Project Baseline Summary Report

Data Source: **EM CDB** Report Number: **GEN-01b**

Operations/Field Office: **Idaho** Print Date: **3/10/2000**

Site Summary Level: **Idaho National Engineering and Environmental Laboratory** HQ ID: **3001**

Project **ID-OIM-114 / Sitewide INEEL Information Network (SIINET)**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

The objective of the Sitewide INEEL Information Network (SIINET) project is to maintain a capable and reliable communications infrastructure that supports the Department of Energy (DOE) missions at the INEEL and enables its workforce to fully utilize information technologies. Demand on these electronic systems has increased, and is expected to continue to increase beyond available capacity.

Two independent networks at the INEEL provide access to communications systems within and between operating areas. Both networks provide access for voice, data, video, life safety, security, and facility management information. The first access network is a DS-3 level T-carrier system that was originally installed in 1986. The technology is outdated and all of the electrical components have been discontinued and are no longer supported by the manufacturer. Spare parts are no longer available from the manufacturer and have to be procured from salvage businesses. An excessive spare parts inventory must be maintained to ensure availability. The repair cycle on failed components averages 6 to 8 weeks, and the reliability of this system will degrade as available off-the-shelf used parts become scarce.

The second access network is an OC-12 SONET ring network that is filled to capacity. The SONET backbone was commissioned in 1992 with the intent of replacing the older T-carrier backbone. Due to funding limitations the network was never adequately sized for the application. This capacity limitation forced the INEEL to retain the outdated T-carrier network. Transmission capacity on the SONET is fully utilized with no space for growth or expansion. If approved as scheduled, the systems installed by the SIINET project will be operational in 2005. The OC-12 SONET ring will have been in service for thirteen years at that time and will be similar in age to the current T-carrier network.

Some of the existing site network equipment is housed in buildings built in the 1950s and 60s. Many of these buildings are a part of the cold war processing system, are subject to tight security controls and environmental concerns, and are scheduled for removal from service in the near future. Before decommissioning can be fully completed the equipment (dial) rooms in these buildings will require relocation. Other network equipment is housed in areas that are too small, or is in basements subject to flooding from piping or spills on the floor above. Additional floor space is required to accommodate new equipment, to support environmental cleanup, and provide proper access controls.

System reliability, while acceptable today, will degrade seriously as older systems are no longer supported by the manufacturer and as newer systems approach a decade in age and older. INEEL telecommunications systems require replacement and modernization for the following reasons.

1. The SONET system commissioned in 1992 is full to capacity with no room for expansion forcing life safety, security, power management and other data onto the older T-carrier network. Any new requirements for data transmission must be carried by the older T-carrier network or not carried at all. Some scientific computing systems are underutilized and less efficient because the INEEL telecommunications system lacks the capacity to transmit data at a satisfactory rate to scientists and engineers located in other areas of the INEEL.
2. The T-carrier network is outdated and the manufacturer has discontinued all of the electrical components. Spare parts are no longer available from the manufacturer and have to be procured from salvage businesses. An excessive spare parts inventory must be maintained to ensure parts availability. The equipment manufacturer has agreed to continue to repair parts only until 2002. The repair cycle on failed components averages 6 to 8 weeks. The technical ability to maintain the reliability of this system will degrade as available off-the-shelf used parts become scarce.

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3. An existing fire alarm system project at the INEEL will require telecommunication services to transmit fire alarm data to a 24-hour post in Idaho Falls. Part of the project scope is to consolidate fire alarm systems and make them more efficient. To accommodate the transmission needs of the project one or more communication users will be moved off of the SONET system and placed onto the outdated T-carrier system, providing space on the SONET for critical fire alarm functions. Any other projects in the future will have to be handled in a similar fashion. Users who are transferred to the T-carrier system will experience an increase and longer duration of communication outages as the system continues to age.

4. The Advanced Nuclear Energy Products organization performs work in the high-speed data acquisition arena. The data they obtain for analysis includes three-dimensional images of spent nuclear fuel (Tomography, real time image slicing) to verify canister/fuel integrity prior to shipment to a final repository. This work is tied closely with site agreements and milestones. The data and images obtained by the acquisition equipment must be hand delivered to both on-site and off-site customers because of its large size. Group members must be remotely located with the acquisition hardware disrupting the synergy normally available in research and development team environments. At least one individual has been located at the Argonne National Laboratory-West (ANL-W) facility where a high-speed connection to other DOE sites is available. The availability of a high-speed telecommunications network across the INEEL site would improve efforts to meet site goals and agreements and prepare fuels and wastes for permanent storage.

5. The Software and Electronics organization is involved in similar, computer intensive work as the Advanced Nuclear Energy Products group mentioned above. The data includes information on existing fuel rods and canisters and determining their condition prior to movement. INEEL decontamination and demolition efforts are being modeled to minimize personnel exposures and to maximize the space in landfills. Subsurface soil contaminant migration patterns are modeled and simulated to quantify environmental concerns. As in item 4 above the availability of a high-speed telecommunications network across the INEEL site would improve efforts to meet site goals and agreements and prepare fuels and wastes for permanent storage.

6. The INEEL Institute will be requiring additional telecommunication services to meet training requirements. Plans are being made, or are already in place to disseminate training directly to the office computer of the trainee. Currently training is recorded on CD-ROMs and the trainee must find an available training station to receive the training. Providing the training information (video and audio) to the individual desktop will increase the number of people who take the training by making it easier to use. The INEEL Institute also has support to develop a system to provide professional development to INEEL personnel through outside sources such at the Western Governors University. This type of system would be used to keep INEEL personnel current with leading edge technology. The INEEL Technical Library requires increased telecommunications services to provide online periodical searches and retrieval as well as web-based home page access to customers' desktops.

7. The teleconferencing system includes 13 different locations around the site to support business meetings. This system increases efficiency and productivity by supporting the need for people to meet together without requiring them to travel to a common conference room. The system is used for both on-site and off-site meetings and supports over 400 meetings per year. The telecommunications group is planning to expand the system to 18 different locations within the next few years. Each teleconferencing location requires a T1 communications link to the network to support the delivery of both high quality video and audio. The capacity to support the expansion of the teleconferencing system is not available on the SONET backbone.

8. Some of the dial rooms are housed in buildings built in the 1950s and 60s and are a part of the cold war processing system. Two of these dial rooms

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require replacement. CPP-602 was built in 1953 and houses the dial room that provides service to the INEEL Nuclear Technology and Engineering Center. It is located in the basement of the building near a nuclear fuels processing area. The room is subject to liquid spills from overhead piping and from wet laboratory operations on the floor above. These spills have the potential of damaging electronic equipment and placing the telecommunications system out of service until repairs can be made. The room was not designed to house the modern telecommunications equipment and is too small to house the existing equipment and the additional equipment to be installed by this project. Because of its location the room is subject to tight security access controls.

ANL-752 was built in 1962 and houses the dial room that provides service to the ANL-W facility. It is similar to the CPP-602 dial room in that it is located in the basement of the building and is subject to liquid spills from overhead piping. These spills have the potential of damaging electronic equipment and placing the telecommunications system out of service until repairs can be made. The room was not designed to house the modern telecommunications equipment and is too small to house the existing equipment and the additional equipment to be installed by this project.

TAN-601 was built in 1956 and houses the dial room providing service to the Test Area North facility. This building is scheduled for demolition in 2010. An underground water pipe running underneath this facility burst in 1997 damaging the floor of the building and leaving a portion of the dial room unusable.

Other dial rooms around the site are overcrowded or poorly designed to support the modern electronic equipment located there and will require modernization.

High-performance computing, scientific and engineering research, computational science, and a spectrum of interactions among people at dispersed sites are critical to the success of the INEEL. Access to the network is an indispensable part of the INEEL programs and is essential for conducting day-to-day work activities. All INEEL programs rely on the existing networks to sustain programmatic missions, increase operational efficiencies, and improve the delivery of information. Modern, reliable communications must be sustained if INEEL programs are to conduct work in a safe, secure, reliable, timely, and cost effective manner.

Project Status in FY 2006:

Project completion is scheduled for FY-05.

Post-2006 Project Scope:

Project completion is scheduled for FY-05. No post-2006 scope identified.

Project End State

The end state of the project will be the installation of a functioning telecommunications system with increased transmission capacity. The system will support efforts to meet INEEL missions, milestones, and agreements with the state and other organizations.

Cost Baseline Comments:

The costs are based upon activity based costs and standard industry accepted estimating basis. Project Cost estimates are developed at each phase of

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the project per the INEEL Cost Estimating Guide. These phases are identified as (1) Conceptual Design, (2) Title I Design, (3) Title II Design; and (4) Approved for Construction (AFC). These estimates may change through time as a part of the normal design evolution, further definition of requirements needed to support the existing mission and project uncertainties based on items such as the stage of design complexity (e.g., conceptual versus AFC), award prices, approved baseline plans, and subsequent changes. At each project phase, a contingency analysis is performed on each estimate to determine the appropriate level of contingency required to perform the project.

Safety & Health Hazards:

The principal hazards associated with this project are standard industrial hazards and construction.

Safety & Health Work Performance:

Safety is mitigated through incorporation of safety codes and standards in the project design, i.e. ANSI, NFPA, NEC, etc.. Representatives from S&H will be involved in the review of the design package to assure adequate controls are included in the construction package. Construction subcontractors are required to submit a project safety plan for review and approval prior to start of construction. Construction contracts require daily Plan of Day meetings and safety oversight. In addition weekly industrial safety and industrial hygiene oversight and assessments are required. A Facility Acceptance Review Committee will be established which will include representation from the occupational and industrial safety, tenant, maintenance, project, and program organizations. The committee will define preventative maintenance procedures, operations procedures, and training requirements; verify all safety concerns have been corrected; verify systems have been tested and are ready to be placed in operations; and conduct a facility inspection to verify readiness prior to the facility being occupied and operated.

PBS Comments:

Baseline Validation Narrative:

Project new start in FY-2001. Project validation is scheduled for spring of FY-99.

General PBS Information

Project Validated? **Date Validated:**

Has Headquarters reviewed and approved project? No

Date Project was Added:

Baseline Submission Date:

FEDPLAN Project? Yes

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
N	N	N	N	N	N	Y	Y

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General PBS Information

Project Identification Information

DOE Project Manager: Wayne Shigley

DOE Project Manager Phone Number: 526-1986

DOE Project Manager Fax Number: 526-9150

DOE Project Manager e-mail address: shiglewb@id.doe.gov

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	31,946	0	31,946			57		500	50	788	5,959	14,766	9,826	0	0
PBS Baseline (constant 1999 dollars)	29,237	0	29,237			57		500	49	752	5,566	13,509	8,804	0	0
PBS EM Baseline (current year dollars)	31,946	0	31,946			57		500	50	788	5,959	14,766	9,826	0	0
PBS EM Baseline (constant 1999 dollars)	29,237	0	29,237			57		500	49	752	5,566	13,509	8,804	0	0

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS EM Baseline (current year dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	0.00%	0.00%	2.70%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project:

Current Projected End Date of Project: 1/31/2005

Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):

Actual 1997 Cost:

Actual 1998 Cost:

Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars): 0

Inflation Adjustment (2.7% to convert 1998 to 1999 dollars): 0

Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 0

Project Cost Changes

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Project Reconciliation

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	29,180	New LICP created from OIM-101
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	29,180	
Additional Amount to Reconcile (+):	0	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**29,180**	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Complete Title Design			3/31/2002								
Complete Construction			1/31/2005								
Project Start			1/31/1999								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Complete Title Design							1	1			Complete Title Design
Complete Construction					Y		1	1			Complete building construction and Electronics installation.
Project Start				Y							SIINET PBS Addition Approval by DOE-HQ