World Institute for Nuclear Security

Workshop on end-of-life management in support of radiological security and technology transition

28TH MARCH - 30TH MARCH 2023

AIX EN PROVENCE, FRANCE

BACKGROUND/RATIONALE

The development of a comprehensive and sustainable approach to radiological security requires the proper management of radioactive sources and their protection by adequate security arrangements throughout their entire lifecycle.

One way to reduce the radiological security risk is to encourage the adoption of technologies that do not contain radioactive material, but which achieve the same beneficial results – often called "alternative technologies". If properly implemented, the transition towards alternative technologies can have a significant impact on improving radiological security, since these technologies are far less attractive for malicious use. Radiological security benefits will only be realised if proper security arrangements are implemented during the transition process, in particular during the transport and end-of-life management of the disused sources.

Each year, thousands of radioactive sources become disused worldwide. Many are exchanged for new ones to continue operation (e.g., industrial radiography and medical teletherapy). Some other disused sources are covered by agreements to return to their original supplier. However, many users cease operations or have no more use for their sources and are not fully aware of options for the adequate or affordable long-term storage or disposal of disused sources.

For instance, many users are unaware of the costs associated with the management of radioactive sources when they become disused, for example, during the transition to alternative technologies. They are unaware that the transportation and disposal costs might be comparable to the purchasing price of the source itself. When confronted with these costly options, some users may opt to not declare their sources as disused and instead store them for extended period of time under substandard circumstances. Poor management of disused high activity radioactive sources has led to significant incidents, which have caused severe damages, including human casualties.

In addition, availability of authorised transport packages, lack of documentation and necessary certificates for sources and devices, insufficient storage capabilities, complex import/export processes, legislative and regulatory constraints from the countries of origin, and the absence of disposal pathways are examples of remaining challenges to an effective management of disused radioactive sources. Finally, in some instances, countries adopting alternative technologies count on international organisations or programmes to help manage disused sources.

Therefore, WINS and the co-chairs of the Ad Hoc Working Group on Alternatives to High-Activity Radioactive Sources (France, Germany and USA) have agreed to co-host a 3-day workshop for countries from Europe aimed at reviewing case studies of effective end-of-life management for radioactive sources; bringing together government representatives, users, industry, and funding organisations regarding disused source management options and considerations; identifying security issues related to the management of disused sources; and addressing the barriers to entry in the adoption of machine-based ionising radiation technologies.

The workshop will support the implementation of INFCIRC/910 on Strengthening the Security of High Activity Sealed Radioactive Sources. It will also complement the efforts of the ad hoc working group aimed at facilitating the adoption of alternative technologies.

The workshop will be conducted at the Aquabella Hotel in Aix en Provence, France

OBJECTIVES

This workshop will review the latest information on the various options to manage disused radioactive sources and how it impacts radiological security globally. It will also address the necessary requirements of an effective end-of-life management pathway as a prerequisite to successful risk reduction through the replacement of radioactive sources with non-radioisotopic alternative technologies. Lastly, it will strengthen communication channels between users, industry, and funding organisations regarding disused source management options and considerations.

The workshop will focus on sealed high activity radioactive sources (Cat. 1, 2 and 3) and will provide participants with the opportunity:

- To develop a common terminology and a better understanding of the usual challenges associated with the management of disused sources;
- To review the international recommendations for end-of-life management of radioactive sources and identify and discuss each step of a comprehensive strategy for an effective management of disused sources;
- To share good practices for the secure management of disused sources and identify and promote synergies between safety and security programmes;
- To interact with source suppliers that manage disused sources, and institutions that can contribute funding to disused source management projects;
- To discuss specific issues and viable solutions including but not limited to return to supplier, financial assurances, low-cost storage solutions, process for designated a source as a waste, and long-term storage and disposal opportunities;
- To identify areas where further work is needed and to propose solutions for an effective improvement of security and safety at any step of the management of high activity disused sealed radioactive sources.
- To address end-of-life management-based barriers to entry (and potential solutions to these barriers to entry) to the transition to non-radioisotopic alternative technologies.

National strategies may vary from country to country, and the industrial and commercial approaches may differ for each supplier. Therefore, the workshop will be designed around the primary process for designing and implementing an effective end of life management strategy. These steps may include onsite storage of sources or transport for reuse or recycle, return to a supplier/manufacturer, repatriation of legacy sources, consolidation at a storage facility, and disposal as waste. For each step, participants will identify the key stakeholders and the challenges they may encounter and will explore pathways to overcome those challenges.

Expert speakers from participating countries will be invited to share their experiences and lessons learned from implementing disused sources management strategies and practices. Industry will be invited to speak about management options offered, and their respective planning process. International donors to disused source management and alternative technology projects also will be invited to speak about available funding mechanisms for participants to explore. Participants will be encouraged to identify immediate steps that can be taken to strengthen radiological security and the management of disused sources in their organisations and countries.

As an outcome from this workshop, WINS will revise its International Best Practices Guide 5.5 *Security Management of Disused Radioactive Sources.*

EVENT OUTLINE

DAY 1: ALTERNATIVE TECHNOLOGIES AND DISUSED SOURCES

SESSION 1	Alternative technologies and disused sources management: Understanding the need	KEY ISSUES: ▪ What are the security concerns related to disused radioactive sources? ▪ What is the impact of alternative technologies on the use of radioactive sources? ▪ What roles do DSRS management and alternative technologies have in a comprehensive radiological security program or strategy?
SESSION 2	Effective management of disused sources in support of technology transition	KEY ISSUES: ▪ Why proper management of disused sources is an essential element of converting to alternative technologies? ▪ How the lack of proper management approaches to disused sources management can constitute a barrier to successful conversion and radiological security risk reduction? ▪ How can the international community better support DSRS management when transitioning to alternative technologies?
SESSION 3	A comprehensive approach to the management of disused sources	KEY ISSUES: ▪ What are the different options for funding and organizing the management of disused radioactive sources? ▪ What are the main elements of a national strategy? What are the roles and responsibilities of various stakeholders? What are we good at? What remains challenging? ▪ What is the role of each stakeholder (e.g., supplier, licensee, regulator, etc.) in anticipating and addressing the need for managing DSRS?

DAY 2: GOOD PRACTICES FOR THE EFFECTIVE MANAGEMENT OF DISUSED SOURCES

SESSION 4	Returning disused sources to the suppliers	KEY ISSUES: ▪ What are the current practices and challenges for returning sources to suppliers or producers? Which stakeholders are involved in this process? ▪ What should source licensees expect and plan for when arranging for the return of a source to a supplier? ▪ What are the responsibilities of countries using the sources and of countries that have originally supplied sources to other countries? ▪ What is the role of international assistance programmes in supporting the return or repatriation of disused radioactive sources?

SESSION 5	Management of disused sources from interim storage to final disposal	KEY ISSUES: ▪ What are possible interim storage options? What are the long-term storage options? ▪ What can we learn from people who are designing and operating such storages? How is ownership transferred and security taken into account? ▪ What are the existing or future options for final disposal of disused radioactive sources? What are the associated costs and remaining technical, regulatory or political barriers? ▪ How can evolutions in technologies facilitate the management of DSRS? Is final disposal the only and ultimate response to the security risk?
SESSION 6	Transport challenges including import/ export requirements	KEY ISSUES: ▪ What are the challenges and costs associated with the domestic/international transportation of disused sources? What could be options to reduce these costs and address challenges? ▪ What legal and technical infrastructure is needed in the country where the source is located? What can be done when an adequate infrastructure is not in place? ▪ Is the import/export framework adequate? Are the transport requirements consistent all over the world? What are the possible liability issues and how are they covered by insurance? ▪ How are security aspects during transport addressed?
CONCLUSION		KEY ISSUES: ▪ What have we learnt? What are we doing well? What remains more challenging? ▪ How can we sustain achievements? ▪ What actions still need to be taken to fully integrate effective DSRS management in alternative technology conversion plans?

DAY 3: VISIT OF WASTE MANAGEMENT FACILITIES AT THE CADARACHE NUCLEAR SITE

SITE VISIT	KEY OBJECTIVES: ▪ Access to state-of-the-art technologies and processes ▪ Sharing of operational experience ▪ Networking between participants