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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
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Office of Nuclear Material Safety and Safeguards
Division of High-Level Waste Repository Safety
Mail Stop (EBB-2-B02)
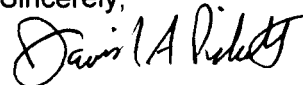Washington, DC 20555-0001

SUBJECT: Intermediate Milestone 14002.01.441.132—Using SharePoint to Support
Development of a Technical Evaluation Report—Letter Report

Dear Mr. Stablein:

This letter transmits the subject report, which is part of the knowledge management activities for
the high-level waste repository safety program. The title changed to Knowledge Captured From
Using SharePoint to Support Program or Project Execution. This report assesses experience
using SharePoint software to support the Yucca Mountain licensing program and documents
knowledge captured from that experience. This captured knowledge is presented with the intent
to facilitate SharePoint use in support of other U.S. Nuclear Regulatory Commission programs
or projects.

Please advise me of the result of your programmatic review. If you have any questions
regarding this paper, please contact me at (210) 522-5582 or Mr. Pat Mackin at
(210) 522-5054.

Sincerely,

David Pickett, Ph.D.
Senior Program Manager
Integrated Spent Fuel Regulatory
Program—Geologic Disposal

DP/ar
Enclosure

NRC		CNWRA Letter Only	SwRI
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REPORT OF KNOWLEDGE CAPTURE ACTIVITY

KNOWLEDGE CAPTURED FROM USING SHAREPOINT TO SUPPORT PROGRAM OR PROJECT EXECUTION

Relevance of Topic to Knowledge Capture

The U.S. Nuclear Regulatory Commission (NRC) staff use Microsoft® SharePoint® for a variety of purposes. SharePoint licenses cost approximately $20 for each user (in 2010). Therefore, when considering the entire agency, these licenses are a substantial NRC resource commitment. Consequently, documenting knowledge captured from SharePoint use can validate the expenditure of resources; justify and facilitate the expanded use of this software, if appropriate; and enable future SharePoint users to benefit from lessons learned from SharePoint applications.

SharePoint has a wide range of features and capabilities. The full range of SharePoint capabilities and flexibility is not likely to be needed for any individual program or project. Carefully tailoring the selection and use of these features and capabilities to the needs of a specific program or project can promote rapid training for users, acceptance by users, ease of use, and task effectiveness. Therefore, capturing knowledge from tailored applications of SharePoint can help ensure its effective future use and support decisions as to whether SharePoint is an appropriate support tool for any specific program or project.

The NRC regulatory process demands close control of access to and release of sensitive unclassified nonsafeguards information (SUNSI), reliable document configuration management, efficient work flow, careful attention to records retention requirements, and occasional implementation of legal privilege or legal hold orders. Additionally, the staff may use external consultants or subcontractors to support the regulatory process, and it may be necessary to integrate these external groups into staff workflow processes. The extent to which SharePoint either facilitates or prevents meeting these demands is important in consideration of its future use by NRC.

Summary of Topic History and Activity

The NRC Division of High-Level Waste Repository Safety (DHLWRS) management team decided to use SharePoint to document the Yucca Mountain (YM), Nevada, high-level waste repository license application review (including adoption review of the associated environmental impact statement). This report captures knowledge from this SharePoint application to inform potential future SharePoint use.

To implement the decision to use SharePoint for the YM licensing review, NRC staff from DHLWRS collaborated with the staff of the Center for Nuclear Waste Regulatory Analyses (CNWRA®) (the NRC Federally Funded Research and Development Center headquartered in San Antonio, Texas) to establish a SharePoint document development and management framework. This collaboration addressed SharePoint use with respect to (i) purchase, control, and coordinated use of SharePoint licenses; (ii) system and data redundancy, reliability, and backup; (iii) document configuration management, access control, and legal hold compliance; (iv) management and control of sensitive unclassified, predecisional, and privileged information; and (v) workflow management. Each of these five areas is analyzed subsequently in this report.

Nature and Category of Report

This report presents knowledge capture analyses for each of the five areas discussed in the preceding paragraph. Each analysis begins with a background discussion that provides the context for the SharePoint application. The background discussion is followed by listings of actions taken and knowledge captured.

Analysis

A.   Purchase, Control, and Coordinated Use of SharePoint Licenses

<u>Background</u>

The Nuclear Waste Policy Act (NWPA) prescribes an aggressive schedule for the YM licensing review. To conduct and document all aspects of this review, DHLWRS management employed joint teams of NRC and CNWRA staffs working in a communal electronic environment and jointly contributing to the licensing review documentation. Two requirements for a multiorganization communal electronic work environment are (i) a mutually accessible, secure data storage and work area (a shared drive) and (ii) in this instance, an effective means of coordinated SharePoint license and shared drive administration.

CNWRA has a small computer support organization (four permanent staff members) that reports to a single manager. DHLWRS managers envisioned the need to modify the SharePoint document library structure and access permissions frequently and quickly (see Section E, "Workflow Management" for more information on this subject). They therefore decided that the small CNWRA computer support organization was more suited to respond quickly and flexibly to the evolving requirements of the YM licensing review than was the more complex and diffuse NRC computer support organization with its effective, but less prompt, help-desk-based customer support system. Therefore, DHLWRS placed responsibility to establish and administer the shared drive and the SharePoint licenses at CNWRA.

Establishing and administering a multiorganization shared drive requires specific information technology expertise and is beyond the scope of this report, because it is not relevant to use of SharePoint. However, use of a shared drive for most NRC programs or projects must take into account requirements to protect SUNSI. These requirements, and their relation to SharePoint use, are relevant to this report and are addressed in Section D, "Management and Control of Sensitive Unclassified, Predecisional, and Privileged Information."

DHLWRS management examined requirements for multiorganization use of SharePoint several months prior to beginning the YM licensing review. This early planning was important because multiorganization SharePoint sites require that the software be administered from a single location. Two key aspects of this single site administration required early resolution: (i) assigning administrative control of all NRC and CNWRA SharePoint licenses to CNWRA and (ii) assuring the CNWRA SharePoint administrator was adequately trained.

NRC purchased DHLWRS SharePoint licenses. CNWRA purchased SharePoint licenses with its internal funds to preserve the flexibility to use SharePoint to support its non-NRC clients. NRC and CNWRA administrative, purchasing, and legal staffs interacted with Microsoft Corporation to establish an agreement authorizing NRC DHLWRS staff SharePoint licenses to be administered from CNWRA. Such an arrangement would be required for any multiorganization SharePoint site where the organizations separately purchase licenses.

Several months before implementing SharePoint for the YM licensing review, CNWRA arranged vendor-led SharePoint training for the software administrator. At a minimum, the training must be sufficient to enable the administrator to establish a SharePoint library file structure, create a SharePoint website, assign access accounts, and control access permissions.

Work flow processes and procedures that enabled closely controlled yet flexible and rapid software administration are addressed in Section E, "Workflow Management," of this report.

Actions Taken

1.   A shared computer drive accessible to both NRC and CNWRA staffs was established at and administered by CNWRA.

2.   CNWRA was assigned responsibility to administer the SharePoint licenses and the SharePoint site, and Microsoft Corporation approved the necessary administrative control transfer.

3.   The SharePoint administrator attended vendor-led training of sufficient scope to meet the expected document development and management needs of the YM licensing review.

Knowledge Captured

1.   Early planning for SharePoint use enables identification and implementation of software license administration procedures.

2.   Multiorganization SharePoint applications require secure, shared computer data storage (a shared drive).

3.   Program schedules and workflow processes can dictate the design of a program- or project-specific computer support organization and may require establishing a support organization that works outside the normal help-desk structure.

B.   System and Data Redundancy, Reliability, and Backup

Background

DHLWRS management planned that the YM licensing proceeding documentation would be extensive. The NWPA-specified prelicensing period lasted for decades and resulted in a large body of source documents. Additionally, the licensing actions for a high-level waste repository are unique, with the need to be prepared for litigation that could generate another substantial body of documentation. Therefore, NRC management had to ensure that the system used to document the licensing review (i) was of sufficient capacity to accommodate a very large amount of data, (ii) would be protected from loss and was adequately backed up, (iii) would exist in redundant copies, and (v) would be available quickly when needed.

Computer system component purchases began almost 2 years prior to receipt of the YM license application. During program planning, NRC managers decided to limit use of graphics and other large files in any staff-produced documents to reduce the associated data storage requirements. Two terabytes of storage capacity was selected as a conservatively sized system to support the YM licensing review, and storage devices of this capacity are available at

reasonable cost. Although the YM licensing proceeding has not progressed to completion, this storage capacity estimate appears to have been adequate. In addition, managers selected data storage components that could have their capacities expanded, if needed.

Requirements for protection from loss, for backup, and for redundancy were met by use of an integrated hardware and software suite designed specifically for these purposes. One primary and one secondary server, each with two terabytes of storage capacity, were purchased to house the licensing review documentation. The two servers were physically separated to minimize the risk that loss of either server due to physical damage would not place the other server out of service, and the servers were connected by a fiber optic line. A "mirroring" software (AvePoint® DocAve 4.5) automatically duplicated all data stored on the primary server to the secondary server. This automated duplication was configured to occur within approximately 1 hour after data were entered on the primary server. As a result, there would be a maximum of a 1-hour loss in information if the primary server were to fail. This primary-secondary data server redundancy functioned essentially as a real-time backup system and provided one means of data redundancy.

In addition to the automated duplication of data from the primary server to the secondary server, the SharePoint server data were backed up to tape in accordance with CNWRA standard operating procedures. Incremental daily backups were performed at the end of normal working hours each day. In addition, once each month full backups were conducted for the entire primary and secondary server data inventories. The tapes generated from these backup procedures were retained to meet the requirements of the legal hold order that was placed on the YM licensing proceeding. Legal hold requirements are addressed more thoroughly in Section C, "Document Configuration Management, Access Control, and Legal Hold Compliance," of this report. Taken together, these items provided a variety of data redundancy and backup measures.

The primary SharePoint feature implemented to support data redundancy, reliability and backup, and availability was the configuration of the system to retain every version of each file generated during the YM licensing review. Each time a file was closed, SharePoint saved that version of the file as part of the file history and made it accessible to anyone with the necessary permissions.

SharePoint includes a feature that automatically requests users to record comments each time a file is modified, saved, and closed. During system training, staff were directed always to add comments identifying the nature of the modifications made and the reasons for those modifications. All modifications are automatically recorded in the version history for the file. The user name, date and time, and version number are also automatically added. These features ensure accurate tracking of file development.

A final SharePoint redundancy, reliability and backup, and availability feature used for the YM licensing review was the inactivation of the "delete" function for anyone other than the system administrator. This action ensured that the entire history of each file was maintained and facilitated compliance with the YM licensing legal hold order once that order was executed. Legal hold requirements are addressed more thoroughly in Section C, "Document Configuration Management, Access Control, and Legal Hold Compliance," of this report.

Actions Taken

1. System hardware and software were purchased substantially in advance of the expected need date.

2. System data storage components were selected with sufficient capacity to ensure adequacy for the entire task, including the ability to expand that capacity.

3. Key system data storage components were duplicated for redundancy.

4. Redundant data storage components were located with sufficient physical separation to provide confidence that only one component would be placed out of commission by a single catastrophic event.

5. Data storage was automatically duplicated on a secondary server using software designed for that purpose and selecting a duplication timeframe short enough to ensure an acceptable maximum potential loss of data in event of a primary server failure.

6. Incremental daily and full monthly system backups were conducted to external media at a frequency consistent with organizational policy.

7. SharePoint was configured to preserve the entire history of each system file.

8. User training stressed incorporating comments in the file history to help document the evolution of each file.

9. The SharePoint delete function was inactivated other than for the system administrator.

Knowledge Captured

1. Early planning using reasonably conservative assumptions can facilitate establishing a SharePoint application tailored to specific program or project needs.

2. SharePoint features allow configuration to support specific requirements for redundancy, reliability and backup, and availability.

3. SharePoint features include the capability to preserve document histories.

4. User training and administrative procedures can enhance the document and configuration management features SharePoint provides.

5. Deactivation of the file delete function supports preservation of document history and compliance with legal hold requirements.

C. Document Configuration Management, Access Control, and Legal Hold Compliance

Background

Several aspects of document configuration management can be facilitated by SharePoint and were incorporated in the YM licensing review. These included (i) tracking the evolution of a document along with an ability to access previous versions, (ii) controlling access permissions to individual documents, (iii) enforcing a consistent format and style and correct grammar, and (iv) complying with a legal hold order.

The SharePoint version history feature allowed tracking the evolution of each file and accessing previous versions. Inactivating the delete file feature, other than for the system administrator, also ensured the ability to access previous versions of files.

NRC and CNWRA technical staff members were assigned to teams established for each of 50 chapters of the YM Safety Evaluation Report (SER). Most of these chapters required contributions from multiple staff members with skills in a variety of technical disciplines, and most staff members were assigned to several chapter teams. Initially, staff members were given read and write access to each chapter for which they were team members. Two problems were identified with this approach: (i) staff who were not initially identified as team members for a specific chapter were often found to be needed as contributors and (ii) only one team member at a time can write to a file because of word processing software limitations.

Flexibility in chapter team assignments was established by giving all project staff read and write access to all YM SER chapter files. This expansion in write access permissions had the potential to result in unwanted or inaccurate contributions from staff members who had insufficient technical knowledge to contribute to a specific chapter area. However, in practice this problem did not occur. In addition, once initial team member contributions were completed to the level that a complete draft of a chapter existed, write access was removed except for those staff members who most likely would need to make further contributions.

The problem of one person at a time write access was resolved in conjunction with addressing the problem of enforcing a consistent format and style and correct grammar. Therefore, resolution of these two issues is addressed together in the following paragraphs.

DHLWRS management recognized that a YM SER must meet the standards for an NRC NUREG as prescribed by NUREG–0650, Preparing NUREG Series Publications. These standards include an appropriate and consistently applied style and format. Therefore, an early action in the licensing review was to develop and approve the style and format for the SER chapters.

Once the chapter format and style were approved (e.g., heading formats, section and subsection definitions, line spacing, font size, and margins), the SharePoint system administrator created Microsoft Word® chapter files directly in SharePoint. Therefore, when staff members entered a chapter file to make their contributions, they were automatically placed in a file with the proper style and format. This removed much of the format and style compliance burden from the technical staff members. Even with the implementation of these preapproved file structures, some secretarial and editorial support staff action was required to refine the format, style, and grammar after technical staff members completed their input.

The implementation of the preapproved SER chapter file formats provided the basis for resolving the limitation of one person at a time write access. The system administrator was able to further subdivide the files and establish separate files at the chapter subsection level. On some occasions, when directed by the responsible NRC manager, the files were even further subdivided. This further subdivision of files generally allowed contributing staff members to write to their portions of the chapters without waiting for other contributors to finish. Once the individual contributors completed their inputs and the responsible NRC manager concurred in the content, the system administrator reconsolidated the files to form complete chapters.

NRC NUREGs require an editorial review prior to publishing. Early in the YM licensing review planning process, NRC management determined that the NRC staff lacked the editorial resources to support YM SER review within the constraints of the prescribed schedule. However, CNWRA has a professional editor on its staff specifically to ensure that its products meet NRC editorial standards. This individual is proficient in use of the NRC Editorial Style Guide (NUREG–1379) and was given responsibility for editing the YM SER. Having a single editor assigned to this task also helped ensure consistency of the SER. The editorial review was integrated into the workflow for SER chapter development. Workflow is addressed more thoroughly in Section E, "Workflow Management," of this report.

The NRC managers who were assigned responsibility for the individual SER chapters (in this program, the responsible managers were the DHLWRS Branch Chiefs) directed the granting and removal of document access permissions through the SharePoint administrator. This control of document access permissions was an effective means of configuration management. Examples of configuration management using document access permissions include restricting changes by contributing staff members during (i) editorial review, (ii) Office of the General Counsel review, and (iii) NRC senior management review. Further discussion of use of access permissions control is provided in Section E, "Workflow Management," of this report.

The Office of the General Counsel imposed a legal hold order on YM licensing review documentation. For documents being prepared in SharePoint, compliance with the legal hold was straightforward. Earlier decisions to preserve each version of all SharePoint files, to conduct frequent electronic backups, and to deactivate the file delete function except for the system administrator were adequate to ensure legal hold order compliance.

Actions Taken

1.	The document history tracking feature of SharePoint was activated.

2.	The file delete feature of SharePoint was deactivated, other than for the SharePoint administrator.

3.	Initially, all project staff were given SharePoint read and write access permissions to the entire set of program files. Access permissions were restricted as staff members completed their input.

4.	NRC management defined and approved a specific style and format for project documents.

5.	The SharePoint system administrator implemented the approved document format and style by creating Microsoft Word SharePoint files.

6.   Chapter files were further subdivided to minimize the limitation that only one person at a time can write to a file. Once individual staff members completed their input to these subfiles, the SharePoint system administrator consolidated the files into complete chapters at the direction of the responsible NRC manager.

7.   Access permissions were used to control access to authors, reviewers, secretarial staff, and the editor to the times most appropriate to support the licensing review workflow processes and procedures.

8.   Legal hold order compliance was implemented through the SharePoint file history preservation feature, through electronic file backups, and by deactivating the file delete function.

Knowledge Captured

1.   SharePoint access permissions can be employed along with workflow management procedures to support document configuration control, review, and legal hold requirements.

2.   File subdivision within SharePoint can be used to mitigate the limitation that only one user at a time can write to a file.

3.   SharePoint and Microsoft Word features can be employed to implement and enforce document format and style specifications and to comply with legal hold requirements.

4.   SharePoint permissions controls, supported by procedures that specify who has authority to control their use, are effective tools for controlling document configuration.

D.   Management and Control of Sensitive Unclassified, Predecisional, and Privileged Information

Background

Many documents supporting NRC licensing actions contain SUNSI and must be protected from unauthorized release, accordingly. SharePoint is well suited to supporting management of SUNSI because access permissions can be easily controlled.

For the YM licensing proceeding, the NRC project manager defined which NRC and CNWRA staff had a need to know for access to the licensing documentation. The SharePoint administrator used this information to establish access accounts for those individuals. Additionally, DHLWRS YM licensing procedures specified that all licensing documentation be prepared in the SharePoint YM licensing site.

SharePoint allows copies of files to be stored external to the SharePoint structure or to be printed in hard copy. Consequently, SharePoint SUNSI management features can be bypassed. DHLWRS management relied on staff training, professionalism, and voluntary compliance with YM licensing procedures to mitigate the potential for loss of control of SUNSI resulting from these liabilities.

The YM licensing program SharePoint site was established at and administered from the CNWRA facilities in San Antonio, Texas. For several years prior to the initiation of the

YM licensing review, NRC and CNWRA staffs had collaborated in a communal electronic work environment supported by an electronic communications link between NRC headquarters and CNWRA facilities. Recognizing the large quantity of SUNSI material CNWRA processed under its NRC contracts, NRC had earlier required that the CNWRA computer network be certified and accredited under the Federal Information Security Management Act (FISMA) and that CNWRA obtain an Authority to Operate from the NRC Designated Approval Authorities. The security protections implemented on this FISMA-certified network are adequate for protecting NRC SUNSI.

Actions Taken

1.   The NRC YM licensing project manager limited access to the YM licensing SharePoint site to those persons with a need to know. The SharePoint administrator implemented this access through access permissions control.

2.   YM licensing review work procedures and policies specified that all licensing documentation be prepared and reviewed within the SharePoint site.

3.   The potential for staff to bypass SharePoint SUNSI controls was addressed by training.

4.   The computing network that was linked to NRC was certified and accredited under FISMA, and CNWRA had an Authority to Operate this network from NRC.

Knowledge Captured

1.   SharePoint access controls can be effectively employed to assist in SUNSI management and protection.

2.   SharePoint SUNSI protection and management features can be bypassed if staff conduct work outside the SharePoint site, copy files to local hard drives, or print hard copies of SharePoint documents.

3.   Staff training can be effective in mitigating SharePoint SUNSI control limitations.

4.   If external individuals or organizations will be using a SharePoint site, the security of external communications links must be considered: FISMA certification and accreditation is generally costly and may require several years to achieve.

E.   Workflow Management

Background

Given the strongly constrained schedule for the YM licensing review, DHWLRS management determined that the associated document control and workflow processes must be closely managed yet extremely flexible, with an ability to support rapid changes as the review and its documentation proceeded and evolved. SharePoint is a complex but powerful software, and the context for employing it for a specific project or program must be carefully considered to ensure that unneeded or complicated features do not inadvertently complicate or confuse program or project execution. To the contrary, the features and capabilities of SharePoint can be specifically selected and implemented to improve workflow management. The YM licensing review SharePoint application was established to support a tailored execution of the standard

NRC regulatory process. Therefore, an important early step was to relate SharePoint features and capabilities to this regulatory process.

DHWLRS management identified the program end products and then defined the processes and procedures that would most effectively develop, control, and support those products. For the YM licensing review, the primary end product was to be an SER, and major aspects of the content and format of the SER had been previously developed in a review plan. The unique NWPA framework and requirements for conducting the YM licensing review included a long period of prelicensing interaction with the potential applicant, the U.S. Department of Energy (DOE). During this prelicensing period, the NRC staff were able to familiarize the DOE staff with the review plan structure. Accordingly, DOE agreed to submit its license application and safety analysis report (SAR) using a structure generally consistent with the review plan. This predetermined structure for both the SAR and the SER provided the basis for the SharePoint file folder structure and allowed this structure to be put in place before the license application was received. There were other YM licensing review products in addition to the SER, and the SharePoint support structure for them was developed using a similar approach.

In establishing a SharePoint framework, DHLWRS explored ways to use SharePoint access permissions control to facilitate workflow. For example, an early decision was to grant read permissions to any staff member assigned to work on the project. This allowed all involved staff to review and benefit from the contributions of colleagues. However, as part of the effort to protect SUNSI information, only those staff members assigned to work on the YM licensing review were given this read access (SUNSI protection is addressed in more detail in Section D, "Management and Control of Sensitive Unclassified, Predecisional, and Privileged Information," of this report.). As another example of use of SharePoint access permissions control to facilitate workflow, write access for staff members was restricted to only those portions of the SER to which they were assigned (this process is addressed in more detail in Section C, "Document Configuration Management, Access Control, and Legal Hold Compliance," of this report). Furthermore, as the SER chapters neared completion and the staff members completed their contributions, write access was restricted to managers, reviewers, and secretarial support staff and to the times when their contributions were needed. A similar sequential access permission management approach was used as SER chapters were consolidated into SER volumes and various levels of review took place. Contributing authors were allowed reaccess to sections they had contributed to if resolution of review comments required changes to those sections. The Microsoft Word track changes feature was used to identify and respond to review comments.

Another consideration in document work flow and access permissions management is the need to notify staff as the current version of a document is moved within the SharePoint file structure to support specific functions. For example, for YM SER development, once chapters were completed, they were consolidated into SER volume folders. Another example was the relocation of the chapter files to separate folders for review by the NRC Office of the General Counsel (OGC) staff. Staff needing access to these files required a way of knowing the location of the current version of the file. Without this information staff might inadvertently access and use an older version of the file or be unable to locate the file. To solve this problem, secretarial support staff inserted "fly sheets" in the previous file locations. These fly sheets used red text and specified the current location of the active file.

This brief discussion is not meant to suggest a specific sequence of permissions control. Rather, it is intended to show that carefully considered, planned, and applied SharePoint permissions control can support both workflow management and document configuration

management. In summary, for any specific program or project and SharePoint supporting structure, a key action is to coordinate SharePoint administration with the details of any workflow process.

Examining whether SharePoint can support or improve timeliness in workflow management is particularly important because most NRC regulatory and administrative programs are executed under aggressive schedules. Actions such as establishing or modifying document file structures and changing document access permissions must be completed quickly, efficiently, and accurately: the required timeframe for these actions will likely be on the order of minutes rather than hours. Reliance on the standard help desk or trouble call processes may be unacceptable. DHLWRS decisions on this aspect of SharePoint administration are presented in Section A, "Purchase, Control, and Coordinated User of SharePoint Licenses," of this report.

SharePoint procedures for actions such as creating files and managing access permissions are straightforward and can be conducted by persons with only a basic level of computer skills. For the YM licensing review SharePoint application, the SharePoint administrator trained the computer support staff members and the lead secretarial support staff member to carry out these actions. To ensure that these individuals took these actions only when properly authorized, formal process control procedures were promulgated (further discussion of these procedures follows). This discussion is not meant to suggest that only computer or secretarial support staff can perform these basic SharePoint administrative actions. For other programs and projects, we have found that project managers can effectively carry out these actions.

Many NRC regulatory or administrative programs have specific execution details that must be accommodated when establishing a SharePoint structure. For example, there may be participation by several staff groups, contributions by consultants or subcontractors, unique schedule requirements or limitations, or legal hold or other record keeping requirements. Early consideration of these details may identify opportunities to use the administrative control features of SharePoint to facilitate program execution. Other sections of this report address these issues in more detail.

Employing SharePoint to support program or project execution requires user training. For the YM licensing review, a handout was prepared that presented simple written instructions combined with SharePoint screen shots for the user actions. Initial training was conducted at a staff meeting at which copies of the written instructions were provided to all attendees. The training handout was also placed on a staff shared drive for continuing access. A secretarial support staff member who was tasked to create files and administer permissions was assigned as the point of contact for SharePoint user questions. This person routinely assisted staff members with SharePoint use. Staff training addressed topics such as login, site navigation, file check out, file saving, use of track changes, and the like.

The YM licensing review was conducted using a formal project plan. This project plan included schedules for the development of each of the 50 chapters of the SER; the consolidation of those chapters into volumes; NRC review, approval, and publishing of each volume; and the resources required to support these actions. However, the project plan did not define workflow processes and procedures or assign responsibilities for specific actions: these procedures were developed separately. Using the workflow processes and procedures as a starting point, the supporting SharePoint administration and control actions and responsibilities were defined. From the standpoint of SharePoint structure administration, the most important result of this action was a clear definition of (i) which staff members had authority to direct changes to SharePoint structure and permissions, (ii) procedures for conveying direction from NRC

managers to CNWRA implementing staff members, and (iii) a reporting chain for documenting completed actions. Rigorous compliance with these SharePoint administration actions resulted in effective SharePoint control and supported document configuration management.

Actions Taken

1.   SharePoint capabilities and features were assessed for their capability to support the YM licensing review needs, including program-specific requirements.

2.   Program end products were defined; processes and procedures to develop those end products were developed; and the SharePoint framework was then tailored to effectively support the products, processes, and procedures.

3.   SharePoint access permissions control was used as a primary tool to support program workflow.

4.   SharePoint features and capabilities were chosen to facilitate meeting program schedules.

5.   Changes in file location were documented by placing "flysheets" in previous locations.

6.   Responsibilities for basic SharePoint administrative actions, such as file creation and permissions control, were assigned to persons in positions most suitable for carrying them out.

7.   Training was provided to all SharePoint users, and a specific individual was assigned responsibility for answering emergent questions.

Knowledge Captured

1.   SharePoint features and capabilities can be matched and tailored to facilitate program-specific requirements and structural components.

2.   Proper selection and tailoring of SharePoint features and capabilities can be negated by ineffective administration of those features and capabilities.

3.   SharePoint access permissions control administration is a powerful tool for facilitating and enforcing workflow management and document configuration.

4.   Most key SharePoint administration actions require only basic computer skills and can be effectively implemented at any level in an organization.

5.   SharePoint administration responsibilities should be clearly assigned to a small number of specific individuals.

6.   Effective SharePoint implementation requires support by managers to ensure compliance with procedures and responsibility assignments.

Potential Future Use of Captured Knowledge

This report of knowledge captured from use of SharePoint to support program or project execution can be of value to any NRC manager considering SharePoint use. Following are some specific suggestions on how this report can be used to generate ideas for using SharePoint in other programs or projects.

1.   Educating Managers on SharePoint Features and Capabilities

        Most managers have received little or no education on SharePoint features and capabilities. Those who have received information may not have had an opportunity to put that knowledge to use. Therefore, it is likely that managers have little awareness of whether SharePoint can support a program of project under their control.

        SharePoint is widely viewed as being complex. Therefore, busy managers are unlikely to feel that they have time to devote to exploring its suitability to support their work. This report provides examples of the ways in which SharePoint can be flexibly employed and might stimulate managers to explore its use.

2.   Demonstrating the Value That Can be Added to Workflow Management by Tailored Use of SharePoint Features and Capabilities.

        Considering the lack of experience with SharePoint use in support of program and project management, the examples presented in this report can inform managers on ways in which this powerful software can support coordination of complex activities within their staffs. It is likely that, without prior experience in applying SharePoint in this manner, it would not occur to managers that these capabilities existed in SharePoint.

3.   Identifying Ways in Which SharePoint is Compatible with the NRC Regulatory Process

        Most managers may not consider SharePoint as a tool that can be specifically integrated with the NRC regulatory process. This report provides examples of how that integration can be done and can stimulate ideas for ways to expand that integration.

4.   Improving Document Configuration and Records Management Processes

        Experience documented in this report shows that SharePoint has powerful features to support configuration management and records management. These features can be particularly useful under conditions of constrained schedules or when records must be maintained for legal reasons. Managers without working SharePoint experience may be unaware that these SharePoint features can be implemented and controlled rapidly and reliably.