NRC NEWS

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"Strengthening Safety through Managing Knowledge"

Prepared Remarks for
The Honorable Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission
at
The South Texas Project Leadership Conference
Bay City, TX
February 24, 2012

Good afternoon. I'm pleased to have the opportunity to address your Leadership Forum today. I have not had the opportunity to visit the South Texas Project before, so I have been looking forward to this trip. I spent an interesting morning today touring the plant.

When Ed Halpin dropped by my office earlier this month, he suggested that I speak to you today about Knowledge Management and I was very pleased to accept, given the significant role knowledge management plays in ensuring continued safety. Knowledge Management is certainly something we have focused on at the NRC.

Just this week, the Commission held a meeting to discuss Omaha Public Power District's plans to return the Fort Calhoun facility to service after prolonged flooding of the site last summer, as well as safety challenges experienced at the plant recently. It was interesting to me that a question asked by one of my fellow Commissioners, regarding leading indicators, was virtually the same question that was asked by a different Commissioner five years ago, in a similar meeting. To me this was a good example of how knowledge management is vital to all levels of an organization.

As a safety regulator, our mission requires us to evolve as we gain new information and experience. We must continually incorporate new lessons into our approach to safety, and having a strong Knowledge Management program helps us to more effectively utilize our information and experience. This is crucial to fulfilling our mission.

Knowledge management is especially important when you are as fortunate as we have been in recruiting and retaining such high-quality staff. People who come to work for us tend to stay for a long time – on average around 22 years. So even though we are, relatively speaking, a small federal agency, when an employee walks out the door due to retirements or normal attrition, we are losing a tremendous amount of knowledge. Given our critical mission, we cannot let that happen. Lessons learned about safety must be integrated into our everyday thinking or we risk history repeating itself.

Despite the agency's involvement in informal knowledge management activities for many years, in 2006 we decided to establish a more structured and formal way to manage and pass on knowledge. This more focused approach was driven by a several things, including an aging work force, an expectation of increased new hiring, and the advent of additional technological tools. Today, we still use the traditional ways of capturing and sharing knowledge, such as through stored technical documents, mentoring, internal seminars and presentations, and training courses. But we are also now using a commercial web-based application that incorporates social networking -- we call it the NRC Knowledge Center.

The Knowledge Center provides an invaluable source of information for an agency like the NRC. Employees can fill out a profile with their name, their education, skills, experience, languages spoken, and areas of high-level expertise. The profiles are searchable, and this is important. If, for example, we were in a situation where we needed a French-speaking nuclear engineer with specialized experience in a narrow technical area, we could quickly search the system and learn if anyone in our staff has that combination of knowledge and skills. And, we could quickly reach them.

Knowing what experts and expertise we have in our agency means we can meet safety challenges more efficiently, and the Knowledge Center provides a way of doing just that.

The Knowledge Center also allows us to establish virtual Communities of Practice and Communities of Interest. At the present time, we have more than 150 communities, ranging from Nuclear Criticality to our Internal Leadership Development Programs.

Employees can join the existing communities, or create new ones. And, within those communities, members can post questions to one another, and those with the answers or related knowledge can reply. The discussion threads are searchable and they are kept permanently. So, new employees who are just beginning their work at the agency can access the community or communities that match their job responsibilities. They can search for specific information, and find discussions years after they actually took place. It's a great way to capture and make knowledge accessible throughout the staff.

These communities of practice provide a very direct means of transferring knowledge and experience that has been accumulated over many years to staffers who are newer to the agency

and a particular work function. It is also a form of informal learning that can compress the time needed for newer staff to build their competencies.

In addition to these detailed and personnel-oriented programs, we also, of course, have our high-level, technical programs to ensure we capture knowledge and lessons on a broad scale, and attempt to integrate those lessons into our everyday thinking so they are not lost. For example, we have an entire branch dedicated to Operating Experience. The staff in this branch analyze events on a daily basis to identify trends and look for opportunities to improve safety through everyday experiences at licensee sites.

Operating Experience not only benefits our staff and inspectors, but provides useful information to licensees as well. We use our Operating Experience program to provide near real-time information on events and issues. Additionally, we use Operating Experience to provide in-depth analysis of significant events. That information is pushed to our staff for their use, and also is available in a searchable database.

We also have a Lessons-Learned Program that is aimed at ensuring that knowledge gained from significant events and issues is retained and disseminated in a manner that will maximize benefit to the agency. The roots of this program go back to 2002 when the Davis Besse Lessons Learned Task Force found that performance and programmatic issues it identified were a repeat of similar issues identified in previous NRC lessons-learned reports. That was inconsistent with the agency's culture of continuously self-evaluating and improving, and was, in part, a direct result of not having a more formalized knowledge management program.

Here are a couple of examples that demonstrate how much transferring knowledge really matters. In 2010, there was a trip of an Emergency Diesel Generator (EDG) following a dual unit reactor trip. As it turned out, a relay on an EDG circuit did not perform properly. When the licensee examined how that happened, they learned that a periodic replacement requirement for the relay was handled by an informal monitoring program that was not tracked by the preventive maintenance program. In 2002, the component engineer who performed the informal monitoring was moved to a new position, and that knowledge was lost. Since this periodic replacement was not done, the relay did not perform properly in 2010, contributing to the loss of the EDG at a critical time.

In another example, a licensee experienced a loss of inventory from the reactor vessel while preparing the reactor for refueling. Since the same procedure was used during prior shutdowns, it was unclear why the same problem had not occurred then. It was learned that more experienced operators had been in the control room during prior shutdowns, and knew they needed to close two main steam drain valves to avoid a loss of inventory. However, those operators did not write condition reports to document and correct the deficient procedure.

Those are just several examples that illustrate how easily knowledge can be lost, and how that can substantially affect plant performance or create unnecessary problems.

Coming from a slightly different direction, I would also like to provide one example of using knowledge management and sharing information. And that is industry's efforts to resolve the pressurized water reactor sump clogging issue. When we issued Generic Letter 2004-02, many licensees collaborated to share information on designing and installing improved reactor sump strainers to help resolve this important safety issue. One area where I understand you plan to share information is the work you are doing in developing a risk informed solution to this problem. While much has been done, we have not yet achieved closure.

Over the past five and a half years, since we began a formal Knowledge Management program at the NRC, we have identified a number of best practices. As you continue to focus on how to document and share the knowledge you gain every day from your jobs, I thought you might be interested in four of the best practices.

First of all, change management is incredibly important. There must be strong, consistent support from the top of the organization and Knowledge Management expectations and processes should be instilled in new employees right from the start. And, it's not always the older employees passing knowledge on to newer staff—sometimes new employees can teach older employees new and better methods for accomplishing a task.

Second, keep Knowledge Management efforts practical, and focus on the mission work and where that work gets done.

Third, knowledge management should be leveraged to strengthen informal staff learning and development. After all, much of knowledge management is really what we used to call teaching. It's mentoring on a daily basis.

Fourth, try different ideas, and always keep the program evolving.

As the one-year anniversary of the Fukushima Dai-ichi accident approaches, we are still thinking about and discussing the lessons learned from that tragedy. As you might expect, the NRC has taken a broad range of steps to ensure that we capture the knowledge that is related to Fukushima. These include the Near-Term Task Force report, a web-based training course, Steering Committee meetings with the staff, Commission papers, an After Action Report on lessons learned from the Operations Center, and more.

In closing, I'd like to make the observation that the nuclear industry sets a very good example in the way it shares information and resources amongst its members. This may be unique across industries. I applaud you for taking that approach to help improve performance for everyone.

Thank you for inviting me to speak to you today. I've enjoyed being with you and I appreciate your well-recognized Texas hospitality – you've certainly lived up to that reputation.

I'll be happy to take any questions you may have.