

## **POLICY ISSUE INFORMATION**

July 25, 2006

SECY-06-0164

FOR: The Commissioners

FROM: Luis A. Reyes  
Executive Director for Operations

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

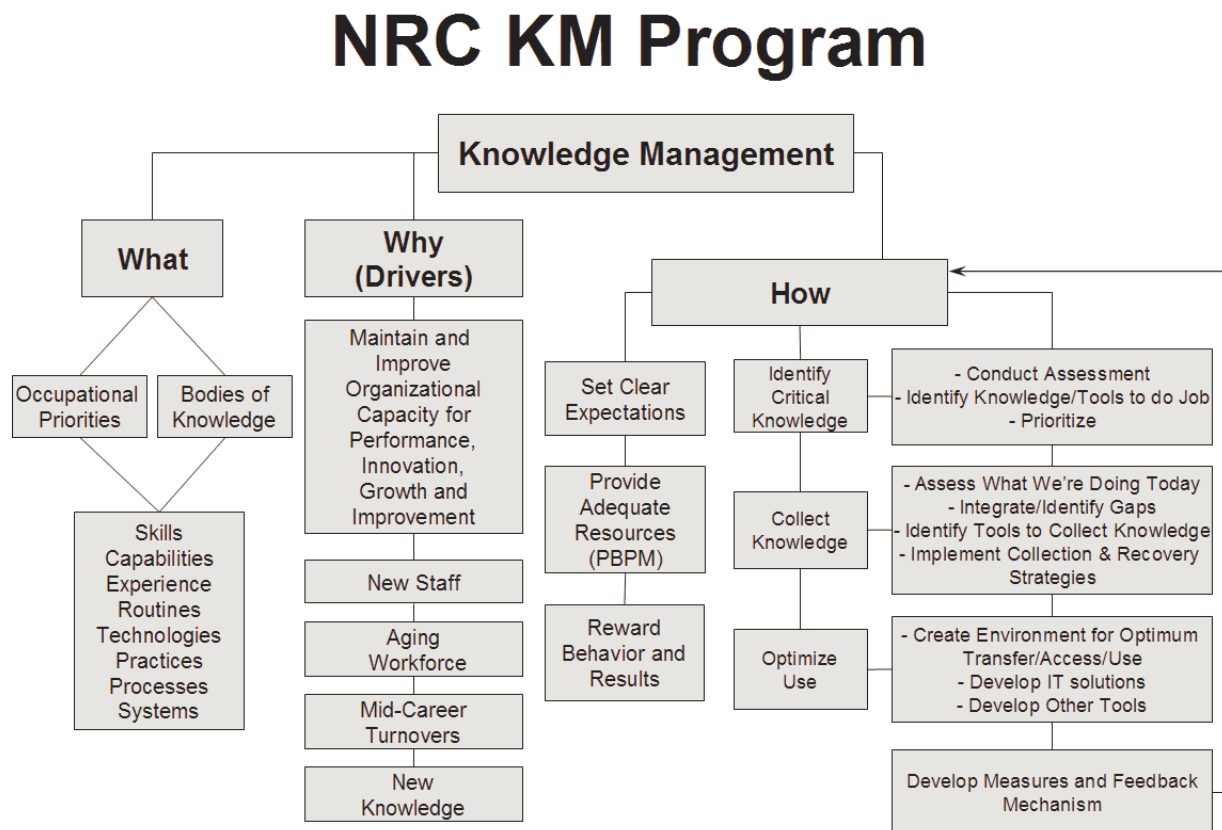
champions to provide cross communication and integration of KM initiatives. Each Office Director and Regional Administrator will also appoint a senior staff KM lead who will assist in the implementation of specific KM initiatives. The Office of Human Resources (HR) will provide program support, coordination,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



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 collecting, 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.

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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

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