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Title/Desc:

CONCEPTUAL BASELINE DOCUMENT FOR THE NUCLEAR  
MATERIALS SAFEGUARDS SYSTEM

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68 ENGINEERING DATA TRANSMITTAL

Page 1 of

1. EDIT

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## RELEASE AUTHORIZATION

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

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**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

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## 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.

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Conceptual Baseline Document  
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## 6. Author

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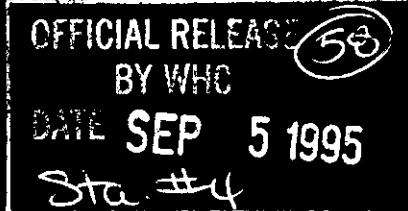
  
Signature

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

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## 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.

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<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

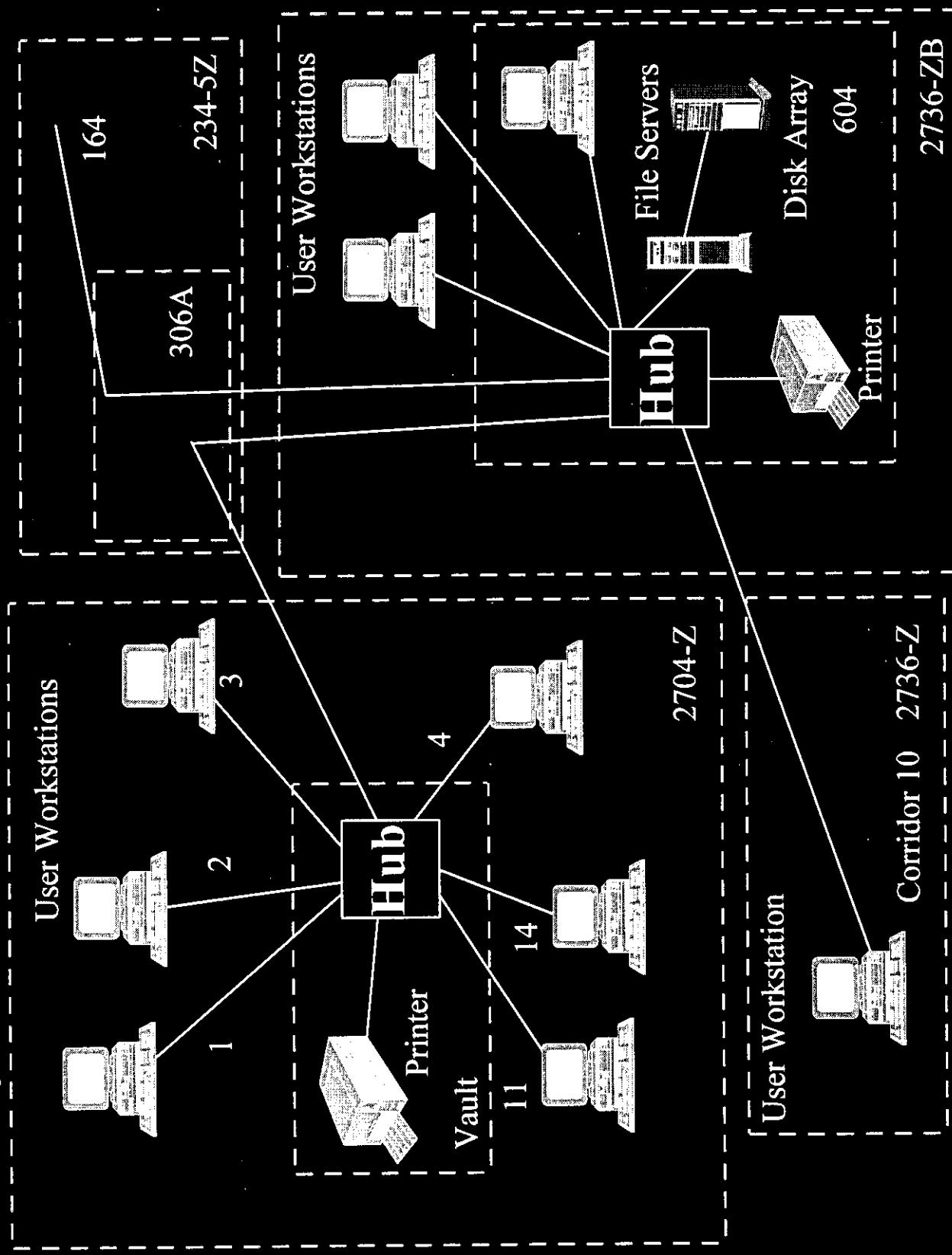
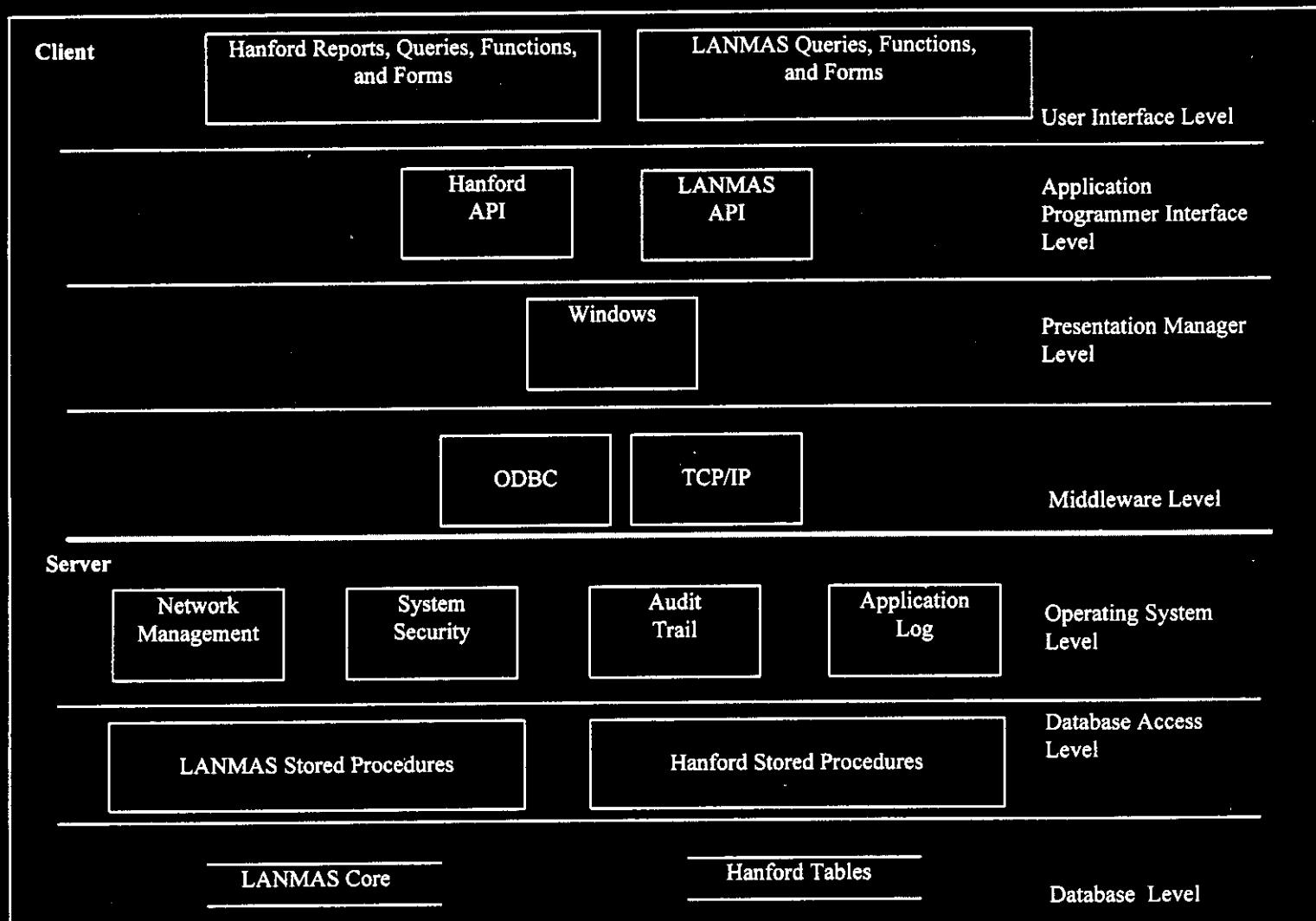


Figure 2. Nuclear Material Safeguards System Replacement Network.



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 uninterrupted 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

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<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  
FILE NO. 2357BAA1

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate - Nuclear Mat Safeguards Sys Repl  
DOE\_R01 - PROJECT COST SUMMARY

PAGE 1 OF 7  
DATE 08/11/95 09:45:26  
BY JJM

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY		TOTAL DOLLARS
			%	TOTAL	
000	System Design/Development	904,000	20	181,000	1,085,000
600	Utilities	304,000	17	50,000	354,000
	(ADJUSTED TO MEET DOE 5100.4)	0		1,000	1,000
	Total Estimated Cost (TEC)	1,208,000		232,000	1,440,000
900	Other Project Costs (OPC) (ADJUSTED TO MEET DOE 5100.4)	98,000 2,000	0 0	0 0	98,000 2,000
	Total Other Project Costs (OPC)	100,000	0	0	100,000
	Total Project Cost (TPC)	1,308,000	18	232,000	1,540,000

REMARKS:

08/11/95

Conceptual Estimate

ARCHITECT  
ENGINEER

OPERATING  
CONTRACTOR

*John J. Murphy for TE Huber*  
*and Associates*  
*John J. Murphy*

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

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

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate-Nuclear Mat Safeguards Sys Repl  
DOE\_R02 - WORK BREAKDOWN STRUCTURE SUMMARY

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	TOTAL TOTAL	SUB TOTAL	CONTINGENCY %	TOTAL TOTAL	TOTAL DOLLARS
110001	System Design Description	54474	0	54474	2.03	1105	55579	20	11116	66696
110002	System Design & Development	179455	0	179455	2.03	3643	183098	20	36619	219717
110003	ECNs, Drawings, PFYR, NEPA	48345	0	48345	2.03	981	49326	20	9865	59191
110004	Contractor Support	443520	0	443520	2.03	9003	452523	20	90505	543028
<b>SUBTOTAL 11</b>	<b>Def Design - Onsite 0/C</b>	<b>725794</b>	<b>0</b>	<b>725794</b>	<b>2.03</b>	<b>14732</b>	<b>740526</b>	<b>20</b>	<b>148105</b>	<b>888632</b>
120001	Procurement Spec/Order	19999	0	19999	3.80	760	20759	20	4152	24910
120002	Field Systems Install Support	53325	0	53325	3.80	2026	55351	20	11070	66422
120003	ATP & Reporting Support	22515	0	22515	3.80	856	23371	20	4674	28045
120004	Engineering Documentation	42660	0	42660	3.80	1621	44281	20	8856	53137
120005	Data Conversion	16590	0	16590	3.80	630	17220	20	3444	20665
120006	Operator/Sys Maintenance Training	12798	0	12798	3.80	486	13284	20	2657	15941
<b>SUBTOTAL 12</b>	<b>Engnrg/Insp - Onsite 0/C</b>	<b>167887</b>	<b>0</b>	<b>167887</b>	<b>3.80</b>	<b>6379</b>	<b>174266</b>	<b>20</b>	<b>34853</b>	<b>209120</b>
<b>SUBTOTAL 1</b>	<b>Engineering</b>	<b>893681</b>	<b>0</b>	<b>893681</b>	<b>2.36</b>	<b>21111</b>	<b>914792</b>	<b>20</b>	<b>182958</b>	<b>1097752</b>
220001	NMSS Equipment & Software	119065	0	119065	2.32	2762	121827	10	12183	134010
<b>SUBTOTAL 22</b>	<b>Procurement-0/C</b>	<b>119065</b>	<b>0</b>	<b>119065</b>	<b>2.32</b>	<b>2762</b>	<b>121827</b>	<b>10</b>	<b>12183</b>	<b>134010</b>
330001	NMSS Equipment	32846	0	32846	6.51	2138	34984	25	8746	43730
<b>SUBTOTAL 33</b>	<b>Installation-0/C</b>	<b>32846</b>	<b>0</b>	<b>32846</b>	<b>6.51</b>	<b>2138</b>	<b>34984</b>	<b>25</b>	<b>8746</b>	<b>43730</b>
400000	Project Management-0/C	146940	0	146940	3.50	5143	152083	20	30417	182499
5	Other Project Costs (OpC)	98000	0	98000	0.00	0	98000	0	0	98000
<b>PROJECT TOTAL</b>		<b>1,290,532</b>				<b>31,154</b>	<b>1,321,686</b>	<b>18</b>	<b>234,304</b>	<b>1,555,991</b>

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

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

PAGE 3 OF 7  
DATE 08/11/95 11:28:57  
BY JJM

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 1-11, 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. NWSS

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NWSS)  
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		ONSITE		SUB		CONTINGENCY		TOTAL	
		SUBTOTAL	SUBTOTAL	INDIRECTS	TOTAL	INDIRECTS	TOTAL	%	TOTAL	%	TOTAL
<b>000 System Design/Development</b>											
110001	System Design Description	54474	0	54474	2.03	1105	55579	20	11116	66696	
110002	System Design & Development	179455	0	179455	2.03	3643	183098	20	36619	219717	
110003	ECNs, Drawings, PFWR, NEPA	48345	0	48345	2.03	981	49326	20	9865	59191	
110004	Contractor Support	443520	0	443520	2.03	9003	452523	20	90505	543028	
120001	Procurement Spec/Order	19999	0	19999	3.80	760	20759	20	4152	24910	
120002	Field Systems Install Support	53325	0	53325	3.80	2026	55351	20	11070	66422	
120003	ATP & Reporting Support	22515	0	22515	3.80	856	23371	20	4674	28045	
120004	Engineering Documentation	42660	0	42660	3.80	1621	44281	20	8856	53137	
120005	Data Conversion	16590	0	16590	3.80	630	17220	20	3444	20665	
120006	Operator/Sys Maintenance Training	12798	0	12798	3.80	486	13284	20	2657	15941	
<b>TOTAL 000</b>	<b>System Design/Development</b>	<b>893681</b>	<b>0</b>	<b>893681</b>	<b>2.36</b>	<b>21111</b>	<b>914792</b>	<b>20</b>	<b>182958</b>	<b>1097752</b>	
<b>600 Utilities</b>											
220001	NWSS Equipment & Software	119065	0	119065	2.32	2762	121827	10	12183	134010	
330001	NWSS Equipment	32846	0	32846	6.51	2138	34984	25	8746	43730	
400000	Project Management-O/C	146940	0	146940	3.50	5143	152083	20	30417	182499	
<b>TOTAL 600</b>	<b>Utilities</b>	<b>298851</b>	<b>0</b>	<b>298851</b>	<b>3.36</b>	<b>10043</b>	<b>308894</b>	<b>17</b>	<b>51346</b>	<b>360239</b>	
<b>900 Other Project Costs (OPC)</b>											
5	Other Project Costs (OPC)	98000	0	98000	0.00	0	98000	0	0	98000	
<b>TOTAL 900</b>	<b>Other Project Costs (OPC)</b>	<b>98000</b>	<b>0</b>	<b>98000</b>	<b>0.00</b>	<b>0</b>	<b>98000</b>	<b>0</b>	<b>0</b>	<b>98000</b>	
<b>PROJECT TOTAL</b>											
		<b>1,290,532</b>	<b>0</b>	<b>1,290,532</b>	<b>2.41</b>	<b>31,154</b>	<b>1,321,686</b>	<b>18</b>	<b>234,304</b>	<b>1,555,991</b>	

KAISER ENGINEERS HANFORD  
Westinghouse Hanford Company  
JOB NO. Z357  
FILE NO. NMSS

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate-Nuclear Mat Safeguards Sys Repl  
DOE\_R05 - ESTIMATE SUMMARY BY CSI DIVISION

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DATE 08/24/95 08:44:22  
BY JJM

CSI	DESCRIPTION	ESTIMATE		ONSITE		SUB		CONTINGENCY		TOTAL	
		SUBTOTAL	SUBTOTAL	INDIRECTS	TOTAL	TOTAL	%	TOTAL	%	TOTAL	DOLLARS
<b>ENGINEERING</b>											
00	Technical Services	443520	0	443520	2.03	9003	452523	20	90505	543028	
15	Mechanical	5159	0	5159	2.04	105	5264	20	1053	63156	
3B	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	
<b>TOTAL ENGINEERING</b>		893,681	0	893,681	2.36	21,111	914,792	20	182,958	1,097,752	
<b>CONSTRUCTION</b>											
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	
<b>TOTAL CONSTRUCTION</b>		396,851	0	396,851	2.53	10,043	406,894	13	51,346	458,239	
<b>PROJECT TOTAL</b>											
		1,290,532	0	1,290,532	2.41	31,154	1,321,686	18	234,304	1,555,991	

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

\*\* IEST - INTERACTIVE ESTIMATING \*\*  
PFP Sfgds & Scty Sys Repl (NMSS)  
Conceptual Estimate  
DOE\_R06 - CONTINGENCY ANALYSIS BASIS SHEET

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DATE 08/10/95 11:29:23  
BY JWM

REFERENCE: ESTIMATE BASIS SHEET PAGE 3 OF 7  
COST CODE ACCOUNT SUMMARY 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 %

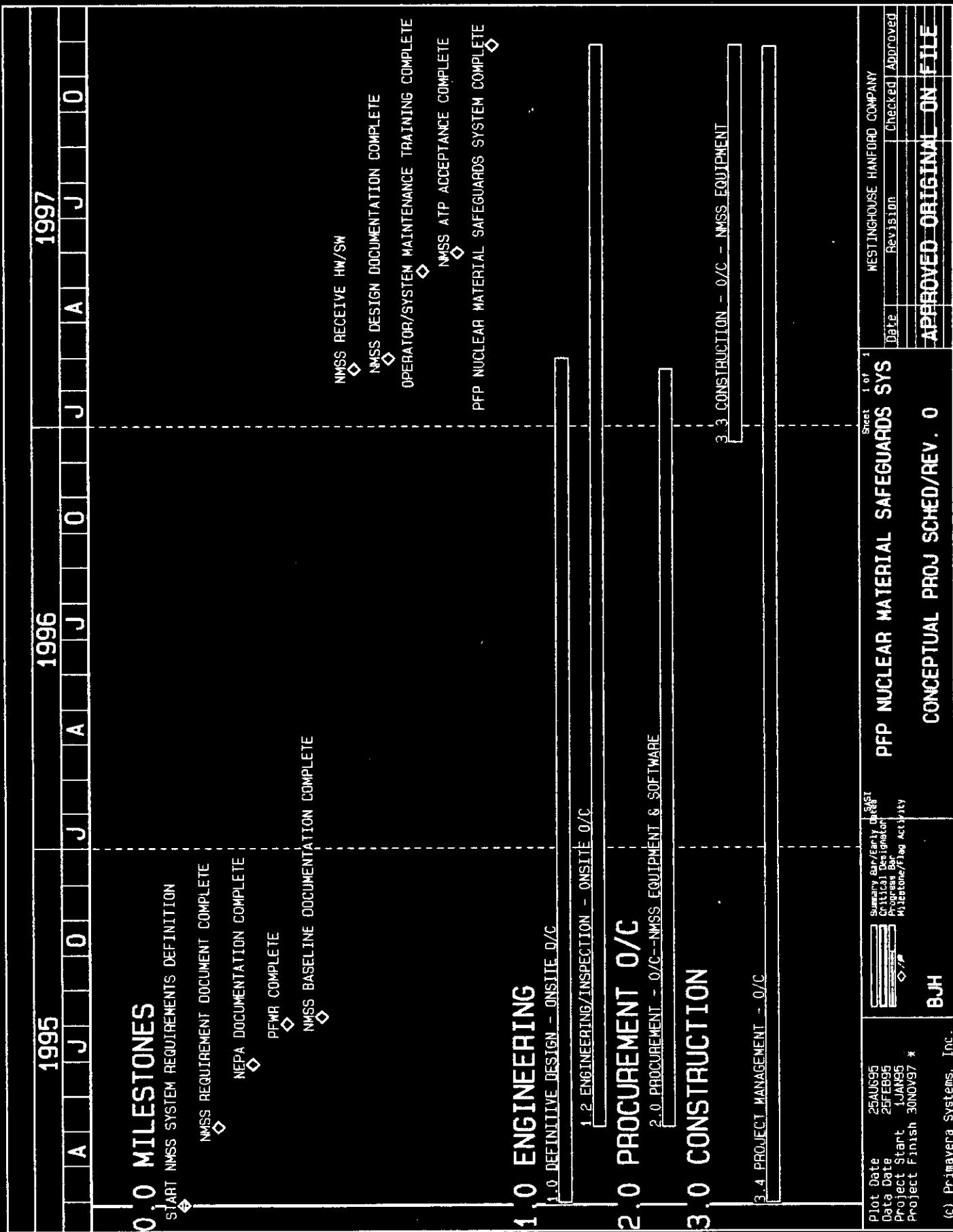
KAI SER ENGINEERS HANFORD  
Westinghouse Hanford Company  
JOB NO. 2357 E36309  
FILE NO. NMSS

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

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONTRACT % =====	ADMINISTRATION TOTAL =====	BID PACK PREP. =====	OTHER INDIRECTS =====	TOTAL INDIRECTS =====
110001	System Design Description	54474	0.00	0	0	0	0
110002	System Design & Development	179455	0.00	0	0	0	0
110003	ECNs, Drawings, PFWR, NEPA	48345	0.00	0	0	0	0
110004	Contractor Support	443520	0.00	0	0	0	0
120001	Procurement Spec/Order	19999	0.00	0	0	0	0
120002	Field Systems Install Support	53325	0.00	0	0	0	0
120003	ATP & Reporting Support	22515	0.00	0	0	0	0
120004	Engineering Documentation	42660	0.00	0	0	0	0
120005	Data Conversion	16590	0.00	0	0	0	0
120006	Operator/Sys Maintenance Training	12798	0.00	0	0	0	0
220001	NMSS Equipment & Software	119065	0.00	0	0	0	0
330001	NMSS Equipment	32846	0.00	0	0	0	0
400000	Project Management-O/C	146940	0.00	0	0	0	0
5	Other Project Costs (OPC)	98000	0	0	0	0	0
PROJECT TOTAL		1,290,532		0	0	0	0

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

APPENDIX B SCHEDULE



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.

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

APPENDIX D SKETCHES AND DRAWINGS

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

To 234-5Z

- [W] Workstation
- [H] Network Hub (New)
- [P] Network Printer (New)
- [W] Workstation (New)
- [K] Keybox (New)
- [F] File Server (New)
- [D] Disk Array (New)
- PDS (New)

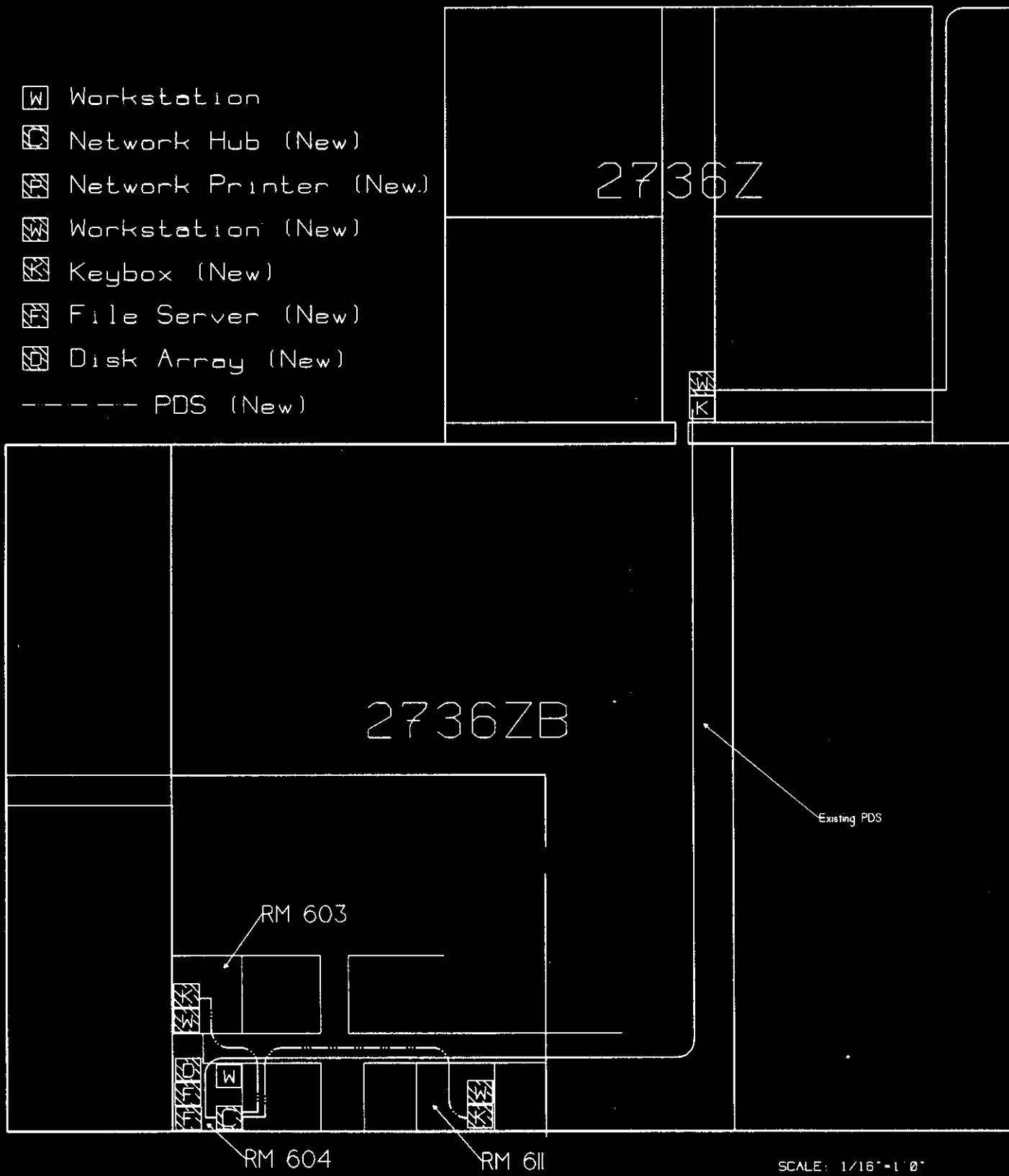
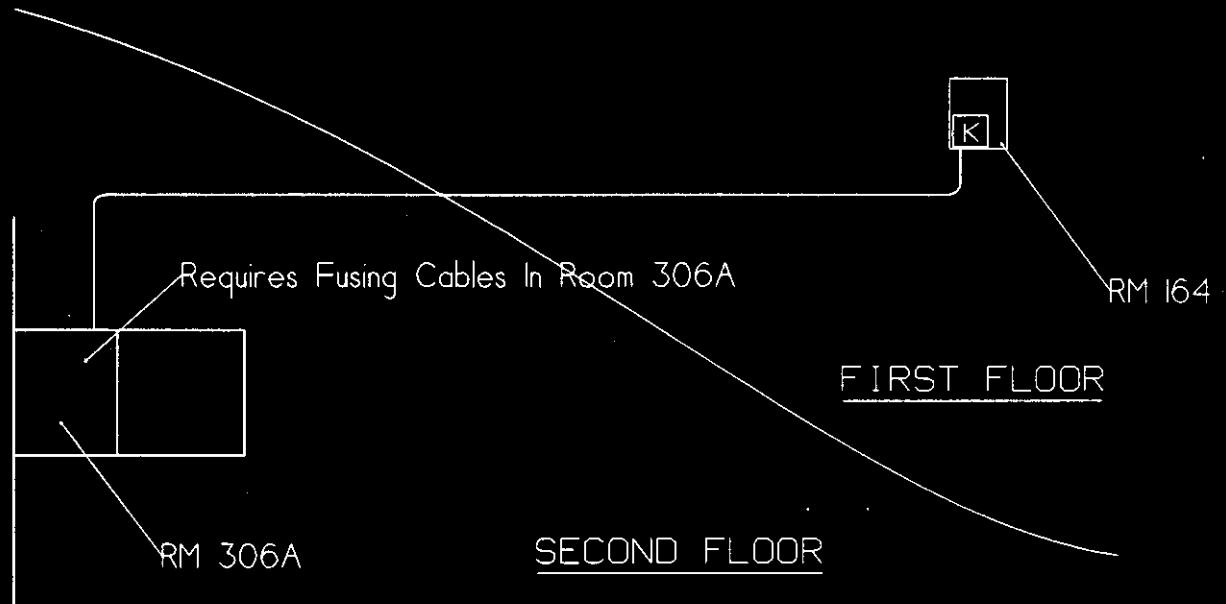


Figure D-2. 234-5Z Partial Network Plan.

 Workstation (New)

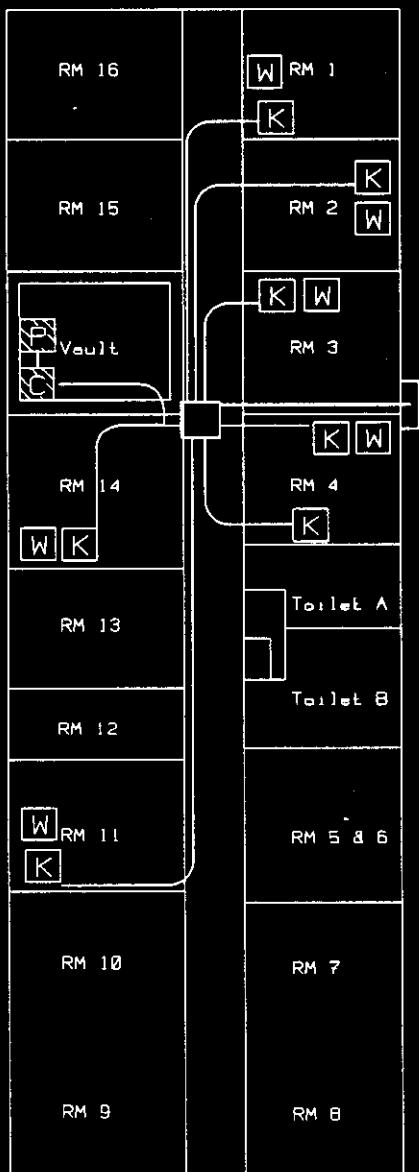
 Keybox



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.

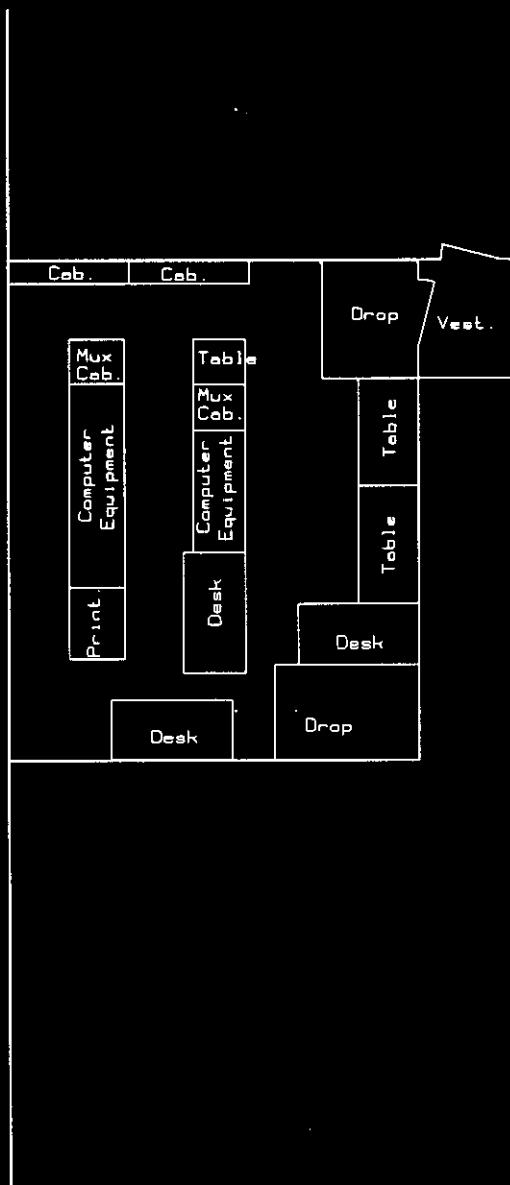
Figure D-3. 2704Z Network Plan.



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

SCALE: 1/16" = 1' 0"

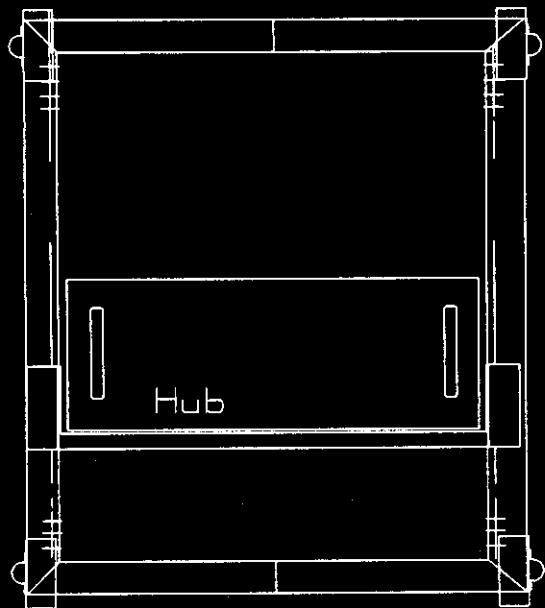
Figure D-4. Nuclear Material Safeguards System  
Equipment in Room 306A/234-5Z.



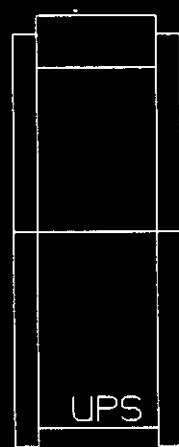
SCALE: 1/8" = 1' 0"

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

Locate Hub Rack Near  
And Above Existing  
Fiber Optic Mux

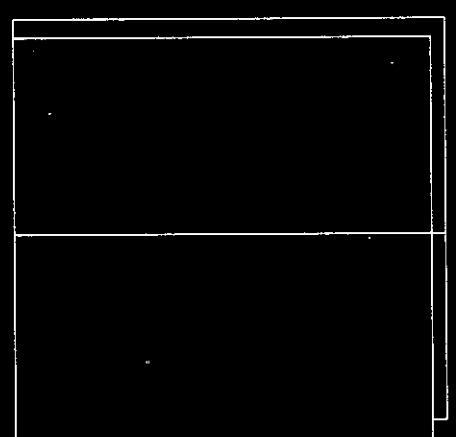
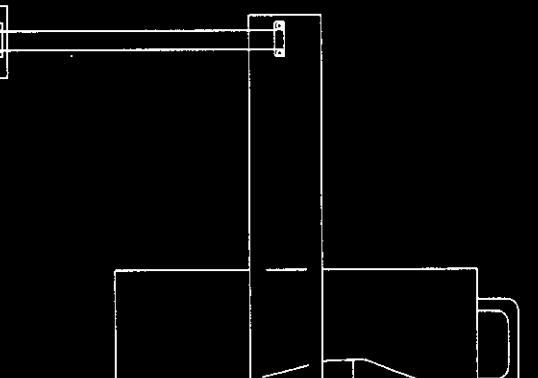


Rack Mounted To Wall  
100 Lbs. Weight  
Limit



Hub Power  
Supplied  
Through UPS

UPS Power  
Supplied By  
Appropriate  
Wall Outlet



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.