Certified Training for Radioactive Source Security Management

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ABSTRACT

In countries with mature regulatory structures, the use of radioactive sources is highly regulated from a safety perspective. Licensees readily accept such regulations because they are well aware of the potential consequences should a safety incident compromise the health, safety and environment of their employees and surrounding communities. In contrast, a comparable security culture has been much later to evolve, largely because many States, regulatory authorities and licensees have still to appreciate how radioactive sources could be used by people with malevolent intentions. In reality, security incidents involving radioactive sources occur quite frequently. According to the Center for Nonproliferation Studies (CNS) Global Incidents and Trafficking Database, from 2013-2014 there were over 325 incidents of theft or loss involving nuclear and other radioactive material: the vast majority of these incidents involve radioactive sources used in industrial and medical applications.

Radiation Safety Officers (or similar professionals) have historically inherited the responsibility of overseeing the implementation of security policies and procedures for radioactive sources. However, senior and line managers are also responsible for the security of radioactive sources, as well as regulatory personnel (particularly inspectors and license reviewers). The number of accountable staff may number in the dozens at larger corporations with extensive commercial or other business interests and staffing resources to match. These individuals often have substantial knowledge of radiation protection and safety practices, but they may lack formal security education and training which has developed their competency in this area. To address this gap, the World Institute for Nuclear Security (WINS) has launched the WINS Academy, an initiative to provide practitioners with opportunities to earn certification in nuclear and radioactive source security management. The training programme has been designed to be completed online, supplemented by in-person courses, and candidates can sit for certification exams at test centres through the Pearson VUE network, which has 5100 accredited test centres in 180 countries.

Leaders of industry who participated in the Nuclear Industry Summit in 2014 supported this approach when they committed to “ensuring that all personnel with accountabilities for security are demonstrably competent by establishing appropriate standards for the selection, training, and certification of staff.” Similar statements were made at the 2016 Nuclear Security Summit in Washington, DC, including a joint statement by 12 States (published as IAEA INFIRC/901) to WINS support certified training.

1. Introduction

Radioactive sources are used routinely by hospitals, research facilities and industry for such purposes as diagnosing and treating illnesses, sterilising equipment and inspecting welds. In countries with mature regulatory structures, the use of radioactive sources is highly regulated from a safety perspective. Licensees readily accept such regulations because they are well aware of the potential consequences should a safety incident compromise the health, safety and environment of their employees and surrounding communities. In contrast, a comparable security culture has been much later to evolve, largely because many States, regulatory authorities and licensees have still to appreciate how radioactive sources could be used by people with malevolent intentions.

This is concerning because we know that terrorists have considered or attempted to use radioactive sources as weapons. As reported by the Associated Press in 2015, Moldovan authorities have interrupted four attempts by gangs to sell radioactive material to extremists in the last five years. The latest known case took place in February 2015, when a smuggler specifically sought a buyer from the Islamic State

group for a huge cache of allegedly radioactive caesium that was enough to contaminate several city blocks [1].

In the effort to ensure the security of nuclear and other radioactive materials, facilities and personnel, many States have incorporated requirements in their regulatory framework that include a variety of consequences should organisations fail to carry out their security responsibilities adequately. This could include regulatory orders for corrective actions, restrictions on an organisation's business activities, revocation of the license to operate, and imposition of civil fines and penalties. If an incident occurs and it is found that an organisation, or individuals within an organisation, were wilfully negligent in implementing required security measures, it is also possible that criminal prosecution could result.

Effectively managing the security of high activity radioactive sources therefore requires that organisations understand and comply with their national regulatory requirements. Yet such requirements vary from state to state (where they exist). Where minimal regulatory requirements exist, an organisation will need to decide if it should do more than required, using a cost-benefit analysis taking into consideration the damage to the reputation of the organisation and possible clean-up or other liabilities if there is an incident.

2. Developing Competency Frameworks

Radiation Protection Officers (RPO), who are also known as Radiation Safety Officers, have historically inherited the responsibility of overseeing the implementation of security policies and procedures because some basic measures, such as material accounting and control of access to radioactive materials, were already part of their safety responsibilities. However, senior and line managers are also responsible for the use of radioactive sources, as well as regulatory personnel (particularly inspectors and license reviewers).

The number of accountable staff may number in the dozens at larger corporations with extensive commercial or other business interests and staffing resources to match. But many users of radioactive sources are small or even very small organisations. In these cases, security is likely to be a responsibility of just one or a few staff. Figure 1 provides an example organisational chart and some of the key roles that might be primarily accountable for security of a site's radioactive sources.

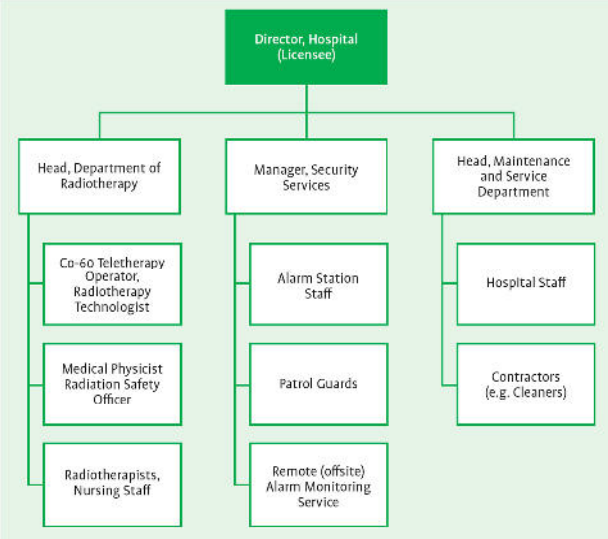

Fig 1: Key roles with accountability for security

These individuals often have substantial knowledge of radiation protection and safety practices, but they may lack formal security education and training which has developed their competency in this area. The word *competency* can be defined as the "qualities an individual needs to have in order to perform the duties of a particular role successfully." The concept is often broken down into three elements: *Knowledge, Attributes* and *Skills* [2]. For example, RPOs might need to have the following security competencies to carry out their job responsibilities effectively:

Security Knowledge

- Possesses accurate, current information regarding threats and risks from the malicious use of sources.
- Understands protection fundamentals (deterrence, detection, delay and response) and management practices.
- Understands the legal obligations and potential liabilities surrounding security matters.
- Is aware of industry regulations as they apply to security issues.
- Understand their role in security incident management, including reporting mechanisms and the chain of command.
- Understands the direct and indirect costs associated with delivering security.
- Understands the range of stakeholders with interest in efficient security practices at the facility.

Security Skills

- Can write security plans and procedures.
- Can help coordinate a security exercise.
- Manages equipment maintenance programmes.
- Conducts internal training and performance testing.
- Develops budgets to sustain enhanced security for radioactive sources.
- Can advocate for options to reduce the security risk associated with sources (e.g. alternative technologies).

Security Attributes/Behaviours

- Promotes security awareness to other staff (prudent security management practices, understanding potential threats and consequences, reporting of incidents, etc.).
- Communicates proactively with other stakeholders on security matters.
- Promotes the need for information protection as appropriate.
- Advocates for an improved security culture.
- Utilises key performance indicators for security.

Once the required competencies are agreed, then an organisation can develop an impactful training programme. The type and amount of training that each employee receives should be based on a systematic job task analysis that identifies individual security responsibilities along with the competences required to carry out each responsibility. The training programme should specify how staff with direct responsibility for the equipment are trained and the procedures they must follow to ensure that the equipment is properly operated and maintained. (Individuals may need to receive certifications in some areas to ensure this.)

3. Implementing Security Training

Security training starts immediately when employees are recruited and receive their first security induction. It continues as they regularly receive refresher training on the basics and specialised training to meet the needs of changing job titles and growing responsibilities. The objective is to establish a competency-based structure

throughout the organisation that defines the knowledge, skills and behaviours employees need to have in order to carry out their security accountabilities and proactively minimise the potential of outsiders or insiders to operate unseen. Senior managers require different competences from frontline operational staff, so the training programme must accommodate different audiences and needs.

International recognition of the need for specialised security training for staff has increased substantially in the last decade and led to a rapid rise in training programmes. In 2012, representatives from 30 International Atomic Energy Agency (IAEA) Member States gathered in Vienna to establish the International Network for Nuclear Security Training and Support Centres (NSSC Network). The Network's vision is to provide excellence in nuclear and radioactive source security worldwide, and its mission is to contribute to the global efforts to enhance capacity building through a worldwide, collaborative network of nuclear security training and support centres. By April 2017, the Network consisted of 64 institutions registered in 58 countries [3]. In addition, the IAEA holds approximately 60 international nuclear and radioactive source security training events annually.

Coincident with and aligned with the development of the NSSC Network, WINS has launched the WINS Academy, an initiative to provide practitioners with opportunities to earn certification in nuclear and radioactive source security management. The target audience is a multi-disciplinary group including board members, executive managers, security directors, scientists and engineers, offsite incident responders, regulators, and other professionals with management responsibilities for nuclear and radioactive source security. All participants begin with a core Foundation Module that sets out security as a fundamental aspect of risk management and corporate reputation, as well as a strategic, operational activity that needs to be implemented organisation-wide. Participants then choose one elective module according to their interests, needs, and background. After completing both modules, they have the opportunity to take proctored exams; if they pass, they are certified by WINS as a *Certified Nuclear Security Professional (CNSP).*

In 2016, WINS released its Academy elective course specifically designed for professionals with direct accountability for the security of radioactive sources used at medical, industrial and research facilities. This course targets RPOs and other managers who are responsible for the use of radioactive sources; it also supports the professional development of regulatory oversight personnel, particularly inspectors and license reviewers. Such individuals often have substantial knowledge of radiation protection and safety practices, but they may lack formal security education and training. The course is intended to be useful to any organisation that needs to secure its radioactive sources, ranging from larger corporations with extensive commercial or other business interests and staffing resources to match, to very small organisations.

The training programme has been designed to be completed online, supplemented by in-person courses, and candidates can sit for certification exams at test centres through the Pearson VUE network, which has 5,100 accredited test centres in 180 countries. Graduates join an elite, and growing, professional network. As of today, approximately 900 participants from 80+ countries have enrolled in the Academy programmes and more than 225 individuals have become CNSPs.

4. Next Steps

In cooperation with its sponsors and selected partners, WINS is producing blended in-person learning materials sensitive to various cultural norms and expectations to complement the online WINS Academy certification courses. These in-person

training sessions can be delivered at selected training centres to serve both domestic and regional needs. WINS will be piloting the first in-person training courses for radioactive source security management with the Instituto Nacional de Investigaciones Nucleares in Mexico.

In conjunction with the development of training materials, WINS is also able to provide assistance for identifying and training national specialists capable to independently deliver the training, and for assisting training centres willing to become certified against international standards such as ISO 29990. This international standard has been developed to improve and standardise the quality of education and training in non-university settings, including industry-training programmes. Achieving ISO 29990 certification offers an internationally recognised external benchmark of quality; demonstrates credibility of the training centre, their competence and professionalism; and gives potential employers and others in the community an objective measurement of participants' knowledge.

These efforts are underpinned by State commitments to support the WINS Academy. During the 2016 Nuclear Security Summit, 12 countries came together and signed a Gift Basket in support of the WINS Academy. Titled a *Joint Statement on Certified Training for Nuclear Security Management*, the effort was led jointly by Canada and the United Kingdom and signed by Finland, Hungary, Indonesia, Kazakhstan, Mexico, the Netherlands, New Zealand, Norway, Thailand and the United States. On 6 December 2016, the Joint Statement was published as IAEA Information Circular 901 (INFCIRC/901) [4]. INFCIRC/901 commits signatory States to support the WINS Academy in its efforts to expand its international certification programme, including through the provision of advocacy, peer review support, contributions, or by other means as necessary.

5. References

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