POLICY ISSUE
INFORMATION

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FOR: The Commissioners

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SUBJECT: THE NRC KNOWLEDGE MANAGEMENT PROGRAM

PURPOSE:

To inform the Commission about the development and implementation of the agency knowledge management (KM) program.

BACKGROUND:

During the February 3, 2005 closed briefing to the Commission on Human Capital, the staff informed the Commission of near-term and long-term strategies for developing a framework to integrate new and existing approaches for generating, capturing, and transferring knowledge relevant to the NRC's mission.

On October 20-21, 2005, the agency's senior managers met to discuss strategic planning for the future. The two major topics of the meeting were preparing for future work and establishing a KM program.

During the January 31, 2006, Human Capital briefing the staff updated the Commission on KM activities and committed to provide the Commission with a paper.

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DISCUSSION:

The NRC is a knowledge-centric agency that relies on its staff to make the sound regulatory decisions needed to accomplish the agency's mission. In the recent past, the agency has enjoyed a stable workforce and a climate of slowly-evolving technologies that has allowed it to meet its performance goals by using an informal approach to KM. That environment has changed and the agency must now institute a systematic approach to KM that can support the faster rate of knowledge collection, transfer, and use needed to accommodate increased staff retirements, mid-career staff turnovers, the addition of new staff, and the broader scope of knowledge needed to expand the agency's knowledge base to support new technologies and new reactor designs.

The term "knowledge management" is a contemporary term of art however; the concept and practice of KM is not new at the NRC. The agency, since its inception, has maintained and continuously improved the individual capabilities of its staff through numerous methods designed to transfer implicit and tacit knowledge, such as formal classroom and on-the-job training, structured qualification programs, informal communities of practice, mentoring, dual-encumbering of positions, and formal development programs. The agency has also maintained its organizational capabilities or structural knowledge largely in the form of explicit knowledge: job aids and desk references, written policies and procedures, regulatory guides, standard review plans, NUREGs, regulatory issues summaries, and statements of consideration for rulemakings. Enclosure 1 provides an expanded discussion of explicit, implicit, and tacit knowledge. Although Web-based applications and databases such as the Commission Decision Tracking System, Agencywide Documents Access and Management System, and the Licensing Support Network support and enhance KM activities, the agency primarily relies on people and not on information technology solutions to transfer knowledge.

A well-designed KM program can return significant value to the agency by providing a systematic approach for identifying, collecting, transferring, and using the staff's relevant, critical knowledge. Offsetting the realizable value obtained through KM is the cost imposed as a burden on the agency staff to develop, learn, and apply the KM principles and practices necessary to effectively implement and execute the program. In order to maximize the KM program's value proposition, it is important to minimize the burden on the staff by integrating KM into the agency's business processes and technology rather than by approaching KM as an additional or ancillary requirement that exists outside of the normal work scope.

Ultimately, KM's effectiveness requires that it be an integral element of the agency's work. Integrating KM will require the staff to think from a KM perspective when designing workflows and to look beyond performing just the task at hand to considering how agency knowledge can be captured so it is shared into the future. This fundamental change in perspective will require a top-down support from senior managers in the form of clear expectations, adequate resources, and rewards for desired behaviors and results.

In order to implement an effective, long-term KM program the agency must also create a sustainable environment for knowledge retention by leveraging existing processes and technology to the maximum extent to: identify and prioritize critical knowledge; recover and collect that information; and transfer, store, access, and use the information. Leveraging existing processes allows the staff to build on what they are already doing and to connect these familiar processes with the newer concepts of KM. More importantly, the staff must be both allowed and expected to share and transfer knowledge as a normal part of their work for the agency.

Implementing an effective, long-term KM initiative and integrating it into the agency's day-to-day routine requires fundamental changes to the agency's organizational culture. Although benefits of the KM initiative can be realized immediately, fully institutionalizing changes of this nature typically requires a period of several years. Because of the significance and duration of the change process, active change management is essential to the success of KM at the NRC. Managing the changes will require clear communications, top-down and bottom-up alignment, building momentum on early successes, and most importantly, leadership to direct the effort over the long-term.

At the October 2005 Senior Management Meeting, the senior managers focused much of their discussion on KM to develop an approach for creating and implementing the key elements of an agency KM program that supports the agency's strategic mission. In their discussions, the senior managers identified KM as essential for accomplishing the agency's current and future work. Additionally, while acknowledging that the agency has a long history of KM activities, the senior managers determined that our programs need to change in order to keep pace with numerous factors, including the growing body of internal and external information relevant to NRC decisionmaking, pending retirements, agency growth, and the accelerated hiring of new staff. Agency programs also need to look at changes in the regulatory environment and adapt innovative solutions to accelerate and improve agency decisionmaking processes through collaboration and best practices of communications and information sharing.

The October 2005 meeting had two important outcomes, the first being an agreed-upon working definition of KM—Knowledge Management (KM) is a continuous, disciplined, and timely process of identifying, collecting, and using information to better accomplish the job. The second was the identification of the following four key action items that are necessary for implementing an agency KM program to consolidate and expand the ongoing KM activities of the offices and regions.

1.   For successful implementation, the agency's KM program must have explicit, visible structure and governance. To that end, the Deputy Executive Director for Materials, Research, and State and Compliance Programs (DEDMRS) has been designated the agency KM champion for overall leadership, direction, and integration of the KM program. Each Office Director and Regional Administrator has named a senior manager who will lead the development and implementation of KM activities within his or her organization. The DEDMRS will form a steering group of office and regional KM

champions to provide cross communication and integration of KM initiatives. Each Office Director and Regional Administrator will also appoint a senior staff KM lead who will assist in the implementation of specific KM initiatives. The Office of Human Resources (HR) will provide program support, coordination, and evaluation. Enclosure 2 provides a summary of KM roles and responsibilities.

2.   The offices and regions are tasked with identifying occupational priorities of NRC staff and critical bodies of knowledge where KM is most needed in their organizations. *Occupational priorities* are those positions where the office or region is most likely to lose significant relevant knowledge in the near term. *Critical bodies of knowledge* are technical and administrative areas of expertise where KM techniques are most needed to avoid losing significant mission-critical knowledge. The occupational priorities and critical bodies of knowledge identified by inputs from the offices and regions will be compiled into a consolidated list to inform and direct the agency's KM efforts.

3.   The staff will develop a set of KM standard practices and techniques from which the offices and regions can select the tools best suiting their individual needs. Standard practices and techniques include mentoring, formal training and qualification programs, policies and procedures, regulatory guides, standard review plans, job aids, best practices, and Information Technology (IT) and Information Management (IM) solutions. A number of offices and regions have already developed their own KM initiatives. The agency KM program will integrate these and other initiatives across the agency to ensure that the staff will have a common set of tools to effectively and efficiently do their jobs.

4.   The staff will investigate and explore innovative IT/IM tools that the agency may incorporate and acquire to support KM and help achieve the Expanded Electronic Government Strategy to make it easier for NRC employees to acquire, access, and use information needed to perform their work. These tools may include content management systems, information portals, and "Google-like" indexing and search programs designed to make existing information available to all staff in a more user-friendly manner. Additionally, some existing tools, such as the Strategic Workforce Planning (SWP) system, may need expanded capabilities to meet the agency's KM needs. In cases where knowledge that is critical to the agency's regulatory mission exists primarily outside of the agency, such as new reactor designs, IT tools will need to be employed that provide connectivity between the staff and external knowledge resources.

The agency KM program includes four categories of initiatives within the program framework to retain the agency's knowledge. The four categories include: HR Processes, Policies, and Procedures; Knowledge-Sharing Practices; Knowledge Recovery Practices; and Information Technology Applications to Acquire, Store, and Share Knowledge. Enclosures 3 through 6 describe the categories and associated initiatives. The initiatives will likely change over time because an important attribute of the agency KM program is the expectation to continually identify, pilot, and assess the effectiveness of emergent knowledge retention methods.

The agency's KM framework is illustrated in Figure 1 and identifies the *what*, *why*, and *how* of the agency's KM program. The *what* determines the program's primary focus, which is on the occupational priorities and critical bodies of knowledge. This represents the knowledge whose loss creates the greatest negative impact on the mission of the agency and provides the first of two dimensions used for prioritizing efforts–importance. The *why* identifies the factors driving the need for knowledge management within the agency. In the context of the KM program framework, the *whys* help identify either the existence or imminence of gaps in the agency's critical knowledge, which provides the second dimension used to prioritize efforts–timeliness.

Figure 1. The NRC KM Program

NRC KM Program
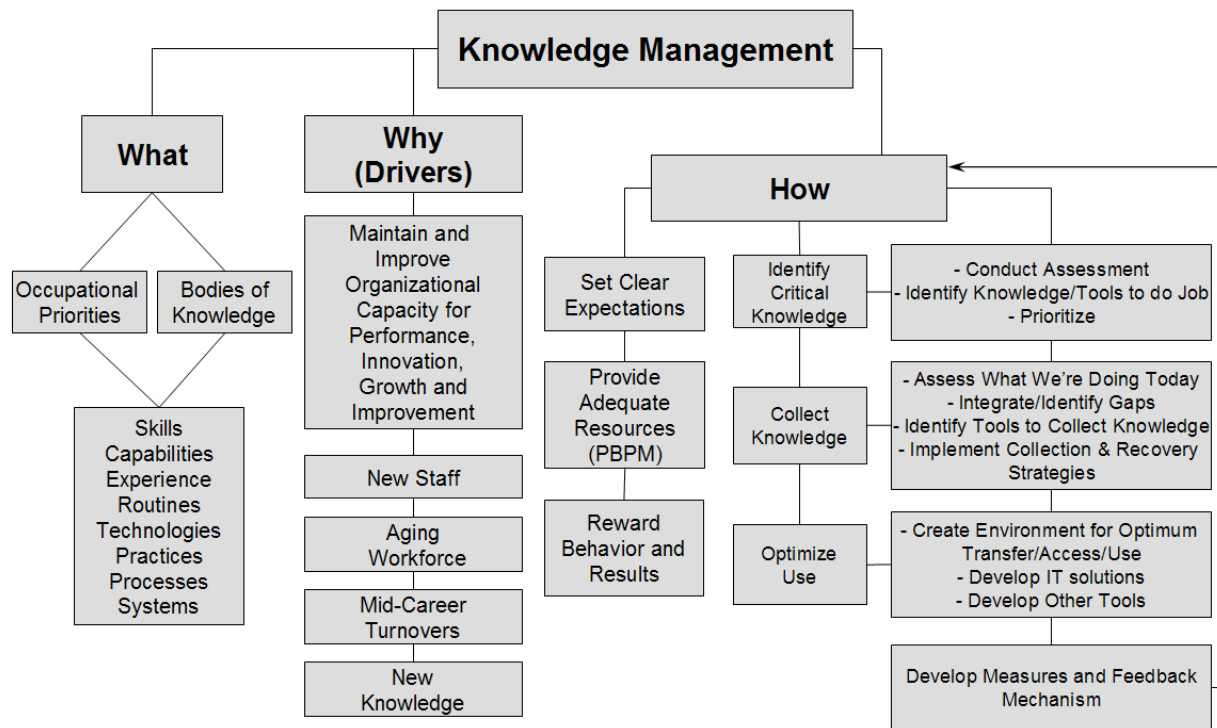
The program framework addresses *how* to accomplish the desired KM program outcomes described above. The first is implementing the program in terms of settings expectation for management and staff; providing adequate resources either by adding new resources or shedding lower-priority work; and rewarding knowledge-sharing behavior and successful program results. The second is conducting the program to continuously assess the agency's critical, relevant knowledge; identifying appropriate tools for knowledge management; applying

those tools to collect, transfer, and use knowledge in an optimal fashion; and gather feedback to improve the program's efficiency and effectiveness. The process for colleting, transferring, and using knowledge is designed as being an iterative and continuous process that provides the program with the inherent ability to adapt to changes in the regulatory environment now and in the future.

The senior managers met again in April of 2006 and aligned with the approaches to an agency KM program discussed in this paper. They will review the progress of the agency KM program during the November 2006 Senior Management Meeting and report the status to the Commission. Enclosure 7 provides milestones and a program time line.

KM, like financial management and personnel management, has always been an inherent responsibility of NRC's managers and supervisors. The highly stable nature of the NRC's workforce in the past has allowed managers to devote less time and focus fewer resources on the knowledge aspect of managing the agency than on the other aspects. Consequently, many KM activities have been identified as lower-priority activities--not because they were considered unimportant but because the stability of the NRC workforce provided an option to defer them until a later time.

For the reasons cited earlier in the paper, most notably the change in the NRC's workforce, continually deferring KM activities is no longer a viable option. Managers and supervisors now need to actively engage in KM by prioritizing the agency's KM activities against other agency activities and allocating necessary resources to KM through the Planning, Budgeting, and Performance Management (PBPM) Process. In the short-term, the involvement of supervisors and senior staff in KM activities may result in the PBPM Process deferring some direct-effort activities: for the long-term, the agency may need to reassess employee to supervisor ratios and the budget models used to determine hours for direct work.

RESOURCES:

Developing and implementing the Agency KM Program will require 9.9 FTE and $140K in FY06, 18.3 FTE and $460K in FY07, and 16.3 FTE and $440K in FY08. More than half of these FTE (6.8 FTE in FY06 and 9.1 FTE in FY07 and FY08) provide KM oversight through the KM Champions and KM Staff Leads. The remaining resources are distributed across the offices and regions and represent the costs for conducting and evaluating KM pilot projects and for identifying appropriate IT/IM applications. For FY06, each of the offices and regions will cancel or defer lower priority work to accomplish the FY06 SMM action item activities. The $140K for FY06 will be funded by HR from cost savings realized from renewing the NRC Careers contract for a two-year period. KM resource needs for FY07 and FY08 will be accommodated with existing resources in the proposed budget currently with the Commission for review. Enclosure 8 includes details of preliminary resource estimates for developing and implementing the short-term actions associated with the agency KM program.

 COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

/RA/

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Enclosures:
1. Knowledge Types
2. KM Roles and Responsibilities
3. Human Resources Processes, Policies, and Practices
4. Knowledge-Sharing Practices
5. Knowledge Recovery Practices
6. IT Applications to Acquire, Store, and Share Knowledge
7. Time Line for the Agency KM Program
8. Agency KM Program Resource Estimates

Types of Knowledge

In a discussion of knowledge management (KM) it is important to have, at least, a working definition of *knowledge* and to distinguish it conceptually from *information* and *data*. While the boundaries between the three are not clearly defined, *data* are generally considered to be structured, factual records of discrete transactions or events. *Information* is data that is structured or arranged to inform or influence by communicating a message, which means that the nature of information is to also be influenced, to varying degrees, by users' interpretations of the message. *Knowledge* implies that information is not only influenced but is combined with the users' own experiences to create the capacity for action.

Much of the current literature in the field of KM classifies knowledge as being either *explicit, implicit, or tacit* knowledge. E*xplicit knowledge* implies declared knowledge (i.e., knowledge that is conscious to the knowledge bearer). Explicit knowledge is easily codified, which is why it is not a problem for the employee to tell about rules and obviously learned facts. Very often this knowledge is already written down in books, procedures, or training materials.

In contrast to such relatively accessible information, *implicit knowledge* is fact based but difficult to reveal, but it is still possible to be recorded. Usually knowledge bearers cannot recall this knowledge by themselves, because the information is too obvious to them. When people are asked what they are doing in the morning they might answer "getting up, taking a shower, having a coffee, going to work, checking their e-mail..." without first thinking about their having had to get undressed to take a shower; without thinking about the multiple steps involved in making coffee; and, without thinking about their having had to switch on the computer before being able to read their e-mail. It is generally feasible to convert implicit knowledge into explicit knowledge through documentation.

The third type of knowledge, *tacit knowledge,* is the most difficult to recall and, thus, to transfer. Tacit knowledge includes cognitive and experience-based knowledge about topics such as how to ride a bicycle or how to talk. These examples describe knowledge everybody just has. However, every individual possesses a large amount of tacit knowledge. Employees, for example, tacitly know how they persuade other people, how to behave in different situations, or how to organize a meeting. Such knowledge cannot be completely explained, since it is wholly embodied in the individual, rooted in practice and experience, expressed through skillful execution, and transmitted by apprenticeship and training through watching and doing forms of learning. Tacit knowledge can be observed; however, it is doubtful that all of this knowledge can be converted to explicit knowledge. This fact is why it is said, "We know more than we know that we know."

Summary of KM
Roles and Responsibilities

These are some of the more significant knowledge management (KM) roles and responsibilities that the staff will fill when implementing the agency KM program. Additionally, the Office of Information Services (OIS) and the Office of Human Resources (HR) have unique roles within the agency relating to KM that are recognized here as well.

1. Agency KM Champion

The Agency KM Champion is a senior manager who is responsible for:
- Monitoring the KM activities of the offices and regions to ensure that the occupational priorities and critical bodies of knowledge are addressed agencywide.
- Overseeing the establishment, implementation, and evaluation of the agency's KM program.
- Coordinating with office and region KM champions to identify, select, assign, and evaluate the results of KM pilot activities.
- Forming and chairing the agency KM steering committee.
- Conducting an annual program review of results, lessons learned, and improvements in agency KM program activities.

2. Agency KM Coordinator

The Agency KM Coordinator is a staff member who is responsible for:
- Authoring and maintaining agency KM policies, procedures and guidance.
- Acting as the Project Manager for contracts supporting agencywide KM activities.
- Managing the funds allocated for agencywide KM activities.
- Acting as the community leader for the agency KM community of practice.
- Maintaining and updating the agency KM Web siste.
- Supporting the conduct and evaluation of KM pilot activities.
- Developing, overseeing, and conducting training on all aspects of KM.
- Serving as the staff liaison between the agency KM community of practice and the agency KM steering committee.
- Conducting focus groups and other appropriate activities to determine agency KM needs.
- Communicating lessons learned in KM pilot projects and development efforts from and to Office and Region KM Champions for incorporation in their KM development activities.

3. Office and Region KM Champions

The Office or Region KM Champions are senior managers who are responsible for:
- Ensuring the development and implementation of their office or regional KM programs.
- Leading development of KM strategies.

- Selecting appropriate common techniques to implement those strategies.
- Heightening awareness and interest in KM.
- Communicating expectations for KM to the staff.
- Promoting interoffice knowledge sharing.
- Sharing KM best practices and communicating them to their offices and regions.
- Periodically providing HR with forecasts of KM gaps and proposed solutions.
- Serving as members of the agency KM steering committee.
- Linking KM to critical business processes and initiatives.
- Reporting KM successes and risks to senior management.
- Communicating lessons learned from KM activities in other offices to those involved in KM development activities in their offices.
- Developing measures and metrics to monitor the effectiveness of office and region KM activities.
- Providing feedback to the Agency KM Champion regarding results and lessons learned in their KM initiatives.

4. Office and Region KM Staff Leads

The Office and Region KM Staff Leads are senior staff members who are responsible for:
- Participating as members of the agency's KM community of practice.
- Supporting the Office or Region KM program and champion.
- Conducting focus groups to obtain staff input on KM needs, capabilities, and techniques.
- Promoting interoffice knowledge sharing.
- Sharing KM best practices and communicating them to their offices and regions.
- Participating in and leading KM pilot activities to support identified priorities of their office or region.
- Providing feedback to the Agency KM Coordinator regarding results and lessons learned in their KM initiatives.

5. Managers and Supervisors

Managers and Supervisors support their office's and region's KM programs by:
- Ensuring that the staff understands and meets the office's or region's expectations for KM.
- Identifying budgeting needs and applying resources to develop and implement KM activities.
- Ensuring that the staff is trained on the use of common KM practices and techniques.
- Identifying occupational priorities and critical bodies of knowledge needed to accomplish the work of their work unit.
- Periodically meeting with employees to identify knowledge gaps (personnel and procedures) and emphasize the use of IDPs for structuring their career development.
- Ensuring that staff receive appropriate rewards and recognition for knowledge sharing.
- Ensuring that new and current employees are aware of the SWP and the importance

of maintaining accurate and current information.

- Periodically comparing needed skills and SWP data to identify short- and long-term skill gaps and proposing and implementing solutions to close identified gaps.
- Ensuring that the retiring workers, who are retained on a limited basis, maintain a primary focus of transferring their knowledge to the agency staff.

6. Staff

Staff members are responsible for:
- Understanding and supporting their office's or region's KM program.
- Directly supporting various KM initiatives, as assigned.
- Sharing knowledge and expertise.
- Ensuring that their SWP information is accurate and up-to-date.
- Using KM tools provided for knowledge sharing.
- Identifying knowledge gaps and proposing solutions to close the gaps. Acting as skills mentors.

7. Office of Information Services

The Office of Information Services (OIS) is responsible for:
- Responding to formally identified needs and requirements for acquiring or developing appropriate IT tools to support KM techniques such as content management systems, search engines, indexing software, and on-line encyclopedias.
- Supporting Office and Regional requests for KM IT solutions.
- Hosting and supporting agency KM applications such as community web sites.
- Assessing and providing the necessary infrastructure for bandwidth and storage intensive KM applications.
- Exploring advanced information and document management solutions such as Google, Wikipedia, Autonomy, or other commercially-available applications for agencywide use.

8. Office of Human Resources

The Office of Human Resources (HR) is responsible for:
- Identifying and disseminating an initial set of KM techniques.
- Coordinating pilots for additional KM techniques as identified.
- Maintaining the common set of KM techniques.
- Exploring options to update the SWP database to better support the agency's KM needs specifically to identify occupational priorities and critical bodies of knowledge.
- Developing and providing training and guidance on KM practices and techniques such as succession planning, using retirees effectively, on-line communities of practice, story telling, and skills mentoring.
- Managing the evolution of the agency's training programs.
- Conducting exit interviews of staff who leave the agency due to reasons other than retirement to determine why they left prematurely.
- Investigating the use of the SWP as source data for a knowledge resource locator or

expert yellow-pages software application.

9. All Offices and Regions

All Offices and Regions are responsible for:

- Identifying, developing, and implementing succession plans for key staff positions.
- Encouraging and providing resources for existing communities-of-practice to develop tools for community knowledge such as written summaries of best practices and community Web sites using standard NRC software.
- Targeting development, recruiting, and contracting efforts to close or prevent skill gaps.
- Utilizing retention allowances and rehired annuitants, as needed, for the purpose of knowledge transfer.
- Using existing agency IT processes to formally identify to OIS the needs and requirements for piloting, acquiring, or developing IT solutions to support or facilitate KM activities.
- Updating and maintaining policies and procedures to ensure that the explicit knowledge they contain is kept current and correct.
- Identifying changes to existing training and qualification programs and new programs.
- Investigating the use of the SWP as source data for a knowledge resource locator or expert yellow-pages software application.

Human Resources Processes, Policies, and Practices

The human resources processes, policies, and practices initiative represents the agency's infrastructure for knowledge retention. This initiative has five principal functions: evaluating the state of the agency's skill and knowledge base; planning career development and succession planning; building an employee retention culture; retaining long-tenure employees; and investing in recruiting processes. The following discussions describe both the agency's current activities in each of these areas and the staff's assessment of what more needs to be done.

Evaluating the Agency's Skill and Knowledge Base

Strategic Workforce Planning

Strategic Workforce Planning (SWP) is the process that the agency uses for identifying the core technical, administrative, and leadership capabilities employees must possess to perform activities and deliver products and services to support the agency's current and future strategic goals. The SWP provides tools for all levels of managers and staff to self-identify their proficiencies in identified skills, competencies, and knowledge areas. Skill gaps identified in the SWP are used for selecting the disciplines sponsored by the Graduate and Undergraduate Fellowship Programs.

As part of the agency KM program, all supervisors and managers will periodically and systematically conduct assessments to identify the skills, competencies, and knowledge areas that are "most critical" for the successful completion of their organization's mission both in the short and long terms. Supervisors and managers will then compare the SWP inputs to identify and project short-term and long-term agency skill gaps. These skill gaps will be used by the offices and regions to target their development and recruiting efforts. (See *Targeted Recruiting* below).

Career Development and Succession Planning Processes

Succession Planning

A formalized succession planning process is conducted by the Executive Resources Board to identify likely succession candidates for specific Senior Executive Service (SES) positions. That process identifies key agency management positions, potential succession candidates, and developmental activities and assignments that should occur prior to filling higher level positions in the agency. Some offices conduct their own succession planning activities at the staff level for key positions.

Under the agency KM program, succession planning would not be restricted to the SES and will be performed at the office level to identify and develop designated backups for key staff roles to help assure that work can be accomplished, knowledge is transferred, and that extended absences, vacations, promotions, and retirements can be handled with less disruption. After identifying key roles, offices will identify one or more potential replacements and create action plans that will outline the training and development activities needed to grow the replacements to the appropriate level of expertise over the anticipated time horizon.

Individual Development Plans

Supervisors and employees use Individual Development Plans (IDP) and other mechanisms to identify developmental activities. The IDP is also valuable as a planning tool when managers and supervisors use identified future staffing needs to help individuals develop skills related to the anticipated gaps. IDPs provide a structure for establishing goals and strategies for employees' development by specifying appropriate training and rotations. The IDP tool is readily available and is already widely-used.

The IDP process is currently being integrated with the new Learning Management System (LMS) to make the process more convenient for staff and supervision and also to create a more powerful tool for planning agency training. As part of the agency KM program the IDP will be given increased emphasis for structuring career development at all staff levels.

Building a Retention Culture

Influencing and Monitoring the Retention Climate

Historically the NRC has been very successful in retaining employees for long tenures, however there is adequate anecdotal evidence, primarily from the external environment, that retention paradigms may be shifting. The agency will continue to monitor employees' sentiment, conduct targeted exit interviews of individuals who leave before retirement, and maintain a senior management awareness of the NRC retention climate as the nuclear industry moves into a new growth phase that will likely create shortages of highly-skilled individuals.

Under the agency KM program, NRC employees would be both empowered and expected to share their knowledge through numerous behaviors described in this paper including mentoring, coaching, and conducting seminars for the staff. The agency KM program would emphasize the importance of person-to-person knowledge transfer particularly from senior experienced staff to junior less-experienced staff. The agency's KM initiatives will encourage sharing of intellectual capital and may include setting expectations and recognizing success.

Policies to Retain Older Workers

Retention Allowance and Waivers of Dual Compensation Limitations

Employees who are planning to leave Federal service or retire from the agency but whose knowledge is needed to carry out critical activities or functions may be offered retention allowances to continue working for the agency for specified periods of time. The allowances encourage knowledgeable, experienced employees to continue serving in mission-critical areas long enough to transfer their knowledge to others prior to leaving the agency. Retention allowances are available and in use within the agency's existing authority.

Current SWP strategies may allow for rehiring annuitants using a waiver of dual compensation limitations. The agency has the authority under certain circumstances to waive the regulations requiring salary "offsets" for rehired Federal annuitants. The NRC may waive the offset to rehire selected retirees who have scarce skills for limited periods when compelled by critical work needs. This practice can be used to provide rehired retirees with ample time to transfer

knowledge that would otherwise be lost from the agency. However, it has in general been used at the NRC to support emergent work and special activities.

Under the agency KM program more emphasis will be placed on using retention allowances and rehiring annuitants for the purpose of knowledge transfer rather than to support special projects or complete unfinished activities.

Reinventing Recruiting Processes

Targeted Recruiting

Several agency offices and regions have been successful during the last two years in targeting their recruiting efforts to fill existing or projected skill gaps identified through the SWP database.

Under the agency KM program the use of the SWP as an information source would be encouraged for all of the offices and regions to inform and direct their hiring processes to meet short-term needs and also to create a pipeline for meeting long-term needs to support succession planning for key staff positions.

Knowledge-Sharing Practices

Knowledge-sharing practices describe the methods and techniques that the agency has or will institutionalize as part of its day-to-day operations. These practices can be generally classified as either those to transfer explicit (easily-codified) knowledge and those that transfer implicit (fact-based) and tacit (cognitive) knowledge.

Practices for Sharing Explicit (easily-codified) Knowledge

Documentation

Codification and Documentation of Processes

Documented policies and procedures are very effective for transferring critical knowledge to individuals, particularly providing instructions for performing repetitive tasks and duties. Documented procedures aid employees long after the individuals with the procedural knowledge have left an organization. Currently the agency codifies knowledge in numerous documents including desk procedures, Management Directives, Standard Review Plans, NUREGs, the NRC History Program, office instructions, processes for license amendments, and project manager handbooks. These documents satisfy a critical need to provide new, less-experienced staff with guidance that was previously passed on by on-the-job training, examples and precedents, and word of mouth.

Under the agency KM program informal processes and procedures will be codified where appropriate. Additionally there will be increased emphasis on maintaining policies and procedures up-to-date and on explicitly increasing discussions of technical bases, justifications, statements of consideration, and etc. included in agency documents to support KM.

Interviews and videotaping

Knowledge Capture Interviewing

Knowledge capture interviewing describes a process for capturing critical tacit knowledge by conducting video interviews of knowledgeable staff and distilling it into short, retrievable video clips or other formats such as interview transcripts. The video clips and interview transcripts are explicit knowledge items that are subsequently used for sharing the knowledge among staff members. Although relatively new to NRC, videotaping face-to-face interviews of subject matter experts possessing critical tacit knowledge is a widely-used methodology in the public and private sectors. Experience in both of those sectors indicates that knowledge capture interviewing is an effective approach for capturing certain types of tacit knowledge.

Knowledge capture interviews are often employed as a short-term approach to capturing the knowledge of departing individuals. Performing interviews may be an effective short-term solution for knowledge that would otherwise be lost from the agency, but the long-term approach of performing interviews throughout an individual's career, as opposed to only at the end of their career, provides several additional benefits. One benefit is that the knowledge is captured and disseminated for reuse by the staff sooner. Another benefit is that there is an

opportunity, almost always lost with the short-term approach, for follow-on discussions with the expert to clarify and expand the captured knowledge. Lastly, particularly when knowledge is event-based, important details that would tend to be forgotten over time may be captured by performing interviews closer to the event.

The staff has conducted some limited training and pilot interview sessions and is evaluating the results as well as resolving some logistical and legal questions such as the status of knowledge capture interviews and community-of-practice postings under the Freedom of Information Act (FOIA) and identifying IT/IM techniques to allow for indexing and cross-referencing interviews before proceeding with an expanded pilot program for this technique.

Training

Formal Training, Qualification, and Development Programs

The NRC's formal training and development programs provide a means of defining, capturing, and disseminating the information and knowledge that is required to carry out the duties for a specific position or activity. They are a mechanism for ensuring that relevant organizational knowledge, experiences, and lessons learned are transferred to replacement staff in a reliable and systematic fashion.

The agency currently has many effective and well-established formal training, qualification, and development programs in place including New Employee Orientation, the Nuclear Safety Professional Development Program, Honor Law Graduate Program, Leadership Potential Program, Team Leader Development Program, Senior Executive Service Candidate Development Program, Acquisition Project Manager Certification, Inspector Qualification, Instructor Qualification, Headquarters Operations Officer Qualification, and Headquarters Emergency Response Officer Qualification. In addition to classroom training activities, many of these programs include on-the-job training elements that facilitate tacit knowledge transfer from more-experienced staff to newer staff.

Under the agency KM program there will not be any direct effort to create new formal technical training, qualification, or development programs. However, these programs will be identified as part of the agency's inventory of KM techniques and evolve over time consistent with the objectives and results of our KM initiatives. We expect that continuous efforts to identify critical bodies of knowledge and programs like the Agency Lessons Learned Program will periodically identify necessary changes or additions to the agency's existing training courses and occasionally the need to develop new training courses.

Training Courses and Technical Seminars

The Technical Training Center and Professional Development Center sponsor numerous courses designed to maintain the important skills and knowledge of the agency staff. These courses are developed using both agency and external subject matter experts to capture their unique knowledge and experience and to disseminate that knowledge widely throughout the agency. Individual offices and regions also provide locally-developed and administered training, operational review sessions, and seminars for their staff on specific topics that aid in transferring knowledge from experienced to less-experienced employees and as a method of transferring lessons learned from events to the staff.

Under the agency KM program the staff will provide knowledge-sharing seminars on technical topics both agencywide, for subjects that have a broad application or interest, and at the local level for technical topics that primarily relate to the work of an individual organization.

Knowledge Management Overview Training

NRC staff members need to understand the senior leadership's vision and expectations for knowledge capture, transfer, and sharing. Managers and supervisors need to understand their roles and responsibilities under the agency KM program and how to use the tools that they need to meet those responsibilities. All staff members will need varying degrees of training and familiarization on how and when to use the agency's KM practices and techniques.

The agency has already engaged some KM thought-leaders including David and Alex Bennet, Steve Denning, and David DeLong to present at agency executive leadership seminars. As a part of the agency KM program, the staff intends to also develop and present KM training to specific categories of employees dealing with both the conceptual and practical aspects of KM as it is applied at NRC.

Practices for Sharing Implicit (fact-based) and Tacit (cognitive and technical skills – experience based/cultural) Knowledge

Storytelling

Stories are real-life situation that someone experienced. Individuals find sharing stories an easy and effective way of illustrating solutions to problem situations and lessons learned. Storytelling is a method for experienced staff to share their knowledge in a way that aids understanding and appreciation for unique situations. This technique for sharing experience is available and in use without constraints. Storytelling is used in work group meetings, team projects, organizational unit meetings (such as staff meetings), in some training courses, and in some developmental assignments.

Under the agency KM program the staff will continue the use of storytelling as a means of sharing institutional knowledge. The staff will develop or procure training on storytelling techniques and explore how to effectively disseminate knowledge-sharing stories.

Mentoring

Mentoring

Mentoring is a mutually agreed-upon relationship in which mentors advise and assist their mentees. From the perspective of knowledge management, it allows individuals to pair with experts as needed to learn ways to improve their skills. Currently the agency has a well-developed career mentoring program in place and also uses clearly-defined advisor roles in the formal development programs. The use of mentoring is effective in individual cases because it allows mentors to share information one-on-one with individuals who need to obtain advice and guidance to enhance their knowledge and skills.

Skills Mentoring Program

The NRC's existing voluntary mentoring program is primarily a career mentoring program whose objectives are to improve staff members' productivity and potential for advancement through enhancement of their present job skills and abilities; support the Upward Mobility and the rotational assignment process by providing employees with guidance and information that will assist them in their career development; improve staff morale by providing satisfying career development experiences through participation in the program; and to enhance the development of a highly qualified and diverse workforce in accordance with the NRC's Comprehensive Diversity Management Plan.

Under the agency KM program, a skills mentoring program will be developed to focus on the transfer of knowledge relevant to the individual's discipline or field of study. Engaging a skills mentor is often an important step in the path to becoming an expert in an individual's discipline. Skills mentoring is viewed as a long-term approach to knowledge transfer—paralleling the more familiar short-term approaches of early replacement hiring and waivers of dual compensation for rehired annuitants. While short-term approaches continue to have a place in the agency's overall approach to KM and SWP, skills mentoring is intended to provide opportunities for more robust knowledge transfer experiences over the long-term.

Early Replacement Hiring (Double Encumbering)

NRC uses the early-replacement hiring (also referred to as double encumbering) technique to provide salaries and benefits funding for up to one year for the purpose of transferring critical skills, competencies, and institutional memory from an employee who is planning to leave the NRC to a replacement employee. It allows for significant overlap between the employee who intends to leave the agency and the new employee who will be replacing the departing employee. This greatly facilitates knowledge transfer in situations for which the departing employee has institutional knowledge which the successor needs.

The agency KM program will not directly expand the use of early replacement hiring. However, early replacement hiring will be identified as part of the agency's inventory of KM techniques and offices will very likely use them to support additional succession planning activities at the staff level.

Rotational, Detail, and Exchange Assignments

NRC uses rotational and detail assignments as developmental opportunities. In the context of knowledge transfer, these opportunities give individuals experience in performing the jobs of current employees and employees who are leaving an organization. Consequently, they are an effective way to transfer critical skills. Rotational assignments are mandatory for some NRC developmental programs (Nuclear Safety Professional Development Program, Leadership Potential Program, and Senior Executive Service Candidate Development Program). They are also used for short-term shadowing opportunities and to rotate staff within a component.

Details and exchanges serve similar purposes to rotations but are generally used to provide NRC employees with opportunities to gain experience by sending them to work with other international, Federal and state agencies and organizations. Alternately personnel from other

agencies and organizations may be detailed or exchanged to gain or transfer knowledge by working at NRC. Visits provide short-term opportunities for staff to share knowledge by either traveling to an outside organization to gain first-hand knowledge of different techniques and technologies.

The agency KM program will not directly create new rotational, detail, or exchange assignments. However, these activities, including shadowing and visits, will be identified as part of the agency's inventory of KM techniques and offices will use them, when appropriate, to support additional developmental and succession planning activities at the staff level.

Teamwork

NRC work teams provide effective environments for transferring technical and historical knowledge on critical subjects and processes. This is especially true when teams are used to review and recommend improvements in key agency processes. Teams are often established by management to work on projects and tasks so this KM tool is already available and has widespread use. There are numerous examples of the effective use of teams to accomplish NRC activities including inspections, rulemaking, policy development, and training.

The agency KM program will not directly increase the use of teams. However, the use of teams as a knowledge sharing and knowledge transfer activities will be identified as part of the agency's inventory of KM techniques and offices may elect to use them as a means of transferring knowledge between new and experienced staff members.

After Action Reviews

Agency Lessons-Learned Program

The staff is currently developing the Agency Lessons-Learned Program (ALLP) to capture, track, store, and retrieve lessons learned. The program supports the agency's goal of providing reasonable assurance that the lessons learned from major events prevent recurrence of other similar events. This program will also enable the retention and dissemination of knowledge gained from future lessons learned, thus increasing its benefit and usefulness to the agency over time.

Under the agency KM program the ALLP will provide guidance and direction for incorporating lessons learned into policy, programs, procedures, and training. The program will also include a searchable repository of lessons-learned items. The Agency Lessons-Learned System is the software component of the ALLP and is envisioned to consist of a repository of document-based and data-based "lessons-learned" information according to the types of lessons learned (e.g., derived from agency task forces, Incident Investigation Teams, etc.), and then searched and retrieved through a Web-based user interface. The system will provide individuals with a mechanism to identify all of the lessons-learned items pertinent to any particular topic or procedure and to quickly locate the source documents.

Communities of Practice

Communities of Practice

Communities of Practice (CoP) are groups of individuals who regularly interact to share knowledge regarding a particular practice. They exist throughout NRC as project teams, work groups, organizational units, and even as professional associations. A common example of more formally-structured community-like groups is the agency's various counterpart meetings. These groups include people with varying levels of experience who have interest and shared levels of involvement in specific subject areas. They also have a sense of community–membership, trust, and willingness to gain and contribute information or solve problems with others in the group. CoPs form as needed and exist as long as the members perceive that need. They are usually self-organizing and do not require action to initiate them.

Under the agency KM program existing communities of practice will be provided with virtual space in the NRC Intranet to store and share their collective knowledge through a commercial community-of-practice software tool. As communities identify their need for a virtual presence they will be supported with training and guidance on maintaining a successful community for knowledge capture and sharing.

Knowledge Recovery Practices

In spite of careful planning and best efforts, it is inevitable that events will occur that cause the agency to lose some critical knowledge. There are three initiatives that are useful for recovering lost knowledge: 1) bringing back employees who have the required knowledge but have left the agency, 2) contracting to outsource the lost capabilities through commercial contracts or interagency agreements, and 3) recreating or relearning the knowledge that was lost.

<u>Using Retirees Effectively</u>

Waivers of Dual Compensation Limitations

Current SWP strategies allow for the waiver of dual compensation limitations. The agency uses its authority, under certain circumstances, to waive the regulations requiring salary "offsets" for rehired Federal annuitants. The NRC may waive the offset to rehire selected retirees who have scarce skills for limited periods when critical work needs compel. This practice is currently being used and can be expanded to provide additional rehired retirees with ample time to transfer knowledge that would otherwise be lost from the agency.

Under the agency KM program rehiring annuitants expressly for the purpose of recovering lost knowledge will be preceded by determining the knowledge of the remaining staff and analyzing the knowledge gap that is intended to be filled by rehiring the departed expert. The rehired retiree will focus on transferring their unique critical knowledge to the incumbent staff with preference over any other work.

<u>Outsourcing</u>

Contract Support

The agency sometimes meets short-term needs to fill current knowledge gaps by contracting for or hiring expert consultants to provide the needed expertise to accomplish specific tasks. Contractors and expert consultants are usually employed where specialized knowledge and skills are needed by NRC but cannot be obtained through normal recruitment channels. The contractors or consultants fill current knowledge gaps and may also focus on transferring their knowledge to agency staff before the end of the contract. Current uses include technical support, organizational consulting, training, administrative support, and coaching.

As part of the agency KM program, office and regional management will weigh all aspects of the need for the lost knowledge and evaluate whether the best approach is to utilize retirees, contract for the expertise, or recreate the knowledge internally. In cases where contracting is considered the best option then all or portions of the work will be outsourced to an appropriate vendor such as engineering consulting firms or National laboratories. Accessing the expertise of the firms or laboratories when needed relieves the agency from the burden of either recruiting or internally recreating knowledge that has either left or has never been retained within the agency. Consideration will be given to require the contractor or consultant to codify or otherwise transfer the missing knowledge to the staff.

Regenerating Knowledge

Regenerating critical knowledge is almost always viewed as the least-desirable method of filling a lost-knowledge gap because it is usually the slowest and most expensive. It presupposes that experts are not available either internally or externally with the exact level or type of knowledge that is missing.

Under the agency KM program recreating lost knowledge will employ a graded approach determined by the case at hand. The first step will be to measure the knowledge of the staff, including those who may have moved to other duties in the agency, to determine where the true knowledge gaps exist. If there are no former agency experts available to be reemployed, then outside experts may be contracted as either paid or unpaid consultants to help obtain important background or source material. Ideally the staff will be diligent to both document their efforts and share their newly-created knowledge within their community of practice.

Information Technology Applications
To Acquire, Store, and Share Knowledge

Information Technology (IT) applications are not viewed by the agency as knowledge management practices, rather as a means to facilitate, accelerate, and enhance the agency's knowledge management practices. None of the IT applications are intended as replacements for the direct person-to-person connection that is necessary for transferring implicit knowledge, particularly for transferring tacit knowledge. However, new knowledge continues to be created at an accelerating pace and IT applications are effective means of capturing, sorting, storing, and disseminating this knowledge and information to maximize the effectiveness of the staff.

<u>Connecting People</u>

On-Line Information Sharing

On-line information sharing describes a range of technology applications and infrastructure used to share information electronically. The applications typically include web sites, which contain previously defined information such as the agency's KM Web site; list servers, which automatically send messages to individuals who have subscribed to particular topical areas, such as the Operating Experience List Server; newsgroups, which allow questions and follow-up answers to be openly posted; chat rooms, which allow real-time electronic interaction among users; and searchable databases and document repositories, like the ADAMS and Licensing Support Network document repositories.

Under the agency KM program the staff will be provided with cost-effective access to technical Web sites that exist outside of the agency such as the online International Journal of Nuclear Knowledge Management, the International Atomic Energy Agency Nuclear Knowledge Portal, and the Nuclear Energy Agency Web site. The staff will also explore IT solutions to enhance the effective online sharing of information that may require development of additional IT infrastructure or employing indexing software such as Google.

<u>Accelerating Learning</u>

Expanding e-Learning (Computer-based Training)

The agency accepts that e-learning (computer-based training) is not a universal replacement for traditional, classroom instruction but in many instances can more effectivley deliver just-in-time, focused learning solutions. Often, delivering training courses through learning solutions that combine a mixture of e-learning and traditional learning (blended learning) accelerate the rate at which new employees achieve the first levels of functionality.

Under the agency KM program the staff will continue to identify and separate the training objectives that can be delivered through e-learning applications from those objectives that are more effectively delivered through more traditional methods. The agency is currently implementing a Learning Management System (LMS) as both the training records system and as an access portal to e-learning courses. The training modules that the agency currently delivers through e-learning, including Allegation Training and the Computer Security Awareness

Time Line for the Agency KM Program

This enclosure describes the time line for implementation of a number of short-term actions associated with the Agency KM program. Some of the action items such as identifying KM Champions and Staff Leads are already complete. Other action items such as collecting, piloting, and assessing KM practices and techniques are ongoing as new or innovative approaches are identified and considered for use by the agency.

1a. Identify Office and Regional KM Champions

Each office and region will identify a champion who is responsible for ensuring the implementation of the office KM program, leading development of KM strategies, selecting common techniques to execute those strategies, heightening awareness and interest in KM, and communicating expectations for KM to the staff.

Responsibility: All offices and regions
Due date: Completed

1b. Identify Office and Regional KM Staff Leads

Each office and region will identify a staff lead for KM who will serve as the office representative in the agency KM community of practice. This community will provide a forum for sharing knowledge on agency best practices in KM.

Responsibility: All offices and regions
Due date: Completed

1c. Develop KM Training and Present to the Office and Region KM Champions and Staff Leads

HR will develop, pilot, and present a KM training course to support identification of occupational priorities; selection of appropriate KM techniques; and application of various KM solutions.

Responsibility: HR
Due Date: August 2006

2a. Identify occupational priorities and critical bodies of knowledge

Each office and region will identify occupational priorities and critical bodies of knowledge for their organizations.

Responsibility: All offices and regions
Due date: September 2006

2b. Develop a consolidated list of occupational priorities and critical bodies of knowledge

The staff will create a consolidated list of the occupational priorities identified by offices and regions for the staff to use when piloting KM techniques.

Responsibility: HR lead
Due date: September 2006

3a. Identify an initial set of KM techniques

The staff will identify an initial set of KM techniques that may be used as pilot solutions for the occupational priorities and critical bodies of knowledge identified by the offices and regions in milestone activity 2a.

Responsibility: HR lead
Due date: October 2006

3b. Collect a common set of KM techniques

After being piloted by the staff, techniques which prove effective will be collected into a common set of agency KM solutions that will be disseminated for use throughout the agency.

Responsibility: HR lead
Due date: Ongoing and continuous

4a. Investigate appropriate IT tools to support KM techniques

The staff anticipates that the agency will need to develop or purchase additional information technology tools in order to facilitate the identification, organization, dissemination, and use of information and knowledge. These tools may include content management systems and Google-like indexing and search programs designed to make existing information available to all staff in a more user-friendly manner. Offices and regions will develop needs and requirements for IT tools that may be appropriate to support the common set of KM techniques and work together with OIS to acquire or develop appropriate solutions.

Responsibility: HR lead/OIS/Offices and regions
Due date: Ongoing and continuous

4b. Explore options to update the SWP database

The staff will explore options to use the SWP database to identify occupational priorities and bodies of knowledge for the offices and regions.

Responsibility: HR lead/OIS
Due date: September 2006

5. Pilot additional KM techniques as identified

Additional KM techniques and solutions will be piloted as needs are identified. Responsible offices will perform pilot activities as they are tasked by the Office and Region KM champions.

Responsibility: HR/Offices and regions
Due date: Ongoing and continuous

6. Assess pilot results

The results of the pilot activities in milestone 5 will be assessed for effectiveness in accomplishing their intended outcomes, portability throughout the agency, and ease of implementation and execution. Effective techniques will be added to the collection of agency KM solutions and disseminated by the agency champion for use by the offices and regions.

Responsibility: KM Steering Committee
Due date: Ongoing and continuous

7. Develop a communications plan for the Agency KM Program

The Agency KM Coordinator together with the KM Steering Committee will develop a communications plan to inform the staff about the purpose, activities, roles, responsibilities, and roll-out schedule for the agency KM program.

Responsibility: OEDO/HR/KM Steering Committee
Due date: September 2006

8. Rollout the production version of the NRC Knowledge Center community of practice (CoP) software

The agency has identified and purchased commercial-off-the-shelf (COTS) community of practice software and is in the final stages of completing the security plan and acceptance testing. Once the product is available the vendor will conduct community editor training and the first pilot communities of practice will be chartered to begin operating with a virtual community space.

Complete security and acceptance testing
Responsibility: HR/RES/OIS
Due Date: December 2006

Schedule and present first vendor training course
Responsibility: HR
Due Date: January 2007

Draft an interim operating instruction for chartering, standing up, and monitoring CoPs
Responsibility: HR/KM Steering Committee
Due Date: January 2007

Migrate pilot CoPs to the new NRC Knowledge Center
Responsibility: HR
Due Date: February 2007

Create a CoP for new employees to replace the Orientation Web page
Responsibility: HR
Due Date: March 2007

9. Develop a pilot application to use the SWP database to create an on-line Knowledge Resource Locator

HR will develop a pilot software application to display the information in the SWP as a Knowledge Resource Locator for agency experts. The application will be evaluated by the KM Steering Committee to decide if the SWP-based application meets the agency's needs for a Knowledge Resource Locator. OIS will be involved from the inception of the development process to facilitate an easy transition to a production version of the application if the proof of concept is approved by the KM Steering Committee.

Responsibility: HR lead/OIS
Due Date: March 2007

10. Identify a pilot application similar to Wikipedia for staff use

The KM Steering Committee will develop needs and requirements to a pilot communally-developed encyclopedia software application similar to the Wikipedia Web product. The application will be evaluated by the KM Steering Committee to decide if the application is an effective tool for capturing and sharing the staff's knowledge through a communal encyclopedia format. OIS will be involved from the inception of the development process to facilitate an easy transition to a production version of the application if the proof of concept is approved by the KM Steering Committee.

Responsibility: KM Steering Committee/OIS
Due Date: June 2007

11. Develop a Skills Mentoring Program

The KM Steering Committee will identify offices and regions to develop a pilot skills mentoring program that will compliment the agency's existing mentoring program by pairing mentors and mentees solely for the purpose of professional development within a particular discipline. The program will be designed to be administered at the office or regional level.

Responsibility: KM Steering Committee/HR/SBCR
Due Date: June 2007

12. Identify sources for knowledge capture interviewing training and support

HR will locate a qualified vendor to develop and deliver training on how to design, conduct, videotape, edit, and disseminate knowledge capture interviews. Individuals from offices and regions will attend the training as assigned by their offices. HR will also determine the most efficient method for videotaping and editing the interviews and for ensuring that they are 508 compliant for use on the NRC's Intranet.

Responsibility: HR
Due Date: June 2007

Course will be incorporated into the Learning Management System in the second quarter of FY 2007. Additionally, the staff is planning to expand the availability of e-learning solutions by investigating the computer infrastructure requirements needed to support a state-of-the-art desktop Web conference capability.

Capturing Knowledge

Electronic Repositories

The agency currently uses a number of electronic repositories to capture and store knowledge and information in explicit (documented) form. Among these are document management systems such as the Agencywide Documents Access and Management System (ADAMS), the Licensing Support Network (LSN), and databases for storing unique information like the Commission Decision Tracking System (CDTS). Many of the individual offices and regions also capture and store knowledge and information in local electronic repositories such as Web-based portals and independent databases.

As part of the agency KM program independent databases and on-line repositories will be linked through office and regional knowledge portals and communities of practice Web sites. To support a goal of opening access to these repositories to the whole agency, more robust document management systems and search engines will be investigated.

Google-like Search Engine

The staff is exploring new search technologies for the ADAMS database and for the NRC intranet. The staff's goal is to eventually have in place an agencywide IT tool that provides search capabilities similar to that of the commercially-available Google application.

Communally-authored Encyclopedia (e.g., Wikipedia)

The staff will explore using a Wikipedia-like knowledge capture and sharing tool. Wikipedia is a Web-based communal encyclopedia that is written and edited collaboratively. Capturing of knowledge and knowledge bases, from Subject Matter Experts (SMEs) or literature collections and annotations, may be codified using a combination of semantic web technologies and digital knowledge bases. In particular, Web document annotation tools, collaborative learning and writing software similar to those used by Wikipedia, could possibly be provided to employees to annotate their documents individually, to facilitate collaborations in document authoring and reviewing, and/or to coordinate research efforts.

Knowledge Mapping

Identifying Occupational Priorities and Critical Bodies of Knowledge through Strategic Workforce Planning

The staff uses the Strategic Workforce Planning (SWP) database to perform an important knowledge management function at NRC by serving as a map of the agency's skills and knowledge. Because the principal use of SWP is as a skill and knowledge inventory, it can be

used as a tool by supervisors to identify or project gaps in the agency's critical competencies. That information is subsequently applied by the offices and regions to direct recruitment and staffing activities, to prioritize the expenditure of training funds, and to identify critical skill shortages for development programs such as the Graduate Fellowship Program.

Currently, the SWP tool does not support the identification of the agency's occupational priorities and critical bodies of knowledge. As a part of the agency KM program, the staff intends to explore modifying the SWP tool to automate those functions.

Knowledge Resource Locator (Expert Yellow Pages)

One of the more straightforward approaches to facilitating knowledge transfer, particularly for the tacit knowledge items that are difficult to otherwise capture and disseminate, is person-to-person transfer between experts possessing the specific knowledge item and individuals seeking the knowledge. Individuals seeking specific knowledge items, especially those who are new to the agency, may expend significant time and effort just in locating the experts who possess the knowledge.

A widely-used and effective approach for connecting knowledge seekers with knowledgeable experts is a knowledge resource locator database. A knowledge resource locator, also called an expert locator or expert yellow pages, provides a matrix that lists the contact information for agency experts organized by occupational priorities and critical bodies of knowledge. Some agency organizations have developed locator lists specific to their organization but the information is neither standardized nor centralized.

As part of the agency KM program the staff is investigating using the SWP to develop a knowledge resource locator of both technical and nontechnical experts that may be made available agencywide as a Web-accessible report through the NRC Intranet and potentially via the NRC Public Web page.

Agency KM
Program Resource Estimates

This enclosure provides preliminary resource estimates for a number of short-term actions associated with the Agency KM Program where needs are currently quantifiable. The resources identified below are approximate estimates based on office size.

1a. Identify Office and Regional KM Champions

Responsibility: All offices and regions
Beginning: February 2006

Estimated Resources:
3.42 FTE in FY06, 4.56 FTE in FY07 and FY08.
(0.4 FTE per office per year for HR, NMSS, NRR, NSIR, OIS, RES, RI, RII, RIII, RIV)
(0.04 FTE per office per year for ACRS/ACNW, ADM, ASLBP, OCA, OCAA, OCFO, OE, OEDO, OGC, OI, OIP, OPA, SBCR, SECY, STP)

1b. Identify Office and Regional KM Staff Leads

Responsibility: All offices and regions
Beginning: February 2006

Estimated Resources:
3.42 FTE in FY06, 4.56 FTE in FY07 and FY08.
(0.4 FTE per office per year for HR, NMSS, NRR, NSIR, OIS, RES, RI, RII, RIII, RIV)
(0.04 FTE per office per year for ACRS/ACNW, ADM, ASLBP, OCA, OCAA, OCFO, OE, OEDO, OGC, OI, OIP, OPA, SBCR, SECY, STP)

1c. Develop KM Training and Present to the Office and Region KM Champions and Staff Leads

Responsibility:
HR Beginning: August 2006

Estimated Resources:
0.10 FTE and $40K in FY06

2a. Identify occupational priorities and critical bodies of knowledge

Responsibility: All offices and regions
Beginning: September 2006

Estimated Resources:
1.71 FTE in FY06, 2.28 FTE in FY07 and FY08.
(0.20 FTE per office per year for HR, NMSS, NRR, NSIR, OIS, RES, RI, RII, RIII, RIV)

(0.02 FTE per office per year for ACRS/ACNW, ADM, ASLBP, OCA, OCAA, OCFO, OE, OEDO, OGC, OI, OIP, OPA, SBCR, SECY, STP)

2b. Develop a consolidated list of occupational priorities and critical bodies of knowledge

Responsibility: HR
Beginning: September 2006

Estimated Resources:
0.05 FTE in FY06

3a. Identify an initial set of KM techniques

Responsibility: HR lead
Beginning: October 2006

Estimated Resources:
0.10 FTE in FY07

3b. Collect a common set of KM techniques

Responsibility: HR lead
Beginning: October 2006

Estimated Resources:
0.10 FTE in FY07 and FY08.

4a. Investigate appropriate IT/IM tools to support KM techniques

Responsibility: HR lead/OIS
Beginning: September 2006

Estimated Resources:
0.05 FTE in FY06, 0.50 FTE in FY07, and 0.70 FTE in FY08
(OIS: 0.30 FTE in FY07 and 0.50 FTE in FY08)
(HR: 0.05 FTE in FY06, 0.20 FTE in FY07 and FY08).

4b. Explore options to update the SWP database

Responsibility: HR lead/OIS
Beginning: September 2006

Estimated Resources:
0.05 FTE in FY06, 0.30 in FY07

5/6. Pilot additional KM techniques as identified and assess pilot results

Responsibility: HR lead/Offices and regions
Beginning: August 2006

Estimated Resources:
1.0 FTE and $100K in FY06, 4.0 FTE and $400K in FY07 and FY08
(0.4 FTE and $40K per pilot project).

7. Develop a Communications Plan for the Agency KM Program

Responsibility: OEDO/HR/KM Steering Committee
Due date: September 2006

Estimated Resources:
0.01 FTE in FY06

8a. Complete NRC Knowledge Center CoP software security and acceptance testing

Responsibility: HR/RES/OIS
Due Date: December 2006

Estimated Resources:
0.05 FTE in FY06 and 0.20 FTE in FY07

8b. Schedule and present pilot NRC Knowledge Center CoP software training course

Responsibility: HR
Due Date: January 2007

Estimated Resources:
0.10 FTE and $40K in FY07 and FY08

8c. Draft an interim operating instruction for chartering, standing up, and monitoring CoPs

Responsibility: OEDO/HR/KM Steering Committee
Due Date: January 2007

Estimated Resources:
0.50 FTE in FY07 (distributed across the offices and regions)

8d. Migrate pilot CoPs to the new NRC Knowledge Center

Responsibility: HR
Due Date: February 2007

Estimated Resources:
0.10 FTE in FY07

8e. Create a pilot CoP for new employees to replace the Orientation Web page

Responsibility: HR
Due Date: March 2007

Estimated Resources:
0.10 FTE in FY07

9. Develop a pilot application to use the SWP database to create an on-line Knowledge Resource Locator

Responsibility: HR lead/OIS
Due Date: March 2007

Estimated Resources:
0.05 FTE in FY06, 0.1 FTE in FY07
(OIS: 0.05 FTE in FY07)
(HR: 0.05 FTE in FY06 and FY07).

10. Identify a pilot application similar to Wikipedia for staff use

Responsibility: OEDO/KM Steering Committee/OIS
Due Date: June 2007

Estimated Resources:
$20.0K and 0.25 FTE in FY07

11. Develop a skills mentoring program

Responsibility: OEDO/KM Steering Committee/HR/SBCR
Due Date: June 2007

Estimated Resources:
0.50 FTE in FY07 (distributed across offices and regions)

12. Identify sources for knowledge capture interviewing training and support

Responsibility: HR
Due Date: June 2007

Estimated Resources:
0.05 FTE in FY07

Agency KM Program Resource Summary

		FY06		FY07		FY08	
Item	Description	FTE	$K	FTE	$K	FTE	$K
1a	Office and Regional KM Champions – 10 large offices	3.00	-	4.00	-	4.00	-
	Office and Regional KM Champions – 14 small offices	0.42	-	0.56	-	0.56	-
1b	Office and Regional KM Staff Leads – 10 large offices	3.00	-	4.00	-	4.00	-
	Office and Regional KM Staff Leads – 14 small offices	0.42	-	0.56	-	0.56	-
1c	Develop KM Training and Present to the Office and Region KM Champions and Staff Leads	0.10	40.0	-	-	-	-
2a	Identify occupational priorities and critical bodies of knowledge – 10 large offices	1.50	-	2.00	-	2.00	-
	Identify occupational priorities and critical bodies of knowledge – 14 small offices	0.21	-	0.28	-	0.28	-
2b	List occupational priorities and critical bodies of knowledge – HR	0.05	-	-	-	-	-
3a	Identify an initial set of KM techniques	-	-	0.10	-	-	-
3b	Collect a common set of KM techniques	-	-	0.10	-	0.10	-
4a	Investigate appropriate IT/IM tools to support KM techniques	0.05	-	0.50	-	0.70	-
4b	Explore options to update the SWP database	0.05	-	0.30	-	-	-
5/6	Pilot additional KM techniques as identified and assess pilot results	1.00	100.0	4.00	400.0	4.00	400.0
7	Develop a Communications Plan for the Agency KM Program	0.01	-	-	-	-	-
8a	Complete NRC Knowledge Center CoP software security and acceptance testing	0.05	-	0.20	-	-	-
8b	Schedule and present pilot NRC Knowledge Center CoP software training course	-	-	0.10	40.0	0.10	40.0
8c	Draft an interim operating instruction for chartering, standing up, and monitoring CoPs	-	-	0.50	-	-	-
8d	Migrate pilot CoPs to the new NRC Knowledge Center	-	-	0.10	-	-	-
8e	Create a pilot CoP for new employees to replace the Orientation Web page	-	-	0.10	-	-	-
9	Develop a pilot application to use the SWP database to create an on-line Knowledge Resource Locator	0.05	-	0.10	-	-	-
10	Identify a pilot application similar to Wikipedia for staff use	-	-	0.25	20.0	-	-
11	Develop a skills mentoring program	-	-	0.50	-	-	-
12	Identify sources for knowledge capture interviewing training and support	-	-	0.05	-	-	-
	Total	9.91	140.0	18.30	460.0	16.30	440.0