

APPENDIX C

LICENSING SUPPORT NETWORK (LSN) ALTERNATIVES BENEFITS

Comparison

In the case of all three alternatives, certain benefits are inherent because of the distributed nature of web-based systems.

Independent operation of various sub-components allows partial functionality in the case of system and/or network outages.

Similarly, under all three alternatives, the system can be more easily reconfigured or extended without disruption to the system as a whole. Since the design emphasis is on the interfaces between distributed stand-alone systems, another stand-alone system (with the correct interface) can be "plugged-in" as an additional component. For example, midway through LSN implementation, a participant may find that the initial server selected for implementation cannot handle its entire documentary collection. In distributed architectures, that participant can obtain another server rather than have to start from scratch with a larger machine.

Additional functionality for participant sites is possible. Participants may choose to publish information on their LSN web site that is not part of the LSN (in that it does not relate to the high-level nuclear waste repository licensing process).

Individual participants, or groups of participants, assume all responsibility for publication of their documents and have a well-defined point at which this publication can be assessed for compliance, i.e., their web site interface.

Spreading the resources available for implementation over multiple sites usually shortens the roll-out period. The "many hands make light work" principle applies (even though there may actually be more work in total).

Conversely, there are meaningful distinctions within the three design alternatives as noted below.

Qualitative evaluations for each of the three alternatives are presented below.

Alternative 1

Qualitative Benefit Table - Alternative 1		
	Rating 1 - High Level of Benefit 2 - Medium Level of Benefit 3 - Low Level of Benefit	Comment
Ability for LSNA to Exercise High Level of Control	3	This alternative involves a distributed architecture with participants sites under local control. Therefore, it will be difficult for the LSNA to maintain systematic controls.
Ability for LSNA to Ensure Overall Configuration Performance	3	The LSNA will be unable to respond quickly to performance problems.
Reduced Participant Burden to Exercise Controls	3	Participants must implement within highly structured guidelines and procedures and be heavily audited.
Reduced Participant Burden to Ensure Performance	3	Participants shoulder the burden for maintaining their operation at a high level of availability and performance.
Reduced Participant Need to Provide Computer/Expertise	3	Participants must have a high level of computer operations expertise.
Increased User Flexibility to Tailor Desktop/Interface	3	This alternative is inflexible and users will have no ability to tailor their desktop interface.
Increased Ease of Use	3	The system will be difficult to use because each collection/server will have a different interface.
Ability to Ensure Unique and Uniform Document Numbering	3	There is no built-in uniform numbering system. This process must be delegated to the participants to implement, introducing the possibility for error.
Improved Consistency of Search Results	3	Since there will be no standardization of participant search and retrieval tools, search results may be inconsistent.
Ability to Ensure Required System Availability	2	Even if one participant's site goes down, other sites are available for searching. If it is DOE's site that goes down, however, it takes 85% of the discovery documents off-line.
Ability to Provide Required Response Time and Performance	3	The response time performance is variable from system to system. The overall system performance is variable.
Ability to Provide Priority Access	3	This alternative does not allow for priority access. Licensing users will be competing against all users on the Internet for access to servers where the file collections are housed.
Average Benefit Rating	2.9	

Alternative 1 is characterized as being of low benefit in delivering efficient and effective access to users. Identified benefits are primarily its ability to ensure required system availability when the system initially goes operational and to ensure availability to users on an ongoing basis thereafter.

Initial Availability -- Because there is no extensive integration, there is a moderate benefit to having the LSN homepage, ADAMS docket, and EIE available for licensing under this approach. To the participants, there is a moderate benefit because parties with smaller collections can meet availability requirements relatively quickly; however, some of this benefit may not accrue because of the size of the DOE collection and questions about the speed at which its collection can be populated.

Operational Availability -- Benefit accrues insofar as large text and image files reside on participant maintained storage devices, which provides a “multi-pathway” capability. This spreads out bandwidth impacts to some degree, especially to the small and mid-size participants. Additionally, if one participant is “down,” the rest are still available although less benefit accrues than would be expected because if the party that is not available is DOE, 85% of the evidentiary collection becomes inaccessible.

Alternative 3

The qualitative benefits associated with Alternative 3 are presented in the following table:

Qualitative Benefit Table - Alternative 3		
	Rating 1 - High Level of Benefit 2 - Medium Level of Benefit 3 - Low Level of Benefit	Comment
Ability for LSNA to Exercise High Level of Control	2	Audit capabilities are good but participant servers' log capabilities are variable.
Ability for LSNA to Ensure Overall Configuration Performance	2	Control provided for search and retrieval but not file delivery and bandwidth
Reduced Participant Burden to Exercise Controls	2	This alternative requires some participant coordination and integration (e.g., when the site gets crawled) but flexibility exists.
Reduced Participant Burden to Ensure Performance	2	Participants still are responsible for ensuring file delivery and bandwidth, but the portal provides some availability features.
Reduced Participant Need to Provide Computer/Expertise	2	This alternative reduces, but does not eliminate the need for participants to perform system administration and data management functions.
Increased User Flexibility to Tailor Desktop/Interface	1	This alternative is very flexible for users and allows them to customize their desktop and interface.

Qualitative Benefit Table - Alternative 3		
Increased Ease of Use	1	The single, uniform query interface provided in this alternative prevents users from having to learn multiple software environments.
Ability to Ensure Unique and Uniform Document Numbering	1	In this alternative, the portal software automatically assigns unique, uniform numbering.
Improved Consistency of Search Results	1	This alternative provides search results consistency and normalization.
Ability to Ensure Required System Availability	2	Search and retrieval is redundant at both portal and participant sites, but file delivery is contingent on the participant server availability.
Ability to Provide Required Response Time and Performance	2	Fetching text and image files is constrained in this alternative and relies on the ability of participants to deliver files from their servers.
Ability to Provide Priority Access	1	This alternative includes the capability to provide priority access to participants.
Average Benefit Rating	1.4	

Alternative 3 is characterized as adding significant qualitative value over Alternative 1, but being somewhat less beneficial than Alternative 5. Qualitative value is evidenced in the number of tools which it provides to help the LSNA and the participants tune overall system performance. This alternative also evidences strong value to prospective users by reason of the standardization and controls provides. Finally, it delivers high benefit given its ability to help meet unforeseen developments in the hearing process.

Performance -- This approach provides a high level of benefit in the area of system availability because the portal and participant sites are independently available and thus provide search and retrieval redundancy should either the portal or the participant site become unavailable. Additionally, having large text and image files reside on participant maintained storage devices provides a “multi-pathway” capability, thereby spreading out bandwidth impacts to some degree. Portal software provides LSNA with controls for search tools and access, design of interface, and system security. This allows the LSNA to monitor and tune system search and retrieval performance whenever general users are accessing collections via the portal site. It also provides capability to provide priority access to participants.

Standardization -- This alternative utilizes software that automatically assigns unique, uniform numbering. It delivers a single, uniform query interface that spares users from having to learn multiple software environments. It provides search result consistency and normalization.

Adaptability -- The software environment is very flexible, allowing users to customize the desktop and interface to meet their information needs while matching their skill levels. In a larger sense, because it is built upon a DBMS environment, it provides a

richer and more powerful system engineering capability to enhance or expand the system should that be required by developments occurring during the licensing proceeding.

Of the alternatives (Alternatives 3 & 5 only) that meet the needs of a complex discovery system and were recommended by TWG, this represents the lowest cost for NRC. This is, in part, because the portal software does double duty in managing the data used in the auditing process.

Alternative 5

The qualitative benefits associated with Alternative 5 are presented in the following table.

Qualitative Benefit Table - Alternative 5		
	Rating 1 - High Level of Benefit 2 - Medium Level of Benefit 3 - Low Level of Benefit	Comment
Ability for LSNA to Exercise High Level of Control	1	Provides all the data and tools needed for LSNA to perform audit and compliance function. The software does double duty.
Ability for LSNA to Ensure Overall Configuration Performance	1	Provides LSNA with controls for search tools and access, design of interface, and system security. This allows the LSNA to monitor and tune system performance.
Reduced Participant Burden to Exercise Controls	1	Participants have no responsibility for exercising controls except for change notification within a five-day window.
Reduced Participant Burden to Ensure Performance	1	Participants have no responsibility for ensuring performance except during initial "crawling" or loading.
Reduced Participant Need to Provide Computer/Expertise	1	Participants could put files on externally accessible server until successfully crawled and then remove them and place the next batch out using automation with little human intervention.
Increased User Flexibility to Tailor Desktop/Interface	1	This alternative is very flexible for users and allows them to customize their desktop and interface.
Increased Ease of Use	1	The single, uniform query interface provided in this alternative prevents users from having to learn multiple software environments.
Ability to Ensure Unique and Uniform Document Numbering	1	In this alternative, the portal software automatically assigns unique, uniform numbering.

Qualitative Benefit Table - Alternative 5		
Improved Consistency of Search Results	1	This alternative provides search results consistency and normalization.
Ability to Ensure Required System Availability	2	Operational milestone is very difficult to accomplish because of customized nature of mass storage. Once operational, central dispatch for maintenance makes for quicker, coordinated response, but relies more heavily on LSN server/storage to ensure ongoing availability.
Ability to Provide Required Response Time and Performance	1	This alternative has the most predictable response characteristics because it provides central control on both file servers and Internet bandwidth for text and image delivery.
Ability to Provide Priority Access	1	This alternative provides the capability to provide priority access to participants.
Average Benefit Rating	1.0	

Alternative 5 is characterized as adding significant qualitative value over Alternative 1 and being of the highest benefit of the three alternatives studied. Like Alternative 3, Alternative 5 evidences qualitative value in the amount of tools which it provides to help the LSNA and the participants tune overall system performance. It also evidences strong value to prospective users as a result of the standardization and controls it provides. Like Alternative 3, it also delivers high benefit by reason of its ability to help meet unforeseen developments in the hearing process. Finally, this approach provides some potential benefit to the participants by decreasing the level of ongoing professional support.

Performance -- This approach provides a very high level of benefit in the area of system availability. It provides this benefit, and the most predictable response characteristics, because it caches complete copies of all documents thus providing central control on both file servers and Internet bandwidth for text and image delivery. Therefore, aggregate performance will likely improve, and will certainly be more predictable in contrast to the performance of distributed systems that is generally more variable. Developing the system in a central campus means that only one telecommunications feed will need the higher bandwidth, minimizing the set of connections needed, localizing the area, and requiring dedicated lines. If bandwidth is inadequate, the LSNA can promptly respond to acquire the needed bandwidth. Performance enhancement is easier to accomplish via a campus approach, especially if the portal server is modular and multi-processor based. Finally, from a system administration point of view, it is the easiest environment in which to remediate availability problems experienced by users because remediation is effected by a single source, the LSNA.

As with Alternative 3, portal software provides LSNA with controls for search tools and access, design of interface, and system security. This allows the LSNA to monitor and tune system search and retrieval performance whenever general users are accessing

collections via the portal site. It also provides capability to provide priority access to participants.

Standardization -- This alternative utilizes software that automatically assigns unique, uniform numbering. It delivers a single, uniform query interface that spares users having to learn multiple software environments. It provides search result consistency and normalization.

Adaptability -- The software environment is very flexible, allowing users to customize the desktop and interface to meet their information needs while matching their skill levels. In a larger sense, because it is built upon a DBMS environment, it provides a richer and more powerful system engineering capability to enhance or expand the system should that be required by developments occurring during the licensing proceeding.

Participant Commitment -- Technical expertise required by participants is lessened (but greatly increased at the LSN campus site). Participants will not necessarily have to be webmasters or acquire webmaster services whereas in the other two alternatives, web site maintenance capability will have to be in-house or acquired. Enhanced central storage imposes the lowest cost burden to the participants in terms of system administration and data management, and might, for example, lessen the participants' requirement to implement rigorous backup and disaster-recovery procedures (since the central storage facility would be an implicit backup). However, this does not relieve participants from their responsibility to provide and preserve the "true copy" of a document.