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Code of Conduct on the Safety and Security of Radioactive Sources:

Guidance on the Management of Disused Radioactive Sources

Report by the Director General

Summary

- On 11 September 2017, the Board of Governors approved the Guidance on the Management of Disused Radioactive Sources contained in Annex 1.
- As requested by the Board, the Director General is transmitting the Guidance on the Management of Disused Radioactive Sources to the General Conference, with the Board's recommendation that the General Conference endorse it and encourage its wide application.

Code of Conduct on the Safety and Security of Radioactive Sources:

Guidance on the Management of Disused Radioactive Sources

Report by the Director General

A. Background

1. The Code of Conduct on the Safety and Security of Radioactive Sources (the Code of Conduct) was developed through, inter alia, a series of meetings with technical and legal experts. In September 2003, the Code of Conduct was approved by the Board of Governors and, in resolution GC(47)/RES/7.B, the General Conference welcomed the Board's approval of the Code of Conduct and endorsed the objectives and principles set out in it.

2. In 2004, the Guidance on the Import and Export of Radioactive Sources was developed following a similar process. It was then approved by the Board of Governors and endorsed by the General Conference in resolution GC(48)/RES/10.D. The text of the Guidance was issued as guidance supplementary to the Code of Conduct. A revision of the Guidance on Import and Export of Radioactive Sources was approved by the Board of Governors and endorsed by the General Conference in September 2011, in resolution GC(55)RES/9.

3. In October 2013, the President of the International Conference on the Safety and Security of Radioactive Sources: Maintaining the Continuous Global Control of Sources throughout Their Life Cycle, recommended that "additional guidance at the international level for the long-term management of disused radioactive sources should be developed".

4. In 2014, the General Conference, in resolution GC (58)/RES/10 paragraph 17, encouraged the Agency to "improve the long-term management of disused sealed radioactive sources." Resolution GC(58)/RES/11 paragraph 22 "calls upon all Member States to ensure that there is adequate provision for safe and secure storage and disposition pathways for disused radioactive sealed sources."

5. In October 2014, the Secretariat convened an Open-ended Meeting of Legal and Technical Experts to Develop Internationally Harmonized Guidance for Implementing the Recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources in Relation to the Long Term Management of Disused Radioactive Sources[1], which was attended by 162 experts from 73 Member States and one non-Member State as well as observers from three international organizations. The objective of this meeting was to review a first draft of guidance and make recommendations regarding the way forward, including on how the guidance should be published. One of the conclusions of the Chairman was that "the meeting agreed that the development of the guidance should continue to be

[1] The Report of the Chairman is available at: http://www-ns.iaea.org/downloads/rw/code-conduct/info-exchange/chair-report-open-ended-meet-oct14.pdf

pursued as supplementary guidance under the Code of Conduct, at a similar level to the Import/Export Guidance."

6. In 2015, the General Conference, in resolution GC (59)/RES/10, noted "the discussion on the ongoing development of supplementary guidance to the Code of Conduct on the Safety and Security of Radioactive Sources regarding the management of disused sealed sources."

7. A second Open-ended Meeting of Legal and Technical Experts was held in Vienna, from 14 to 17 December 2015[2] and was attended by 128 experts from 66 Member States, as well as observers from two international organizations. The objective of this meeting was to review the draft guidance as revised following the first meeting. The Chairman concluded that "The meeting agreed that the development of the guidance should continue to be pursued as supplementary guidance under the Code of Conduct, while IAEA should consider the additional development of more detailed technical guidance on the management of disused sources."

8. The draft guidance, as revised following the second meeting, was sent to Member States on 23 February 2016 for a 120-day comment period. The relevant Safety Standards Committees and the Nuclear Security Guidance Committee were also invited to submit comments to the Secretariat.

9. A third Open-ended Meeting of Legal and Technical Experts was held in Vienna, from 27 June to 1 July 2016, and was attended by 108 experts from 69 Member States and one non-Member State, as well as an observer from one international organization. The objective of the meeting was to review the draft guidance, as revised in response to the comments received, with a view to reaching a consensus on the text and its publication. The Report of the Chairman is in Annex 2 to this document. It records that "A large number of States agreed that the text does not need further revision and supported the approach that the document should be sent to the Board of Governors for approval as supplementary guidance under the Code". It also records that consensus was not reached on this matter.

10. In 2016, the General Conference, in resolution GC(60)/RES/9, requested that "the Secretariat take note of and consider, as appropriate, the report of the Chairman from the 2016 Open-ended Meeting of Legal and Technical Experts to Develop Internationally Harmonized Guidance for Implementing the Recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources in Relation to the Management of Disused Radioactive Sources containing draft supplementary Guidance on the Management of Disused Radioactive Sources."

11. At the March 2017 Session of the Board of Governors the issue was considered and the Chair indicated that in light of the discussion, more time would be required for further deliberation, through informal consultations to be chaired by the Governor of the Argentine Republic, H. E. Ambassador Rafael Mariano Grossi. These consultations would be carried out with a view to finalizing the issue at the September 2017 Board at the latest. (Chairman´s conclusion on Item 2, Board of Governors, 8 March 2017 and Note by the Chair of the Board of Governors on Open Ended Consultations on the Draft Guidance on the Management of Disused Radioactive Sources, 15 March 2017). The informal consultations were concluded and resulted in the revised text which is enclosed as Annex I.

[2] The Report of the Chairman is available at: https://www-ns.iaea.org/downloads/rw/code-conduct/info-exchange/chairman-report-dec2015-meeting_final.pdf

12. In September 2017, the Board of Governors approved the draft *Guidance on the Management of Disused Radioactive Sources* that is contained in Annex 1 to this document and requested the Director General to transmit it to the General Conference with a recommendation that the Conference endorse it and encourage its wide implementation; and to issue it as guidance supplementary to the Code of Conduct.

Annex 1

Guidance on the Management of Disused Radioactive Sources

I. PREAMBLE

In line with the relevant applicable norms, nuclear safety and security is the prime responsibility of States. While radioactive sources offer many benefits in medicine, industry, agriculture, research and education, they pose risks to human health and the environment unless they are safely and securely managed. Through implementation of the Code of Conduct on the Safety and Security of Radioactive Sources (the Code), the strengthening of national legislative and regulatory infrastructures globally has led to major improvements in the protection and control of radioactive sources.

This supplementary Guidance is intended to consolidate and provide further detail on the management of disused sources consistent with the Code in response to requests from Member States.

It stands as supplementary guidance under the Code of Conduct, at a similar level as the Guidance document on the Import and Export of Radioactive Sources.

This non-legally binding Guidance takes account of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997) as well as the relevant Safety Standards and Nuclear Security Series publications and the Nuclear Energy Series. It is intended to be used by States when establishing or strengthening their national policy, strategy, legislations and regulations consistent with their relevant international commitments.

II. STRUCTURE

Each section of this Guidance addresses a particular topic related to management of disused sources. Each section is introduced with explanatory text intended to provide background information and context on the section's topic as well as references to the relevant provisions of the Code. Following this explanatory text, numbered operative paragraphs provide guidance to States on the section's topic.

III. OBJECTIVE

Paragraph 5(b) of the Code states that the objectives of the Code "should be achieved through the establishment of an adequate system of regulatory control of radioactive sources, applicable from the stage of initial production to their final disposal, and a system for the restoration of such control if it has been lost." Paragraph 7(a) indicates that every State should take the appropriate measures necessary to ensure "that the radioactive sources within its territory, or under its jurisdiction or control, are safely managed and securely protected during their useful lives and at the end of their useful lives." Paragraphs 14, 15, 20, 22 and 27 also contain provisions that are directly relevant to the management of disused sources.

1. Within the context of the overall lifecycle management of radioactive sources, the objective of this Guidance is to encourage States to improve the safety and security of disused sources in line with the provisions of the Code. The intent is to identify actions to

be taken, starting with the decision to acquire a radioactive source and continuing through disposal, to ensure that disused sources are safely and securely managed.

2. This Guidance is intended to advise States on the available management options for disused sources. These options, described further in this Guidance, include reuse or recycling, long-term storage and disposal and return to a supplier. Short-term storage and transport, which are addressed in this Guidance, are not considered as options in themselves, but are often necessary interim steps in the implementation of options.
3. While the return to a supplier is also considered as an option, the objective of this Guidance is neither to place the sole responsibility for the management of disused sources on the Supplier State nor to ascribe obligations on these States to take back sources they may have previously supplied.

IV. SCOPE

4. This Guidance applies to all radioactive sources within the scope of the Code, including orphan sources, once regulatory control has been regained.
5. This Guidance addresses the management of a radioactive source once it becomes disused but does not address the circumstances in which a radioactive source may become disused.
6. This Guidance is focused on the safe and secure management of disused sources. While recognizing that such management should be compatible with the State's overall programme for radioactive waste management, this Guidance does not address such a programme, which is dealt with in other IAEA publications.

V. DEFINITIONS

7. The terms used in this Guidance have the same meanings as those terms defined in the Code and the supplementary Guidance on the Import and Export of Radioactive Sources (the Import–Export Guidance). The following additional terms are specifically defined for this Guidance:
   a. "Long-term storage" of a disused source means "storage" (as defined in the Code) in a dedicated facility pending disposal;
   b. "Metal recycling industries" means all those entities involved in the recycling of scrap metal, such as facilities carrying out collection, sorting and processing of scrap metal, including foundries, and metallurgical operations;
   c. "Recycling" means using the radioactive material from a disused source in a new radioactive source or in an unsealed form;
   d. "Reuse" means using a disused source for its original application or for another application without disruption of the existing outer source capsule or creation of a new outer source capsule;
   e. "Short-term storage" of a disused source means "storage" (as defined in the Code) in conjunction with the implementation of a chosen management option (return to a supplier, reuse, recycling, or long-term storage and disposal);
   f. "Supplier"[3], as defined in the IAEA Nuclear Safety Glossary 2016, in accordance with the Basic Safety Standards, means any legal person to whom a registrant or

[3] The term *supplier* of a source is formally defined in the *International Basic Safety Standards: Radiation Protection and Safety of Radiation Sources* (IAEA Safety Standards Series No. GSR Part 3), which are the general standards of safety for radiation sources established by IAEA Board of Governors on 12 September 2011. These standards are also

licensee delegates duties, totally or partially, in relation to the design, manufacture, production, or construction of a source.

VI. APPLICATION OF THIS GUIDANCE

This Guidance provides a general framework for the management of disused sources.

Detailed requirements and guidance relevant to implementation of this Guidance are found in the IAEA Safety Standards, in the recommendations and guidance in the IAEA Nuclear Security Series publications, and in the guidance in the Nuclear Energy Series, including those listed in Annex 1. These publications recognize the need for safety and security measures to be applied using a graded approach, whereby the degree of effort to be devoted in any particular situation is commensurate with the risk to be addressed. This graded approach is also reflected in the system for categorization of radioactive sources used in the Code. While the Code applies to Category 1–3 radioactive sources, it indicates that the provisions may be extended to other radioactive sources and to aggregations of lower activity sources.

In implementing this Guidance, each State should make appropriate use of the IAEA Safety Standards, and where applicable, the Nuclear Security Series publications and other relevant technical publications. Each State should also encourage the regulatory body, other competent authorities, and relevant industries to co-operate in order to ensure that disused sources are managed in such a way that individuals, society and the environment are appropriately protected.

8. Each State should adopt a graded approach to safety and security in the management of disused sources.
9. While the scope of this Guidance is defined, States should also consider applying the same principles to the management of other potentially harmful disused sources, such as categories 4 and 5 radioactive sources.
10. Each State should take account of its national circumstances and apply the provisions of this Guidance as appropriate.

VII. NATIONAL POLICY AND STRATEGY FOR THE MANAGEMENT OF DISUSED SOURCES

The Code includes a number of provisions addressing topics related to management of disused sources, including establishment of a national register of radioactive sources (paragraph 11); encouragement of reuse and recycling when practicable and consistent with considerations of safety and security (paragraph 14); responsibilities of designers, manufacturers, suppliers, users and those managing disused sources for the safety and security of radioactive sources (paragraph 15); storage of radioactive sources in facilities appropriate for the purpose of storage (paragraph 20(p)), including storage of disused sources for extended periods of time in facilities fit for that purpose (paragraph 20(q)); considerations for adequate regulatory control up to the final disposal of disused

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adopted by policy making organs of their co-sponsoring intergovernmental organizations, namely: the European Commission, the Food and Agriculture Organization of the United Nations, the International Labour Organization, the OECD Nuclear Energy Agency, the Pan American Health Organization, the United Nations Environment Programme and the World Health Organization. This definition is the same used in the previous *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*, which had been established by the Board at its 847th Meeting on 12 September 1994 and are still in use by some States. The definition is incorporated into the *IAEA Safety Glossary*, including in the 2016 Edition, which has the primary purpose of harmonizing the terminology and usage in the IAEA safety standards for protecting people and the environment from harmful effects of ionizing radiation, and in their application.

sources (paragraph 5(b) and paragraph 22(c) on records for the transfer and disposal of radioactive sources); arrangements for the safe management and secure protection of radioactive source once they have become disused, including financial provisions where appropriate (paragraph 22(b)); consideration of agreements, where applicable regarding the return of disused sources to a supplier (paragraph 20(e)(7)); and re-entry of disused sources into a State's territory for return to a manufacturer if, in the framework of its national law, the State has accepted that they be returned to a manufacturer authorized to manage the disused sources (paragraph 27). The Code also includes provisions for national strategies for gaining or regaining control over orphan sources (paragraph 8(c) and (d)).

A national policy and strategy on the management of disused sources, which may be part of a broader policy and strategy, enables a State to address all these provisions in a coherent manner. A national policy represents a statement of the government's intent; a strategy sets out the mechanisms for implementing the national policy.

Funding mechanisms for the management of disused sources may differ for newly acquired radioactive sources, for radioactive sources that have been previously authorized, and for orphan sources. For newly acquired radioactive sources, such mechanisms may include trust funds, surety bonds, letters of credit, insurance policies, bank guaranties, taxes or any other mechanism adopted by the State. For previously authorized radioactive sources and for orphan sources, the State may apply a case-by-case approach to funding, for example by the user or directly by the State.

11. Each State should establish a national policy and strategy for the management of disused sources that reflects the State's long-term commitment to their safe and secure management. The policy and strategy together should:
    a. Include provision for maintaining regulatory control of a radioactive source when it becomes disused;
    b. Provide that, prior to acquisition of a radioactive source, licensees have adequate arrangements in place , including funding for the management of the radioactive source, once it becomes disused;
    c. Identify responsibilities and arrangements, including funding , for the management of a disused source in cases where such arrangements were not made prior to acquisition of the radioactive source, or in cases where prior arrangements can no longer be implemented;
    d. Provide that an orphan source, once identified, is brought under regulatory control and, if it cannot be returned to beneficial use, managed as a disused source or radioactive waste, as appropriate;
    e. Consider all feasible management options for disused sources and ensure the most appropriate management options are adopted;
    f. Ensure the availability of short-term storage and transport arrangements for the management options adopted;
    g. Establish a decision-making process for designating a disused source as radioactive waste, taking into account potential effects of such designation on subsequent management options;
    h. Ensure the timely availability and sustainability of long-term storage, and the necessary financial and organizational resources;
    i. Provide for the development of a national disposal programme for disused sources in a timely manner; and

j. Ensure that information on disused sources is maintained by the State, for example in the national register of radioactive sources or in the national inventory of radioactive waste.

12. Each State should ensure that the national policy and strategy for the management of disused sources is part of, or compatible with, the national policy and strategy for the management of radioactive waste.

13. Each State should ensure that State organizations with responsibilities for safety and security of radioactive sources, particularly the regulatory body, promote appropriate safety culture and security culture in their implementation of the national policy and strategy and ensure the availability of appropriate programmes for the training of all those involved in the management of disused sources.

VIII. LEGISLATION AND REGULATIONS

Legislation and regulations relating to safety and security of radioactive sources is covered in paragraphs 18 and 19 of the Code. The Import and Export Guidance document also contains provisions related to radioactive sources which apply to disused sources. A State's legislation and regulations give explicit expression to its national policy and strategy.

14. Each State should ensure that legislation and regulations include provisions for the safe and secure management of disused sources that give legal effect to the national policy and strategy.

15. Legislation and regulations should ensure that:
    a. All activities related to the management of disused sources are subject to authorization, inspection and enforcement of regulatory requirements; and
    b. Each disused source remains under continuous regulatory control.

16. Each State should include in its consideration of the technical and administrative capability, resources and regulatory structure of the Importing State an assessment of whether arrangements are in place in the Importing State for the safe and secure management of the radioactive source if it is or when it becomes disused.

IX. REGULATORY BODY ROLES AND RESPONSIBILITIES

Paragraphs 20–22 of the Code deal with the general roles and responsibilities of the regulatory body. Paragraph 20(e)(vii) indicates that States "should ensure that the regulatory body established by its legislation has the authority to … attach clear and unambiguous conditions to the authorizations issued by it, including conditions relating to … the safe and secure management of disused sources, including, where applicable, agreements regarding the return of disused sources to a supplier." Paragraph 22 indicates that States "should [among other things] ensure that its regulatory body: (a) establishes procedures for dealing with applications for authorization; (b) ensures that arrangements are made for the safe management and secure protection of radioactive sources, including financial provisions where appropriate, once they have become disused; … (m) provides guidance on appropriate levels of information, instruction and training on the safety and security of radioactive sources and the devices or facilities in which they are housed, to manufacturers, suppliers and users of radioactive sources."

17. Each State should ensure that the regulatory body:
    a. Develops regulations and/or guidance on the safe and secure management of disused sources;
    b. Establishes regulatory provisions for acquisition and use of a radioactive source that include:

(i) The specific arrangements to be put in place for the safe and secure management of the radioactive source once it becomes disused;
(ii) Adequate financial provisions, where appropriate, to cover the costs of management once the radioactive source becomes disused, including the identification of responsibilities for implementing these provisions; and
(iii) A notification by the user to the regulatory body or other competent authority once the radioactive source becomes disused.

c. Where necessary, modifies the authorization for a radioactive source already in use to ensure its safe and secure management once it becomes disused;
d. Establishes provisions for unforeseen circumstances that may require the management of a radioactive source as a disused source, such as abandonment of a radioactive source or bankruptcy of the user;
e. Implements the decision making process for designating a disused source as radioactive waste;
f. Ensures, within its jurisdiction, that responsibility for the safety and security of a disused source is defined when the disused source is transferred to a third party, such as a carrier, a supplier, or the operator of a storage, waste processing or disposal facility;
g. Specifies the safety and security requirements for short-term storage, for example by a user on its premises prior to further management option, including the time limit for such short-term storage;
h. Specifies safety and security requirements for reuse or recycling of disused sources;
i. Specifies safety and security requirements for long-term storage and disposal of disused sources;
j. Verifies compliance with the legislation, regulations and conditions of authorization for the management of disused sources through inspections and undertakes any necessary enforcement actions;
k. Develops or obtains access to the necessary competencies and capacity needed to implement its regulatory responsibilities for the safe and secure management of disused sources. Such competencies should specifically include:
(i) Establishing regulations and conditions of authorization for the safe and secure management of disused sources including those designated as radioactive waste;
(ii) Reviewing and assessing plans and arrangements for the management of disused sources, including financial provisions, where charged with that authority or through cooperation with other governmental authorities, and
(iii) Conducting inspections of facilities and activities related to the management of disused sources.
l. Provides regulations and/or guidance on the knowledge and competencies needed by those responsible for the management of disused sources;
m. Provides regulations and/or guidance on retention of information specific to each radioactive source (and related device) necessary for its safe and secure management, once it becomes disused; and

n. Liaises and coordinates with all relevant stakeholders in order to ensure effective cooperation in the event of the discovery of an orphan source, for preparation of its subsequent safe and secure management.

18. In cases where the regulatory body possesses disused sources or is allocated responsibilities for their management, each State should ensure that the regulatory body establishes internal arrangements to preserve the effective independence of regulatory functions consistent with the provisions of paragraph 19(a) of the Code.

X. SHORT-TERM STORAGE

Short-term storage of a disused source is not in itself a management option but rather a necessary interim step in implementing one or more of the management options, such as reuse, recycling, return to a supplier and long term storage and disposal. Typical examples of short-term storage are storage at the user's site when a radioactive source is declared disused and stored pending further management. A further example is storage of an orphan source found at a border control point of a State or in a facility within the metal recycling industries.

The appropriate duration for short-term storage is likely to depend on national strategy applicable to the particular disused source and the capability of the user to provide safe and secure storage. A disused source with a relatively short half-life (for example, less than 100 days) could be stored in a safe and secure facility for a period necessary to allow for its decay to a level at which it can be released from regulatory control and managed as non-radioactive material. However, storage in short term conditions of a disused source for protracted periods running into many years, particularly at most user's site, is not generally appropriate as it may increase the safety and security risks, and to complicate its further management.

19. Each State should ensure that:
    a. Short-term storage of a disused source always occurs in safe and secure conditions, with proper authorization and periodic inspections;
    b. Short-term storage occurs in a manner that does not preclude future management options; and
    c. The regulatory body sets an appropriate time limit for short-term storage of a disused source, contingent upon availability of other management options.

XI. TRANSPORT, TRANSIT AND TRANSSHIPMENT

In accordance with Paragraph 7(a) of the Code, radioactive sources should be safely managed and securely protected during their useful lives and at the end of their useful lives. In accordance with Paragraph 1 of the Code, management includes transport and thus transport is an integral part of management of disused sources. In addition, paragraphs 28 and 29 of the Code address transport in the context of import and export of radioactive sources.

Transport of a disused source may present specific challenges, including the lack of an approved transport package, valid source special form certificate, or a carrier willing to transport the consignment. In addition, certain shipments may require competent authority approval.

20. Each State should:
    a. Ensure that the competent authority has access to the capabilities and resources necessary for the regulatory oversight or approval of shipments, packages and source special form and non-special form radioactive material for the transport of disused sources, when needed;

b. Ensure the availability of certified transport packages and associated services for disused sources, when needed;
c. Consider using special arrangements for the transport of disused sources that have lost their special form certificate and for the use of transport packages which have lost their certification and cannot be recertified in a timely fashion;
d. Ensure that the legislative provisions, regulatory and administrative arrangements are in place that allow for the transit or transshipment of disused sources through their territories; and
e. Encourage carriers to accept shipments of disused sources that have been approved by the competent authority.

XII. OPTIONS FOR THE MANAGEMENT OF DISUSED SOURCES

Management options for disused sources include, reuse or recycling, long-term storage and disposal and return to a supplier. These options may take place within a State or may necessitate the export of the disused source to another State. In the latter case, the Import-Export Guidance applies. The particular combination of options should be selected in accordance with the national policy and strategy.[4]

REUSE OR RECYCLING

Paragraph 14 of the Code provides that "every State should encourage the reuse or recycling of radioactive sources, when practicable and consistent with considerations of safety and security." A disused source, by definition, is no longer used, and is not intended to be used, for the practice for which an authorization has been granted; however, the radioactive source may be suitable for other uses (e.g., research and training activities, calibration of radiation detection equipment). Reuse, in some cases, may be as simple as transferring the device to another user, whereas recycling is always a technically demanding task that requires particular expertise and authorization. Reuse of a disused source is normally subject to source integrity and quality verification according to regulatory standards. Reuse and recycling may require the removal of the radioactive source from the device in which it is housed and its emplacement in a new device which are potentially hazardous operations. If these operations are required, they should only be carried out with appropriate authorization, knowledge, equipment, facilities, and skills.

21. Each State should ensure, when considering the possibility of reuse or recycling of a disused source, that the appropriate facilities, expertise and technologies will be available or developed when necessary.

LONG-TERM STORAGE AND DISPOSAL

Paragraph 20(q) of the Code indicates that States "should ensure that the regulatory body … has the authority to … ensure that, where disused sources are stored for extended periods of time, the facilities in which they are stored are fit for that purpose."

Long-term storage of disused sources, even if planned for an extended period of time, is not meant to be a permanent solution but rather a stage prior to disposal. Long-term storage requires ongoing regulatory control and associated resources, which cannot be ensured indefinitely. Where disposal

[4] The management options presented in the following paragraphs do not indicate an order of preference. It is at the sole discretion of States to select an option or combination of options, as appropriate.

facilities are available, consideration should be given for disused sources to be disposed of, rather than stored in a long-term storage facility.

Disposal of disused sources declared as radioactive waste (i.e. their emplacement in an appropriate facility with no intention of retrieval) is the final step in their safe and secure management, as stated in the definition of management of radioactive sources and the objectives of the Code (Paragraph 5(b)). Many States do not, at present, have actual or planned disposal facilities and will need to make arrangements for long-term storage and disposal of their disused sources.

22. Regarding long-term storage, each State should ensure:
    a. The availability of long-term storage of disused sources in authorized facilities;
    b. That long-term storage capacity is sufficient for existing and foreseen disused sources as determined by periodic review;
    c. That a long-term storage facility is subject to a safety and security assessment prior to authorization by the regulatory body and is located, designed, constructed, operated, and decommissioned in conformance with regulatory requirements for safety and security;
    d. That disused sources are stored to facilitate future handling and processing;
    e. That disused sources to be stored in a long-term storage facility are conditioned as required by the regulatory body and comply with applicable acceptance criteria;
    f. That the operator of a long-term storage facility maintains control of the facility and undertakes regular verification of the status of the disused sources in storage;
    g. That the regulatory body conducts periodic review and inspection of the long-term storage facility and undertakes any necessary enforcement actions; and
    h. That the records of disused sources in long-term storage facilities are established and maintained.
23. Regarding disposal, each State should:
    a. Develop a disposal programme for disused sources that are designated as radioactive waste, that is compatible with the State's overall radioactive waste management programme;
    b. Ensure that a disposal facility for disused sources is subject to a safety and security assessment prior to authorization by the regulatory body and is sited, designed, constructed, operated, and closed in conformance with specific regulatory requirements;
    c. Ensure that disused sources to be disposed of are conditioned as required by the regulatory body and comply with the waste acceptance criteria established for the disposal facility; and
    d. Ensure that information is recorded on disused sources that are planned for disposal and those that have already been disposed of.

RETURN TO A SUPPLIER

Paragraph 20(e)(7) of the Code indicates that "every State should ensure that the regulatory body established by its legislation has the authority to attach clear and unambiguous conditions to the authorizations issued by it, including conditions relating to the safe and secure management of disused sources, including, where applicable, agreements regarding the return of disused sources to a supplier."

A disused source could be returned to its original supplier, to the supplier of the replacement radioactive source or replacement device, or to any other supplier, provided the supplier is authorized to manage the disused source safely and securely, and has an agreement in place to receive the disused

source. The supplier is able to evaluate and determine whether the disused source can be reused, recycled or designated as radioactive waste and stored and disposed of.

24. When return to a supplier is the selected option for a disused source, the State should consider requiring that prior to the acquisition of the radioactive source, the user has an agreement with the supplier for its return once it becomes disused. In this agreement, consideration should be given to at least the following elements:
    a. An undertaking by the supplier to take the disused source within a specified time period;
    b. The arrangements for transport and associated conditioning of the disused source in connection with its return, including the provision of a transport package certified in accordance with transport regulations and the maintenance of the source special form certificate as applicable; and
    c. The initial estimation, periodic revision, if needed, and allocation of the costs of return between the user and the supplier.
25. For a radioactive source for which such an agreement does not exist and return to a supplier is the selected option, the State should encourage the user to identify a supplier authorized to manage the disused source and establish an agreement to accept the radioactive source, once it becomes disused.

Paragraph 27 of the Code of Conduct indicates that the re-entry of disused sources for return to a supplier may be possible if authorized by National Law. However, return of a disused source to a supplier is not always feasible at the time it becomes disused. One impediment to return to a supplier is the cost involved, particularly when the supplier is in another State from the one in which the radioactive source was used, and such costs were not taken into account, or no agreement was made, at the time of acquisition. Another impediment to return to a supplier occurs when the supplier with whom an agreement was previously made is no longer in business or is bankrupt or when the identity of the supplier of the radioactive source or device cannot be confirmed. The unavailability of a certified transport package or the loss of a source special form certificate at the time of the return of the disused source may be other challenges. Additionally, the State may have prohibited the import of radioactive waste, in which case, if the disused source is designated as radioactive waste, its import would be refused. To address these situations, the State would need to consider other management options.

XIII. MANAGEMENT OF ORPHAN SOURCES

In many States, radioactive sources were in use before a national infrastructure for safety and security had been developed or adequately strengthened and were therefore not under regulatory control. Even in States with long-established and well-developed infrastructures, control of radioactive sources may have been lost, sometimes as a consequence of the absence of any strategy regarding their management once they are no longer in use. The Code includes a number of provisions relating to such orphan sources (e.g. paragraphs 9(a), 13(a), 22(o)). Paragraph 22(o) of the Code indicates that each State "should ensure that its regulatory body…is prepared to recover and restore appropriate control over orphan sources…". All orphan sources, once found, should therefore be brought within the system of the protection and control of radioactive sources[5] and be returned to beneficial use or managed as disused sources, according to this Guidance.

[5] The detection of an orphan source may trigger specific actions and investigations that fall out of scope of this Guidance, see NSS 15 and SSG-19 for further details.

26. Each State should :
    a. Ensure that persons who are likely to encounter an orphan source during the course of their operations (such as metal recycling industries and customs posts) are aware of the actions required for radiation protection and for the safe and secure management of the orphan source until it can be recovered and placed under regulatory control;
    b. Ensure that any person who discovers an orphan source and who has promptly notified the competent authorities will not, as a result, incur any penalty or liability;
    c. Ensure that as soon as an orphan source has been discovered, it is promptly placed in a safe and secure condition, brought under regulatory control and if appropriate, managed as a disused source or radioactive waste; and
    d. Make financial provisions to cover the costs of management of orphan sources, including provisions to address situations in which a former user of the orphan source cannot be traced or cannot provide funding.

XIV. INTERNATIONAL AND REGIONAL COOPERATION

The Code aims to foster international cooperation in order to achieve its objectives (see paragraph 5(a)). Paragraph 20 (n) deals with liaison among the State's regulatory body, the regulatory bodies of other countries and international organizations in order to promote co-operation and the exchange of regulatory information.

27. Each State is encouraged to cooperate with other States and relevant regional and international organizations, as appropriate, to enhance the management of disused sources and their transport , including by:
    a. Establishing bilateral and regional arrangements;
    b. Sharing information, in line with its competences, related to disused sources including i.e. imports and exports, missing, lost, stolen and found radioactive sources
    c. Making use of regional regulatory networks and other international and bilateral mechanisms to share information and experience on the management of disused sources; and
    d. Addressing exceptional cases where the management of a disused source is not possible, the State concerned may seek international assistance either from the original supplier or other parties, including State Parties, for the return of the disused source on the basis of mutually agreed terms and conditions.

XV. GENERAL

Paragraph 30 of the Code deals with the role of the IAEA for collecting and disseminating information and for developing relevant technical standards and providing for their application. For management of disused sources, assistance may be provided for the establishment and implementation of a national strategy, which may include the development of long-term storage and disposal facilities. Peer reviews of relevant regulatory infrastructures and training can also be provided.

28. The IAEA should, as appropriate and subject to the consent of the States concerned and the availability of funds:
    a. Maintain a list of States that have written to the Director General that they are working towards following this Guidance;
    b. Assist States, upon their request, in implementation of this Guidance;
    c. Gather and disseminate information from events involving disused sources;

d. Disseminate this Guidance and related information widely; and

e. Disseminate any additional information resulting from IAEA programmes designed to assist States in strengthening their national infrastructure for the management of disused sources which a particular State may wish to provide.

29. This Guidance should be reviewed and, if appropriate, revised by Member States every five years or earlier if necessary.

30. States should understand that the provisions of paragraph 17 of the Code concerning confidentiality should apply where appropriate with respect to information provided or exchanged pursuant to this Guidance, including information made available to the IAEA that was provided to it in confidence.

31. In the interests of international safety and security, the cooperation of all States in following this Guidance would be welcome.

Annex 1: Bibliography

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, INFCIRC/546, 24 December 1997

Code of Conduct on the Safety and Security of Radioactive Sources, IAEA/CODEOC/2004, Vienna, 2004

Guidance on the Import and Export of Radioactive Sources, IAEA/CODEOC/IMP-EXP (2012 Edition), Vienna, 2012

Safety Standards

Safety Fundamentals

- Fundamental Safety Principles, IAEA Safety Standards Series No. SF-1

Safety Requirements

- Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 (Rev. 1)
- Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3
- Predisposal Management of Radioactive Waste, IAEA Safety Standards Series No. GSR Part 5
- Regulations for the Safe Transport of Radioactive Material (2012 Edition), IAEA Safety Standards Series No. SSR-6
- Disposal of Radioactive Waste Specific Safety Requirements, IAEA Safety Standards Series No. SSR-5

Safety Guides

- Building Competence in Radiation Protection and the Safe Use of Radiation Sources, IAEA Safety Standards Series No. RS-G-1.4
- Regulatory Control of Radiation Sources, IAEA Safety Standards Series No. GS-G-1.5
- Categorization of Radioactive Sources, IAEA Safety Standards Series No. RS-G-1.9
- Safety of Radiation Generators and Sealed Radioactive Sources, IAEA Safety Standards Series No. RS-G-1.10
- Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities, IAEA Safety Standards Series No. SSG-8
- Radiation Safety of Industrial Radiography, IAEA Safety Standards Series No. SSG-11
- Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries, IAEA Safety Standards Series No. SSG-17
- National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources, IAEA Safety Standards Series No. SSG-19
- Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition), IAEA Safety Standards Series No. SSG-26
- Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition), IAEA Safety Standards Series No. SSG-33
- Management of Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education, IAEA Safety Standards Series No. WS-G-2.7, (currently under revision by DS454)

- Storage of Radioactive Waste, IAEA Safety Standards Series No. WS-G-6.1
- Borehole Disposal Facilities for Radioactive Waste, IAEA Safety Standards Series No. SSG-1

Nuclear Security Series Publications

Fundamentals

- Objective and Essential Elements of a State's Nuclear Security Regime, IAEA Nuclear Security Series No. 20

Recommendations

- Nuclear Security Recommendations on Radioactive Material and Associated Facilities, IAEA Nuclear Security Series No. 14
- Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control, IAEA Nuclear Security Series No. 15

Implementing guides

- Nuclear Security Culture, IAEA Nuclear Security Series No. 7
- Security in the Transport of Radioactive Material, IAEA Nuclear Security Series No. 9
- Security of Radioactive Sources, IAEA Nuclear Security Series No. 11
- Nuclear Security Systems and Measures for the Detection of Nuclear and Other Radioactive Material out of Regulatory Control, IAEA Nuclear Security Series No. 21

Nuclear Energy Series and other publications

- Reference Design for a Centralized Spent Sealed Sources Facility, IAEA-TECDOC-806
- Handling, Conditioning and Storage of Spent Sealed Radioactive Sources, IAEA-TECDOC-1145
- Management for the Prevention of Accidents from Disused Sealed Radioactive Sources, IAEA-TECDOC-1205
- Management of Spent High Activity Radioactive Sources (SHARS), IAEA-TECDOC-1301
- Management of disused long lived sealed radioactive sources (LLSRS), IAEA-TECDOC-1357
- Safety Considerations in the Disposal of Disused Sealed Radioactive Sources in Borehole Facilities, IAEA-TECDOC-1368
- Review of Sealed Source Designs and Manufacturing Techniques Affecting Disused Source Management, IAEA-TECDOC-1690
- Management of Disused Sealed Radioactive Sources, IAEA Nuclear Energy Series No. NW-T-1.3

Annex 2

Open-ended Meeting of Legal and Technical Experts to Develop Internationally Harmonized Guidance for Implementing the Recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources in Relation to the Management of Disused Radioactive Sources

Vienna, 27 June to 1 July 2016
Report of the Chairman

1. An open-ended meeting of technical and legal experts was held from 27 June to 1 July 2016 at the IAEA Headquarters in Vienna under the chairmanship of Mr J Zarzuela (Spain) to develop internationally harmonized guidance for implementing the recommendations of the Code of Conduct on the Safety and Security of Radioactive Sources (the Code) in relation to the long-term management of disused radioactive sources. This was the third such meeting, the first having been held in October 2014 and the second in December 2015. The objective of this third meeting was to review the draft guidance that had been revised on the basis of the comments received during the 120-day comment period with a view to reaching a consensus on the text and its format.

2. The meeting was attended by 108 experts nominated by 69 Member States of the IAEA (Albania, Argentina, Armenia, Austria, Azerbaijan, Bangladesh, Belarus, Bolivia, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Central African Republic, Chad, Chile, Congo, Côte d'Ivoire, Czech Republic, Democratic Rep. of the Congo, Egypt, Estonia, France, Germany, Ghana, India, Iran, Iraq, Italy, Japan, Kazakhstan, Kenya, Kyrgyzstan, Lebanon, Lesotho, Madagascar, Malaysia, Mali, Mauritania, Mexico, Morocco, Niger, Nigeria, Norway, Panama, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russian Federation, Senegal, Serbia, Spain, Sudan, Sweden, Thailand, the Former Yugoslav Republic of Macedonia, Tunisia, Turkey, Ukraine, United Kingdom, United States of America, Uruguay, Viet Nam, Yemen, and Zimbabwe) and one non-Member State of the IAEA (Comoros). The meeting was also attended by an observer from the International Source Suppliers and Producers Association (ISSPA). The Scientific Secretaries for the meeting were Mr H. Mansoux (Division of Radiation Transport and Waste Safety) and Ms C. George (Division of Nuclear Security). The rapporteurs for the meeting were Messrs Fred Morris and Anthony Wrixon (consultants).

3. The meeting was opened by Mr Juan Carlos Lentijo, Deputy Director General and Head of the Department of Nuclear Safety and Security. After welcoming the experts, he indicated that the IAEA would like to congratulate the 132 Member States that have expressed their political support to the Code. This was a significant achievement, one of the highlights as the IAEA begins its 60th anniversary celebrations during the current year. He expressed that the Code had helped Member States to improve the safety and security of radioactive sources. Just one month previously, over 190 representatives from 100 Member States, as well as observer organizations, clearly affirmed the importance of the Code, through their significant participation in the third open-ended meeting to discuss implementation of the entire Code and its supplementary Import-Export Guidance. Clearly, Member States find the Code extremely useful to draw upon as a resource in which to aid them in establishing their national safety and security infrastructures for radioactive sources. However, the management of disused radioactive sources has long been recognized as a critical issue because of their vulnerability to

accidents or malicious use. The improvement in the safety and security of disused sources was therefore still a challenge to be addressed.

4. Mr Lentijo went on to note that the draft Guidance, under discussion during the week, is intended to assist States to ensure that the necessary framework is in place so that when a radioactive source becomes disused, its management is straightforward. He also noted that many States are confronting legacy issues, where radioactive sources have been imported prior to the establishment of the legal and regulatory framework, or commercial take-back agreement with the supplier. All management options need to be explored to ensure that return to a supplier or to return to an exporting state, are not the immediate or the sole management options. In view of this, he expressed his pleasure at the numbers attending the current meeting, which was a clear indication of the importance assigned by Member States in finalizing the development of the guidance. He expressed his hope that agreement would be reached on the content and format of the document by the end of the week.

5. The Chairman recounted the history of the Code and the supplementary Import-Export Guidance under the Code. He also noted the formalized process established in 2006 for meetings on the Code every three years, four of which had now been held, the last being in 2016. He noted the need for additional guidance with respect to the management of disused sources had been identified by Member States in a variety of fora, including the Abu Dhabi Conference in 2013, the suggestion being that this guidance could take the form of supplementary guidance to the Code but, as with the Code itself, would not be legally binding.

6. The Chairman went on to review the development of the guidance on management of disused sources. He noted the conclusions and recommendations made at the first two open-ended meetings (October 2014 and December 2015). He also noted that the second meeting showed that there was continued support for the initiative to develop such guidance and to continue to pursue its development as supplementary guidance under the Code. The meeting had recommended that the Secretariat should send the revised draft guidance to Member States for a 120-day comment period, inform the relevant IAEA Safety and Security Committees for their appropriate contribution to the review and following the comment period, should convene a consultancy meeting to address the comments received and prepare a further draft of the guidance. The IAEA should then schedule this third open-ended meeting to review the revised draft, with a view to finalizing it for submission to the Board of Governors for approval as supplementary guidance under the Code.

7. The Chairman noted that 96 comments had been received from 11 States and that these had been reviewed during a consultancy meeting and a further draft of the document had been developed. The purpose then of this third open-ended meeting was to review the draft and, if possible, agree on the text and the format, so that it could be submitted to the Board of Governors for approval as additional guidance under the Code.

8. Following discussion of administrative matters, Ms Christina George gave a presentation on the progress in the development of the guidance on the management of disused sources—the rationale for the guidance, the proposed format and status of the draft guidance, and the proposed path forward. She also provided an overview of the draft in the form that it had been sent to the meeting participants. In conclusion, she said that the guidance is intended to be highly visible, would address the management of disused sources from both a safety and security perspective and builds on the Code on a topic of broad interest to many States.

9. The Chairman then invited Mr F Morris (rapporteur) to walk-through the draft document highlighting the major changes that had been made to the draft guidance on the basis of the comments that had been received. Following this, the Chairman invited experts to review the document, paragraph by paragraph, with a view to finalizing the text. This took most of the week. Most of the changes made were related to improving the clarity of the text. The most significant issues had to do with the organization of the document for the presentation of the management options so efforts were made to restructure the document for better clarity. Other issues that arose were clarification of the meaning and use of the term 'supplier' and clarification of the differences between return to a supplier outside of the State in which the radioactive source becomes disused and national management of a disused source, including the situation in which the supplier to whom the source is returned is within the same State.

10. Following resolution of these issues on the content of the document, the meeting proceeded to discuss the format in which the Guidance should be produced, and specifically whether it should be published as supplementary guidance under the Code, similar to the Import-Export Guidance. Many States (fifty) actively expressed strong support for the document to be at the same level as the Import-Export Guidance, recognizing that there is a major need for a document at this level. They noted that management of disused sources poses significant challenges in many States and that this level of document would help States to establish the necessary policy framework to safely and securely manage disused sources. One State, however, while recognizing the utility and quality of the document produced as a result of the meetings, registered its objection to adoption of the document as supplementary guidance under the Code because in this State's view, the Code already addresses the management of disused sources, and the new document was developed not within the framework of the Code and therefore cannot have the same status as the Import-Export Guidance. No other State participating in the meeting expressed support for this position.

11. The Chairman drew the following conclusions:
    a. As revised during the meeting, the content of the draft document was agreed to by the experts from all but one State participating in this meeting;
    b. A large number of States agreed that the text does not need further revision and supported the approach that the document should be sent to the Board of Governors for approval as supplementary guidance under the Code;
    c. One State however did not agree with this approach and considered that the text would need to be revised once the issue of the format had been resolved.

12. The Chairman recommended that the Secretariat be informed of results of the meeting and engage in consultations with Member States with a view to finalizing this document.

Javier Zarzuela Jiménez

Chairman

1 July 2016