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Knowledge Management Initiatives for International Safeguards
U.S. Nuclear Regulatory Commission

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The challenge of addressing domestic knowledge management for international nuclear safeguards employed in a State by the International Atomic Energy Agency (IAEA) and best practices in nuclear weapon nonproliferation has been addressed by several State Parties to the "Treaty on the Non-Proliferation of Nuclear Weapons" (NPT) in an effort to minimize errors when implementing obligations under a Comprehensive Safeguards Agreement and Additional Protocol. In principle, State Regulatory Authorities (SRA) use regulations for enforcement and federal register notices for dissemination of information regarding the licensee's responsibilities. Albeit important for those entities to be aware of these obligations and how they might be implemented, it is essential that a SRA retain experiences associated with IAEA safeguards activities and nonproliferation knowledge to mitigate the possibility of future misinterpretations of these obligations.

The United States of America (U.S.) Nuclear Regulatory Commission (NRC), as the independent regulatory authority for the U.S. commercial nuclear industry and other nuclear installations not owned by the U.S. Department of Energy (DOE), is responsible for ensuring the safe and secure use of nuclear and radioactive materials. The NRC also provides direct support of U.S. Government efforts to meet its nuclear non-proliferation obligations under the NPT, the "Agreement between the [U.S.] and the [IAEA] for the Application of Safeguards in the [U.S.]" and Initial Protocol thereto (INFCIRC/288)", and the "Protocol Additional to the Agreement between the [U.S.] and the [IAEA] for the Application of Safeguards in the [U.S.]" (INFCIRC/288/Add. 1), as well as the Agreement between the [U.S] and the [IAEA] for the application of safeguards in connection with the Treaty for the Prohibition of Nuclear Weapons in Latin America (INFCIRC/366)."

At the NRC, knowledge management is described as capturing critical information and making the right information available to the right people at the right time. It includes, but is not limited to: mentoring, seminars, databases, electronic reading rooms, formal and informal training, interviews, procedures, desk references, communities of practice, websites and portals. The NRC defines knowledge management as a continuous, disciplined, and timely process of identifying, collecting, and using information to better accomplish the job. Since the KM program's inception, the NRC has done a great deal of foundational work around establishing a governance structure, creating a shared understanding around the concepts of KM, and developing various approaches and methodologies for applying KM practices, and implementing tools to increase knowledge capture, sharing and collaboration.

It could be said that there is no "right" solution for determining what knowledge practice to use, however, the practice(s) should depend on:

- Why: Why do you want to transfer the knowledge? Identify the knowledge gap.
- Who: Identify the knowledge receiver. What is their level of expertise/experience and learning style?

- How: Understand how the knowledge will be applied, where will it be maintained?
- What: Identify what type of knowledge is being transferred?

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- KM Templates/Checklists
- Best Practice Collection
- Video Library
- Communities of Practice
- NUREG/KM
- ADAMS – Official Agency Document Repository
- Social Media Platforms (Facebook, YouTube, Flicker)
- Lessons Learned Program
- Mentoring Program

The International Safeguards Team at the NRC utilizes many of the KM practices and implementing tools to provide a workable solution to maintaining core competencies for International Safeguards Analyst within the Office of Nuclear Material Safety and Safeguards. Examples of communities of practice, mentoring, qualification programs and library of safeguards related documents help to build and retain a knowledge base for the analysts.

As described by the Swiss Agency for Development and Cooperation (SDC) Federal of Foreign Affairs (FFA), in their *Knowledge Management Toolkit, (2009)* a Community of Practice (CoP) is a group of committed people, active in a common domain, with a genuine interest in each other's expertise based on their own practice. Members combine their own interests with an open mandate from their organization and work together in a rather informal structure. The six essentials of a CoP, in brief:

1. There is a **Community** of active members with a lively interest in sharing their knowledge.

2. There is a **Domain** where a thematic orientation is relevant and meaningful to the members who share specific topics, experience and practice.

3. There is a **Practice** of sharing experience, concepts and strategies, which serves as a kind of reality check for the team.

4. There is **Motivation** of its members that is recognized in their personal interest and the priority they assign to the CoP in their daily work.

5. There is a **Mandate** that shows management interest and commitment to the CoP.

6. There is a **balance of formal and informal structure** of a CoP that is beyond organizational boxes and lines. Hierarchy is not an important element.

The International Safeguards Team at the NRC utilizes the CoP concept by collaborating and communicating across areas of responsibilities, promoting knowledge sharing throughout all members of the team. A library of safeguards and nonproliferation related documents is

maintained by the team on a common shared drive within the NRC network, thereby improving productivity and decision making.

Strengthening international safeguards implementation knowledge management in the U.S. is also being addressed through a progressive training and qualification program at the NRC. The basis for this program utilizes a qualification plan specifically designed to ensure the NRC International Safeguards Analysts, Import and Export Analysts, and Nuclear Materials Management and Safeguards System Analysts are evaluated against a standard of knowledge outlined in a qualification plan. The knowledge standard is designed to qualify analysts to effectively represent NRC and U.S. interests in domestic and international meetings on non-proliferation issues, and to ensure the NRC and its commercial licensees comply with international treaties and agreements. The scope of the program plan includes initial training on the NRC and its domestic regulatory responsibilities, then focuses on required core training for each analyst position. The course focus provides trainees with an opportunity to understand how the U.S. State System of Accounting for and Control of nuclear materials (SSAC) was established and how it is now being maintained.

Completion of the self-paced training and qualification plan requires the future analyst to obtain the requisite levels of knowledge for qualification in their specific analyst position. In principle the qualification plan has two primary segments:

Part 1: Initial training includes familiarization with the day-to-day NRC organization at an agency-level, office-level and professional level in their work environment. Ethics, objectivity and professional conduct are important concepts that are learned in this program through on-line training and some classroom training provided by the NRC training department.

Part 2: Core training is designed to provide explicit course criteria outlined within each qualification guide to ensure an analyst is provided information necessary to comprehend what is required to become proficient in their particular analyst position.

Outlined in the overall plan is a qualification journal that includes minimum training requirements for personnel assigned as International Safeguards Analysts, NMMSS Analysts, or Import/Export Analysts. The document consists of a series of qualification guides and assigned knowledge levels with associated individual signature cards. Each signature card is used to document task completion, as indicated by the appropriate signature blocks. The journal establishes the minimum knowledge levels and areas of study that must be completed for each signature card. Any qualified member of the staff, as approved by the supervisor, may review with the trainee and initial specific items on the qualification cards.

Strengthening of the International Safeguards Analyst training and qualification program is further achieved through providing on-the-job training, allowing for greater exposure to various constituents of the U.S. SSAC. Important integrated knowledge and experience is achieved through on-the-job training in activities related to the national objective to account for and control nuclear material in the U.S. and the international objective to provide the basis for the application of IAEA safeguards under the US-IAEA Safeguards Agreements.

Mentoring is a dynamic, reciprocal, personal relationship in which the Senior International Safeguards Analyst assists in the development of the International Safeguards Analysts, NMMSS Analysts, or Import/Export Analysts. Mentors share advice, experience, perspectives, proficiencies, resources and skills in their role as teacher, sponsor, role model and guide through the qualification process. Typically, analyst mentoring is performed using a one-on-one

relationship, however, group analysis of a complex problem is sometimes used to provide the analyst a broader scope of understanding of domestic and international safeguards relationships.

Once all assigned material has been reviewed by the trainee and signed-off to the satisfaction of the individual's supervisor, completion of the qualification cards is acknowledged by his/her supervisor's signature. A three-member oral Qualification Board is organized for the trainee that requires him/her to answer a series of comprehensive questions regarding their specific analyst position. After the successful completion of this Board review, a subject matter expert, the Analyst's Supervisor, a Senior Executive Service manager must provide approval signatures.

Videos are becoming much more prevalent in KM with greater accessibility between government organizations. The NRC and DOE collaborate each year to provide a forum for NRC licensees, DOE facilities, holders of nuclear material, and other stakeholders to discuss nuclear material control and accounting measures at the Nuclear Material Management and Safeguards System Annual Meeting. Digital video equipment is being used at these annual gatherings of experts in the field of domestic and international (IAEA) safeguards to record experiences of the participants. Limited access to the videos is provided to US Government employees for the purpose of maintaining a consistent legacy of best practices and performance.

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