

Licensing Support Network (LSN) Business Case

1. REQUIREMENTS IDENTIFICATION AND DEFINITION

1.1 Mission Need

Section 114 (d) (2) of the Nuclear Waste Policy Act of 1982 (NWPA) requires the Commission to issue a final decision approving or disapproving issuance of the construction authorization for a mined geologic repository to store high-level radioactive waste at Yucca Mountain, NV, within three years of the U.S. Department of Energy (DOE) license application. The Licensing Support Network (LSN) is a critical tool to ensure that document access, and the associated hearing agenda, can all be handled in an expeditious manner. As outlined in 10 CFR Part 2, Subpart J, it will establish a system to provide shared document discovery and facilitate electronic motions practice for the hearings on DOE's license application for the repository.

1.2 Objectives

The objective of implementing the Licensing Support Network (LSN) is to reduce the time needed for the licensing hearing at NRC to give the Agency some chance of meeting the congressionally mandated three-year licensing process time frame. It is generally acknowledged that although the system does not guarantee the licensing time frame will be met, without the LSN it may not be possible to meet the mandated time frame. The system achieves this time saving by replacing classic "discovery" exchanges among parties. Additionally, the LSN is intended to benefit the repository licensing proceeding by making all parties' relevant documents publicly accessible before docketing, by establishing an electronic and publicly accessible docket, and by making motions practice a fully electronic process.

The system must be available in time to allow DOE and NRC to meet their obligations to make documents available 30 days after DOE's submission of its site recommendation to the President of the United States. Other participants make documents available 30 days after the site selection decision becomes final after review by Congress.¹

The FY 1998-99 Operating Plan for the Office of Nuclear Materials Safety and Safeguards (NMSS) included Planned Accomplishment HLWRR 13, and the Office of the Chief Information

¹ 10 CFR §2.1003. Although Subpart J at §2.1007(a)(2) requires that NRC must provide electronic access to the LSN at the NRC Public Document Room (PDR) and at all NRC Local Public Document Repositories (LPDRs) in the vicinity of the site (including Las Vegas, Reno, Carson City, Nye County and Lincoln County), this requirement was included in the rule prior to NRC's announcement of the LPDR program being canceled so there will not be any LPDRs operational in the vicinity of the site by July 2001.

NRC's capability includes ongoing relationships with selected regional libraries of the Government Printing Office Federal Depository Library Program (FDLP) which maintain, permanently, 48x microfiche collections of NRC publicly available documents released between January 1981 and October 1999; these collections may also be found in certain FDLP Selective Depository Libraries and in some other libraries as well. These depositories include the libraries at the University of Nevada Las Vegas and the University of Nevada Reno.

DOE is required to make access available via its network of public document rooms. Broader Internet access is expected to compensate for the closure of NRC's LPDRs and the State of Nevada Public Libraries have indicated web access terminals are available in all library branches across the state, including in the above noted locations.

Officer (OCIO) included Planned Accomplishment CIO S1. Together these Planned Accomplishments (PA) addressed the rulemaking process to revise 10 CFR Part 2, Subpart J, and enable the use of web technology to establish an NRC website and develop it to support the licensing process. The Direction Setting Issue (DSI) associated with the development of the Licensing Support Network was DSI #6:High-Level Waste and Spent Fuel; the Staff Requirements Memorandum (SRM) associated with these initiatives was COMSECY-96-056.

1.3 Information Management Problem

The Licensing Support Network is a critical tool to ensure that document access, and the associated hearing agenda, can all be handled in an expeditious manner. To achieve the three-year hearing process, the Commission envisioned that the information and data supporting a DOE application needed to be available simultaneously, in a centralized database, to all interested parties before the application was submitted and formal NRC review began. It thus established in 10 CFR Part 2, Subpart J, a Licensing Support System (LSS) to ensure that all documents relevant to the licensing are made equally accessible in a timely manner to all parties and potential parties. Then-emerging information management technologies for issue identification, electronic storage and retrieval, and electronic mail were recommended to achieve the objectives of more effective and efficient review.

Ultimately, it was recognized that technological advances, particularly the emergence of web technology, called for changes in the proposed system design. Subpart J was revised in late 1998 to allow the implementation of the renamed Licensing Support Network using web technologies. As a web-based method of access to the combined participant collections, the LSN will be available to anyone who has access to the Internet, in particular the World Wide Web (WWW). Moreover, as was the case with the LSS, it is likely that representatives of the parties to the proceeding, e.g., approximately 500 individuals², will need to be provided with a mechanism for priority access to the LSN especially, during the discovery and motions practice phases.

No existing system accomplishes what the LSN is intended to do, although existing NRC capabilities can help fulfill two identified capabilities -- electronic document submission and establishment of an electronically accessible docket.

A number of information management and technology challenges are associated with this effort to develop a web-based solution.

Efficient & Effective Internet Technologies -- Need to ensure that web technology can be adapted to meet search and retrieval functionality.

Ensuring Document & Data Integrity -- Need to provide the LSN Administrator (LSNA) with the ability to ascertain that documents, once placed on the web, are not changed or removed. Meeting Subpart J's data integrity requirement implies that a baseline will be

² U.S. Department of Energy, Office of Civilian Radioactive Waste Management (OCRWM). "Licensing Support System Preliminary Needs Analysis." Prepared by SAIC, Inc., February, 1988.

established of the holdings of each participant that can be routinely compared in an audit mode with later versions of the participant collections.

Data Exchange Standards -- Need to formulate a viable web-based replacement for the old technical solution and examine its impact on previous agreements (such as header structure), which will require substantial coordination with the parties and potential parties to the licensing.

Availability for Start of Proceeding -- In accordance with 10 CFR § 2.1003(a), the target date for LSN operational implementation is July 2001. The LSNA and the sponsoring office, the Atomic Safety and Licensing Board Panel (ASLBP) are responsible for ensuring timely implementation of the LSN to support the anticipated March 2002 submission of the repository license application to the NRC.

Participant Advice in Design & Operation -- In accordance with 10 CFR Part 2, Subpart J, the current approach for accomplishing the LSN design and implementation is to interact with the Licensing Support Network Advisory Review Panel (LSNARP) and its Technical Working Group (TWG), which is comprised of the parties and potential parties to the licensing, to identify viable technical solutions. The work of the TWG to date has been based on an almost identical application developed by DOE and subsequent discussions with their program manager, the contractors who developed the application, and the product vendor. This is discussed in greater detail below in Section 1.6.

1.4 Scope

The LSN is responsible for addressing various requirements associated with NRC's mission to complete the adjudicatory process for the license application in a three-year time frame. Four components comprising the system's functionality have been identified:

- establishing an effective Internet-based method of accessing (search & retrieve) the records collections of the parties and potential parties to the high-level waste repository licensing proceeding;
- providing an audit/compliance subsystem, including the automated tools and policies and procedures needed to monitor participant compliance with the availability and document integrity submission requirements found in 10 CFR Part 2, Subpart J;
- providing a web-accessible official docket file for the proceeding; and
- providing electronic information exchange to support motions practice.

NRC's ADAMS external collections, containing publically accessible docket files will meet the docket requirements. Similarly, NRC's Electronic Information Exchange (EIE) infrastructure will meet the Subpart J motions practice requirements.

Not in the scope of this project's delivery:

NRC Documentary Availability Compliance as Participant -- Like the other participants, NRC must make its high-level waste collection of materials externally accessible. The LSN will require access to a library of NRC's high-level waste documents that must be established on the ADAMS external server. Lead responsibility for meeting this obligation rests with NMSS, the collection's "owners," and with OCIO, the records custodian for the agency.

Making ADAMS "Crawlable" -- Some code development may be required within ADAMS to allow it to be accessed by the LSN to implement the system's search and retrieval and audit capabilities. The cost of this effort is reflected in Section 2.6.1 below, although the responsibility for implementing this effort, since it resides with other agency offices, is not included in the LSN project management plan except to reflect the project team's efforts at coordination.

Other Participants' Documentary Availability -- Subpart J requires access to data provided by the stakeholders identified below in Section 1.5, and possibly to collections maintained by other potential parties to the hearing not as yet identified. Access to these collections of information includes access to structured data (bibliographic headers), unstructured data (full text files), and to image object files as provided by each of the participants.

The cost of these efforts is reflected in Section 2.6.1, below. The responsibility for implementing these efforts resides with non-NRC organizations and is not, therefore, included in the project management plan except to reflect the project team's efforts at coordination.

1.5 Stakeholders

As a web-based method of access to the combined collections, the LSN will be available to anyone who has access to the Internet/WWW. However, the system is generally intended to support the licensing process and therefore representatives of the parties to the proceeding likely should be provided with a mechanism for priority access to the LSN, especially during the discovery and motions practice phases. These stakeholders include:

- U.S. Department of Energy, Office of Civilian Radioactive Waste Management
- U.S. Nuclear Regulatory Commission
- State of Nevada
- Nye County, NV
- Tribal Interests/National Congress of American Indians (NCAI)
- Industry Coalition/Nuclear Energy Institute (NEI)
- Public/Nevada Nuclear Waste Task Force (NNWTF)
- Affected Units of Local Government (AULG)
 - Clark County, NV
 - Churchill County, NV
 - Esmeralda County, NV
 - Eureka County, NV
 - Inyo County, CA
 - Lander County, NV
 - Lincoln County, NV

- Mineral County, NV
- White Pine County, NV

Internal constituencies within NRC include:

- Office of Nuclear Materials Safety and Safeguards
- Office of the General Counsel
- Office of the Secretary of the Commission (SECY)

To the extent that the Yucca Mountain licensing becomes politically or procedurally contentious, additional stakeholders may include:

- Chairman and Commissioners of the Nuclear Regulatory Commission
- Office of Commission Appellate Adjudication (OCAA)

ASLBP has pursued a strategy of eliciting technical coordination among the parties and potential parties in the development of viable technical alternatives for the LSN. The results of this coordination are reflected in the technically viable solutions presented in Section 1.9 below.

1.6 Benchmarking / Redesign Review

1.6.1 Redesign

The LSN reflects an effort to streamline the way that the high-level waste repository licensing proceeding will be conducted. In the past, the license application hearing process was built around the classic “discovery” exchange of documents between parties. This largely manual process is paper intensive and time consuming. With this process, it is difficult to ensure that all parties’ relevant documents are publicly accessible or that the evidentiary collection used for exhibits submitted during the licensing process are complete. Because the decision schedule in the NWPA is ambitious and requires the Commission to make a decision more quickly than was possible in most contested reactor licensing proceedings, and because the repository licensing proceeding will be unique compared to the typical Commission reactor and materials licensing cases, the Commission recognized that significant changes in its procedural approach to the adjudicatory proceeding would be required.

Accordingly, the NRC FY 1998-1999 Operating Plan recognized the development of a web-based LSN was a significant information technology initiative for the agency. The objective of the LSN is to establish:

- an Internet-based method of accessing (search & retrieve) the records collections of the parties and potential parties to the licensing of a high level waste repository at Yucca Mountain;
- a mechanism to automate motions practice;
- a web-accessible official docket file for the proceeding; and

- the automated tools, policies, and procedures needed to ensure participant compliance with the availability and submission requirements found in 10 CFR Part 2, Subpart J.

The Commission amended the agency's Rules of Practice with Federal Register publication of a revised Subpart J on December 30, 1998. The revised rule allows the application of technological developments that have occurred since the original rule was adopted while achieving the original goals of facilitating the NRC's ability to comply with the schedule for decision on the license application and providing a means for a thorough technical review of the license application and equitable access to information for the parties to the hearing. The revised 10 CFR Part 2, Subpart J, took effect January 29, 1999.

In response to a recommendation by the Executive Council, in the July 9, 1999 SRM on SECY-99-114, the Commission directed that the ASLBP become the LSN business sponsor for the and assume responsibility for the LSNA.

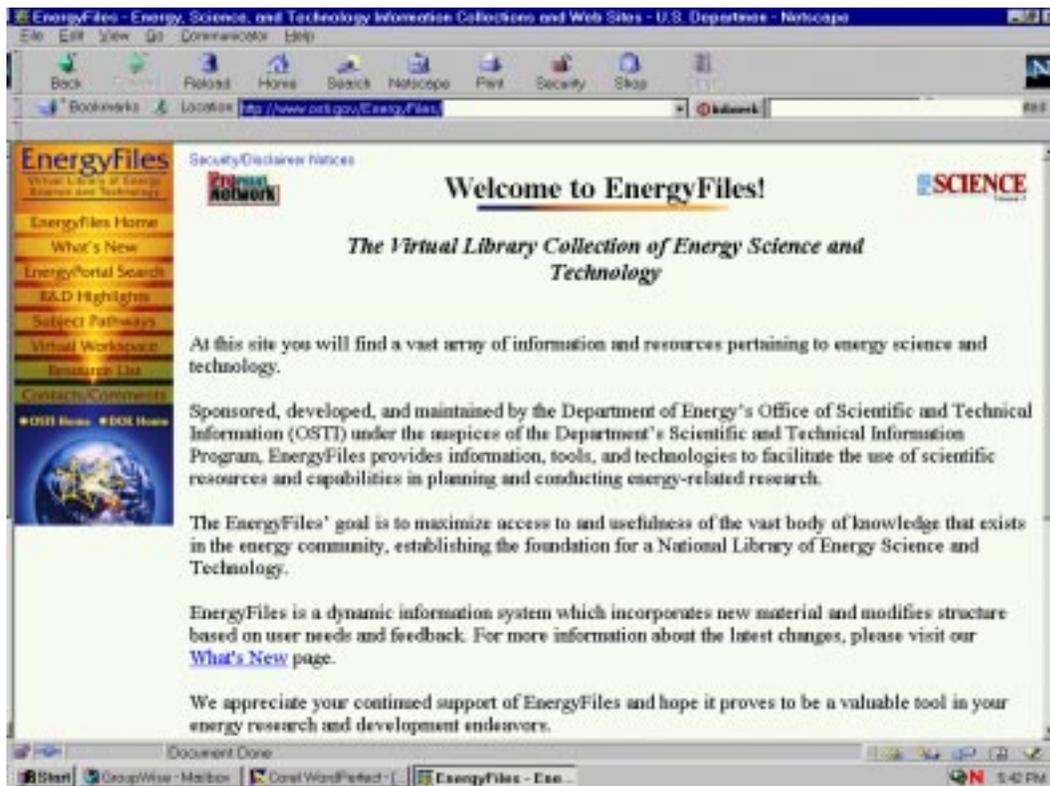
1.6.2 Benchmarking

The objective of the LSN is to facilitate the NRC's ability to comply with the schedule for decision on the repository construction authorization, to provide an electronic environment that facilitates a thorough technical review of relevant documentary material, and to ensure equitable access to the information for the parties to the hearing. For our benchmarking investigations, this translates into finding:

- relatively sophisticated search and retrieval software solutions
- that are web-based
- covering diverse collections of technical documentation
- that have been made uniformly accessible
- in a cost efficient, **non-customized** way,
- with an interface that is easy to use.

Background research immediately identified existing DOE systems that provided web-based access to diverse legacy documentary collections via a uniform user interface. The first location identified was the newly developed portal site to the DOE's Office of Scientific and Technical Information (OSTI). This website received a Hammer Award from Vice President Gore's National Partnership for Reinventing Government (NPR). A snapshot of the portal homepage is presented below. From that homepage one can navigate to "Energy Portal Search" to see the integration of multiple databases being accessed from a single location. The OSTI portal may be accessed at the following URL:

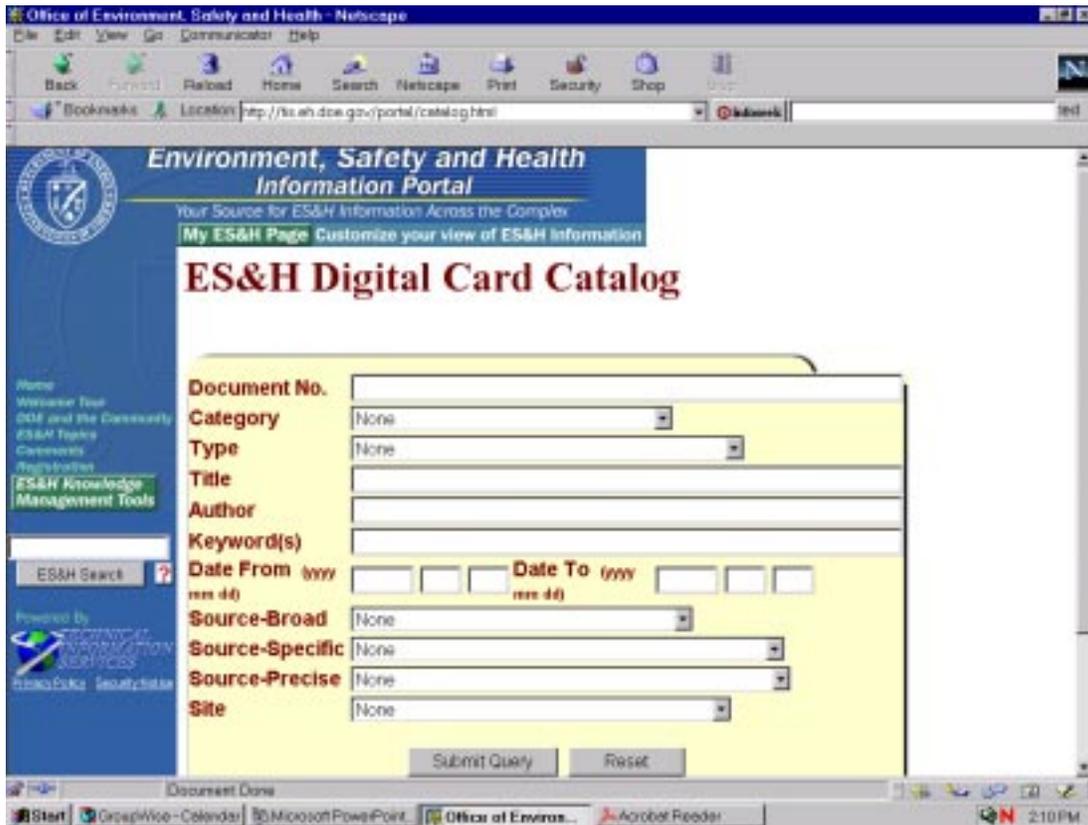
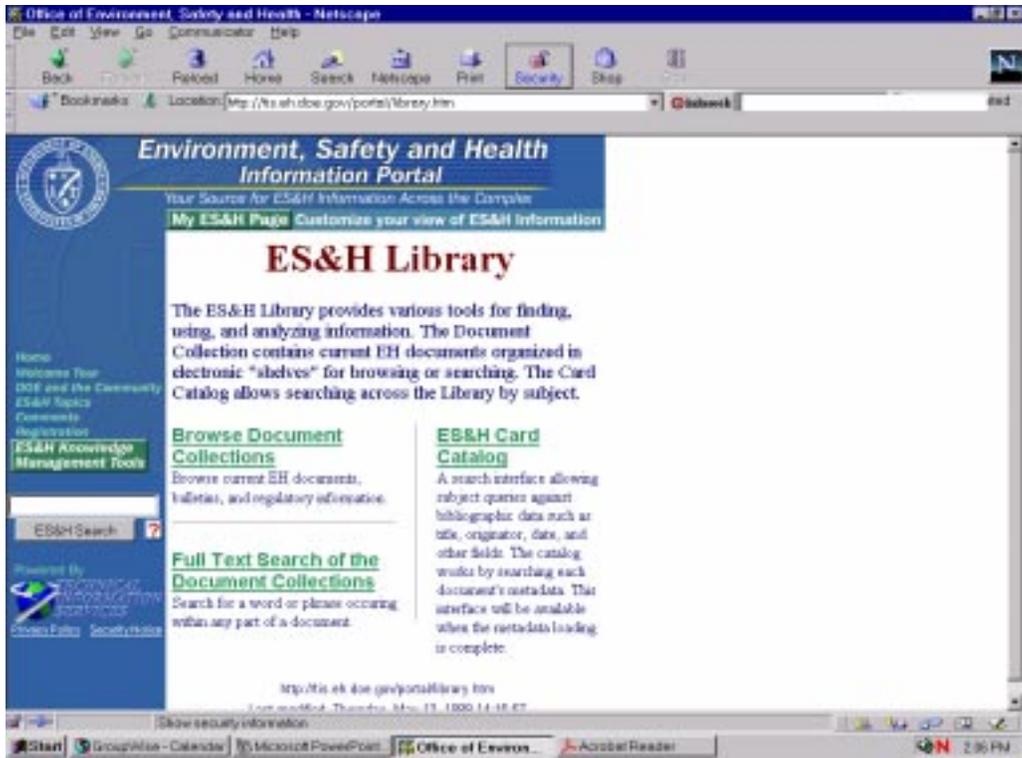
<http://www.osti.gov/EnergyFiles/>



Subsequent to identifying this location, another DOE organization - Environmental Safety & Health (ES&H) - was located which also utilized a portal software application. This application may be located at the URL:

<http://www.tis.eh.doe.gov/portal>

The following two screen shots present the homepage for this application and the screen that is used as a uniform search interface to multiple underlying databases. Note that it provides for both structured and text file search arguments.



Benchmarking was not performed against LSN's requirements for electronic document exchange because of our intention to rely on NRC's EIE infrastructure. Similarly, benchmarking was not performed against the requirements for making an electronic docket available because of our intention to rely on NRC's ADAMS infrastructure.

Review of the audit and compliance component was performed by consultant Labat-Anderson, Inc., in support of the LSNA and the TWG's development of candidate architectures. Attributes for this capability include solutions that:

- provide programs that visit Web sites and read their pages and other information to create entries for a search engine index
- use the hypertext links on each page to discover and read a site's other pages
- provide programs that then selectively create an index (sometimes called a "catalog") from the pages that have been read
- are programmable to identify documents at those sites that are new or updated against the maintained index
- examine other attributes of host server performance such as response time parameters.

We found that the software required to perform participant site auditing, specifically robots and spiders that would crawl the web and report changes, afforded the following choices:

- 1) a bare-bones package, requiring custom software code development to manipulate the raw data gathered into something meaningful, or
- 2) a package that already had most of this functionality built in.

The projected cost of custom development was far higher than the cost of the enhanced packages. This is discussed in greater detail in Section 2.5, Alternative 1.

1.7 Data, Functional, and Infrastructure Requirements

The data, functional, and infrastructure requirements associated with the LSN are derived from 10 CFR Part 2, Subpart J and also from the essential elements of an automated discovery system, that, in turn, feeds an electronic docket. DOE and NRC must make their materials available on the web beginning 30 days after DOE's submission of its site recommendation to the President of the United States. All other participants must make their documents available 30 days after congressional action on the site recommendation. Implicit in this time line is the need to provide the hardware and software defined by the selected design concept to the extent required to meet the functional requirements.

While the participant systems must make their relevant data available, Subpart J levies no additional specific performance requirements for data availability except to specify that the overall system design must be "efficient and effective." The criteria for efficient and effective is essentially performance based. If parties are unable to use the system, or if the system is slow or cumbersome, they have recourse through the NRC presiding officer who rules on such complaints and can impose requirements or appropriate sanctions on the applicant and other parties to the proceeding.

The following sections provide a summary of the identified requirements. The detailed requirements are contained in the document entitled "History of LSN Functional Requirements" included as APPENDIX G.

1.7.1 Data Requirements

Data used by the system resides on computer systems to be provided by the participants. It is comprised of structured data bibliographic headers, searchable full text, and images for those documents that are not text searchable. Data requirements for meeting the audit and compliance capability are met using the files and additional metadata characterizations extracted from files on the participant's servers and from usage log files of the participant servers themselves. This is discussed in greater detail in Section 2.5, under Alternative 1, LSNA Audit Capability.

Data volume will be a significant factor in determining whether a hardware and software architecture can be judged to be "efficient and effective." High and low data volume estimates are provided on the tables included in this section. These charts indicate that there could be significant variation in the number of documents that DOE will make available -- the result of conflicting reports made by various Department of Energy representatives over the past year. The high-end count is reflected in this document to follow a conservative approach to both system design and project costing.³

³ At the February 1998 Advisory Review Panel meeting, DOE represented that there were 742,000 documents [estimated 6,900,000 pages] in the OCRWM **program records** management system. During interviews with NRC's Office of the Inspector General (OIG) in the summer of 1999, DOE records management representatives claimed to have 700,000 pages of what they considered **relevant** material. Conversely, by September 1999, DOE reported to the LSNA that it planned on making 10,000 documents and 100,000 pages available for the externally accessible collection to **support its license application**. At the October 1999 TWG meetings, representatives stated that their total collection would consist of approximately 200,000 documents (1,860,000 pages).

HIGH ESTIMATE OF RELEVANT LSN PAGES as of February 15, 2000

Year	DOE Pages/Year	DOE Cumulative	NRC Pages/Year	NRC Cumulative	Others Pages/Year	Others Cumulative	Total Pages Added Yearly	Total Cumulative Relevant Pages
1999		4,000 k ⁴		306 k ⁵		90 k ⁶		4,396 k
2000	440 k	4,440 k	34 k	340 k	9 k	99 k	483 k	4,879 k
2001	488 k	4,928 k	37 k	377 k	10 k	109 k	535 k	5,414 k
2002	887 k	5,815 k	38 k	415 k	11 k	120 k	936 k	6,350 k
2003	1,015 k	6,920 k	77 k	492 k	12 k	132 k	1,194 k	7,544 k
2004	1,245 k	8,165 k	121 k	613 k	13 k	145 k	1,379 k	8,923 k
2005	1,306 k	9,471 k	119 k	732 k	14 k	159 k	1,439 k	10,362 k
2006	1,326 k	10,797 k	43 k	775 k	16 k	175 k	1,385 k	11,747 k
2007	864 k	11,661 k	46 k	821 k	17 k	192 k	927 k	12,674 k
2008	933 k	12,594 k	43 k	864 k	19 k	211 k	995 k	13,669 k
2009	1,008 k	13,602 k	46 k	910 k	21 k	232 k	1,075 k	14,744 k
2010	952 k	14,554 k	57 k	967 k	23 k	255 k	1,032 k	15,776 k

⁴ This estimate assumes that approximately 50% of currently stored DOE program-relevant (~8 million) pages may be relevant to the HLW licensing proceeding in accordance with the definition of "documentary material" in 10 CFR § 2.1001 of the LSN Rule when other participant requests are addressed by the presiding officer. {Note: The previous DOE page estimate to be stored through 1999 was over 7.3 million pages, applying a 50% relevancy factor.} Yearly additions (pages/year) for DOE and NRC are based on the yearly percentage increases used in the previous LSS input estimates. (Milestone date shifts have been taken into account).

⁵ It is estimated that there are 18,000 currently stored NRC program-relevant documents with an average of 17 pages per document. The high estimate conservatively assumes a highly contentious, multi-paneled licensing hearing with potentially unforeseen delays and extensions that will combine to take the equivalent of 2.5 years. Accordingly, hearing transcripts (~285 pages/day, 5 days/week, 48 weeks/year) and exhibit material (~1,000 pages/month) have been added into years 2003 - 2005 estimates.

⁶ It is estimated that approximately 6,000 program-related documents (~10 pages/document) are currently stored by other LSN participants and an additional 3,000 program-related documents (~10 pages/document) are stored by their consultants and contractors. Yearly additions are estimated at 10% per year.

**LOW ESTIMATE OF RELEVANT LSN PAGES
as of February 15, 2000**

Year	DOE Pages/Year	DOE Cumulative	NRC Pages/Year	NRC Cumulative	Others Pages/Year	Others Cumulative	Total Pages Added Yearly	Total Cumulative Relevant Pages
1999		100 k ⁷		306 k ⁸		60 k ⁹		466 k
2000	11 k	111 k	34 k	340 k	6 k	66 k	51 k	517 k
2001	12 k	123 k	37 k	377 k	7 k	73 k	56 k	573 k
2002	22 k	145 k	38 k	415 k	7 k	80 k	67 k	640 k
2003	28 k	173 k	77 k	492 k	8 k	88 k	113 k	753 k
2004	31 k	204 k	121 k	613 k	9 k	97 k	161 k	914 k
2005	33 k	237 k	39 k	652 k	10 k	107 k	82 k	996 k
2006	33 k	270 k	43 k	695 k	11 k	118 k	87 k	1,083 k
2007	22 k	292 k	46 k	741 k	13 k	142 k	81 k	1,164 k
2008	23 k	315 k	43 k	784 k	14 k	156 k	80 k	1,244 k
2009	25 k	340 k	46 k	830 k	16 k	172 k	87 k	1,331 k
2010	24 k	364 k	57 k	887 k	17 k	189 k	98 k	1,429 k

⁷ This estimate is the minimum number of relevant web pages that DOE currently intends to make available based on its understanding of what is "documentary material" under Subpart J. Yearly additions (pages/year) for DOE and NRC are based on the yearly percentage increases used in the previous LSS input estimates (Milestone shifts are taken into account).

⁸ It is estimated that 18,000 currently stored NRC program-relevant documents have an average of 17 pages per document. For the low estimate, it is assumed that the licensing proceeding will take 1.5 years. Accordingly, hearing transcripts (~285 pages/day, 5 days/week, 48 weeks/year) and exhibit material (~1,000 pages/month) have been added into years 2003 - 2004 estimates.

⁹ It is estimated that approximately 6,000 program-related documents (~10 pages/document) are currently stored by other LSN participants. Yearly additions are estimated to be 10% a year.

1.7.2 Functional Requirements

The following paragraphs provide a summary of the functional requirements for the four LSN components described in Section 1.4 plus the functionality required from all participant systems, including the NRC's high-level waste document collection. Functional requirements are presented in APPENDIX A.

1.7.2.1 Internet-based Access Core Functionality

The core functionality of the system is to provide a system that:

- provides shared access to documentary material
- provides timely, effective access, search, and retrieval for large collections of diverse documents
- identifies where associated images are easily located
- provides unique document ID across the enterprise (electronic equivalent of a Bates #)
- provides priority access during key phases of the licensing process
- delivers documents into the NRC docket file
- assures integrity of exchanged documents
- allows LSNA to document integrity of participant collections
- ensures uninterrupted performance over at least a three-year licensing time frame

1.7.2.2 Audit System

The LSNA is the individual within NRC responsible for coordinating access to the data via the LSN and for ensuring the integrity of data available on it. The LSNA provides technical support to the Pre-Application Presiding Officer verifying substantial and timely compliance with the requirements in 10 CFR § 2.1003 regarding availability of material in electronic form. Additionally, the LSNA is responsible for monitoring and coordinating the ongoing integrity of the data that has been made available. To accomplish this mission, the LSN will have an audit and reporting capability to independently monitor system activities of the LSN site and the underlying participant collections.

To ensure the ongoing availability of data, component subsystems such as the participants' servers and the LSN server site must be made available to the LSN audit system for collection of server activity associated with posting, modification, and deletion activities as well as server performance data in responding to requests for files. The audit system will provide authorized individuals the ability to monitor participants' document server performance in providing requested object files (such as for images associated with previously retrieved text).

Component subsystems such as the participants' servers and the LSN server site must also be made accessible to the audit system to enable it to record all activity (accounting) associated with posting, modification and deletion activities conducted on each underlying document collection's bibliographic, text, and image files.

1.7.2.3 Docket File Functionality

The LSN is intended to support the hearing process and the NRC resources established for maintaining licensing dockets. The LSN provides no resources to accomplish the docketing process within NRC, but still must integrate with the NRC docket.

In its management of the official docket, SECY must provide a docket that receives, stores, distributes, and maintains documents. A separate pre-license application docket will provide similar capabilities. In addition to the official docket, there is a requirement to provide a Protective Order File. Moreover, consistent with the original LSS requirements, unavailability of the electronic docket for more than four hours in any day must be communicated back to the presiding officer so that the day is not counted in the computation of time. Case management capabilities associated with the docket include transcript and deposition exhibit management.

1.7.2.4 Electronic Information Exchange Functionality

Each participant must utilize a secured, electronic process by which all filings are able to be submitted/received electronically to comply with service requirements.

NRC resources must support motions practice, i.e., the process of formally communicating, submitting, and responding to legal submissions that is conducted between the parties and the presiding official. This is the mechanism whereby all filings are able to be submitted/received electronically. NRC will provide this mechanism -- Electronic Information Exchange (EIE) -- for participants to use for all their motions practice. The NRC also can receive electronically transmitted depositions via EIE and enter them into the docket file. Similarly, the presiding officer's issuances and orders will also be transmitted electronically via EIE.

This core capability provides a means to authenticate transmitted files in support of motions practice. NRC has established a separate, agency-wide EIE capability that ensures the integrity of files being transported across the Internet. The LSN site and the participants to the Yucca Mountain licensing proceeding must be able to utilize this existing NRC capability, which is based on PureEdge™ (formerly UWI™) forms and Verisign™ digital signaturing software. The NRC procedure provides a mechanism whereby all filings can to be submitted/received electronically and incorporates password security code techniques as part of the digital signature certificate issuance procedure, including digital signaturing technologies for transmission of documents. The NRC procedure should provide a mechanism to deliver all answers, orders, and decisions in accordance with 10 CFR § 2.1013(c) [e.g., electronically, using a secure process].

1.7.2.5 Participant System Functionality

Each participant (including NRC) must meet core requirements for making their documentary materials available and for providing the computerization necessary to comply with the Subpart J provisions for document production and service. These include requirements for providing structured data bibliographic headers and searchable text of its documentary material and a description of where an authenticated image of the document may be obtained. Where text is not available, the image must be made available online in lieu of the text file. Structured data bibliographic headers are required for items not suitable for image or text. Similarly, structured

data bibliographic headers are required for privileged, confidential, safeguards, and other types of limited access documents.

Participants must demonstrate substantial and timely compliance with key Subpart J procedural requirements to be granted party status in the subsequent licensing adjudication. These include requirements that participants follow document and data format standards for providing electronic access and that they follow procedures and standards for motions practice.

Participants also must designate an official responsible for administering their computer system to make their documents available. Section 2.1009 of 10 CFR makes this official responsible for, among other things, establishing procedures to make that participant's documents available, to ensure that each of the participant's documents has a unique ID, and to train the participant's staff on how to make their documents available. The rule also requires participants to have this designated official certify that procedures have been implemented, that documentary material has been made electronically available, and to update these certifications at 12-month intervals.

DOE, as the applicant, must submit the license application to the docket in electronic form.

1.7.3 Infrastructure Requirements

The issue of infrastructure requirements has been examined from two perspectives. The first is the configuration and connectivity of this web-based application; the second is its integration with other NRC infrastructure components such as ADAMS.

LSN Infrastructure for White Flint Installation -- If installed at the NRC, equipment needed for the LSN may include a server device to act as a host machine for the LSN webpage and a server device to act as the audit data capture and analysis resource. Each of these server devices will require additional storage capabilities that vary based on the ultimate solution (one of three alternatives being evaluated contemplates substantial RAID capability). Each of these devices will require a robust backup and recovery capability to ensure uninterrupted access to the participants, especially during the hearing phase of the licensing proceeding. Each of these server devices also will require equipment to support connection with the NRC LAN/WAN infrastructure.

Housing the LSN at an off-site location was examined in a sensitivity analysis. The infrastructure requirements are essentially the same, with the exception of connectivity with the NRC LAN/WAN infrastructure. If housed externally, NRC's external server is accessed via the web by the LSN as a guest account. Impact on the NRC infrastructure likely would be negligible if the application is outsourced for operations to a Virtual Private Network (VPN) or Application Service Provider (ASP) such as UUNet.

LSN Interaction with Other NRC Infrastructure -- The ADAMS external library server must be available to be "crawled" by the LSN during scheduled update sessions. Special attention will be required in implementing web "crawler" access through the NRC firewall to the ADAMS external server.

The ADAMS hearing docket will generate increased access by external users. Cataloging of submitted materials going into the SECY docket files will generate

increased volumes of documents and likely will require additional resources (staff and equipment) to process them.

NRC's current telecommunications infrastructure is deemed adequate to support connectivity of the configurations noted above. The PC equipment to be utilized by the LSNA technical staff will require high-end processors and large display monitors.

1.8 Interfaces With Other Systems

The LSN intrinsically interfaces with participant systems, with the ADAMS electronic docket established to support agency adjudications, and with file transfer mechanisms that will be used to support electronic filings.

Interface With NRC's ADAMS System -- ADAMS makes the agency's publicly available official record material available on an Internet accessible file server and an electronic document management system with structured and unstructured data storage, search, and retrieval capabilities. NRC's high level waste related documents must be identified and aggregated into a directory or library area at that URL location and must be made available. With this need to open the ADAMS external server to a "crawler," detailed technical interaction between the OCIO and LSN integrators will be required.

ADAMS contains, in both its internal/non-web-accessible and externally accessible collection, directory areas dedicated to licensing docket files. The LSN will utilize this capability to meet the docket requirements of 10 CFR Part 2, Subpart J. At a minimum, the docket file location will be the target URL/directory for a uni-directional hot-link from the LSN homepage to provide users with single-click access to the docket.

Unstructured data files, including image files, must be importable from the LSN discovery collections into the ADAMS docket collection, with the ADAMS docket collection providing some mechanism to capture and store in an ADAMS profile record the unique LSN accession number, perhaps by including it in the existing "Document/Case Number" field in ADAMS.

Interface with NRC's Electronic Information Exchange (EIE) Infrastructure -- NRC's EIE infrastructure will be used to meet secure transmission requirements for motions practice during the licensing proceeding. Little, if any, additional integration is anticipated.

Interface with Participant Systems -- Department of Energy -- The Department of Energy anticipates developing their document access system on a UNIX platform with C2Net's Apache/Stronghold and utilizing Fulcrum as the text search engine.

Interface with Participant Systems -- State of Nevada -- The State of Nevada has not provided information on their automation plans.

Interface with Participant Systems -- Nye County, NV -- Nye County hosts their current website on America On Line (AOL).

Interface with Potential Participant Systems -- Clark County, NV -- Clark County uses Windows NT Server 4.0 (IIS 4) with Infoseek and Excite search engines.

Interface with Potential Participant Systems -- Lincoln County, NV -- Lincoln County uses Windows NT Server 4.0 (IIS 4) with Asp MS Access search engines.

Interface with Potential Participant Systems -- White Pine County, NV -- White Pine County uses Windows NT Server 4.0 (IIS 4) with Asp MS Access search engines.

Interface with Potential Participant Systems -- AULG's on a Shared County Host -- A number of the participant counties have expressed an interest in sharing resources. The platform for this system has not yet been identified.

Interface with NCAI, Industry, Citizen Advocacy Groups -- These organizations have not yet identified their intended hardware and software platforms.

Interface with Potential Participant Systems -- It should be anticipated that parties not yet identified will petition to intervene in the licensing proceeding. Once the LSN is established, it will be incumbent upon those participants to conform their system capabilities to those that have been established and made operational in the LSN final configuration.

1.9 Potential Solutions

The LSNARP TWG, which is comprised of computer technology representatives from the LSNARP's members, was chartered at the first LSNARP meeting in October 1999 to examine potential alternative computer system solutions in-depth and report back to the Panel. The TWG evaluated the following five alternative solutions for a web-based system.

- ① **SIMPLIFIED** - *Link Everyone's System URL*
- ② **MODERATE** - *Central Search Interface*
- ③ **PORTAL FED BY DISTRIBUTED PARTICIPANT WEB SITES** (*remote storage*)
- ④ **PORTAL FED BY DISTRIBUTED PARTICIPANT WEB SITES ON A SINGLE CAMPUS** (*proximate storage*)
- ⑤ **PORTAL WITH ENHANCED CENTRAL STORAGE FED BY DISTRIBUTED PARTICIPANT WEB SITES**

Alternatives 1 and 2 were not recommended by the TWG. Alternatives 3, 4, and 5, all variants of Internet "portal" technology, were recommended by the TWG. This technology supports the gathering and organizing of large amounts of data from legacy systems scattered across multiple locations. It presents this information to users in an easy-to-use, customizable, browser-based interface.

At the February 2000 LSNARP meeting, at the request of several of the LSNARP members, all five of the alternatives that the TWG studied were presented to the LSNARP. Although there was consensus by the LSNARP against further consideration of Alternative 4, a proposed solution requiring all parties to co-locate their computers, the Advisory Panel's deliberations resulted in no further affirmative consensus on a recommendation for a design alternative. No LSNARP representative voted for or supported Alternative 2, which involves a central site that would perform searches by interfacing with the various search engines on the individual participant web sites.

In connection with the other three alternatives, DOE and the NNWTF expressed strong sentiment in favor of Alternative 1. Similarly, the State of Nevada favored Alternative 1 but also endorsed Alternative 3 if the LSNA concluded this approach was necessary for full compliance with 10 CFR Part 2, Subpart J. Nye County initially was in favor of Alternative 1, but subsequently revised its vote in favor of Alternative 5.

Alternative 1 makes each participant responsible for creating its own web site and providing its own search engine, with NRC principally responsible for maintaining an LSN web site with links to participants' sites. The TWG noted that this solution, although likely to have the least initial NRC expense of the five alternatives, would neither provide a uniform, centralized document search and retrieval capability nor a centralized information indexing system. Additionally, the TWG pointed out that this architecture does not provide a "priority access" system for parties or their counsel and could significantly increase NRC costs for monitoring the integrity of participant databases.

The LSNA, who also serves as the NRC's representative to the LSNARP, voted for Alternative 3. That proposed solution represents the lowest cost alternative of the three portal architectures recommended by the TWG. Alternative 3 employs "portal" technology in which software controlled by the LSNA would periodically "crawl" the other participants' web sites and create a central index of all participant database documents that would be accessible through a central search engine at the LSNA-maintained web site. When a user requests access to documents identified in a search, the portal obtains the files over the Internet from the server at the individual participant web site where the document resides. Alternative 3 provides a single user interface and allows creation of a priority user system to address denial of service problems that otherwise might arise in the event of heavy public usage or hacker attacks.

As mentioned above, Nye County revised its initial vote and now favors Alternative 5. The LSNARP representative of the affected units of local government (AULG) requested additional time to caucus its members because not all of its members were present at the meeting. As of this writing, there is no internal consensus within the local government group, with sentiment being expressed for Alternatives 1, 3, and 5. Under Alternative 5, the LSNA-maintained "portal" web site would not only have a central document index and search engine, but also would have copies of all participant documents to respond to searches, thus making it unnecessary to deliver documents from the individual participant sites for presentation to the user. Although Alternative 5 has some potential system performance advantages, it also substantially increases the system costs to the NRC because of the significant electronic storage capacity it requires. Conversely, however, it lowers the cost to the other participants who need only make files available for initial LSN loading and, like Alternative 3, does not necessarily impose the requirement for participants to provide search engine controls at each of their sites.

For the purposes of this Capital Planning and Investment Control Analysis, the three alternatives that had some level of participant interest were subjected to an in-depth analysis. These are:

Alternative 1: Linked - Simple Homepage with Pointers to Other Homepages (Strong Participant Interest)

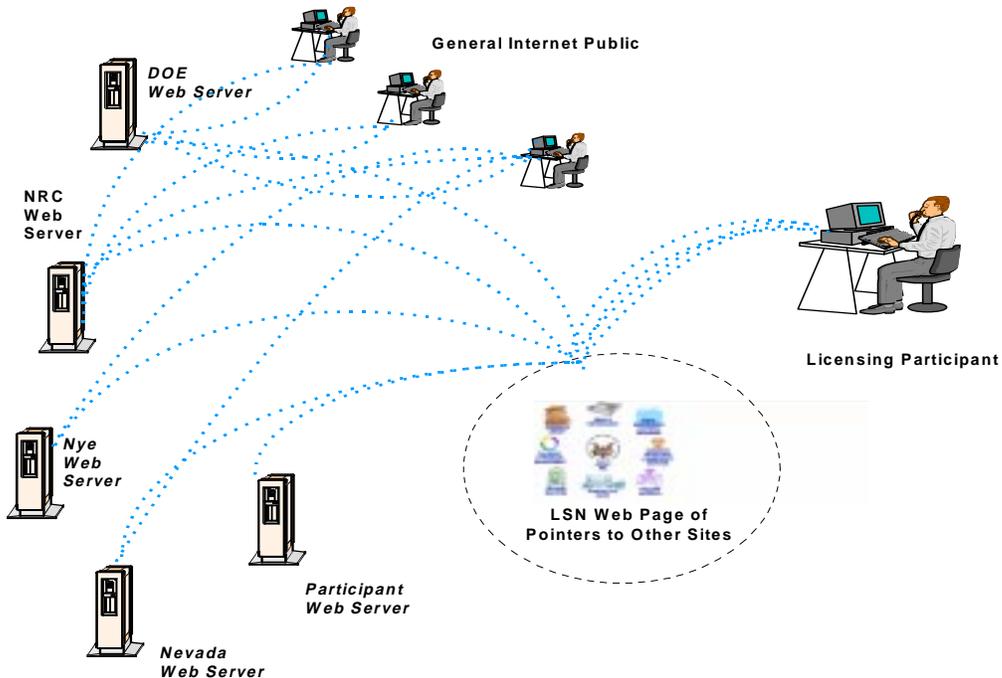
Alternative 3: Distributed - Portal with Comprehensive Interface with Files Delivered by Participant Sites (LSNA Recommendation and Some Participant Interest)

Alternative 5: Consolidated Storage - Portal with Comprehensive Interface with Participant Files Copied to a Central Store Operated by LSN (Some Participant Interest)

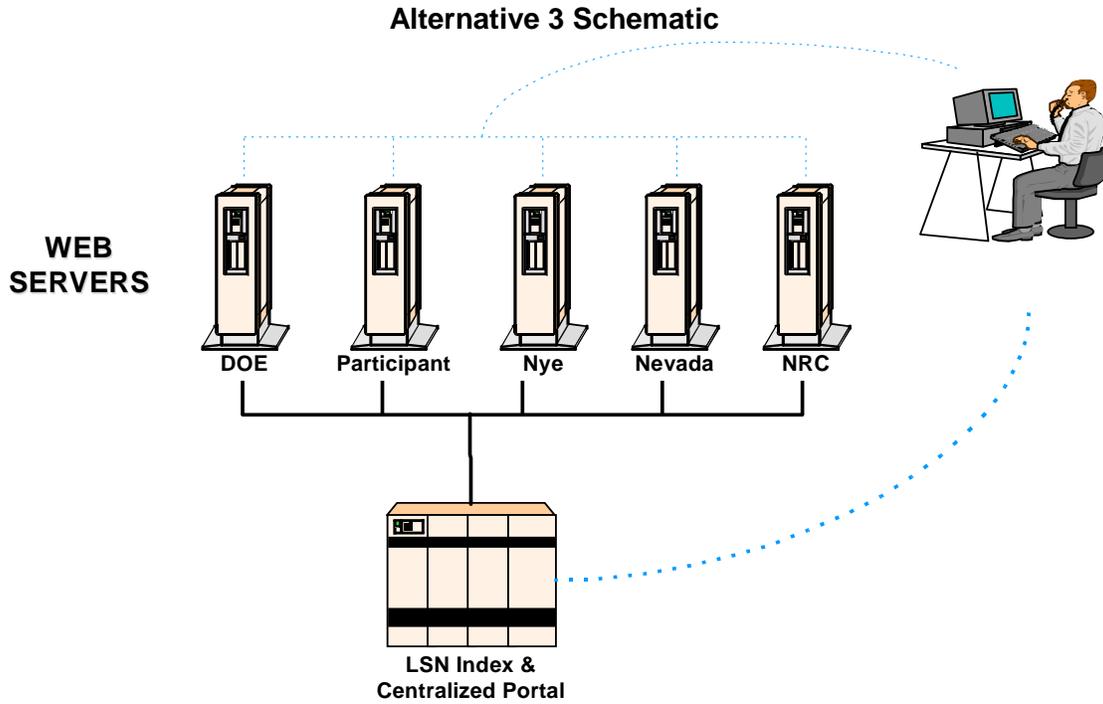
The three final design alternatives share many characteristics; however, they differ in important ways, most significantly in the areas of (1) the ability of the LSNA to exert management control over the overall LSN; (2) the burden placed on participants to fund, create, and manage their sites; and (3) the overall cost to the NRC for the “home site.” A graphic depiction of each alternative is presented on the following pages. A detailed description of each is included in “Discussion of LSN Design Alternatives” that is provided as APPENDIX H.

In Alternative 1, the homepage simply carries links to other parties’ home pages and licensing participants directly access those sites just as would any other general user of the Internet. Search and retrieval processes are conducted using the tools provided at each individual site.

Alternative 1 Schematic



Alternative 3 provides a centralized search engine and interface and the participants' file servers deliver the documents.



Alternative 5 also provides a centralized search engine and interface, but the portal also retains a copy of each document that resides on the participants' file servers, thus providing redundancy and quicker response.

