

Safety and Security Interface
Increasing Security of Category 1 and 2 Materials within the United States

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Abstract

The events of September 11, 2001, heightened concerns about the use of risk-significant radioactive materials in a malevolent act within the United States. Such an event is of particular concern because of the widespread use of radioactive materials (often contained in sealed sources) in the United States by industrial, medical, and academic institutions. The theft or diversion of such materials, in risk-significant quantities, could lead to their use in a malicious act. A significant culture change occurred at the U. S. Nuclear Regulatory Commission (NRC) and for the regulated community, to have to consider the potential for malevolent unauthorized access to licensed radioactive materials. This challenge was significant because safety and security professionals spoke “different languages” and have different constraints on their work. Security professionals want to control the flow of information; safety professionals see the need to share information. This paper will discuss the safety and security interface and discuss how the NRC ensures the safety and security of Category 1 and 2 radioactive materials within the United States.

Safety and Security Interface

The U.S. Nuclear Regulatory Commission (NRC) was created as an independent agency to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment. The mission of the NRC is to license and regulate the United States' civilian use of radioactive materials to protect public health and safety, promote the common defense and security, and protect the environment. When radioactive materials were first used in widespread academic, industrial and medical applications, the traditional focus of the NRC safety program was to control and manage the material from the perspective of preventing inadvertent and unintentional unauthorized access and common theft for monetary reasons. As a result of past incidents involving Orphan Sources and loss of control events such as melting sources in smelters, in the late 1990s, the NRC as well as other regulatory organizations outside of the U.S. recognized the need to improve the control over risk-significant radioactive sources. While it was known that these materials could be used for a malicious intent and the regulatory community was taking responsible actions to address these issues of source control, there was no sense of urgency.

The events of September 11, 2001 in New York City changed the threat environment and resulted in a significant culture shift regarding the security of radioactive materials. The U.S. framework for security and control of radioactive material requires multi-jurisdictional

coordination. Several U.S. governmental agencies have authority, sometimes overlapping, over radioactive materials and it was agreed that the NRC would domestically ensure security of Category 1 and 2 materials used in commercial, academic and industrial applications within its existing regulatory and oversight structure.

While the NRC's fundamental goals to protect public health and safety, and to protect the environment, remained unchanged, the NRC had to increase its requirements for the secure use and management of radioactive materials. Immediately after September 11, the NRC worked internally and with other Federal and State agencies to identify priority actions for enhancing the security of risk significant radioactive materials and facilities. These initial actions resulted in the dissemination of a number of Security Advisories to licensees, which were used to recommend specific actions to enhance security, to address potential threats, and to communicate general threat information. These actions taken by NRC licensees were voluntary and were not legally binding on the regulated community. However, the regulated community understood the change in the threat environment and the need for increased security and implemented the requested actions.

The NRC also looked internally at its organizational structure and, at that time, and determined that the assignment of security responsibilities was spread across the agency within various organizational safety programs. As a result, in 2002, the NRC established a centralized security office. This change resulted in streamlined communications, improved the timeliness and consistency of information, and provided a more visible point of contact and effective counterpart to other security-focused U.S. federal agencies. As expected, this centralized security office consisted of staff experienced in physical security programs and safeguards; however, the NRC also staffed this security office with professionals experienced in radiological safety programs. Establishing a central security office could have resulted in a separation of safety and security, where the two sides do not effectively communicate with one another. However, the NRC recognized the importance of the safety and security interface and ensured that safety and security professionals worked together within its organization.

With voluntary security measures in place, the NRC proceeded with several different activities, in parallel. The NRC provided experts that served on both national and international working groups to determine what radioactive material needed to be protected. With this as its main consideration, the NRC staff actively participated in studies, both domestic and international to look at commonly used medical, academic and industrial radioactive materials (often contained in sealed sources). These efforts eventually became the list of sources found in the IAEA Code of Conduct on the Safety and Security of Radioactive Sources.

The NRC also met with Agreement State regulators¹ and the regulated community regarding the voluntary security actions. Due to the sensitive nature of the discussions, for the most part, these meetings were closed to the public. The public was kept informed about the occurrence of these discussions, but they were not invited to observe or participate. As an independent regulator, the NRC sought to move away from voluntary security and move towards legally binding requirements which could be subject to inspection and enforcement. As this transition occurred, the safety and security interface was an important consideration. The NRC recognized the need to carefully integrate this increased security with the existing regulatory structure for safety of radioactive material.

At the same time there was a significant culture change occurring for many licensees, as well as regulators, in that all had to consider the potential for malevolent unauthorized access to licensed radioactive materials. Addressing this culture change has required a cooperative effort by many stakeholders, and a willingness to consider new, and sometimes unfamiliar, approaches to addressing the potential threat. The challenge was significant because safety and security professionals use unique terminology and have different constraints on their work. For example, there was significant debate about requirements to label radiation areas at publicly accessible areas such as hospitals and universities and to label packages of radioactive material. Security professionals recommended removing such labelling; labelling gives the adversary the advantage because of easily locating radioactive material. Safety professionals debated against this because workers, emergency responders, and the general public needed to know where such materials were located for safety reasons. It was concluded that ensuring safety and emergency preparedness outweighed the security risk associated with labelling radioactive material.

Together with the law enforcement and intelligence communities, the NRC staff, conducted threat analyses. These threat analyses documented the credible motivations, intentions, and capabilities of potential adversaries. In parallel, the NRC conducted security assessments that evaluated the physical protection system effectiveness of different licensee types in a variety of event scenarios. The NRC developed countermeasures to improve the probabilities that adversaries will be detected, interrupted, and successfully neutralized. The NRC conducted facility security assessments, or vulnerability assessments, to help determine the additional security and control measures need to protect against the risk of sabotage and malevolent use of stolen, risk-significant material. Because of the great number and diversity of radioactive material users, the assessments were done on representative facilities.

¹ The NRC does not solely regulate the safety of radioactive material within the U.S. In accordance with the law provided certain criteria are met, the NRC can relinquish its authority to regulate the safety of radioactive material to a State. States that enter into an agreement with NRC to regulate radioactive material are called “Agreement States”. The NRC does oversee and ensure that Agreement State programs are compatible and consistent with the NRC’s program.

Once the NRC identified specific actions that licensees needed to take in order to enhance the security and control of risk significant radioactive materials and facilities, the NRC issued Orders which imposed legally binding requirements to individual licensees. It is important to note, it is the NRC policy to use a deliberative and transparent process for issuing new regulatory requirements that will impact the regulated community, also known as a rulemaking.

Rulemaking is a process that often takes several years to complete. Issuing Orders is another method by which the NRC can issue requirements quickly without considering public or stakeholder comments during the decision making process. However, due to the events of September 11, it was essential for the NRC to act quickly to remove any security gaps by using Orders, rather than the preferable process by rule.

As a practical matter, NRC could not issue Orders increasing security across all its programs at the same time. The NRC took a graded approach to issuing Orders that increased security. Orders for the most risk significant facilities, such as commercial nuclear power plants, were issued in 2002. Large panoramic and underwater irradiators received Orders in June 2003. Manufacturers and Distributors of radioactive material received Orders in January 2004. Other risk-significant materials licensees received Orders in late 2005. In 2007, the NRC issued the last large set of Orders to licensees and these orders required fingerprinting and a criminal history background check on anyone with unescorted access to Category 1 and 2 material.

Since issuance of the Orders, the NRC continued inspecting licensees for compliance with security requirements and began the public process to establish security rules in the Federal regulations that will replace the Orders. A significant collaborative effort between the NRC and the Agreement States was necessary to develop a rulemaking that could replace seven sets of Orders and provide generally applicable requirements to a broad set of licensees. There were many insights gained over the years from inspections, self-assessments, and external audits. The challenge was to create a security rule that incorporated realistic approaches to enhancing security that would interface and integrate well with the existing safety rules. The rule is an optimized mix of performance based and prescriptive requirements that provides the framework for the licensee to develop a security program with measures specifically tailored to its facility. The new security rule was effective May 20, 2013 and key requirements include:

- Background checks, including fingerprinting to help ensure that individuals with unescorted access to radioactive materials are trustworthy and reliable.
- Controlling personnel access to areas where risk-significant radioactive materials are stored and used. Access must be limited to individuals that require access to the area and are deemed trustworthy and reliable, based on a background and criminal history check.
- Documented security programs that are designed with defense in depth to detect, assess and respond to actual or attempted unauthorized access events.
- Coordination and response planning between the licensee and local law enforcement agencies for their jurisdiction.
- Coordination and tracking of radioactive materials shipments.

- Security barriers to discourage theft of portable devices that contain risk-significant radioactive materials.

As the requirements were developed, the safety and security interface was an important consideration. This increased security had to be incorporated into the existing regulatory structure without causing a degradation of either safety or security by inadvertently implementing conflicting requirements. Also, the NRC sought to minimize regulatory burden which could be created due to similar, duplicative requirements. Where existing safety systems support security, licensees may take credit for those systems in their security plans. For example, licensees with Category 1 and 2 materials must coordinate with the local law enforcement regarding responses to threats at their facility. The licensee must provide to their law officials a description of its facilities, radioactive materials, and security measures. The licensee must also state that it will request a timely armed response by law enforcement to any actual or attempted theft, sabotage, or diversion. This coordination could include meetings, telephone conferences, plant tours, training in radiation protection, table top exercises, and other communications to provide information. Certain licensees are required to have an emergency plan in place. Depending on the location within the United States, this plan could include routine coordination with local law enforcement to respond to an emergency at the facility. The coordination with law enforcement requirement within the security rule is flexible such that a licensee could use their emergency plan to demonstrate compliance with portions of the security requirements.

Conclusion

The NRC's fundamental goals to protect public health and safety, and to protect the environment, remained unchanged since the events of September 11. However, the NRC has increased its requirements for the secure use and management of radioactive materials. This effort required both the regulator and the licensee to view control of sources differently. It was a culture change for both the NRC as a regulator and for our regulated community. Safety professionals, who were more familiar with protecting the public from accident situations, have to also think like a security specialist and consider that someone could use these sources with intent to cause public harm. The NRC's rule, Part 37, "Security of Category 1 and 2 Materials," became effective on May 20, 2013. But the NRC's efforts in security don't end with this rule, the NRC has to continuously assess its programs to ensure that they protect public health and safety, to protect the environment, and to ensure the secure use and management of radioactive materials