

PLUTONIUM DISPOSITION PROJECT (U)
Project M09A

SCOPE OF WORK
E-SOW-K-00018 Revision 0

For

Public Address and Telecommunications Systems (U)

Originated by: *Ron O. Disher* Date: 4/3/07
Ron Disher
Senior Electrical Designer

Reviewed by: *S. S. Shah* Date: 4/3/07
Suman Shah
Principal Electrical Engineer

Approved by: *Roderick King* Date: 4/3/07
Roderick King
Electrical/I&C Lead

Approved by: *Clayton Holloway* Date: 4/3/07
Clayton Holloway
Mechanical Lead

Approved by: *Ghada Elchouti* For _____ Date: 04.03.07
Ghada Elchouti
C/S/A Lead

Approved by: *James Plimley for D.N.* Date: 4.3.07
Drew Negus
Plant Design Lead

Approved by: *B.C. Patel* Date: 4/4/07
B.C. Patel
Project Engineer

Approved by: *John Hammond (for JH)* Date: 4/3/07
John Hammond
Construction Lead

Approved by: *David Eisele* Date: 4 APR 07
David Eisele
Design Authority

UNCLASSIFIED
DOES NOT CONTAIN UNCLASSIFIED
CONTROLLED NUCLEAR INFORMATION
DC/RO: *Tyler Drenth* 4-3-07

Revision	Revision Date	Affected Section	Description of Change
0	4-4-07	N/A	Initial Revision



Table of Contents

1	SCOPE.....	4
1.1	General Description.....	4
1.2	Background.....	4
2	ACRONYMS/ABBREVIATIONS.....	4
3	DESCRIPTION OF PHYSICAL WORK.....	5
3.1	Performance Category and Functional Classification (PS, GS).....	5
3.2	Electrical.....	6
4	ASSUMPTIONS.....	7
4.1	General Assumptions.....	7
4.2	Specific Assumptions.....	7
5	REFERENCES.....	7
5.1	Drawing List.....	7
5.2	Design Input Documents.....	8
5.3	Applicable SRS & Industry Codes, Guides and Standards.....	8
5.4	Related Scopes of Work (SOW).....	8
6	ATTACHMENTS.....	8
6.1	Attachment 1, Bulk Material List.....	8
	Attachment 1, Bulk Material List.....	9

1 SCOPE

1.1 General Description

This Scope of Work (SOW) Covers the Public Address and Telecommunication Systems for the Plutonium Disposition Project. The Public Address System with speakers in all areas of the building is vital to carry important site announcements and emergency notifications. The Telecommunications Systems are comprised of the In Plant Intercom Phone System and the Public Phone System. The In Plant Intercom Phone System is a closed loop phone network that is used to communicate between control and process areas of the building with the security related benefit that there is no outside access to the network. The Public Phone System is the Verizon based network that provides outside network access to the building.

1.2 Background

The Office of Environmental Management has approximately 13 metric tons (MT) of plutonium in approximately 21 MT bulk materials without any defined disposition path. The Plutonium Disposition (PUD) Project is critical to meet the Department of Energy's strategic goal of providing a responsible resolution to the permanent disposal of the nation's excess high-level radioactive materials and waste; and to enable the cleanup of Environmental Management sites.

The Plutonium Disposition Facility (PDF) will be located at the K-Area Complex (KAC) to disposition up to approximately 13 Metric Tons (MT) of Environmental Management (EM) owned surplus plutonium. The facility will utilize a vitrification process to vitrify plutonium into a lanthanide borosilicate (LaBS) glass matrix. This glass will be packaged into Bagless transfer cans and placed inside a Defense Waste Processing Facility (DWPF) type canister. The canister will be transported to DWPF and filled with High Level Waste (HLW) glass. The DWPF canisters will be stored in the Glass Waste Storage Buildings and later transported to the geologic repository at Yucca Mountain.

This Scope of Work (SOW) has been developed for the purpose of facilitating construction cost and schedule estimates for the Conceptual Design Report (CDR) on the PUD project. The input to this SOW was the approved technical baseline consisting of a Facility Design Description (FDD) and associated System Design Descriptions (SDD). Every intent has been made to assure alignment and consistency between this SOW and the appropriate sections of the technical baseline, in order to provide accurate estimates. This SOW is not a PUD technical baseline document. A more detailed description of the system can be found in the associated SDD listed in the reference section.

A **HOLD** is placed to identify information that is preliminary in nature, results from a design uncertainty, originates from insufficient documentation, needs verification, or identifies a discrepancy. A **TBD** is placed to identify places in the text where numeric values or descriptive information is not available at the time that the current revision of the SOW is released.

2 ACRONYMS/ABBREVIATIONS

AC	Alternating Current
AWG	American Wire Gauge
BB	Building Block
DCS	Distributed Control System
DS	Design Services
DWPF	Defense Waste Processing Facility
ECF	Entry Control Facility
EMT	Electrical Metallic Conduit

E3S	Electronic Safeguards and Security System
GS	General Services
IEEE	Institute of Electrical and Electronic Engineers
IMC	Intermediate Metallic Conduit
KAC	K-Area Complex
LaBS	Lanthanide Borosilicate
LLW	Low Level Waste
NFPA	National Fire Protection Association
PC	Performance Category
PC&S	Process and Control Services Department
PS	Production Support
PU	Plutonium
PUD	Plutonium Disposition
PuVit	Plutonium Vitrification
SDD	System Design Description
SOW	Scope of Work
SRID	Safeguards and Security Requirements Identification Document
SRS	Savannah River Site
S&S	Safeguards & Security
SSC	Structure, System, Component
TBD	To Be Determined
UCNI	Unclassified Controlled Nuclear Information
UNO	Unless Noted Otherwise

3 DESCRIPTION OF PHYSICAL WORK

3.1 Performance Category and Functional Classification (PS, GS)

3.1.1 Performance Category

The performance category for the Public Address System and Telecommunications system is PC-1 as defined in G-FDD-K-00001, Rev. C, Table 1-2.

3.1.2 Functional Classification

3.1.2.1 The systems in this SOW shall be designed in accordance with the requirements of WSRC Manual WSRC-E7, Conduct of Engineering and Technical Support Procedure 2.25 Rev 14, "Functional Classification", as follows:

- A. Public Address System
 - 1. Functional Classification – Production Support (PS)
- B. In Plant Intercom Phone System
 - 1. Functional Classification – Production Support (PS)
- C. Public Phone System and SRS Network

1. Functional Classification – General Services (GS)

3.2 Electrical

3.2.1 The following will be the major electrical components:

3.2.1.1 Public Address System:

The PA system consists of four amplifier racks on the -20 and -40 levels which receive input signals from microphones to be located in the 105-K main control room at +15 level, the waste handling control room at the -20 level, and the Feed Prep/Oxidation, Milling and Mixing/Vitrification, and Bagless/NDA process control rooms at the -40 level. The PA amplifiers are to be wired to output 350W/2ch at 70.7V which are to power 8 ohm, adjustable wattage loudspeakers. For available location of PA system see drawings SK-DE-COMS-001 thru SK-DE-COMS-0011.

3.2.1.2 In Plant Intercom Phone System:

The In Plant System is a closed loop phone network that consists of a Central Exchange Switch that routes calls from handset to handset. The handsets shall have the ability to dial combinations of numbers along with programmable preset combinations for 1-touch dialing. The handsets shall be capable of hand-held privacy talk as well as hands-free intercom talk. For available location of Plant Intercom Phone system see drawings SK-DE-COMS-001 thru SK-DE-COMS-0011. Trunk lines that connect floors levels shall be copper riser-rated multi-conductor cables. Distribution lines shall be CAT 3 minimum multi-conductor cables.

3.2.1.3 Public Phone System and SRS Network:

The public phone network consists of an existing Main Distribution Facility (MDF) in the main control room that is operated by the Local Exchange Carrier which is currently Verizon Inc, several fiber optic feeder cables to Intermediate Distribution Facilities (IDF) that are located throughout the building. From the IDF, distribution cables are routed to individual phone jacks. For available location of Public Phone System and SRS Network see drawings SK-DE-COMS-001 thru SK-DE-COMS-0011. Distribution cables shall be minimum CAT 5E in the Universal Wiring Cable configuration per attachment #4 of WSRC-TM-95-1. Phone jacks, unless otherwise noted on drawings, shall meet the Universal Wiring Outlet configuration per Attachment #4 of WSRC-TM-95-1. Fiber optic feeder cables shall be six-fiber, riser-rated cables. Equipment for the IDFs shall be provided by Verizon Inc. Verizon Inc. shall make all wiring terminations to the MDF and IDFs.

3.2.1.4 Plant Design:

Not Applicable

3.2.1.5 Civil/Structural/Architectural:

Not Applicable

3.2.1.6 Mechanical:
Not Applicable

3.2.1.7 Instrumentation and Controls:
Not Applicable

4 ASSUMPTIONS

4.1 General Assumptions

- 4.1.1 The Construction Agency will be the SRS Construction Group. DS will provide engineering documentation for the installation of this equipment and will rely on the use of SRS Guides and Standards.
- 4.1.2 SRS Construction Group will procure all bulk materials.
- 4.1.3 SRS Construction Group will procure all off-the-shelf components and equipment identified on engineering data sheets that do not require testing or quality documentation.
- 4.1.4 Existing unused conduit is available primarily for wall/floor penetrations for the PA and telecom systems in various areas of the complex.

4.2 Specific Assumptions

4.2.1 Electrical

- 4.2.1.1 The PA system is to receive input signal from the existing 105-K PA system.
- 4.2.1.2 Adequate space is available in the Telephone Equipment room at the +15 level for any required additions to the public phone system equipment.
- 4.2.1.3 PA equipment and Plant Intercom Phone System shall be powered from the Facility UPS power panel with a minimum of 2-120V, 20A circuits.
- 4.2.2.4 Telecommunications upgrades for 0' grade level Personnel Wing Modifications are covered in C-SOW-K-00008.

5 REFERENCES

5.1 Drawing List

- 5.1.1 PUD Project Drawings & Sketches
 - 5.1.1.1 E-EF-K-02088 - Public Address Riser Diagram
 - 5.1.1.2 E-EF-K-02089 - In Plant Phone System Riser Diagram
 - 5.1.1.3 SK-DE-COMS-0001- Telecommunication Plan -40 Level NE
 - 5.1.1.4 SK-DE-COMS-0002- Telecommunication Plan -40 Level NW
 - 5.1.1.5 SK-DE-COMS-0003- Telecommunication Plan -40 Level SW
 - 5.1.1.6 SK-DE-COMS-0004- Telecommunication Plan -40 Level SE
 - 5.1.1.7 SK-DE-COMS-0005- Telecommunication Plan -40 Level Greenfuel Disassembly
 - 5.1.1.8 SK-DE-COMS-0006- Telecommunication Plan -20 Level NE
 - 5.1.1.9 SK-DE-COMS-0007- Telecommunication Plan -20 Level NW
 - 5.1.1.10 SK-DE-COMS-0008- Telecommunication Plan -20 Level SW
 - 5.1.1.11 SK-DE-COMS-0009- Telecommunication Plan -20 Level SE
 - 5.1.1.12 SK-DE-COMS-0010- Telecommunication Plan -20 Level ECF
 - 5.1.1.13 SK-DE-COMS-0011- Telecommunication Plan +14 and +21 Level Crane Control Area
 - 5.1.1.14 E-E9-K-02190 - Chiller Building Power Plan
 - 5.1.1.15 SK-DE-HVAC-0005 – 13.8kV Power Plan and Electrical & I&C Services

5.2 Design Input Documents

The following Facility Design Description and System Design Descriptions are the baseline documents used to develop this SOW.

5.2.1 Facility Design Description

5.2.1.1 G-FDD-K-00001, Rev B "PUV Facility Design Description"

5.2.2 Facility Requirements

5.2.2.1 M&O-PUD-2006-00065, Rev. B "PA & Telecom Requirements Meeting Minutes"
9/12/2006

5.3 Applicable SRS & Industry Codes, Guides and Standards

5.3.1 Industry Codes and Standards

5.3.1.1 NFPA 70 – National Electric Code, 2005 Edition

5.3.2 SRS Guides & Standards

5.3.2.1 WSRC-TM-95-58, Guide No.
16051, Rev. 2 "Installation of Electrical Raceway Systems & CableTrays"
16052, Rev. 3 "Installation of Electrical Wires, Cables & Terminations"
16053, Rev. 2 "Installation of Electrical Equipment"
16055, Rev. 2 "Installation of Lighting & Communication System"

5.3.2.2 WSRC-TM-95-1, Attachment no. 4, Rev. 6 "Standardization of Equipment and Components"

5.4 Related Scopes of Work (SOW)

5.4.1 E-SOW-K-00017, Electrical General Scope of Work
C-SOW-K-00009, Structural and Architectural Modifications for the K-Area complex.
C-SOW-K-00008, Scope of Work Multifunctional Room in 105-K

6 ATTACHMENTS

6.1 Attachment 1, Bulk Material List

Attachment 1, Bulk Material List

Quantity	Allotment	Item	Description	Reference
184	Each	Public Address Speaker	70.7V, Adjustable Internal Transformer for Multiple Wattage Settings Atlas #AP-15T	E-DS-K-00025 E-EF-K-02088 SK-DE-COMS-0001 thru SK-DE-COMS-0011
5	Each	Public Address Microphone		E-EF-K-02088
4	Each	Public Address Amplifier	2ch,350W/ch,70V,30HZ-50KHZ Atlas #CP700	E-DS-K-00024 E-EF-K-02088 SK-DE-COMS-0001 thru SK-DE-COMS-0011
12000	FT	#14 AWG Wire	Wire for PA circuits	E-EF-K-02088 SK-DE-COMS-0001 thru SK-DE-COMS-0011
1000	FT	¾" IMC conduit		E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
1	Each	Intercom system Central Exchange Switch	56ch,300-5000HZ,electronic switch Ring-Master #RM5000	E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
1	Each	Intercom Master Handset	Ring-master #AE111 Desktop unit	E-EF-K-02089
33	Each	Intercom Handset	Ring-Master #AE916	E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
500	FT	50 Pair Telecom Cable	22GA,50 twisted pair, riser-rated shielded cable	E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
1	Each	Intercom Distribution Panel	Hoffman 24"X20"X6" box with backboard panel and 66-type punch down block	E-EF-K-02089 SK-DE-COMS-0003
6800	FT	Intercom System CAT5E telecom distribution cable	8 twisted pair, 22GA, shielded cable	E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
4600	FT	¾" IMC conduit		E-EF-K-02089 SK-DE-COMS-0001 thru SK-DE-COMS-0011
31	Each	Public Phone Universal Wiring Outlet	SRS standard Telecom receptacle with 1 voice,2 data ports	SK-DE-COMS-0001 thru SK-DE-COMS-0011 WSRC-TM-95-1, Attachment #4
2100	FT	8" basket type cable tray		SK-DE-COMS-0001 thru

Quantity	Allotment	Item	Description	Reference
				SK-DE-COMS-0011
1800	FT	2" EMT conduit		SK-DE-COMS-0001 thru SK-DE-COMS-0011
14000	FT	Public Phone CAT5E telecom distribution cable	8 twisted pair, 22GA, shielded cable	SK-DE-COMS-0001 thru SK-DE-COMS-0011
2400	FT	Public Phone Fiber optic Feeder Cable	6-fiber, loose tube, singlemode, 8.3/125um, riser- rated cable	SK-DE-COMS-0001 thru SK-DE-COMS-0011