction. These include hazardous work permits, confined space permits, lock and tag and radiation work permits.

A review process is in place to determine the effect and update requirements to the PFP FSAR as a result of this activity. No further safety analysis is required.

This work consists of general light industrial activity of a low hazard potential, it is commonly accepted by the general public, with the safety envelope of the PFP FSAR and meets the definition of acceptable risk.

The component procurement and installation is safety class 4.

## 5.5 Environmental Compliance

The replacement activity of Safeguards and Security systems in PFP was evaluated and found to qualify for the sitewide categorical exclusion under B1.3, Routine Maintenance, and B2.5, safety and environmental improvements of a facility, replacement of facility components. This exclusion is valid provided the work scope for replacement doesn't increase and the wastes generated are recycled or disposed of in an existing waste disposal unit.

## 6.0 REFERENCES

WHC-SD-CP-ES-161 Rev. 0, Replacement Analysis for Safeguards and Security Systems of Hanford Protected Areas, January 1994.

WHC-SD-CP-CSRS-010, Nuclear Material Safeguards System (NMSS) Replacement System Requirements Specification, May 1995.

WHC-95-705710, ADP Acquisition Plan, NMSS and VSIS Replacement Systems, May 1995.

WHC-CM-3-10, Software Practices, Westinghouse Hanford Company

15540-95-PKH-093, Letter from PFP Environmental Engineering concerning SAFEGUARD AND SECURITY UPGRADES AT THE PLUTONIUM FINISHING PLANT CATEGORY EXCLUSION, 6/27/95.



WHC-SD-CP-DRD-002 Rev.0

APPENDIX A COST ESTIMATE SUMMARY



KAISER ENGINEERS HANFORD

Westinghouse Hanford Company  
JOB NO. Z357 E36309  
FILE NO. NMSS

\*\* IEST - INTERACTIVE ESTIMATING \*\*

PFP Sfdds & Scty Sys Repl (NMSS)  
Conceptual Estimate-Nuclear Mat Safeguards Sys Repl  
DOE\_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

PAGE 2 OF 7  
DATE 08/24/95 08:44:09  
BY JJM

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	SUB TOTAL	CONTINGENCY %	TOTAL DOLLARS
110001	System Design Description	54474	0	54474	2.03	1105	20	66696
110002	System Design & Development	179455	0	179455	2.03	3643	20	219717
110003	ECNs, Drawings, P&ID, NEPA	48345	0	48345	2.03	981	20	59191
110004	Contractor Support	443520	0	443520	2.03	9003	20	543028
SUBTOTAL 11	Def Design - Onsite O/C	725794	0	725794	2.03	14732	20	888632
120001	Procurement Spec/Order	19999	0	19999	3.80	760	20	24910
120002	Field Systems Install Support	53325	0	53325	3.80	2026	20	66422
120003	ATP & Reporting Support	22515	0	22515	3.80	856	20	28045
120004	Engineering Documentation	42660	0	42660	3.80	1621	20	53137
120005	Data Conversion	16590	0	16590	3.80	630	20	20665
120006	Operator/Sys Maintenance Training	12798	0	12798	3.80	486	20	15941
SUBTOTAL 12	Engrng/Insp - Onsite O/C	167887	0	167887	3.80	6379	20	209120
SUBTOTAL 1	Engineering	893681	0	893681	2.36	21111	20	1097752
220001	NMSS Equipment & Software	119065	0	119065	2.32	2762	10	134010
SUBTOTAL 22	Procurement-O/C	119065	0	119065	2.32	2762	10	134010
330001	NMSS Equipment	32846	0	32846	6.51	2138	25	43730
SUBTOTAL 33	Installation-O/C	32846	0	32846	6.51	2138	25	43730
400000	Project Management-O/C	146940	0	146940	3.50	5143	20	182499
5	Other Project Costs (OPC)	98000	0	98000	0.00	0	0	98000

PROJECT TOTAL 1,290,532 0 1,290,532 2.41 31,154 1,321,686 18 234,304 1,555,991

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfdds & Scty Sys Repl (NMSS)  
Conceptual Study Estimate  
DOE\_R03 - ESTIMATE BASIS SHEET

KAISER ENGINEERS HANFORD  
Westinghouse Hanford Company  
JOB NO. 2357 E36309  
FILE NO. NMSS

1. DOCUMENTS AND DRAWINGS  
=====
- DOCUMENTS: #WHC-SD-CP-DRD-002 Draft copy, unchecked Conceptual Baseline Document for Nuclear Material Safeguards System Replacement. Unsigned and not dated.
- DRAWINGS: NONE
2. MATERIAL PRICES  
=====
- UNIT COSTS REPRESENT CURRENT PRICES FOR SPECIFIED MATERIAL. VENDOR INFORMATION WAS OBTAINED FOR THE FOLLOWING ITEMS: Hardware & software costs were received from WHC.
3. LABOR RATES  
=====
- A.) WHC HOURLY RATES ARE BASED UPON THE FY 1995 PLANNING RATES \* (REPORT BGHB2001).
4. GENERAL REQUIREMENTS/TECHNICAL SERVICES/OVERHEADS  
=====
- (WHC FUNDED EXPENSE)
- A.) ONSITE PLANT FORCES GENERAL REQUIREMENTS, TECHNICAL SERVICES AND CRAFT OVERHEAD COSTS ARE INCLUDED AS A COMPOSITE PERCENTAGE APPLIED TO THE BASE LABOR RATE AND INCLUDED IN THE LABOR RATE/HOUR.
5. ESCALATION  
=====
- ESCALATION PERCENTAGES WERE CALCULATED FROM THE AUGUST 1994 UPDATE OF THE ECONOMIC ESCALATION PRICE CHANGE INDICES FOR DOE CONSTRUCTION PROJECTS AS PUBLISHED BY THE "OFFICE OF INFRASTRUCTURE ACQUISITION" FM-50.
6. ROUNDING  
=====
- U.S. DEPARTMENT OF ENERGY - DOE ORDER 5100.4 PAGE 1-32 SUBPARAGRAPH (N), REQUIRES ROUNDING OF ALL GENERAL PLANT PROJECTS (GPP'S) AND LINE ITEM (LI) COST ESTIMATES. REFERENCE: DOE 5100.4, FIGURE I-11, DATED 10-31-84.
7. REMARKS  
=====
- A) O/C labor markups for department overheads & G&A are included with the base labor rate used. G&A % added for this expense project is 17%.
- B) Cost of procured items (WBS 2) were provided by O/C.
- C) O/C supplied manhours for Engineering (WBS 1).
- D) Assume all hardware will be setup temporary, connected, and checked out before removal of old system and permanent installation of new system.
- E) Assume only minor modifications to cable & wiring systems will be needed (minor modifications at CAS, POC, AMOSS). No changes will be made to cabling going to sensors.
- F) Escalation % rates used are per attached schedule.
- G) OPC (Other Project Costs) are included as a cost to date of \$98,000.
- H) Assume "clean" work areas and job conditions.

KAISER ENGINEERS HANFORD  
Westinghouse Hanford Company  
JOB NO. 2357 E36309  
FILE NO. NMSS

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate-Nuclear Mat Safeguards Sys Repl  
DOE\_R04 - COST CODE ACCOUNT SUMMARY

PAGE 4 OF 7  
DATE 08/24/95 08:44:16  
BY JJM

COST CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	SUB TOTAL	CONTINGENCY		TOTAL DOLLARS
							%	TOTAL	
000	System Design/Development								
110001	System Design Description	54474	0	54474	2.03	1105	20	11116	66696
110002	System Design & Development	179455	0	179455	2.03	3643	20	36619	219717
110003	ECNs, Drawings, PFWR, NEPA	48345	0	48345	2.03	981	20	9865	59191
110004	Contractor Support	443520	0	443520	2.03	9003	20	90505	543028
120001	Procurement Spec/Order	19999	0	19999	3.80	760	20	4152	24910
120002	Field Systems Install Support	53325	0	53325	3.80	2026	20	11070	66422
120003	ATP & Reporting Support	22515	0	22515	3.80	856	20	4674	28045
120004	Engineering Documentation	42660	0	42660	3.80	1621	20	8856	53137
120005	Data Conversion	16590	0	16590	3.80	630	20	3444	20665
120006	Operator/Sys Maintenance Training	12798	0	12798	3.80	486	20	2657	15941
TOTAL 000	System Design/Development	893681	0	893681	2.36	21111	20	182958	1097752
600	Utilities								
220001	NMSS Equipment & Software	119065	0	119065	2.32	2762	10	12183	134010
330001	NMSS Equipment	32846	0	32846	6.51	2138	25	8746	43730
400000	Project Management-O/C	146940	0	146940	3.50	5143	20	30417	182499
TOTAL 600	Utilities	298851	0	298851	3.36	10043	17	51346	360239
900	Other Project Costs (OPC)								
5	Other Project Costs (OPC)	98000	0	98000	0.00	0	0	0	98000
TOTAL 900	Other Project Costs (OPC)	98000	0	98000	0.00	0	0	0	98000
PROJECT TOTAL		1,290,532	0	1,290,532	2.41	31,154	18	234,304	1,555,991

CSI	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
=====										
ENGINEERING										
00	Technical Services	443520	0	443520	2.03	9003	452523	20	90505	543028
15	Mechanical	5159	0	5159	2.04	105	5264	20	1053	6316
38	Computer Engineer	413921	0	413921	2.71	11207	425128	20	85025	510156
5F	Design Engineer	14746	0	14746	2.03	299	15045	20	3009	18054
67	Tech Editor	7001	0	7001	2.03	142	7143	20	1428	8572
68	Estimator/Planner	9334	0	9334	3.80	355	9689	20	1938	11626
TOTAL ENGINEERING		893,681	0	893,681	2.36	21,111	914,792	20	182,958	1,097,752
CONSTRUCTION										
00	Technical Services	98000	0	98000	0.00	0	98000	0	0	98000
16	Electrical	151911	0	151911	3.23	4900	156811	13	20929	177740
19	Project Management	146940	0	146940	3.50	5143	152083	20	30417	182499
TOTAL CONSTRUCTION		396,851	0	396,851	2.53	10,043	406,894	13	51,346	458,239
PROJECT TOTAL										
		1,290,532	0	1,290,532	2.41	31,154	1,321,686	18	234,304	1,555,991
=====										

REFERENCE:
ESTIMATE BASIS SHEET
COST CODE ACCOUNT SUMMARY

PAGE 3 OF 7  
PAGE 4 OF 7

THE U.S. DEPARTMENT OF ENERGY - RICHLAND ORDER 3700.3 "COST ESTIMATING, ANALYSIS AND STANDARDIZATION" DATED 3-27-85, PROVIDES GUIDELINES FOR ESTIMATE CONTINGENCIES. THE GUIDELINE FOR A CONCEPTUAL ESTIMATE SHOULD HAVE AN OVERALL RANGE OF 15 TO 25 %.

CONTINGENCY IS EVALUATED AT THE THIRD COST CODE LEVEL AND SUMMARIZED AT THE PRIMARY AND SECONDARY COST CODE LEVEL OF THE DETAILED COST ESTIMATE.

# ENGINEERING

Contingency was applied at 20% due to problems which might be encountered during software design and modification.

AVERAGE ENGINEERING CONTINGENCY
20 %

# CONSTRUCTION

Procurement contingency was allowed at 10% due to confidence in hardware equipment costs needed for this project and projected software costs.

Construction contingency was allowed at 20% due to difficulties which might be encountered in setting up parallel system with the existing and possible problems in making the changeovers.

O/C Project Management contingency was allowed at 20%.

AVERAGE CONSTRUCTION CONTINGENCY
17 %

AVERAGE PROJECT CONTINGENCY
18 %

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate-Nuclear Mat Safeguards Sys Repl  
DOE\_R07 - ONSITE INDIRECT COSTS BY WBS


KAISER ENGINEERS HANFORD  
Westinghouse Hanford Company  
JOB NO. 2357 E36309  
FILE NO. NMSS

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONTRACT ADMINISTRATION		BID PACK PREP.	OTHER		TOTAL	
			=====	=====		=====	=====	=====	=====
			=====	=====	=====	=====	=====	=====	=====
110001	System Design Description	54474	0.00	0	0	0	0	0	0
110002	System Design & Development	179455	0.00	0	0	0	0	0	0
110003	ECNs, Drawings, PFR, NEPA	48345	0.00	0	0	0	0	0	0
110004	Contractor Support	443520	0.00	0	0	0	0	0	0
120001	Procurement Spec/Order	19999	0.00	0	0	0	0	0	0
120002	Field Systems Install Support	53325	0.00	0	0	0	0	0	0
120003	ATP & Reporting Support	22515	0.00	0	0	0	0	0	0
120004	Engineering Documentation	42660	0.00	0	0	0	0	0	0
120005	Data Conversion	16590	0.00	0	0	0	0	0	0
120006	Operator/Sys Maintenance Training	12798	0.00	0	0	0	0	0	0
220001	NMSS Equipment & Software	119065	0.00	0	0	0	0	0	0
330001	NMSS Equipment	32846	0.00	0	0	0	0	0	0
400000	Project Management-O/C	146940	0.00	0	0	0	0	0	0
5	Other Project Costs (OPC)	98000	0.00	0	0	0	0	0	0

===== 1,290,532 0 0 0 0 0 0 0 0 0  
PROJECT TOTAL



APPENDIX B SCHEDULE

1995				1996				1997						
A	J	O	J	A	J	O	J	A	J	O				
<b>0.0 MILESTONES</b> START NMSS SYSTEM REQUIREMENTS DEFINITION NMSS REQUIREMENT DOCUMENT COMPLETE NEPA DOCUMENTATION COMPLETE PEMR COMPLETE NMSS BASELINE DOCUMENTATION COMPLETE NMSS RECEIVE HW/SW NMSS DESIGN DOCUMENTATION COMPLETE OPERATOR/SYSTEM MAINTENANCE TRAINING COMPLETE NMSS ATP ACCEPTANCE COMPLETE PFP NUCLEAR MATERIAL SAFEGUARDS SYSTEM COMPLETE														
<b>1.0 ENGINEERING</b> 1.0 DEFINITIVE DESIGN - ONSITE O/C 1.2 ENGINEERING/INSPECTION - ONSITE O/C														
<b>2.0 PROCUREMENT O/C</b> 2.0 PROCUREMENT - O/C--NMSS EQUIPMENT & SOFTWARE														
<b>3.0 CONSTRUCTION</b> 3.3 CONSTRUCTION - O/C - NMSS EQUIPMENT 3.4 PROJECT MANAGEMENT - O/C														
Plot Date 25AUG95 Data Date 25FEB95 Project Start 1JAN95 Project Finish 30NOV97 *						Summary Bar/Early Dates Critical Designation Progress Bar Milestone/Flag Activity			Sheet 1 of 1 <b>PFP NUCLEAR MATERIAL SAFEGUARDS SYS</b> <b>CONCEPTUAL PROJ SCHED/REV. 0</b>			WESTINGHOUSE HANFORD COMPANY Date _____ Revision _____ Checked _____ Approved _____ <b>APPROVED ORIGINAL ON FILE</b>		
(c) Primavera Systems, Inc.														

APPENDIX C PLANT FORCES WORK REVIEW

The Plant Forces Work Review (PFWR) Committee has reviewed this work scope and determined it does not require a PFWR submission (per Gary Maxwell message, subject: "PFWRs", 8/10/95).

APPENDIX D SKETCHES AND DRAWINGS

Figure D-1. 2736Z and ZB Network Plan.

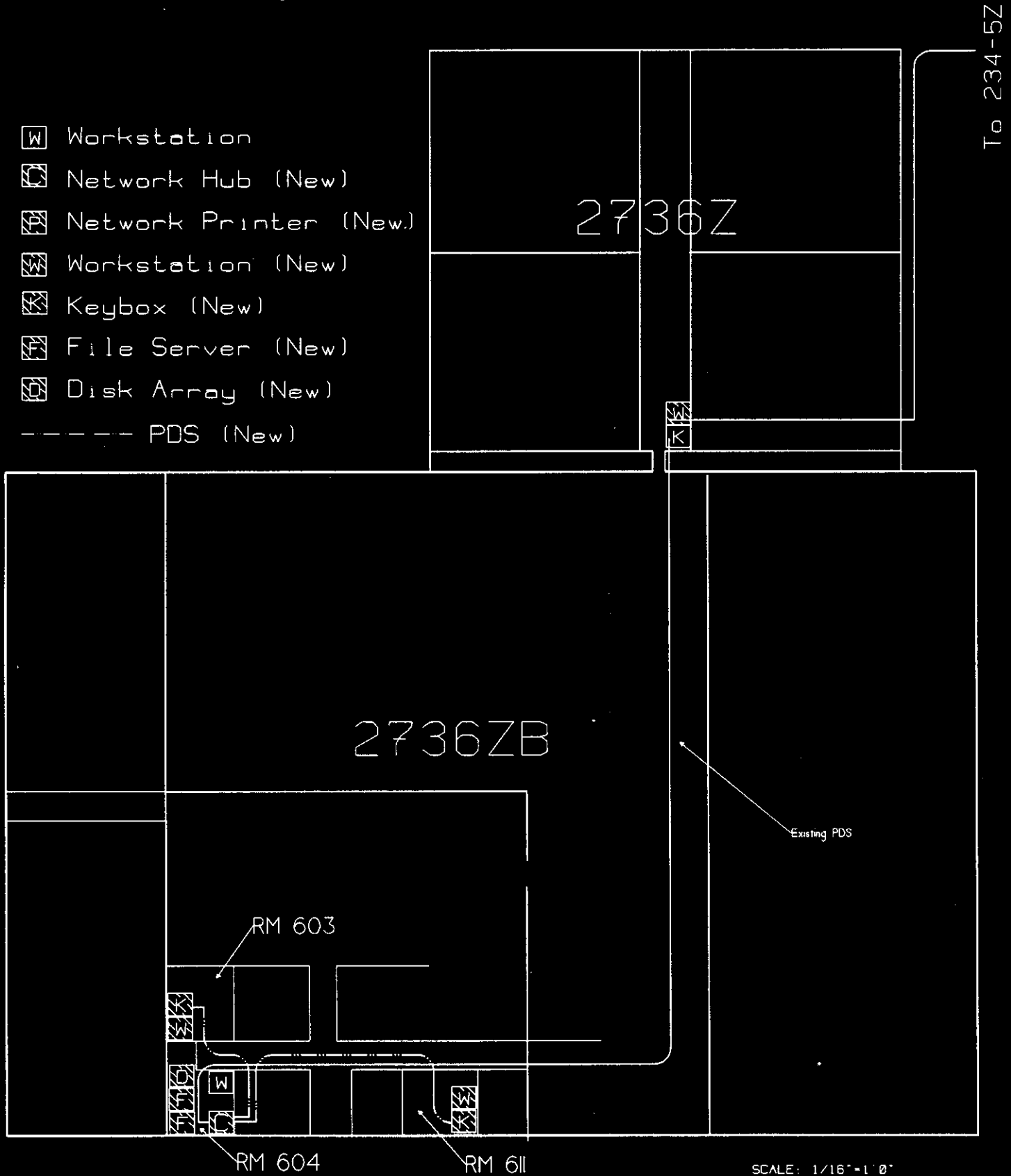
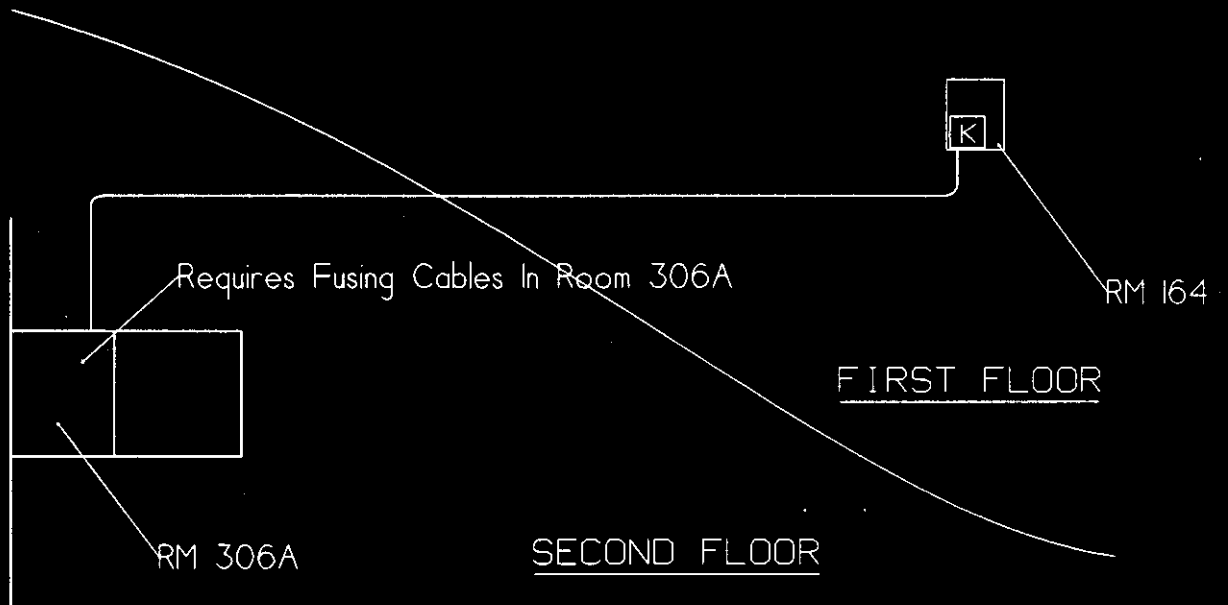


Figure D-2. 234-5Z Partial Network Plan.

☒ Workstation (New)

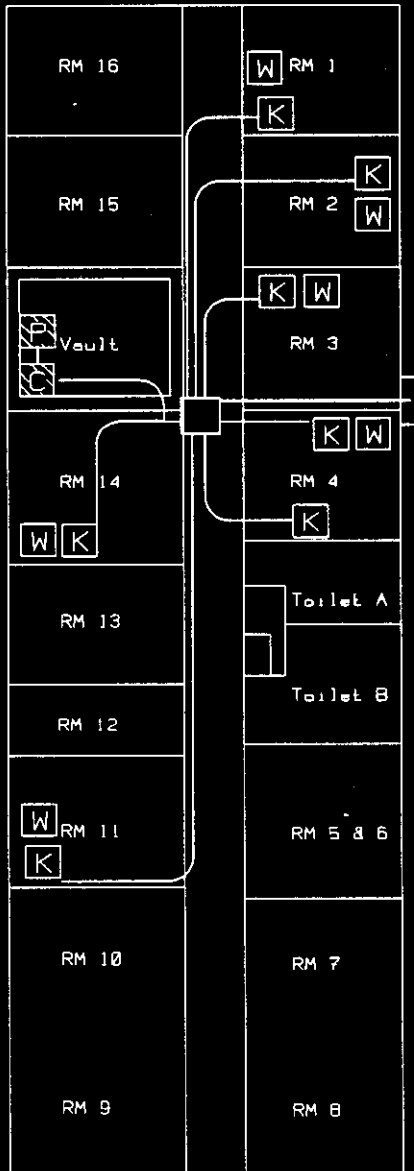
☐ Keybox









SCALE: 1/32" = 1'0"

NOTE: EXISTING PDS BETWEEN 306A AND 164  
IS LOCATED ON THE DUCT LEVEL.  
CABLES ARE COILED IN 306A AND 164.

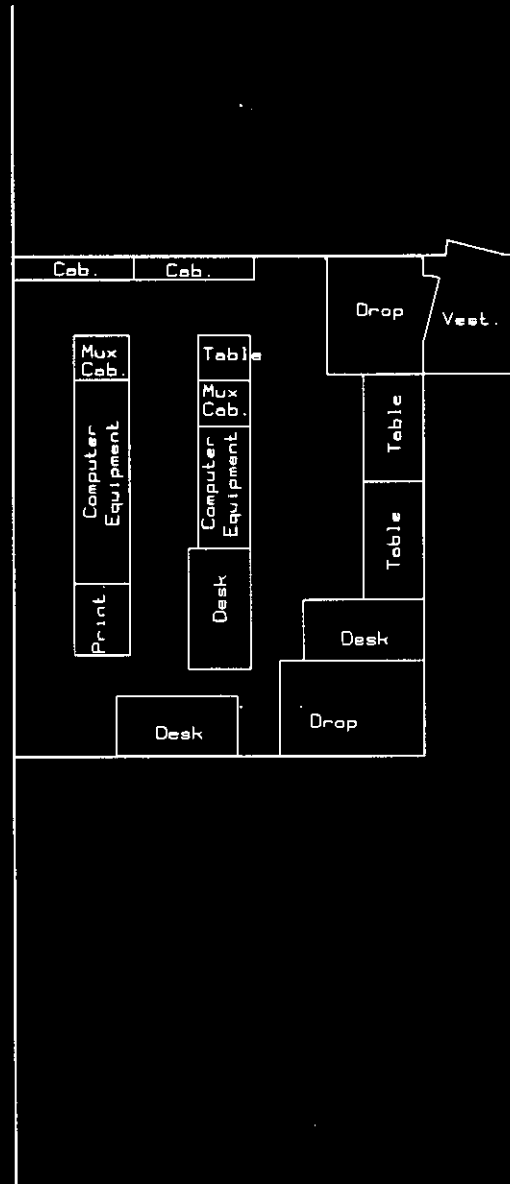
Figure D-3. 2704Z Network Plan.



-  Network Hub (New)
-  Network Printer (New)
-  Workstation (New)
-  Keybox (New)
-  Workstation (Existing)
-  Keybox (Existing)

SCALE: 1/16"=1'-0"

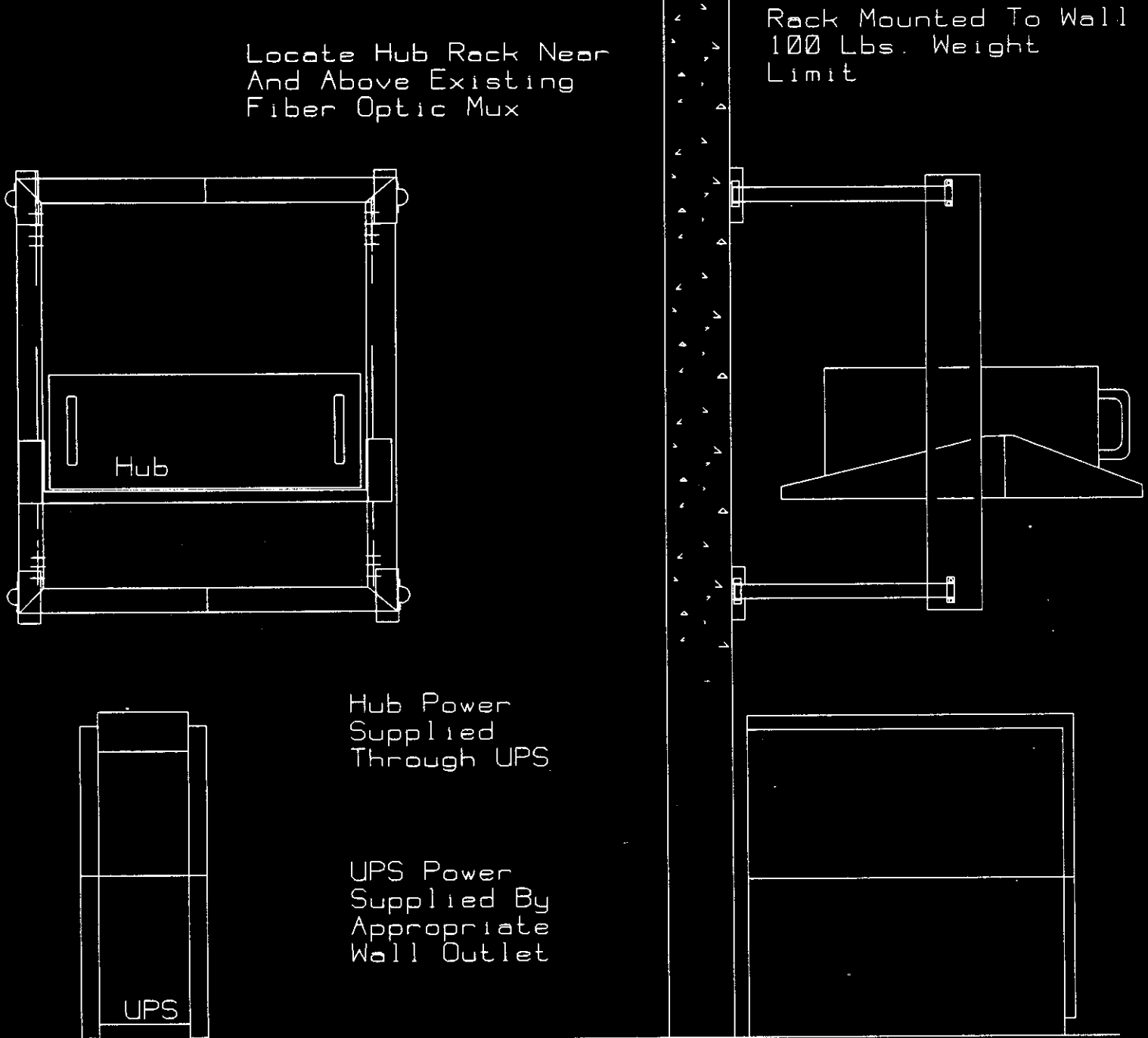
Figure D-4. Nuclear Material Safeguards System  
Equipment in Room 306A/234-5Z.



SCALE: 1/8" = 1' 0"



Figure D-5. Nuclear Material Safeguards System  
Network Hub Equipment Racks.



Wall Mounted Equipment Rack For Network Hub  
UPS To Be Located On Floor

Scale: 1/8" = 1"

APPENDIX E ASSUMPTIONS

The NMSS Replacement Baseline Document was developed under the following assumptions:

- The fiber optic cable used for RS-232 communication will be reused for the network. This assumption is based on cable testing which showed that the cable has acceptable performance for the network equipment.
- LANL will deliver the LANMAS software by 11/01/1995.
- Physical locations will remain valid through CY 2002. These locations were validated based on planned 94-1 activities.
- Building emergency power will be used for the file server located in 604/2736ZB.
- Redundancy will be provided through resources shared with the Vault Safety and Inventory System.