

# Virtual Roundtable on Strengthening the Coordination of International Programmes and Organisations involved in the Adoption of Alternative Technologies to Radioactive Sources in Support of Radiological Security

Thursday, 10 December 2020, 16:00 – 18:30 CET

## Event report

### Background

Developing a comprehensive and sustainable approach to radioactive source security requires the proper management of these sources and their protection by adequate security arrangements throughout their lifecycle. Although radioactive sources clearly have multiple benefits, they also have the potential to cause significant harm to people, property and the environment should they be lost or stolen and fall into the wrong hands. They could not only cause bodily harm and significant social disruption, but this would also damage the reputation and credibility of any organisation involved. To increase security resilience, the total amount of radioactive material in circulation must be decreased, strict control over the radioactive sources in use must be enforced, a strong security culture must be fostered, and careful planning and security exercises must take place to ensure the response is effective should a security event occur.

An important way to reduce radioactive material in circulation is to replace radioactive sources, where possible, with viable and economically feasible non-isotopic alternative technologies. Ongoing research, advancements in new technology, and improvements in existing technologies have made alternatives to radioactive sources attractive and cost effective. 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 and cannot be used, for instance, in a radiological dispersal device. Ensuring full radiological security benefit requires that replaced sources are then repatriated to their supplier or enter a proper disposal pathway.

A large group of stakeholders is involved in the decision-making process for the kind of radiation-generating devices – radioactive source-based or non-isotopic – that are selected and operated for a particular application in medicine, industry, agriculture or research. Decisions about which device to use are based on various factors such as available resources, technical requirements and user preferences. Stakeholders outside the operating organisation (end users) – such as those in government agencies (the ministry of health, for example) or financing organisations, including international programmes, are also an integral part of the process.

Experience has shown that some end users may select a device without full prior knowledge of all related opportunities and challenges (e.g. understanding long-term costs associated with certain devices; knowing about a funding opportunity for a specific technology; anticipating the need to manage disused sources when switching to alternative technologies; etc.). In many cases, the assessment of radiological security concerns come as a secondary review after the technology has been selected or is being readied for operation and licensing.

At the international level, multiple efforts support the safe and secure use of radioactive sources through a range of activities aiming to strengthen the competencies of the organisations using or regulating these sources. International efforts also include programmes, especially in the healthcare sector, that support the purchase, delivery and commissioning of sources and associated devices and technologies in low- and middle-income countries (LMICs). More recently, some of these international initiatives have included programmes to support the development of non-isotopic alternative technologies to radioactive sources in order to incentivise LMICs and their end users to adopt such technologies and ensure the proper disposal of disused sources.

However, experience also shows that international efforts might not yet be fully coordinated and that some overlap, duplication of efforts, or conflicting priorities exist. In some cases, a sponsor has funded the replacement of radioactive sources and associated devices with an alternative technology while another sponsor was funding the purchase of a new, similar source-based device in the very same country. In addition, while some IAEA activities clearly encourage the adoption of alternative technologies, current IAEA policy does not prevent the Agency from providing high activity sources for medical or industrial applications through its technical cooperation programme to its Member States requesting such support, as long as they meet the required safety standards.

## Objectives of the Roundtable

The main objective of the virtual roundtable was to bring influential international stakeholders and individual experts involved in the development, procurement, commissioning and disposal of radiation equipment together to review ongoing activities in order to better understand their respective missions and overall activities. Another objective of the roundtable was to demonstrate the diversity of parties involved and how decision makers can influence which equipment or which technology will actually be used. It was finally an opportunity for participating organisations and experts to better know each other and identify gaps and opportunities for enhancing their respective coordination and contributions.

## Process and Participants

The roundtable was conducted online and was professionally facilitated by Mr Carl Reynolds, UK. The event was structured around two main sessions: One reviewed international programmes and existing mechanisms that ensure their coordination, and the second aimed to identify and discuss challenges and opportunities for strengthening these mechanisms and their enhanced overall coordination.

In order to inform the discussions, three international speakers were invited to attend the live session and to share the key messages of their presentations, the full versions of which had been made available to the participants prior to the roundtable:

- *Romanian Stakeholders and International Programmes involved in the Adoption of Alternative Technologies to Radioactive Sources in Support of Radiological Security* (Sorin Repanovici, CNCAN, Romania)
- *Accelerator Technologies: Current Status and IAEA Activities* (Valeriia Starovoitova, NAPC, IAEA)
- *Strengthening National Cancer Care Resources* (Mulape Kanduza, Cancer Diseases Hospital, Lusaka, Zambia)

In preparation for the roundtable, participants were also encouraged to listen to a podcast on *The Ad Hoc Working Group of Stakeholder States involved with Alternative Technologies to High Activity Radioactive Sources* (A discussion between WINS Head of Programmes Pierre Legoux and Renate Czarwinski, former chair of the Ad Hoc Working Group, Germany).

A group of 45 international experts representing a diverse range of stakeholders involved in the development or adoption of alternative technologies or in activities supporting the safe and secure use of radioactive sources attended the roundtable.

## Key Findings

### The availability and adequacy of alternative technologies

A good portion of the discussions revolved around the availability of non-isotopic alternative technologies to replace radioactive sources and the challenges still faced by certain organisations, in particular in LMICs, to adopting such technologies.

It was mentioned that some alternative technologies, such as Linac-based radiotherapy systems, are already in wide use and, according to many users, possess distinctly superior features compared to systems using Co-60 sources. However, alternative technologies such as Linacs have their own requirements in terms of necessary infrastructure, regulations, safety and maintenance. In addition, for some important applications (e.g. brachytherapy), there are not yet any viable alternatives to radioactive sources. Concerted efforts are thus needed to continue the development of alternative technologies and to support their wider adoption and sustainable use in all countries and regions of the world.

Several experts mentioned that despite the existence of many fora on the topic, comprehensive, reliable and up-to-date information on available alternative technologies was still difficult to access and that further attention should be given to this area. It was agreed that end users do not always take fully informed decisions and the open question was: *Where do end users go to find answers to their questions?* Providing data on technology performance (and other issues) is essential in supporting the decision-making process. Professional associations were seen as a good support opportunity.

Discussions during the event also demonstrated the complexity of the topic and highlighted the fact that there are no clear-cut divisions between those favouring and opposing certain technologies. Some believed that the primary decision criteria should not be radiological security, but rather providing the best quality treatment for cancer patients or delivering cost-effective sterilisation or irradiation services. Others reminded the group of the security risk associated with radioactive sources and of the importance of using all available means to reduce that risk.

It was finally noted that we should not talk about alternative technologies as a new solution. Quite a few experts stressed that in most cases isotopic and non-isotopic technologies have been working in parallel for years, especially in the medical area. It was agreed that both technologies will remain in use in the near future.

### **The process for deciding what technology to procure**

For most LMICs, the decision to use alternative technologies involves several stakeholders, such as the end users/operators, regulators and other governmental entities, the IAEA and funding organisations. The fact that comprehensive information on alternative technologies is not yet accessible to all practitioners was emphasised. Also, concerns about the possible lack of awareness among key stakeholders were underlined.

Participants highlighted the importance of understanding the interconnection and impact of any decision regarding the choice of a technology. End users are not always aware of the consequences of a technological choice on other aspects of a practice (e.g. downtime) or on the management of the replaced source. For instance, it was reported that the decision to move from cobalt to Linac machines is often made by doctors who may not consider other issues, such as disposal or repatriation of the old source, in their planning.

Discussions also covered the role of regulatory bodies and donors. It was agreed that regulators must be fully trained to have the competence to regulate and monitor the acquisition of any technology and the safe and secure removal and disposal of disused sources. The justification principle was also seen as an important tool to influence the selection of a technology. Regarding donors, it was indicated that they need to be convinced that they're investing their money logically. They want to be sure their money is used effectively (e.g. treating the maximum number of patients; sustainable local support). Technology and other considerations are still secondary for donors, but they could be influenced. As governments most often discuss directly with donors/funders, the IAEA can facilitate this discussion whenever possible.

It was agreed that alternative technologies should be promoted in a balanced manner. The recipients must be ready to use them (having the appropriate knowledge, regulatory framework, local support, sustainability etc.). It was also recognised that some end user organisations in LMICs had difficulties in adopting alternative technologies and needed assistance. There was a clear understanding that

international organisations and programmes cannot provide full support to all LMICs requiring assistance. The roundtable agreed that the switch to alternative technologies would not happen overnight.

### **The importance of effectively addressing the end of life of radioactive sources**

Adopting alternative technologies involves security risks (e.g. transfer of the source from the source user to an interim storage or disposal facility). Actual risk reduction will only happen if the end of life of the replaced sources is properly addressed. In some instances, LMICs adopting alternative technologies count on international organisations or programmes to take care of the disused sources.

Related with this, some participants reported not enough coordinated work was done on recovery, repatriation and disposal of disused high activity sources. In many LMICs, the cost of disused source removal and repatriation is prohibitive. Funding is an issue and causes serious delays in moving from cobalt to Linacs in the medical sector. Also, safe and secure interim storage options or disposal pathways are still lacking in many LMICs. There is evidence that some LMICs would like to convert to alternative technologies but are prevented from doing so by the absence of repatriation options. To address the above challenges, the idea of establishing an integrated IAEA programme involving its relevant technical divisions and all applications of radiation technologies could be further explored.<sup>1</sup>

### **The role of international programmes and their coordination**

It was recognised that there are many international actors, but the available information about various programmes is fragmented. Nobody seems to have the full picture of all existing international programmes, and no organisation seems to have been taking the lead for developing such a comprehensive picture. It was also mentioned that some key players, such as funders, WHO and technology vendors, did not attend the roundtable and that outreach efforts should be made to secure their future participation.

The need to map out all international programmes, consolidating their main missions and contributions under a single framework, was emphasised. It was agreed that the consolidation of this information and sharing it with a large audience would be necessary to avoid repeating the same discussions and periodically re-initiating the same work.

Participants thought that some shortcomings in coordination among the known international programmes existed and clearly encouraged them to work on enhancing their coordination. It was mentioned that existing networks and fora should and could play a more active role. It was also stressed that the right experts need to attend the existing coordination meetings and that they need to be empowered by their respective authorities to take decisions.

The IAEA plays a central role in supporting Member States benefiting from radiation technologies. IAEA assistance is essential for many countries, in particular in human health matters. It was thus encouraging that the roundtable was attended by a large number of IAEA staff.

The IAEA also works with multiple external organisations and programmes, including WHO, FAO, UNICEF and other UN bodies; funders such as the Islamic Development Bank; and more developed Member States that provide technical resources and extrabudgetary support.

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<sup>1</sup> In the medical area, the IAEA Programme of Action for Cancer Therapy (PACT), established in 2005 with the objective of “creating a unified vision and operational framework for all IAEA cancer-related activities” provides integrated support for cancer control and care in LMICs. To achieve universal access to radiotherapy services, in 2010 PACT proposed a comprehensive strategy that can address all aspects of radiotherapy acquisition and use including support for transfer to Linacs and the safe and secure management of radioactive sources.

Refs: IAEA. 2017. *Radiotherapy in cancer care: facing the global challenge*.

<https://www.iaea.org/publications/10627/radiotherapy-in-cancer-care-facing-the-global-challenge>.

Enwerem-Bromson, N. (former director, PACT) & Abdel-Wahab, M. (director, NAHU). 2015. *Expanding global access to radiotherapy: the IAEA perspective*. The Lancet Oncology Commission.

[https://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045\(15\)00287-9.pdf](https://www.thelancet.com/pdfs/journals/lanonc/PIIS1470-2045(15)00287-9.pdf)

The IAEA promotes a one-house approach with the Technical Cooperation Department acting as the main vector of assistance, supported by technical departments. IAEA participants reported multiple opportunities for information exchange amongst various IAEA departments and divisions. Internal coordination within the IAEA seems to be strong as regards technical cooperation project review, design, approval and implementation. Participants also reported coordination meetings across departments. There is no evidence of formal coordination of all activities involved in developing alternative technologies and supporting their adoption.

IAEA support in planning upgrades and training and capacity building is very extensive, but supply of sources by the IAEA seems to be limited. There are, however, few statistics on the number of sources replaced or supplied each year by vendors, the IAEA or through bilateral agreements between countries. There are limited international mechanisms to oversee the supply of Category 1 and 2 sources. It is challenging to anticipate the magnitude of the radiological security risk in the medium and long term.

## WINS Suggestions for a Possible Way Forward

Follow-on meetings were strongly supported by participants, and WINS committed to explore opportunities and provide the group with possible options as follows:

### 1. Map out international programmes

Developing a comprehensive global picture of all international programmes and organisations involved in the adoption of alternative technologies to radioactive sources is a prerequisite for discussing their activities and coordination.

It is suggested that WINS, with the support of a group of experts, tries and identifies the major international organisations and programmes (including their roles, responsibilities and achievements) that are interested and can contribute to different aspects of radioactive source replacement and alternative technologies. The first step in this effort would be to identify and consolidate the work already conducted in this area to avoid duplication of efforts. To facilitate the research and reporting, it is suggested that programmes and organisations are grouped by topical areas (e.g. medical applications, industrial applications), stakeholder groups (e.g. funders, vendors, etc.) or any other commonalities.

### 2. Consolidate information on available alternative technologies and offer further opportunities to discuss experiences and lessons learned from adopting alternative technologies

We need to be able to answer the following question: *Where do end users find answers to all the questions they have regarding the availability of alternative technologies and best practices for adopting them?*

A lot of efforts have already been made to answer this question. There are many fora discussing alternative technologies. Countries discuss the topic frequently but not usually in a coordinated manner.

WINS will continue to implement a set of activities to consolidate and share information on alternative technologies. In particular, WINS will continue to invite stakeholders involved in this area to share their experiences and lessons learned during workshops and other international events. The discussions will review the current availability, feasibility and possibilities for replacement. Among others, these exchanges will include information on new devices under development, incentives for replacement, risk assessment and efficacy of replacement techniques, regulatory changes required, role of suppliers, international collaboration etc. Based on these discussions, WINS will periodically review and revise its series of publications, such as its Best Practices Guides and Special Reports. All presentations, reference materials and findings will be made available and shared with the community on the WINS website.



Many countries, organisations and working groups are also conducting efforts to consolidate information on available alternative technologies and offer further opportunities to discuss experiences and lessons learned from adopting these technologies. The Ad Hoc Working Group of Stakeholder States involved with Alternative Technologies to High Activity Radioactive Sources has already taken steps to enhance the exchange of information between these various parties. WINS is suggesting that actions be taken to strengthen the role of the Ad Hoc Working Group in coordinating these existing efforts.

### **3. Continue the discussion on coordination and cooperation**

The discussions during the roundtable were very fruitful but also highlighted the span and complexity of the topic. Achieving strengthened coordination will require long-term, independent but coordinated efforts, initiated and sustained by leading organisations.

In order to contribute to the collective efforts and maintain some momentum, WINS is proposing to organise a follow up meeting with a selected group of experts in order to develop a roadmap describing actions to identify possible coordination gaps and suggest measures to strengthen cooperation and coordination. This group may start by analysing a few cases of known moves to alternative technologies (such as those presented during the roundtable and others). Such case studies will highlight the issues faced by the various stakeholders involved and also underscore strengths and weaknesses in the process. The outcome of these case studies may lead to the development of a guidance document (a kind of user's manual for governments, end users, regulators, vendors and donors/funders) of practical steps and prerequisites for a safe, secure and sustainable transfer to alternative technologies.

### **4. Encourage the IAEA to maintain and strengthen its internal coordination efforts by creating a working group on alternative technologies**

The IAEA could be encouraged to establish a working group within the Agency to provide guidance on alternative technologies. This group, e.g. the Alternative Technologies Support Group, could be similar to the Nuclear Power Support Group established in 2006. It would serve as a base for information sharing and coordination opportunities for all IAEA activities related to various applications of radioactive sources and alternative technologies, their implementation and their impact on other IAEA programmes.

In addition, IAEA Member States could be encouraged to request the Secretariat take further actions for supporting effective external coordination. For example, the IAEA could host coordination meetings, invite experts with proper credentials to attend these events, and ensure practical follow up on the main conclusions. The IAEA is encouraged to explore all opportunities, including taking initiatives, for supporting better external coordination based on its current mandate.

### **5. International legal and institutional frameworks**

Finally, a review of international legal and institutional frameworks could be initiated to assess what changes would be required to ensure that Category 1 and 2 source supply and movements are effectively monitored and recorded (cradle to grave approach). This could be included under one of the above actions or undertaken by a few experts as a separate task supported by the IAEA or another organisation (to be determined).