

2 PART 1 - PROJECT MANAGEMENT PLAN

The LSN Project Management Plan defines activities planned to satisfy project requirements, describes the management and technical approach to accomplish the project objectives, and provides a master schedule and staffing plan for performing these activities.

2.1 Project Definition

The GRCI/AT&T Team is responsible for the design, development, integration, testing, operations and maintenance, and documentation of the LSN. These responsibilities include engineering activities that define the hardware and software design needed to satisfy the NRC requirements for the LSN: the procurement, installation, integration, and testing of commercial-off-the-shelf (COTS) hardware and software, and the development, testing, and configuration of software. All work performed by the GRCI/AT&T Team (GRCI, Autonomy, MSD, and Commerce One), including system documentation, will be in compliance with the NRC SDLCM.

2.1.1 Project Deliverables

The following table includes the Project Deliverables to be delivered to NRC, including the date due.

Task Element	Project Deliverable	Due Date
3.1	Project Action Plan (PAP)	1/10/2001
3.1	Project Definition and Analysis Document (PDAD)	1/10/2001
3.1	Project Action Plan (PAP) Update	1/29/2001
3.1	Project Definition and Analysis Document (PDAD) Update	1/29/2001
3.1	Logical Design Document	2/12/2001
3.1	Physical Design Document	2/26/2001
3.1	Tactical Integration Plan (TIP)	3/26/2001
3.1.3	Design Review Agenda	2/26/2001
3.1.3	Design Review	3/5/2001
3.2.1	Software Development Plan (Part of PAP)	3/19/2001
3.2.1	Software Engineering Notebook	9/10/2001

Task Element	Project Deliverable	Due Date
3.2.2	Open LSN URL to Participants and Public	4/2/2001
3.2.2	Production Release 1.0	9/10/2001
3.2.3.1	Draft LSN Training Plan (Technical and End User)	4/30/2001
3.2.3.1	Final LSN Training Plan (Technical and End User)	7/30/2001
3.2.3.2	Deliver LSN Tutorial	8/20/2001
3.2.6	Draft LSN Test Plan	3/13/2001
3.2.6	Final LSN Test Plan	6/11/2001
3.2.6.1	LSN Comprehensive Software and System Test Results	8/6/2001
3.2.7.1	LSN Operational Support Guide	7/9/2001
3.2.7.2	LSN Rollout Plan	6/29/2001
3.2.7.3	Draft LSN User Guide	6/4/2001
3.2.7.3	LSN User Guide	8/13/2001
3.4.1	Weekly Project Activity Report	Weekly (except when Monthly is scheduled)
3.4.3	Monthly Progress Report	First Wednesday after the 10 th of each month

2.1.2 Management Approach

The GRCI/AT&T Team will follow the NRC's SDLCM while developing the LSN Web Portal. This management approach requires detailed planning of project activities for monitoring project progress. This plan will be maintained in Microsoft Project format. The detailed plans identify tangible interim products that are quantifiable and can be used as a measure of progress. The LSN Project Schedule for software development is based on estimates and development metrics obtained from other GRCI/AT&T programs and experiences. The GRCI/AT&T Project Management Plan (PMP) defines the staffing requirements and hours needed to produce each interim product and requires reporting status based on metrics. GRCI will use an earned value methodology for evaluating progress and for reporting project status. The criteria are 0% prior to beginning a task, 50% once a task is begun, and 100% when it has been delivered to the Government. The plan will include dollars by labor category and the assigned personnel which

will support each task. Status reports are prepared and meetings are held weekly (normally on a Wednesday) between the GRCI/AT&T Development Team and the Government to discuss progress and identify problems and solutions. Subcontractor personnel are fully integrated into the Development Team. QA and Test personnel ensure all products meet both NRC and GRCI/AT&T standards. They are independent of the Development Team and report directly to Senior Management.

2.1.3 Monthly Reports

The GRCI Program Manager will provide a monthly summary report to the Government on the first Wednesday after the 10th of the month. This date was picked to ensure that financial data is available for the report. The report will summarize the month's activities and identify problems and solutions. If there are updates or changes to the Work Breakdown Schedule (WBS), the reason and justification for the change will be submitted to the Government together with any cost or schedule impacts. If at any time the project deviates 5% in cost or schedule from the Project Management Plan, the GRCI/AT&T Program Manager will schedule an update with the NRC Program Manager.

2.1.4 Technical Approach

Figure 2 below presents the LSN system architecture. It shows the major functions in the center box with external systems, participants, and other users on the outside of the box. The AT&T/GRCI team will develop the LSN from standard, off-the-shelf hardware, operating systems, COTS products and reusable components, with minimal custom software development.

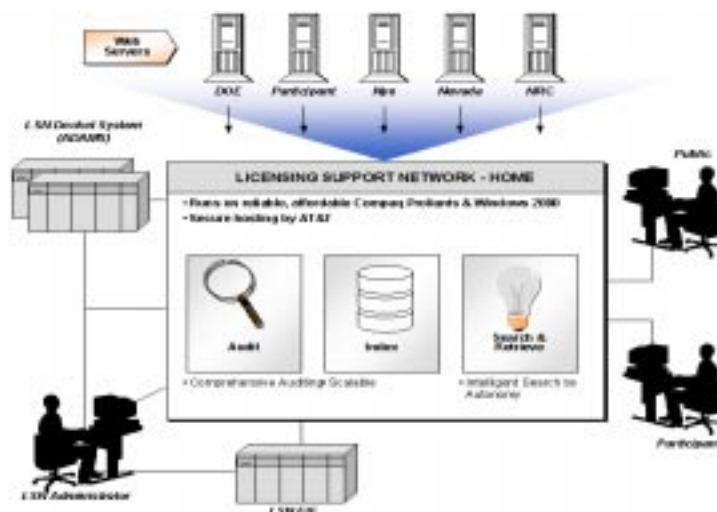


Figure 2. System Architecture

The three major functions provided by the LSN are shown in the central box in the graphic. They are (1) **Audit** to ensure document integrity and report various performance metrics, (2) **Index** participant sites, and (3) **Search and Retrieve** participant documents. Above the central box are servers representing some of the participant sites. These participant sites represent where documents and other materials are stored. Each site has a home page, along with general web content, and provides additional administrative functions, such as an access list of the priority participants and a web server log that will assist in auditing.

Although auditing is performed with a mix of products, all auditing metrics are consolidated into a SQL Server database and uniformly presented to the administrator through limited access hypertext pages. The Webtrends Log Analyzer and WhatsUp Gold products are used to provide network performance monitoring. The Autonomy logs provide statistics on document additions, changes, and deletions or other transactions as it “crawls” each site at the byte level. Specifically, the product will detect any byte changes in a document that has been placed in a participant’s document library. Automated extracts imported from participants’ web logs provide document usage information.

The Autonomy product provides the indexing of participant sites plus intelligent search and retrieval services. The intelligent search capability will significantly assist the licensing process by allowing participants to spend their time analyzing content, rather than sifting through millions of documents.

The heart of the solution is centered around Autonomy’s unique ability to perform searches based on the content and context of the searcher’s requirements, in addition to the regular search capabilities provided by other search engine vendors. Searches based on context rather than key words or phrases return only those documents that respond to the searcher’s specific requirements, instead of all documents that contain a specific key word or words, which could result in millions of returned documents. This characteristic greatly reduces the workload on system users and, at the same time, provides them with more reliable and relevant information. In addition, the Autonomy software provides the audit capabilities required of the LSN to do byte-level checks of documents; therefore, a minimum amount of custom code is required to provide that functionality. Specifically, the product will detect any byte changes in a document that has been placed in a participant’s document library. The use of the Autonomy product line enables the GRCI/AT&T Team to develop a robust LSN that meets users’ needs.

The Microsoft Windows 2000 operating system was selected because of its ease of use, flexibility, power, and low cost. The web servers and database servers selected for LSN use are Compaq Proliants, chosen for their reliability, scalability, and economy. The Compaqs will be loaded with the Windows 2000 operating system.

Access to the LSN for priority users will be managed through the use of multiple COTS products. All users will enter through a gateway that identifies users’ access privileges. Priority users will be switched to a specific path into the network that will provide priority processing. General public users will go through another path to access the system. If priority users are not

utilizing the entire LSN bandwidth, part of the available bandwidth can be utilized temporarily by nonpriority (general public) users. This load balancing combines high availability with efficient resource use.

The GRCI/AT&T Team will combine a modified Rapid Application Development (RAD) and package approach to developing the LSN. This approach will be based on integrating COTS products along with some development code to tie the system together. Visual Basic (VB Script) will be used and embedded in .asp pages. The most likely scripting tool is Microsoft Visual InterDev. As software is developed, it will be shown to the Government so they can see the status and development progress leading up to production Release 1.0 on 10 September 2001. During the design phase, several experiments may be conducted to test and finalize parts of the system. Design activities and the resulting artifacts can be demonstrated during weekly meetings. A limited capability LSN site will be up in April 2001 and successively thereafter additional functionality will be added to it. In close coordination with the government, willing participants will be invited over the summer to allow their sites to be indexed. As both sites and documents are added to the LSN system, the developers and the government will begin to exercise core functions such as search, retrieval, and auditing. Additionally, the government, with support from the GRCI/AT&T Team, will invite selected participants to use the system and capture their comments.

2.2 Project Management Plan

This section describes GRCI/AT&T's method for managing the project, the project schedule, and the organization that will be used to meet the NRC requirements.

2.2.1 Work Breakdown Structure

The Work Breakdown Structure (WBS) defines the functional areas and work that need to be performed to satisfy requirements. Each functional area has been decomposed into individual work packages whose completion is required in order to satisfy the Statement of Work (SOW). The following paragraphs describe general responsibilities for the accomplishment of the WBS elements.

WBS 1. The Project Manager is responsible for the daily direction of staff activities in performing the project activities. Project Management includes personnel management, monitoring and reporting on project activities to NRC and senior GRCI management, budgeting, testing, QA, and CM. A Technical Writer is responsible for preparing all the project documentation.

WBS 2. System Engineering is responsible for the overall system design, hardware and software procurement, and development hardware integration and testing.

WBS 3 through 3.4 and 3.8 through 3.9. Software Development is responsible for the software design and the development of software and the integration of applications. Activities include design, coding, unit testing, and documentation.

WBS 3.11, 3.12, and 3.13. System Testing is responsible for developing system test plans and procedures and for conducting system testing. Testing will be done following the guidelines of GRCI's Pinnacle methodology. System Testing personnel will also assist NRC in performing system acceptance testing.

WBS 3.5 through 3.7 and 3.10. Training is responsible for developing all training plans, training material including the tutorial and the *LSN Operational Support Guide*, as well as creating the CDs for the NRC to distribute to the end users and system administrators.

2.2.2 Project Schedule

The project schedule that identifies all the project activities by WBS number is shown in Appendix A.

2.2.3 Project Organization

The Project Organization is shown in Figure 3 below. Detailed position responsibilities are identified in Part 2, Section 2.2.1.

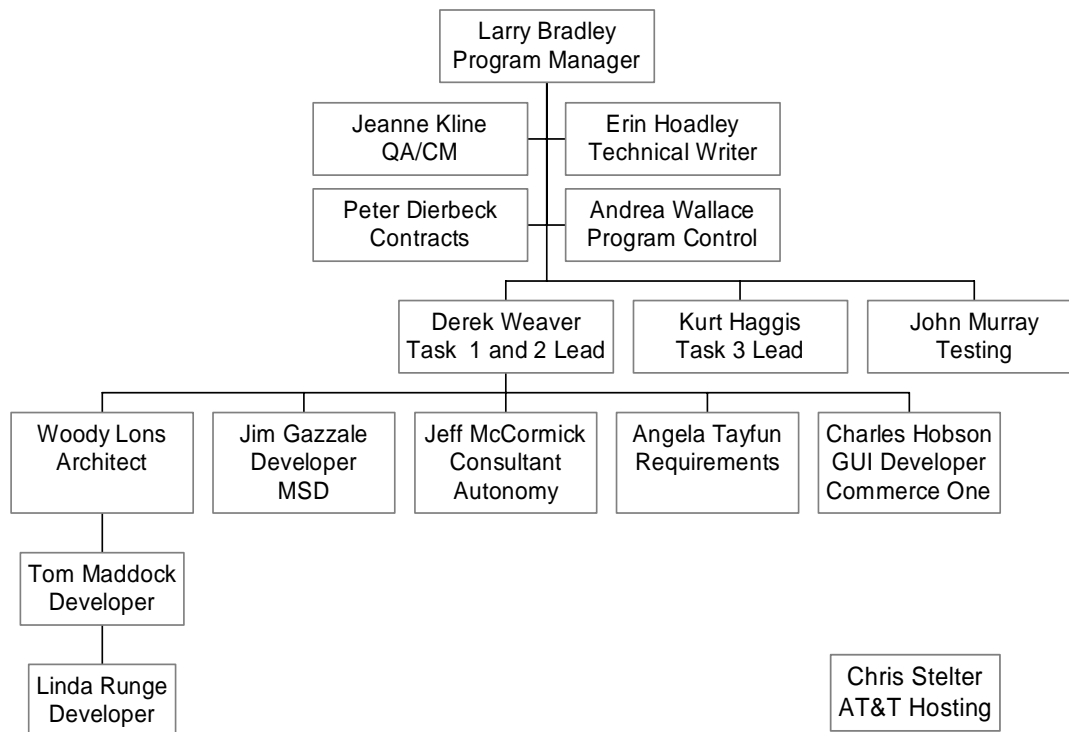


Figure 3. GRCI LSN Project Organization Chart

2.2.4 Skills

Itemized below are the special skills needed and the team member responsible for ensuring that the LSN Project Management Plan is successfully implemented:

- The Program Manager is experienced in program management.
- The system engineering team, including subcontractors, has experience designing client/server systems and large, web-based applications.
- The team includes a Certified Records Manager (CRM).
- The team possesses system administration experience.
- The software engineers (including Database Analysts and Database Administrators) have experience in information management to include developing, integrating, and maintaining software applications that have been developed using the COTS products selected for the LSN Project (i.e., SQLServer 2000, Autonomy, WebTrends, and WhatsUp Gold).
- The test engineer has experience with system testing of hardware and software components, as well as security systems.

- The training specialists have experience with the development of training tutorials and computer-based training.
- All team members have a college degree or equivalent in computer science, information technology, or engineering.

2.2.5 Interfaces

The interfaces between the GRCI/AT&T and NRC personnel on the project are both formal and informal. This communication flow is bidirectional. Formally, the GRCI/AT&T Program Manager and NRC LSN Program Manager meet every Wednesday for a weekly meeting to discuss all issues related to the project. There are also formal contacts between the Government and GRCI/AT&T contracting officers. Monthly, there is a formal report to the government on how the project is proceeding, along with performance metrics. Technical information is exchanged between the Development Team and the NRC through numerous daily email and phone interactions. Interfaces with the LSN participants will also occur at logical points of system development. Current known LSN Participants include:

- State of Nevada
- Churchill County, NV
- Clark County, NV
- Esmeralda County, NV
- Eureka County, NV
- Inyo County, CA
- Lander County, NV
- Lincoln County, NV
- Mineral County, NV
- Nye County, NV
- White Pine County, NV
- Nuclear Energy Institute (NEI)
- National Congress of American Indians (NCAI)
- Department of Energy (DOE)
- Nuclear Regulatory Commission (NRC)

2.3 Risk Management

Risk assessment is a continuous process throughout the life of a project. The following sections discuss the risk management approach to be followed throughout the LSN web portal project.

2.3.1 Risk Description

The LSN has risk because, as a Clinger–Cohen program within the NRC, there are great visibility and sensitivity not only within the NRC, but outside as well. The program will have national focus. There are numerous outside organizations, including the State of Nevada, counties, non-governmental organizations, and the general public, who will be participants and their interests

will be at odds. The LSN deals with a sensitive issue, which is the disposition of high-level nuclear waste. The level of technical prowess among the participants varies. The LSN is the gateway to a tremendous wealth of data that will grow exponentially as the licensing application proceeds.

The following are currently recognized as major areas of risk:

- Risk 1** User acceptance, which is highly contingent on the search and retrieval capabilities of the system
- Risk 2** Requirements definition and understanding
- Risk 3** Unknown requirements
- Risk 4** Project staffing
- Risk 5** Software capability to support users in litigation (e.g., discovery)
- Risk 6** Procurement of software and hardware before design review
- Risk 7** Cost overruns
- Risk 8** Transition between project phases (design, implementation, maintenance and operation)

Risk 1, User Acceptance. To gain acceptance, it is essential to involve the end user as early as possible in the development life cycle. Obviously, the LSN cannot completely meet every need of every user; it will however, meet all written requirements. The LSN Program Manager will guide the project toward a common sense of the greatest good for the greatest number.

Users will have a chance to participate in the project review and key participants will have the opportunity to interact with the LSN Web Portal beginning in April 2001. Early participation on the part of key participants ensures that their requirements can be considered during the design process, as opposed to redesigning the system later in the software development life-cycle.

Risks 2 and 3, Requirements. Requirements must be clearly defined and able to be tested to minimize misunderstanding between developers and users. Interpretations of requirements often vary and good judgment is required to ensure that the project's scope does not shift or expand.

Risk 4, Project Staffing. Staffing risks do not affect the quality or acceptance of the system, but have significant impact on schedules and budgets. Many people on this project are identified as key, but outside events, emergencies, and departures may occur.

Risk 5, Software Capability. The software has to support the LSN Functional Area 5, timeliness (system performance) requirements. It must provide the necessary search and retrieval capabilities, as well as provide speed and accuracy. However, all COTS products have deficiencies or will not perform some task to the degree desired.

Risk 6, Procurement. Hardware equipment procurement processes have an impact on the delivery of the production system and on the development of the application. Development

systems, as well as operational systems, must be in place in advance of the times they are needed so that adequate testing can be performed to ensure that the equipment is ready for use.

Risk 7, Cost Overruns. Cost overruns, if not managed correctly, can impact the system by leading to incomplete or late system development, or inadequate training, for example. In addition, the period of performance spans government fiscal years.

Risk 8, Project Phase Transition. In many projects, there is risk associated with transition from one phase to another (e.g., design to development). This risk can be magnified if the transition is from one company to another. Problems can include a long learning curve for new team members and lack of buy-in by the incumbent team.

2.3.2 Risk Management Process

Project risk is evaluated at the beginning and throughout the life cycle of every GRCI project. Risks are identified, tracking mechanisms are defined, and mitigation plans are prepared. During the life of the LSN project, risks will be monitored and mitigation plans implemented. Risk mitigation activities will be monitored on a monthly basis (at a minimum) and evaluated by GRCI and Government personnel to determine if the risk has been eliminated.

2.3.3 Risk Mitigation

The planned risk mitigation activities are described below:

Risk 1, User Acceptance. To mitigate user acceptance risk, the NRC and the Development Team will engage in rapid development and open the LSN Portal to selected participants so they can interact with, and provide comments to, the NRC Program Manager and the GRCI/AT&T Development Team. In order to involve the end user as early as possible, the NRC Project Team and GRCI/AT&T met with users and other key participants in Nevada in January 2001. NRC personnel will be invited to participate in all design and development activities, per the discussion conducted during the 21 February 2001 Weekly Status meeting.

Risks 2 and 3, Requirements. The GRCI/AT&T Team will meet with NRC Information Management (IM) staff to clarify the terminology and meaning of the requirements. Obviously, a thorough and agreed upon *Project Definition and Analysis Document (PDAD)* is a crucial step in this process. However, nothing is as crucial as the bidirectional communication flow between the Government and the Development Team. Functional capabilities will be demonstrated to NRC staff throughout development and will help identify and correct misunderstandings. The GRCI/AT&T Team will ensure that the requirements, when baselined, are clearly defined and able to be tested. In addition, the GRCI/AT&T team will keep the requirements under configuration control and will notify the government if any proposed new or changed requirements will shift or expand the project's scope.

Risk 4, Project Staffing. The Program Manager will use multiple mechanisms to acquire the correct skills and staffing levels to complete the project on time and within budget. The GRCI/AT&T Program Manager and Task Lead will review the staffing monthly to ensure that it is adequate and that the project has the skill sets available to complete all the tasks on schedule and within budget. All key personnel working on the project are long-term GRCI/AT&T employees.

Risk 5, Software Capability. The LSN commercial off-the-shelf (COTS) software has been specifically selected to support the LSN Functional Area 5, timeliness (system performance) requirements. Autonomy, the COTS package that will provide the search and retrieval capability for the LSN, was specifically chosen for its speed and accuracy. However, all COTS products have deficiencies or will not perform some task to the degree desired. In these cases, custom code will be written to provide the functionality desired.

Risk 6, Procurement. Equipment will be identified early so there is sufficient time to acquire the appropriate approvals, issue requisitions, and have the equipment delivered. The arrival of the production hardware and software is critical to meeting the delivery of the first production release. The purchase requisition has been prepared and the team will periodically check to ensure that each organization with a procurement responsibility has all the information required to complete the process. The AT&T Data Center in Ashburn, VA was brought on-line January 2001.

Risk 7, Cost Overruns. The GRCI/AT&T Team, in coordination with the government, has modified the delivery date for the monthly report to allow timely financial information to be provided to the government as part of these reports. Furthermore, the government and GRCI/AT&T Team hold four status meetings per month which allows opportunity to discuss financial concerns. Finally, in March of 2001, the GRCI/AT&T Project Manager provided a monthly spending plan for the life of the project to the NRC Project Manager.

Risk 8, Project Phase Transition. The GRCI/AT&T team manages phase-over risk by assigning a core team to the project throughout the project life. The costs are managed by not dedicating each member of the team full time to all phases. In addition, the phase one and two (design and implementation) lead is the same person and the phase three (maintenance & operation) lead will participate (minimally) in phase one and two to ensure continuity. Finally, it should be noted that the same organization will be responsible for all phases of the project—design, implementation, and maintenance and operation.

2.4 Quality Assurance, Configuration Management, Data Management, and Records Management

This section describes the approach that the GRCI/AT&T Team will follow to provide quality assurance, configuration management, data management, and records management.

2.4.1 Quality Assurance

Quality assurance (QA) is a planned and systematic set of activities, which provides management with an independent view of approved processes that are being used to assure high quality products are being produced. Quality assurance involves:

- Inspecting, reviewing, and auditing the activities and products to verify that they comply with published SDLCM Methodology procedures and standards.
- Providing senior managers and project managers with the results of these inspections, reviews, and audits.

The inspection and review activities occur throughout the life cycle of the project and provide management with the visibility needed to ensure adherence to established plans, procedures, and standards.

The LSN project will comply with the QA procedures, standards, and forms contained in the SDLCM. The QA Manager works as a key member of the team and attends all meetings and reviews. The QA Manager reports directly to the Program Manager and senior GRCI management.

Achieving quality is accomplished by providing management and users with the appropriate visibility into the processes being used and the products being developed. QA involves the following:

- Objectively reviewing and auditing the products and activities to verify that they comply with the applicable procedures and standards;
- Providing the project and other appropriate managers with the results of these reviews and audits; and
- Measuring the completion of milestones compared to the project schedule.

The LSN project will utilize the SDLCM quality assurance processes and procedures to implement a Quality Assurance Plan (QAP). This plan identifies the project team members responsible for performing quality assurance and maintaining the relationships between QA and other parts of the organization (such as program management, configuration management, and the software engineering and development teams).

2.4.2 Configuration Management

Configuration management (CM) is the discipline of applying administrative and technical procedures throughout the system development life cycle to:

- Identify, define, and baseline software and associated documentation in a system;
- Control modifications to, and releases of, the baseline;
- Record and report the status of the baselines and modification requests;

- Ensure baseline completeness, consistency, and correctness; and
- Control storage, handling, and delivery.

CM includes the following major activities:

- CM process implementation – definition and documentation of the configuration management activities;
- Configuration identification – definition and identification of items subject to configuration control;
- Configuration control – evaluation, coordination, and approval or disapproval of proposed changes to controlled items;
- Configuration status accounting – recording and monitoring of changes to controlled items; and
- Configuration evaluation – verification that controlled items meet their assigned requirements and are accurately documented.

The LSN project will comply with the configuration management (CM) procedures, standards, and forms contained in the SDLCM. All project deliverables (software, hardware, and documentation) will be under CM control. CM will be responsible for the control and promotion of software from development to system testing, to acceptance testing, and to the production environments. CM will control changes to the production environment. Only approved changes will be promoted from development to production. Developers will make changes only to software in CM.

Electronic copies of the documentation produced for the LSN project will be maintained in the Project Repository located on a shared drive under Homer/ITG3/Nrc/ in a separate folder for each deliverable.

2.4.3 Data Management

Data management (DM) is closely related to configuration status accounting. While configuration status accounting focuses on recording and monitoring changes to controlled items, DM focuses on maintaining official correspondence records, CM records, and controlled documentation.

2.4.4 Records Management

The CM organization will be responsible for records management. Records reflecting all deliverables, reviews, inspections, design documents and diagrams, software source code, mail and other correspondence, and other documentation designated by the Program Manager will be maintained by GRCI in the previously identified directory. These documents will be provided to the NRC as indicated in the Project Schedule. Specifically, the CM organization is responsible for completing the required government forms and delivering them to the Records Management Branch to notify them that an application system has been newly developed.

2.5 SDLCM Methodology Tailoring

The GRCI/AT&T Team will follow the NRC SDLCM Methodology, although tailoring of specific work products may be needed to accurately reflect the software development methodology used.

2.6 Hardware and Software Inventory Control

All hardware and software will be maintained by GRCI using the GRCI Government Property Control Policies & Procedures. Highlights of these policies and procedures include conformance with FAR Part 45, tagging of all government owned equipment, and annual (minimum) inventory audits.

2.7 Hosting

The LSN will be housed at the AT&T Ashburn, VA hosting facility. As a managed service, AT&T will provide all network services including 3MPS bandwidth optimization, firewall, and intrusion detection. In addition, AT&T will provide 24/7/365 technical support for web server or network connectivity problems. Overall, a 99.4% uptime guarantee is provided.