

Regional Workshop on Ensuring the Resilience and Sustainability of Radioactive Source Security

Vienna, Austria - 13 and 14 February 2019

Report

BACKGROUND

In the last few years, many States have markedly increased the security of their radioactive sources. Multiple factors have contributed to this progress. For example, most States are fully aware of the consequences that could result from a malicious use of sources; therefore, they have issued and enforced regulatory requirements for the security of their sources. These regulations, based on the international recommendations and guidance published by the IAEA, have provided a framework to permit effective regulatory oversight of security for radioactive materials.

Sustaining radioactive source security and resilience requires close communication and cooperation among a wide range of stakeholders, including regulators, licensees, law enforcement, security vendors, education and training organisations, and international agencies. Through bilateral and multilateral efforts, the international community has helped many States strengthen their regulatory framework and enhance the security provisions they have implemented for sources in use, storage and transport. Such efforts and initiatives have greatly increased source security in many States; it is now essential, however, to demonstrate the resilience and sustainability of these arrangements over a period of years.

Fundamentally, sustainability requires the proper management of sources throughout their lifecycle—from the moment they are being produced and the security systems that protect them are being designed to proper disposal at the end of their lifecycle. To increase resilience, strict control over the sources in use must be enforced, a strong security culture must be fostered, and careful planning and exercising must take place to ensure the response is as effective as possible if an event occurs. And of course, a strong legislative and regulatory framework, security regulations, and incentives to adopt alternative technologies whenever feasible play a fundamental role.

To further explore this topic, WINS organised a regional workshop that focused on the best practices European countries have adopted to ensure sustainable and resilient radiological security arrangements. The workshop took place 13–14 February in Vienna, Austria, and was attended by 50 delegates from 24 countries and 1 international organisation. The delegates were drawn from regulatory bodies and law enforcement agencies.

OVERVIEW OF THE EVENT

The professionally facilitated workshop incorporated a number of presentations from experts, as well as hands-on group discussions that enabled participants to explore topics in greater depth and learn from each other's experiences. Additionally, an instant electronic voting system was used that enabled participants to anonymously share their views on selected questions.

The primary objective of the workshop was to identify and discuss the criteria and parameters at the state level that promote and demonstrate sustainable security of radioactive sources. Consequently, the workshop agenda covered such topics as:

- The key elements for creating a sustainable radiological security framework
- The roles and responsibilities of regulators in promoting site-level sustainability
- Best practices for inspecting security arrangements and enforcing regulatory requirements
- Challenges and risks associated with the transport of radioactive sources
- The role of law enforcement agencies and examples of practices supporting the development of response capabilities
- The security challenges for managing disused radioactive sources
- Developing skills and competencies for people involved in the security of radioactive sources
- Options for permanently reducing the risks (e.g. replacement by alternative technologies)
- Benchmarking opportunities and ways to incentivise countries to report on their challenges and achievements

WORKSHOP PROGRAMME

Wednesday 13th February 2019

OPENING SESSION

Ms Raquel Delgado, WINS Project Manager, opened the workshop by welcoming participants on behalf of WINS. She provided a brief background on WINS and its activities, presented the objectives of the event, and provided a preliminary overview of the workshop agenda. She also commented on selected results from the pre-workshop survey, such as participants' workshop expectations and barriers they had identified for achieving an effective and sustainable radioactive security framework.

Participants were then asked to introduce themselves at their tables and discuss their expectations for the workshop. These included to:

- Learn how to promote effectiveness and sustainability through regulations, inspections and coordination with response agencies
- Share ideas and strengthen regional cooperation
- Establish new expert contacts/networking
- Learn and be informed about best practices for the security of radioactive waste and sources and for communicating among state agencies
- Learn how to create a regulatory framework to minimise the risk of radiological consequences of radioactive sources in a sustainable way while recognising the benefits of their use

Mr Miroslav Gregoric (Slovenia) delivered the keynote presentation on the most important elements for creating a sustainable radiological security framework. He set the framework for workshop discussions by providing an overview of the interrelations in nuclear security and the elements that form a sustainable security regime. He also provided examples of the consequences of a malicious use of radioactive sources and gave an overview of the guidance available for establishing a security regime, in particular the Code of Conduct on the Safety and Security of Radioactive Sources and the IAEA Nuclear Security Series publications.

The presentation was followed by table discussions on how effective the existing national legislative and regulatory infrastructures are for governing the security of radioactive sources. Participants identified several key elements of a sustainable national regime, including:

- the existence of a political commitment/strategy
- strong regulatory bodies, adequate laws and regulations, and competent inspectors and operators

- outside review
- good enforcement policies
- effective cooperation among agencies
- clear roles and responsibilities of all stakeholders
- international cooperation
- proper allocation of resources
- effective security culture
- security plans with a graded approach
- training and exercises
- adequate financial and human resources

Participants also highlighted the challenges in measuring the effectiveness of the regulatory framework in the absence of an incident. In addition, they pointed out aspects that need improvements, such as establishing a stronger relationship between the regulatory authority and law enforcement, engaging key stakeholders, promoting and improving security culture, and the need for dynamic, regularly updated legislation.

SESSION 1: DEVELOPING A ROBUST NATIONAL REGIME

Session 1 reviewed the development of an effective regulatory regime for radioactive source security. It also included a panel that addressed European and US experiences and gave participants the opportunity to discuss the roles and responsibilities of regulators.

Mr David Ek, Sandia National Laboratories (USA) opened the session with a presentation titled *IAEA Nuclear Security Series Guidance for Establishing Regulatory Requirements*. He said that regulations don't make a sustainable regime but enable it. He then provided an overview of the Code of Conduct and of relevant IAEA Nuclear Security Series guidance published in NSS No. 14 *Nuclear Security Recommendations On Radioactive Material and Associated Facilities*, NSS No. 11 *Security of Radioactive Sources* and NSS No. 9 *Transport Security*. Mr Ek also reviewed the three steps for developing a regulatory framework, briefly highlighted the types of regulatory approaches (prescriptive, results-based and combined approach), and provided an overview of NSS No. 30-G *Sustaining a Nuclear Security Regime*, which distinguishes between national level and operational level sustainability. Mr Ek concluded by emphasising that security culture is important, but that effective regulations and enforcement also need to exist to ensure a sustainable regime.

Mr Sorin Repanovici, National Commission for Nuclear Activities Control (Romania) delivered a presentation on the development and enactment of adequate security regulations. He started by giving an overview of the existing radiological sources in Romania and their applications. Mr Repanovici then set out the national legislative and regulatory framework related to nuclear security and highlighted international programmes where Romania is collaborating with the IAEA and other partners on a bilateral basis. He concluded his presentation by highlighting Romania's national mechanism for cooperation in nuclear security matters and providing examples of interagency cooperation and national and regional exercise programmes.

The presentations were followed by a panel discussion with the above speakers and **Mr. Julius Ziliukas, Radiation Protection Center (Lithuania)** and **Mr Håvar Sollund, Norwegian Radiation and Nuclear Safety Authority**. The panellists shared their experiences on the types of resources necessary for implementing effective regulation, on the issues in regulation across different practices, and on the challenges faced when establishing a source registry. Some of the findings were:

- The lack of security culture and security awareness is reflected in the lack of sufficient security regulations.

- Some countries encourage replacing radioactive sources with alternative technologies and have enacted legislation to encourage this.
- Some countries have established an electronic source registry where sources are registered.
- Some countries have highlighted the costs of implementation for operators and the challenges of enforcing measures in certain environments, such as hospitals.
- Most countries currently do not have public awareness/information campaigns.

Finally, at their tables, participants were asked to identify and discuss the roles and responsibilities of regulators in promoting site-level sustainability from cradle to grave. Some of the findings were:

- The regulator should be independent from the industry.
- The regulator should provide implementation guidance and training to licensees on new requirements.
- During the authorisation process, regulators should set clear requirements in terms of security, and operators should appoint a security coordinator. Some countries use private security companies licensed by the Ministry of the Interior.
- There should be requirements for a plan for lifecycle management that include funding for end-of-life disposal.

SESSION 2 – SECURITY INSPECTIONS PLANNING

Session 2 provided an overview of existing best practices for security inspections planning and enforcement of regulatory requirements. It also gave participants the opportunity to identify gaps and opportunities for optimising cooperation amongst stakeholders.

Mr Armand Viplak, Hungarian Atomic Energy Authority, made a presentation titled *Effective Licensing, Inspection and Enforcement Mechanisms to Ensure Compliance*. He began by setting out the responsibilities of the Hungarian regulator and providing information on the national legal background. He then explained that security inspections can be both announced and unannounced. For announced inspections, documentation and regulatory compliance is checked, equipment is inspected, and the capability of response forces is tested. For unannounced inspections, these tasks are usually shorter, can take place during weekends or at night, and focus on detection capabilities. He also said that reports from the licensee are sent to the regulator, who can request the licensee to assign additional response officers to the facility if needed. Only private companies are used in response in Hungary, and the regulator is entitled to assess their performance.

The presentation was followed by a table discussion that asked participants to identify best practices for inspecting security arrangements and enforcing regulatory requirements. Participants mentioned the following best practices:

- A formal training programme for becoming a certified inspector within the regulatory authority
- A legal framework that empowers individual inspectors
- The ability to escalate findings through an enforcement management model
- The site continuously reports to regulators after the inspections
- Lessons learned for improving inspection check-lists and regulations

SESSION 3 – SECURITY IN THE TRANSPORT OF RADIOACTIVE SOURCES

Session 3 addressed the risks of transporting radioactive sources. In particular, it gave participants the opportunity to discuss experiences and lessons learned associated with the implementation of transport security measures.

Mr Robert Officer, International Nuclear Services (UK) opened Session 3 with a presentation titled *The Challenges and Risks Associated with the Transport of Radioactive Sources*. He described the work of

INS, provided an overview of the international framework, and explained the UK regulatory framework. He also explained the UK's approach to source categorisation, security levels and respective security measures. In addition, he explained the content and elements of a transport security plan and highlighted lessons learned related to the usage of tracking devices. He concluded by pointing out that regulatory compliance is a challenge and that overregulation often means loss of business for the carrier.

The presentation was followed by a panel discussion consisting of Mr. Officer, **Mr Stig Isaksson, Storlommen Konsult AB (Sweden)** and **Mr David Duhamel, Oak Ridge National Laboratory (USA)**. They discussed lessons learned along the supply chain and how to address different vulnerabilities. Some of their findings included:

- Information sharing (e.g. on insider or cyberthreats) can be an issue when several stakeholders are involved in one shipment.
- Transshipment points, in which the responsibility for the source starts and ends, can be a challenge because they depend on the regulations of the country where the shipment ends.
- There is constant communication between the operator and law enforcement. However, further coordination is necessary to ensure coordination among different organisations.
- The transport of radioactive sources should deserve the same attention as nuclear material.

Carousel to discuss strategies to mitigate the risk of transporting radioactive sources

Participants were asked to split into five groups, each of which rotated through five working stations. The objective was to discuss strategies to mitigate the risk of transporting radioactive sources. The topics addressed at the stations and their respective findings include:

List the key stakeholders involved in transport security and their roles. Discuss what works and what needs improving.

- Examples of stakeholders: operator/consignor, regulatory body/competent authority, carrier, consignee/receiver, police/guards/escorts, customs, ports (sea/river), security/intel organisations
- What works: high percentage of successful transports; international framework for shipments
- What needs improvement: communications, contingency planning, compliance with requirements, coordination between neighbouring countries, more effective use of technology

List the aspects to consider in a transport security plan (e.g. people, procedures, processes, materials, resources). Discuss what works in the review and approval of security plans.

- Aspects to be covered: Who is responsible, what is being transported, how and when it is being transported, how it is being protected. Elements of the routes: contingencies, alternative routes, who decides that alternative routes should be taken, who communicates what to whom, threat and risk. Include as many pictures as possible so they can be handed over to law enforcement in case of an incident.
- The transport security plan should be informed by a threat assessment plan.
- What works in the review and approval of plans: lessons learned in terms of prior incidents, compliance records from the carrier, tabletop exercises (TTX).

List examples of transport security regulations that are performance-based and prescriptive. Discuss how the balance between both is affected by local politics, culture, resources, etc.

- Performance-based (specification of the threat): infrequent transport, politically sensitive shipments, affected by the current threat assessment, security plan

- Prescriptive-based (qualified authorities and operators): regular transport, industrial radiography/brachytherapy/unsealed medical sources, normal threat level, qualification of personnel, less experienced countries

Discuss the role of exercises in evaluating the performance of security measures during transport. List ways of promoting better engagement by law enforcement agencies.

- Exercises deliver assurances internally and externally; they help stakeholders understand criteria, provide understanding of equipment, people and tactics used; and promote stakeholder engagement.
- Ways of promoting better engagement of law enforcement agencies: better lines of communication, familiarity with police services—including the wider emergency team, promotion of a common understanding.

Discuss why the tracking and monitoring of radioactive material is important and list barriers to implementation.

- Why: easily/quickly detect loss/theft. In case of an accident or driver illness, the location can be tracked and the appropriate resources can be deployed.
- Barriers: financial costs, cybersecurity, technology gaps and system failure, multiple countries with varying policies, road conditions, number of people involved

Thursday 14 February 2019

SESSION 4 – ENGAGING LAW ENFORCEMENT AGENCIES AND DEVELOPING NATIONAL RESPONSE PLANS

Session 4 focused on the roles and responsibilities of law enforcement agencies, reviewed examples of the development of response capabilities, and explored ways to effectively engage with response organisations.

Mr. Michał Horoszko, Ministry of the Interior and Administration (Poland) made a presentation titled *the Role of Law Enforcement Agencies and Examples of Practices Supporting the Development of Response Capabilities*. He began by giving an overview of the Polish legal framework on antiterrorist actions and set out the coordination process among authorities in case of a terrorist event. He then provided details on the national crisis management plan, gave examples of projects undertaken by the police, and explained a current amendment to the atomic law.

Mr. Daniel Romano, Office of Radiological Security/Y12 National Security Complex (USA) made a presentation titled *Alarm Response Training: Strengthening Site and Law Enforcement Relationships*. He began with an overview of the rationale for the establishment of ORS response training. He then explained the target audience for the response training and highlighted some of their best practices, which included the creation of jurisdictional response plans, additional training opportunities, and continued programme relationships with stakeholders. Mr. Romano also pointed out that having a sustainability strategy is essential in order to adapt to the circumstances; in addition, he described the ORS train-the-trainer programme.

After this series of presentations, participants were asked to form table groups, reflect on what they had heard, identify challenges, and explore options to engage effectively with response organisations. Some main findings included the importance of:

- Multi-stakeholder engagement to ensure a clear chain of command
- Formalising such engagement through Memoranda of Understanding
- Additional training opportunities and flexible training programmes for first responders that adapt to specific needs

- Train-the-trainer programmes to ensure sustainability
- Practice: TTX for identifying flaws and making improvements
- Continued programme relationships with stakeholders
- Clarifying legal responsibilities and liabilities of police officers

SESSION 5 – EFFECTIVELY MANAGING DISUSED SOURCES

Mr Milos Mladenovic, Nuclear Facilities of Serbia shared his operational experience in a presentation titled *Options for the Management of Disused Sources and Associated Security Challenges*. He introduced the work of NFS in the management of disused sources and explained the interface between safety and security. Mr Mladenovic finished by giving an example of how management in his organisation is involved in the development of nuclear security culture. This includes the development and implementation of a security self-assessment survey.

The presentation was followed by a discussion on the security challenges for managing disused radioactive sources. Some main findings included the importance of:

- Putting requirements on licensees to ensure security from cradle to grave
- Having financial assurances for disposal
- Keeping an up-to-date registry of radioactive sources
- Having a legislative framework that foresees the repatriation of sources to the producer
- Having supplier agreements in place to ensure that sources are returned to the supplier countries

SESSION 6 – BUILDING COMPETENCIES

In Session 6, focused on the skills and competencies for individuals who have roles and responsibilities for radioactive source security. It also addressed the role of the regulator and the licensee in defining the required competencies.

Ms. Rhonda Evans, Head of the WINS Academy, opened Session 6 with a presentation titled *Building Competence*. She broadly explained what radioactive source security is and the elements that support the sustainability of radioactive source security. She also explained what is meant by competence and highlighted the importance of defining competencies. Ms Evans ended her presentation by describing the stakeholders with roles in defining competencies and explained how certification can contribute to competence development and maintenance.

Her presentation was followed by a dialogue between Ms. Evans and **Mr. Victor Paschenko, State Nuclear Regulatory Inspectorate of Ukraine** on their experiences in developing skills and competencies for people involved in the security of radioactive sources and the role of the regulatory body and the operator in defining such competencies. Mr. Paschenko described the training and qualification process in the Ukraine, which includes entry requirements (examinations) followed by an assessment of competencies every three to five years.

Both panelists agreed that developing competence is a good way to determine whether individuals have the required knowledge, skills and maturity to be able to respond effectively to an incident. They also agreed that it is ultimately possible to have confidence in a system only if there is confidence in the competences of the regulator and licensee.

Following the dialogue, participants were asked to fill out a self-assessment form on professional development opportunities in nuclear security and to discuss good practices for professional development in security in small groups. Some of their findings highlighted the importance of:

- Making use of current opportunities in the organisation and attending trainings from other organisations (e.g. police-related training for regulators)

- Interagency working groups
- Exchanging practices between peers
- Mentor programmes for new colleagues
- Participating in international workshops
- Certification
- Self-assessment: What are my strengths and weaknesses? Where are the gaps?

SESSION 7 – THE WAY FORWARD- ENSURING SECURITY EFFECTIVENESS AND SUSTAINABILITY

The final session of Day 2 allowed participants to discuss options for permanently reducing radioactive source risks, including replacing them with alternative technologies. It also allowed them to discuss reporting and benchmarking practices by regulators and other key stakeholders.

Ms Valeriia Starovoitova, IAEA opened the session with a presentation titled *Exploring the Role of Alternative Technologies for Permanently Reducing the Risk*. She highlighted the role of the key stakeholders involved, set out considerations for the adoption of alternative technologies, and explained the pros and cons of adopting such technologies. She concluded by summarising the main transition challenges, such as technical, regulatory and economic.

Ms Cristen Ford, Office of Radiological Security (USA) then gave a presentation on the ORS Alternative Technologies Programme. She provided the context for the establishment of the programme and set out options that support the consideration of alternative technologies, such as key stakeholders, evaluation questions and areas for engagement. Ms Ford also explained some considerations for replacing sources and the ORS' strategy to promote alternative technologies.

These presentations were followed by a panel discussion consisting of Ms Starovoitova, Ms Ford and Mr. Sollund who addressed the role of alternative technologies in strengthening sustainability and resilience. The main findings of the discussion were:

- Several key stakeholders need to be involved in the decision to transition to alternative technologies.
- Considerations regarding costs, user preferences, technical requirements and timeframe need to be considered.
- The legislative framework should support the replacement of sources with alternative technologies.

Mr. Stig Isaksson, Storlommen Konsult AB (Sweden) opened the second part of the session with a presentation on benchmarking opportunities and ways to incentivise countries to report on their challenges and achievements. He pointed out the need for sharing security information and the potential barriers for information sharing. He also gave examples of bilateral, regional and international forums for information sharing and highlighted the importance of peer review and benchmarking as tools for public and international assurances.

His presentation was followed by a brief group discussion on the challenges and barriers to an effective radioactive source security regime and the role of benchmarking and reporting in strengthening sustainability.

In the last activity of the workshop, participants were asked to identify three follow-up actions for themselves, their organisations and their countries and to share some of their take-aways. Examples of such actions included:

At the country level:

- Organising and conducting national exercises on nuclear security

- Publishing source security regulations and supporting guidance for use, storage and transport
- Establishing a national security committee for nuclear and other radioactive sources

At the organisational level:

- Creating an office for the security of nuclear facilities and protection of critical infrastructures
- Reviewing the regulatory framework on radioactive source security
- Developing standard operation procedures together with other institutions on the detection and response of radioactive sources and developing guidance on how to prepare security plans

At the individual level:

- Learning more about the international framework (IAEA, EU, etc.)
- Sharing information with co-workers about the need to further strengthen the security of radioactive sources
- Improving skills and competencies by taking part in education and training initiatives

In her concluding remarks, Ms. Delgado thanked participants for their active contributions during the workshop and encouraged them to continue exchanging ideas and experiences in protecting radioactive sources, as well as to share lessons learned with the entire community. In their final evaluations, participants expressed a high level of satisfaction with the workshop, saying it had been a very useful learning experience and that they would recommend it to others.