3 PART 2 – SOFTWARE DEVELOPMENT PLAN

3.1 Overview of Software Development and Integration Activities

The Development Team will utilize the SDLCM Methodology standards and procedures for all development with minor tailoring to support the software development methodology. An essential step in successful software development is a walk-through of the planned design. The LSN Design Review was conducted on March 5, 2001. Peer Reviews, in addition to management reviews, will be used to ensure that the work products produced satisfy the customer requirements and work products defects are corrected prior to production release. Efficient use of COTS tools and applications by the development team will greatly reduce the need to develop custom code. Any custom code created will be checked into CM and maintained under CM control. This will ensure the integrity of the software baseline. Peer Reviews will be conducted to evaluate any custom code that is developed. These evaluations, together with unit, integration and system testing, will ensure that the code implements the design. QA will maintain the Peer Review artifacts.

3.2 Software Development Organization and Responsibilities

3.2.1 Development Team Personnel

The Program Manager (PM) is responsible for:

- Project planning and scheduling of activities;
- Allocating and directing staff to accomplish tasks;
- Removing obstacles to project success;
- Project monitoring and coordination of all activities;
- Status reporting to customer and GRCI/AT&T management;
- Staffing activities required to complete all deliverables defined in the SOW;
- Coaching and developing team members;
- Coordinating and developing the business and technical aspects of the program;
- Deliverables and quality of the project; and
- Budget monitoring and control.

The Task Lead is responsible for:

- Technical project coordination and all IT related aspects of the project;
- Managing all technical development of the system;
- Having high-level knowledge of technology, tools and methodology used in the project;
- Marshaling the development team;
- Managing staff and contractors involved in the project;
- Working with the Program Manager;
- Controlling the development schedule; and

- Stepping in to be the Program Manager in his absence.

The System Engineers are responsible for:

- System requirements definition;
- Overall system design;
- System administration;
- Hardware integration;
- Performance analysis;
- Developing prototypes;
- Gathering technical alternatives;
- Refining the design;
- Building the application;
- Testing against user and technical requirements;
- Documenting the requirements, design, software, and operational and maintenance processes;
- Developing and obtaining approval for all project products; and
- Following SDLCM Methodology guidance.

The Software Engineer is responsible for:

- Software requirements definition;
- Software design;
- Investigating alternatives;
- Developing prototypes;
- Software development;
- Software integration;
- Unit testing;
- Documenting the requirements, design, software, and operational and maintenance processes; and
- Following SDLCM Methodology guidance.

The Test Engineer is responsible for:

- System testing of hardware and COTS software;
- System testing of custom, non-COTS software;
- Preparing test reports;
- Coordinating delivery activities between Configuration Management and the government;
- Testing the application;
- Initial user test planning, coordination, and feedback;
- Assisting NRC with acceptance testing;
- Testing the auditing software; and
- Test deficiency remediation.

The Training Specialist is responsible for:

- Preparing end-user and tutorial training materials, and
- Preparing operational support guide materials.

Quality Assurance (QA) is responsible for:

- Ensuring that all deliverables comply with SDLCM Methodology procedures, standards, and forms;
- Performing audits of deliverables to ensure that they satisfy required functions; and
- Conducting project audits at the end of each life-cycle phase.

Configuration Management (CM) is responsible for:

- Ensuring that Project CM capabilities comply with the SDLCM Methodology procedures, standards and forms;
- Providing configuration control of all deliverables;
- Promotion of software from development, to unit test, to system integration test, to government acceptance test, and to production; and
- Configuration Control Board activities.

The Documentation Specialist is responsible for preparing all documentation delivered to the client. In addition to the above positions, a Security Engineer will support the Project by developing the LSN Security Plan and coordinating security testing as required.

3.2.2 Interfacing Groups

The Interfacing Groups are documented in Part 1, Section 2.2.5, of this document.

3.3 Software Development Technical Approach

The software development technical approach that will be followed throughout the LSN project is described in the following subsections.

3.3.1 Activities, Tools, and Products

The life cycle phases to be performed during the performance period of the LSN contract are identified on the project schedule shown in Appendix A. These phases include project management, analysis, design, development, testing, deployment, and system documentation. The tool(s) to be used during each life cycle phase are identified in the following table:

ACTIVITY	TOOL(S)
Project Management	MS Project Risk Radar WordPerfect MS Word MS PowerPoint MS Excel
Analysis	WordPerfect MS Word MS PowerPoint MS Excel
Design	Rational Rose ERwin WordPerfect MS Word MS PowerPoint MS Excel
Development	HTML Active Server Pages (ASP) Visual Basic (VB) Autonomy WebTrends WhatsUp Gold WordPerfect MS Word MS PowerPoint MS Excel
Testing	Mercury Interactive Autonomy WebTrends WhatsUp Gold WordPerfect MS Word MS PowerPoint MS Excel
User Testing	LSN Web Portal
NRC Acceptance Testing	LSN Web Portal

All written project documentation will be provided to the government in WordPerfect format.

3.3.2 Implementation

The COTS software will provide approximately 80 percent of the LSN functionality. The GRCI/AT&T Team will create a Graphical User Interface (GUI) that presents a uniform and intuitive look and feel. This will be done using hyper text markup language (HTML). Screen layouts, including icons, pull down menus, keys, and tool bars will be in compliance with Section 508 Guidelines.

3.3.3 Testing

The GRCI/AT&T Team will conduct unit, integration, and system testing of all software. Software testing will include functional and performance testing. Final testing of the release will be conducted on the production environment at the LSN Web Hosting site in Ashburn, VA. AT&T will conduct hardware and security testing at the site and be responsible for meeting the 99.4% reliability requirement. After completion of system testing, GRCI/AT&T testing personnel will support the NRC in performing acceptance testing. Acceptance testing is performed to validate the system against the original requirements. Acceptance testing begins after completion of system testing. Acceptance testing will be performed in accordance with the government approved test plan. A draft Test Plan was provided to NRC on March 13, 2001, with the final test plan to be delivered to the government on June 11, 2001.

3.4 Software Development Management Approach

The Project Manager will employ a variety of management tools to manage all aspects of the LSN project during the software development life cycle phases. These tools include:

- The project documentation, specifically the:
    - Project Action Plan (PAP)
    - Project Definition and Analysis Document (PDAD)
    - Logical Design Document
    - Physical Design Document
- The Project Management Plan (as required by the GRCI Quality Management System (QMS)) which contains:
    - Actions Items
    - Schedule
    - Work Products List
    - Monthly and Cumulative Financial Charts
    - Organization Chart

- Critical Resources Chart
- Risk Plans and Mitigation Plans
- Metrics (e.g., from peer reviews, change requests, Configuration Control Board meetings, quality assurance activities, configuration management activities and requirements management activities).

Weekly and monthly meetings between NRC and GRCI are scheduled to review the project activities that have been accomplished and prepare for upcoming project milestones. The monthly status meeting will be conducted on the first Wednesday after the 10th of each month in order to allow the GRCI Finance Department adequate time to prepare data to be input to the monthly financial charts. Action items from these meetings are documented in minutes that are then used by the Project Manager to track task completion.

3.4.1 Software Development Resource Requirements

The following table indicates the staff effort required to design, develop, and deploy the LSN system, together with the estimated number of hours for each position.

LSN STAFF SUPPORT SERVICES IN ACCORDANCE WITH THE SOW	Qty. in Hours
Project Manager	1,070
Task Area Leads (Tasks 1&2)	1,405
Task Area Lead (Task 3)	524
Senior Analyst	2,476
Systems Analyst	950
Web/Internet Expert	865
Senior Software Engineer	1,213
Junior Engineer	1,213
Senior Database Analyst	1,006
Database Administrator	607
Technical Writer	1,102
Clerical	492
COTS Expert	80
Program Control Specialist	323
Systems Trainer	607

3.4.2 Software Development Milestones and Schedules

See Appendix A.

3.4.3 Software Development Measures

The GRCI/AT&T Team will use an earned value system to monitor the development of the LSN. Activities will be defined for tangible interim products. Staffing for each activity will be identified, and a staffing profile for the project will be prepared. Microsoft Project will be used to schedule and report on development progress. Earned Value Management System (EVMS) will be tracked using 0% (work package has not begun), 50% (work package opened), and 100% (work package delivered to the government). Additionally, at the monthly status meetings GRCI shall provide the government an updated copy of the Project Schedule and a spreadsheet indicating financial information for the past month.

4 ACRONYMS

ACRONYM	DEFINITION
ADAMS	Agencywide Documents Access Management System
AT&T	American Telephone and Telegraph
CA	California
CD	Computer Disk
C.F.R.	Code of Federal Regulations
CM	Configuration Management
COTS	Commercial-off-the-shelf
CRM	Certified Records Manager
DM	Data Management
DOE	Department of Energy
EIE	Electronic Information Exchange
EVMS	Earned Value Management System
GRCI	GRC International, Inc.
GUI	Graphical User Interface
HTML	Hyper Text Markup Language
LSN	Licensing Support Network
LSNA	Licencing Support Network Administrator
MSD	Management Systems Designers, Inc.
NCAI	National Congress of American Indians
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NV	Nevada
NWPA	Nuclear Waste Policy Act
PAP	Project Action Plan
PDAD	Project Definition and Analysis Document
PMP	Project Management Plan
QA	Quality Assurance
QAP	Quality Assurance Plan
QMS	Quality Management System
RAD	Rapid Application Development
SDLCM	System Development Life-Cycle Management
SDP	Software Development Plan
SOW	Statement of Work
SQL	Structured Query Language
TIP	Tactical Integration Plan
URL	Uniform Resource Locator

ACRONYM	DEFINITION
VA	Virginia
VB	Visual Basic
WBS	Work Breakdown Structure

5 REFERENCES

- Statement of Work, U.S. Nuclear Regulatory Commission, and Contract Number GS-35F-4507G dated 12 December 2000.
- GRC International (GRCI) Nuclear Regulatory Commission (NRC) Licensing Support Network (LSN) , Volume 1 – Technical Documentation, 25 August 2000.
- 10 C.F.R. Part 2, Subpart J.
- Technical Documents, Plans, and Standards:
  - Workforce Investment Act of 1998, Rehabilitation Act Amendments of 1998, Section 508, Implementation.
  - Computer Security Act of 1987.
  - System Development and Life-Cycle Management (SDLCM) Methodology, Procedures, Standards, and Forms, Version 1.2, December 1999.
  - System Development and Life-Cycle Management (SDLCM) Methodology, Handbook, Version 2.2, December 1999.