1. The Open-ended Meeting of Legal and Technical Experts on the Implementation of the Guidance on the Management of Disused Radioactive Sources (Guidance), was held from 17 to 20 August, 2021, virtually from IAEA Headquarters in Vienna, under the chairmanship of Ms Cristina Dominguez (Argentina).

2. The meeting was attended by 247 experts from 100 Member States and 1 International Organization: Afghanistan, Albania, Argentina, Armenia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, China, Comoros, Congo, Costa Rica, Croatia, Cuba, Cote d’Ivoire, Democratic Republic of the Congo, Dominican Republic, Egypt, Eswatini, Ethiopia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kyrgyzstan, Latvia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mexico, Montenegro, Morocco, Myanmar, Nepal, Niger, Nigeria, North Macedonia, Oman, Pakistan, Paraguay, Philippines, Portugal, Qatar, republic of Moldova, Romania, Russian Federation, Rwanda, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Seychelles, Slovakia, Spain, Sri Lanka, Sudan, Sweden, Syrian Arab Republic, Tajikistan, Thailand, Togo, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United Republic of Tanzania, United States of America, Uruguay, Uzbekistan, Viet Nam, Zambia, Zimbabwe and the Organization for Security and Co-operation in Europe (OSCE).

The Scientific Secretaries for the meeting were Mr Ronald Pacheco (Division of Radiation, Transport and Waste Safety) and Mr Timothy Hayes (Division of Nuclear Security).

3. The objective of the meeting was to share with Member States the results of the four (4) Regional Virtual Meetings on the Implementation of the Guidance on the Management of Disused Radioactive sources that took place in Europe from 25 to 27 January 2021, Africa from 23 to 25 March 2021, Asia and the Pacific from 26 to 28 April 2021, and the Americas from 28 to 30 June 2021, as recommended by the Code of Conduct on the Safety and Security of Radioactive Sources and by the Guidance on the Management of Disused Radioactive Sources, and to further discuss the challenges faced by regulatory bodies and other stakeholders.

4. The meeting was opened by Ms Elena Buglova, Director of the Division of Nuclear Security (NSNS). In her opening remarks, Ms Buglova reviewed the objective of the meeting and recognized the efforts of the Secretariat and also of Member States to remain engaged during
the COVID-19 Pandemic to conduct and participate in the Regional Virtual Meetings to assist in the sharing information in relation to the safety and security of radioactive sources. Ms Buglova further highlighted the role radioactive sources serve in society while stressing that ensuring the safety and security of radioactive sources is an ongoing effort that continues throughout the source lifecycle, including when sources become disused and that effective end of life management plans are needed for disused sources as outlined in the Guidance to reduce the probability of disused radioactive sources falling out of regulatory control and potentially contributing to accidental exposure or use in malicious acts.

5. Opening of the meeting was continued by Mr Peter Johnston, Director of the Division of Radiation, Transport and Waste Safety Department of Nuclear Safety and Security (NSRW). In the opening remarks of Mr Johnston, it was stated that political commitment to the Code and Guidance and implementation assist global improvements of the control and protection of radioactive sources, including safety and security of the disused radioactive sources. However, he noted that we can never be complacent, and efforts should continue in all circumstances, in particular during the COVID-19 pandemic. Mr Johnston brought participants attention to the fact that political commitment to the Guidance is a good starting point for establishing or revising of the National Policy and Strategy or legislation and regulations for the management of disused radioactive sources. Mr Johnston noted that proposals and conclusions of the meeting will inform IAEA activities and may also be used in national action plans to improve safety and security on the management of disused radioactive sources.

6. Presentations on topics relevant to the safety and security of disused radioactive sources were made by representatives of the IAEA Secretariat and invited participants in plenary sessions during the meeting. All presentations will be made available to participants on a secured shared webpage\(^1\). Therefore, their detailed contents are not replicated in this report and only a short summary is provided below.

**Overview of the IAEA Activities to Support the Code and Supplementary Guidance Implementation**

7. The Secretariat (Mr Timothy Hayes, NSNS) reviewed results of the surveys conducted for the four (4) Regional Virtual Meetings providing participants with both global and regional results for implementation of the Guidance provisions. The review of the global results highlighted the following common challenges faced by all regions in relation to the Guidance:

- Establishment of a National Policy and Strategy for the management of disused radioactive sources;
- Short-term and Long-term storage;
- Consideration of a disposal option in the National Policy and Strategy,
- Establishment of return to supplier agreements; and

- Reuse and Recycling.

The results also highlighted the need and benefit of having a National Policy and Strategy for the management of disused radioactive sources. It was noted that regions with a higher percentage of States that had a National Policy and Strategy for the management of disused radioactive sources, had fewer challenges in relation to implementation of the Guidance.

8. The Secretariat (Mr Ronald Pacheco, NSRW) provided a summary of the main conclusions and recommendations from the four (4) Regional Virtual Meetings. These meetings were attended by a total number of 262 Experts and 113 States. During the summary, Mr Pacheco presented the meeting groups topical sessions which were based on the results of the survey and highlighted the main conclusions and recommendations stated in the Chair Reports; from Europe Mr J. Duffy (Ireland); from Africa Mr F. Ollite (Mauritius); from Asia and Pacific Ms A. Shehhi (United Arab Emirates), and from the Americas Ms C. Dominguez (Argentina). Five common findings from the regional meetings were highlighted:

- Funding for the management of disused radioactive sources;
- Return to the supplier agreements;
- Short-term storage;
- Establishment of an appropriate Legislative and Regulatory Framework; and
- Reuse and recycling.

9. The Secretariat (Mr Juan Carlos Benitez-Navarro, NEFW) provided an Overview of Draft Technical Document (TECDOC) on Reuse and Recycling of Disused Sealed Radioactive Sources (DSRS). The IAEA efforts in assisting Member States in the safe and secure management of DSRS was described. The need for a technical document on the reuse and recycling of DSRS was explained. Mr Benitez-Navarro provided details on the different options for the reuse or recycling of DSRS and the national framework and infrastructure required for the implementation of these options. Practical examples of national experiences on the reuse and recycling of DSRS in some countries were illustrated. The timeline for the preparation of the IAEA publication on reuse and recycling of DSRS was explained and the participants were encouraged to contribute with national experiences. The Secretariat invited all participants to visit the IAEA Professional Network DSRSNet and share experiences in the reuse and recycling of DSRS.

10. The Secretariat (Mr Ronald Pacheco, NSRW), provided information about the wording in the Code of Conduct and the supplementary Guidance related with the financial provisions to cover the cost of the management once the radioactive source becomes disused, including the identification of responsibilities for implementing this provision as stated in the paragraph 17 (b) (ii) of the Guidance. The importance of creating requirements was also highlighted as were, competence, and skills to the regulatory staff to review and assess the financial
conditions. The results of the self-assessment questionnaire were presented in which most of the States make the user responsible for the sources and request a signed agreement with the supplier. However, most of the States do not give consideration in these agreements to the initial estimation, periodic revision and allocations of costs. Mr Pacheco noted that the IAEA is drafting a Technical Document to provide advice about the National scheme needed for financial provisions including regulatory framework. At the end of his presentation some countries like Lithuania, France and Canada expressed their National experience in implementing financial provisions.

11. The Secretariat (Ms Judit Silye, Office of Legal Affairs (OLA)) provided a presentation on the legal aspects and global importance of the political commitment to the Code of Conduct and its supplementary Guidance. Ms Silye, in her presentation, provided an overview of the difference between legally binding and non-legally binding instruments and by comparing the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management with Code of Conduct on the Safety and Security of Radioactive Sources. She also explained their different nature and implementation. In this context, she highlighted the voluntary nature of the Code and its supplementary Guidance, including the voluntary preparation of National Papers and participation in technical meetings. In addition, in her presentation, Ms Silye explained in detail how a Member State can express its political commitment to the Code and its supplementary Guidance.

12. The Secretariat (Mr Ronald Pacheco, NSRW) familiarized participants with the forms for providing political commitment to the Code and supplementary Guidance. He provided a practical example of the process for expressing the political commitment as well as the wording used for most of the Member States. As well, Mr Pacheco placed emphasis on the benefits for States working toward following the provisions in the Code of Conduct and Guidance in relation to the safety and security and for the management of disused radioactive sources.

13. The Secretariat (Mr Timothy Hayes, NSNS) provided information to participants on the International Conference on the Safety and Security of Radioactive Sources: Accomplishments and Future Endeavours CN-295. Mr Hayes reviewed the purpose of the conference, key deadlines and dates and encouraged nominations and submission of synopses for papers.

14. The Secretariat (Mr Stephane Defour, IEC) provided a presentation on the role of the IAEA in the preparedness and response to nuclear and radiological emergencies. The presentation highlighted the importance of having adequate level of emergency preparedness and response in relation to disused radioactive sources. Mr Defour provided an overview of the Agency’s roles in preparedness addressing the development of standards, guidance and tools, capacity building activities and means for their implementation as well as on services available for self-assessment and peer review in EPR (EPRIMS and EPREV). Mr Defour summarized the Agency’s roles in response to a nuclear or radiological emergency. He focused on arrangements for sharing information and requesting assistance focusing on the Response and Assistance Network (RANET). This included an explanation of how, and who, can request international assistance even in relation to emergencies involving disused radioactive
sources. Some International Assistance Missions involving disused Radioactive Sources were noted.

Summary on the Presentations on Implementation of the Guidance

15. Mr Richard Wassenaar, representing the International Source suppliers and Producers Association (ISSPA) and Nordion Inc., presented the role of suppliers in the management of disused radioactive sources focusing on reuse and recycling. Mr Wassenaar reviewed the structure and 17 members of ISSPA. Mr Wassenaar highlighted that disused sources are still radioactive sources and should be treated in the same manner and noted that the term ‘disused radioactive sources’ does not necessarily reflect that these sources may still be reused or recycled. For the members of ISSPA, it was presented that the management of disused radioactive sources begins at the start of the radioactive source lifecycle. At the end of the lifecycle, it was noted that suppliers often facilitate reuse and recycling when disused radioactive sources are returned to the supplier. For States where developing the necessary in-country reuse and recycling capacity or options may not be achievable, the role of suppliers in this area was highlighted.

16. Ms Nathalie Semblat from Global Affairs Canada presented Canada’s global initiatives for DSRS focusing on activities to address the threat posed by disused sealed radioactive sources. Ms Semblat highlighted the various programmes that Canada supports to fulfil Canada’s pledges to the Global Partnership Against the Spread of Nuclear Weapons and Materials of Mass Destruction, Nuclear Security Summits, the Global Initiative to Combat Nuclear Terrorism, and UN Security Council Resolution 1540. Ms Semblat also provided an overview of the global support Canada provided in relation to the management of DSRS focusing on projects related to DSRS consolidation and removal, long-term management and enhancing nuclear security regimes.

17. Mr Evan Thompson from the U.S. Department of Energy (DOE), Office of Radiological Security (ORS) provided an overview of US international efforts to search and secure radioactive sources. Mr Thompson presented that ORS implements the removal of sources to long-term storage or disposal in order to reduce the risk of misuse. It was also presented that ORS assists to build capacity, assisting countries to develop domestic capabilities to locate and secure orphan and disused radioactive sources. ORS also assists by providing training of partners on aspects of source removal and by investing in technologies that enhance capabilities of ORS, partners, and the IAEA to remove sources, so that sources are removed in a timely manner. Mr Thompson also highlighted that ORS works to promote IAEA guidance in international fora and within their international partnerships and encourage their partners to commit to these documents and align their policies and practices. Mr Thompson’s presentation also covered the development of new storage solutions that ORS is developing and also the development of a new modular mobile hot cell which would be transported in ISO storage containers and could be assembled for use in a couple of days.

18. Mr Alejandro Cortes from the Nuclear Safety and Safeguards National Commission (CNSNS) of Mexico provided an overview of an event that occurred in 2013 in Mexico involving the loss of control of a disused Category 1 Co-60 radioactive source. The event
described by Mr Cortes was the result of a vehicle theft that was transporting a disused Category 1 Co-60 source. Mr Cortes provided a summary of the event including calculated dose to the population and first responders. Mr Cortes also reviewed the global media attention that the event attracted. To conclude, Mr Cortes reviewed the extensive efforts required to search for and secure the disused radioactive source.

19. Following the presentations, discussion sessions were held.

Conclusions

20. A number of high-level conclusions were identified by the Chair:

21. The level of participation and engagement during the meeting demonstrated the interest in the need for, and the importance of this Guidance for the safety and security in the management of DSRS.


23. The conclusions of the four (4) Regional Virtual Meetings made it possible to identify common areas where greater effort and assistance is required for implementation of the Guidance and also highlighted common challenges, which were summarized in the following key findings:

23.1. **Legislative and Regulatory Framework for the Management of Disused Radioactive Sources**

Most of the States recognized the need to strengthen their national policy and regulatory framework for the management of DSRS identifying the following:

- Strengthening the role and responsibilities of the regulatory body;
- Establishing specific regulations and guidance;
- Notification system and requirements for declaring a DSRS;
- Establishing requirements for financial guarantees, provisions for unforeseen circumstances (e.g., abandonment of a radioactive source or bankruptcy); and
- Development of national strategies for cooperation with stakeholders and national and international organizations.
23.2. **Financial Provisions**

The main challenges identified were the allocation of responsibilities for implementing the Guidance provision as stated in the paragraph 17 (b) (ii) and setting requirements and competence in most of the regulatory bodies to estimate, review and assess the financial conditions.

23.3. **Return to the Supplier**

Most States informed that the return of the DSRS to the supplier is normally used as the main management option. However, the main challenges identified were:

- Development of regulatory requirements;
- Procedures for supplier agreements to assist in the return the DSRS; and
- Need to involve additional financial and human resources and competencies of the Regulatory Body to evaluate this specific task.

23.4. **Short-term Storage**

Most of the States used short-term storage as an interim solution. However, the following challenges were reported:

- Development of regulations, procedures and authorizations to impose time limits for short-term storage; and
- Measures to ensure the safety and security conditions of the radioactive sources that are stored in the facility.

23.5. **Reuse and Recycling**

Most of the States do not use or consider the option of reuse or recycling as management options. The following challenges were reported:

- Development of national strategies and best practices to establish options on the reuse or recycling of disused sources; and
- Development of technical expertise and regulatory procedures such as authorizations for reuse or recycling.

24. During the meeting a growing interest has been noted on reuse and recycling options of DSRS and the international activities carried out by Suppliers and Producers in these areas. Participants requested information on the allocation of resources to assist with transport, agreements, financial cost and disposal of disused sources. ISSPA, as a key stakeholder presented its perspectives, and identified important issues associated with the lifecycle of DSRS.
25. The interactive nature and level of participation in the meeting allowed for further understanding of the following:

- The strengths and limitations of the existing databases related to sealed sources in some States;
- Regulatory framework associated with the control of DSRS;
- Limitations or constraints (regulatory, financial, market, management options, etc.) faced by stakeholders throughout the life cycle of radioactive sealed sources;
- Stakeholder views regarding possible management options and opportunities for improvement to address these issues;
- Relevant actions and efforts by regulatory agencies to address long-term storage of sealed sources; and
- Scope and purpose of existing national collection and recovery programs from sealed sources.

26. During the meeting the importance of synergies between the Guidance (non-binding legal instrument) and some of the key international legal instruments, namely the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (binding legal instrument) were discussed. Both instruments are complementary and the exchange of experiences in both cases results in global improvements to the safety regime.

27. All States must contend with the consequences of loss of control of DSRS and transnational nature of the threat posed by acts of nuclear terrorism. The universalization and effective implementation of the Guidance can benefit all countries by facilitating international cooperation, including the exchange of information on nuclear security threats. This is particularly important since most countries use such materials for industrial, medical, or other purposes, including those without a nuclear program.

Recommendations

28. A number of recommendations were identified by the chairperson:

29. The States should create and promote dialogue between regulators, legal and technical experts, suppliers, producers and other relevant stakeholders on what, when, how, and with whom to exchange relevant information under the provision of the Guidance, including benefits and challenges, pertinent actions and efforts by regulatory agencies to address the management of DSRS and scope and purpose of existing national sealed source collection and recovery programs.
30. The States and the Secretariat should carry out follow-up actions on the key findings of the four (4) Regional Virtual Meetings and continue promoting meetings to exchange information and strengthen international cooperation.

31. The States should continue efforts in capacity building for the various DSRS management options and consider providing additional guidance on the return to supplier management option.

32. The States should consider establishing requirements for financial guarantees to assist in the management of disused radioactive sources. The Secretariat could support these actions.

33. The States should use the opportunity offered by the 2022 International Conference on the Safety and Security of Radioactive Sources (CN-295) to complement and improve the implementation of the Guidance and advance in its universalization.

34. The States should foster a National Policy and Strategy for the management of disused radioactive sources. Key to this is the enlightening of policy makers, government and industry officials, and the public about technical, regulatory, and policy matters associated with the management and disposal of DSRS as well as key regulatory objectives.

35. The Suppliers of radioactive sources should be encouraged to facilitate reuse and recycling when disused radioactive sources are returned to them in order to assist States where in-country reuse and recycling capacity or options may not be achievable.

36. The Secretariat should continue to promote universalization and effective implementation of the Guidance, in particular with countries that have not yet expressed political support, and to facilitate the organization of regional and international meetings.

37. The Secretariat should continue to report on IAEA activities and resources to States to help them provide Political Commitment to the Code of Conduct and its Supplementary Guidance and to implement the provisions into their national legislation, accessible upon request.

38. The Secretariat should conduct workshops and activities to review best practices for effective management of disused radioactive sources and identify safety and security issues and solutions related to the management of disused radioactive sources.

Cristina A. Dominguez, Chairperson

20 August, 2021