

Safety of Radioactive Waste Management

A. Background

1. Following the adoption of the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (the Joint Convention) in September 1997, the Agency, in co-operation with the European Commission, the Nuclear Energy Agency of the Organisation for Economic and Co-operation and Development (OECD/NEA) and the World Health Organization, organized the International Conference on the Safety of Radioactive Waste Management that took place in Córdoba, Spain, in March 2000 (the Córdoba Conference). Subsequently, the Agency, in cooperation with the European Commission and OECD/NEA, organized the International Conference on Issues and Trends in Radioactive Waste Management that took place in Vienna in December 2002 (the Vienna Conference).

B. The Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management

2. The Joint Convention entered into force in June 2001. The first Review Meeting of Contracting Parties to the Joint Convention took place in November 2003. An account of the Review Meeting is given in paragraphs 56-59 of document GC(48)/INF/3 (the Nuclear Safety Review for the Year 2003), in which two matters are highlighted — namely; the need for some improvements to the working arrangements for the Joint Convention and the adoption of measures to promote the Joint Convention.

3. At a meeting of the General Committee for the Joint Convention held in June 2004, improved arrangements — based on experience gained at the first Review Meeting — were recommended for adoption by the next meeting of Contracting Parties.

4. Agency staff members have made presentations promoting the Joint Convention at a number of international meetings and at various Agency regional workshops and other events.

C. The International Action Plan on the Safety of Radioactive Waste Management

5. Following the Córdoba Conference, the Secretariat proposed (in the *Report on the Safety of Radioactive Waste Management* contained in the Attachment to document GOV/2001/31-GC(45)/14) to implement seven actions for enhancing the safety of radioactive waste management. In September 2001, the Board of Governors requested the Secretariat to implement those actions. Progress in implementing the actions was described in Attachment 5 to document GOV/2002/35-GC(46)/11, which was before the General Conference at its 2002 session. The list of actions was subsequently updated in the light of the deliberations of the Vienna Conference, resulting in an international Action Plan on the Safety of Radioactive Waste Management consisting of nine actions (see, in this connection, Annex 7 to document GOV/INF2003/15-GC(47)/INF/4 and paragraph 24 of General Conference resolution GC(47)/RES/7.A).

D. Implementation of the Action Plan

6. The progress made in implementing the Action Plan is described below.

Action 1: *Develop a common framework for the management and disposal of different types of radioactive waste, paying particular attention to large volumes of waste containing long-lived naturally occurring radionuclides.*

7. A document with proposals for a common framework and its application was reviewed by the Subgroup on Principles and Criteria of the Agency's Waste Safety Standards Committee (WASSC) in 2002. Particular issues raised were the optimum approach for the disposal of non-heat-generating long-lived radioactive waste and the need for international consensus on appropriate disposal options for such waste. In October 2003, the document was presented to the US National Academies' Committee on Improving the Regulation and Management of Low Activity Radioactive Waste, which concluded that a common framework would be of considerable assistance in the development of consistent approaches to the management of radioactive waste. The document, which is expected to be published towards the end of 2004, will be used as a working document in the revision of the safety standard on radioactive waste classification and in the consideration of appropriate disposal options for large amounts of low-level waste, including low-level waste containing naturally occurring radionuclides.

Action 2: *Assess the safety implications of the extended storage of radioactive waste and of any future reconditioning which may be necessary and develop safety standards for the long-term storage of radioactive waste.*

8. A position paper prepared by international experts and entitled "The long-term storage of radioactive waste: safety and sustainability" was published by the Agency in 2003. The document, which reviews the ethical and philosophical issues surrounding the extended storage of radioactive waste, is intended as an international reference point for discussions on the subject and as an aid to Member States in taking decisions on the long-term management of radioactive waste.

9. The Safety Guide on the storage of radioactive waste has been reviewed by Member States and is undergoing revision on the basis of comments received.

10. An international project on the safety assessment of waste management prior to disposal is scheduled to commence towards the end of 2004, one component of the project being the safety assessment of long-term storage.

Action 3: *Promptly develop safety standards for geological disposal, addressing inter alia – issues of human intrusion, institutional control, retrievability, the content of the safety case and any implications of nuclear safeguards requirements for the design of the repositories.*

11. A draft Safety Requirements document on geological disposal has been prepared. In view of its importance and of the need to obtain the fullest possible international consensus on its contents, OECD/NEA was invited to co-sponsor it. The draft was reviewed by Member States in 2003 and revised by the Secretariat to take account of the comments received. WASSC and the Radiation Safety Standards Committee (RASSC) and the Radioactive Waste Management Committee of OECD/NEA have now subsequently approved the standard, which will be submitted to the Agency's Commission on Safety Standards and to OECD/NEA's Steering Committee.

12. Work has started on a supporting safety guide which will elaborate on the safety considerations involved in disposal facility site investigation, characterization and selection, facility design and development, and facility operation and closure. The safety guide will also elaborate on the requirements for a safety case specified in the Safety Requirements document and on the need to demonstrate that any measures facilitating retrievability will not have an adverse impact on safety.

13. The Safety Requirements document addresses — and the safety guide will address — the safety implications of safeguards implementation at geological disposal facilities, and liaison is being maintained with the Agency's Department of Safeguards and with safeguards experts in concerned Member States.

Action 4: *Develop an internationally accepted and harmonized approach for controlling the removal of materials and sites from regulatory control.*

14. A safety guide on the principles of exclusion, exemption and clearance has been approved by WASSC, RASSC and the Commission on Safety Standards; it will be published towards the end of 2004. Safety guides relating to the removal of materials and sites from regulatory control are being developed. Complementary safety reports are under development, one on monitoring for compliance with clearance criteria and one on the removal of sites from regulatory control. Both documents are scheduled for publication in 2005. (See in this regard document GOV/2004/54-GC(48)/8).

Action 5: *Develop a structured and systematic programme to ensure adequate application of the Agency's waste safety standards and facilitate their application in implementation of the Joint Convention.*

15. The existing approaches for evaluating the use made and the effectiveness of the waste safety standards are being analysed with the intention of improving the arrangements for providing safety-related assistance, peer review services and education and training.

16. A comprehensive syllabus for training in radioactive waste safety has been drawn up on the basis of the waste safety standards, and training packages are being created. A worldwide programme of training events is in place, covering all aspects of waste management and with emphasis on safety assessment and decommissioning.

17. A series of questionnaires has been developed on the basis of the waste safety standards in order to assist in the appraisal of the standards, their use and effectiveness. The series includes a questionnaire that can be used by States when preparing or reviewing reports required under the Joint Convention.

Action 6: *Explore ways to ensure that information, knowledge and skills concerning radioactive waste management are made available to future generations.*

18. A draft document has been prepared on the use of archiving as a means of preserving knowledge about radioactive waste disposal facilities for future generations. The proposals in it have been successfully tested in relation to the recording of the results of a safety assessment at a near-surface repository. It has been reviewed at a technical meeting and is being revised by the Secretariat in the light of comments made there. It emphasizes the need to maintain the information context - as well as the information itself - relating to the safety of facilities and the need to adopt the recently developed international standards on archives. The document will be published towards the end of 2004.

Action 7: *Address the broader societal dimensions of radioactive waste management by:*

- *Disseminating information, in appropriate formats and by appropriate means (including the Internet), on the main issues related to radioactive waste management;*
- *Disseminating information on lessons learned from national experiences of stakeholder involvement in decision-making;*
- *Involving concerned persons in relevant Agency activities, especially those related to the Agency's safety standards; and*
- *Ensuring that the societal aspects of radioactive waste management are adequately covered at relevant conferences and other meetings organized by the Agency.*

19. This action has been addressed at a number of meetings. For example, in December 2002, at the International Conference on Issues and Trends in Radioactive Waste Management, there were sessions

on the involvement of concerned persons (stakeholders) in and public attitudes towards radioactive waste management, with a variety of concerned persons participating, and in 2003 a meeting was held for the purpose of eliciting the views of stakeholders about the way in which the Agency's radioactive waste safety standards are developed and the content of those standards.

20. While there is support for the Agency's involving stakeholders to a greater degree in Agency activities related to radioactive waste management and for the Agency's role in disseminating relevant information, most Member States do not wish to see the Agency involving itself more directly in matters related to the social dimensions of radioactive waste management.

21. The idea of inviting a broad range of stakeholders to attend meetings of WASSC as observers is being considered, the intention being to make the process of international safety standards development more comprehensible to stakeholders.

Action 8: *Review the new developments related to policies for the control of radioactive discharges to the environment, taking into account the availability and cost-effectiveness of discharge reduction technologies and the broader implications for radioactive waste management of reducing discharges.*

22. A technical document (IAEA TECDOC) on the regulatory control of radioactive discharges is in preparation, its purpose being to provide an overview of current regulatory practices related to the control of radioactive discharges in Agency Member States, of issues of general concern which may influence future regulatory practices and of related work being done by the Agency and other organizations.

Action 9: *Explore international mechanisms for facilitating the management of spent sealed radioactive sources through:*

- *The return of such sources to their suppliers;*
- *The development of regional repositories for the disposal of such sources; and*
- *Studies on the feasibility and safety of the borehole disposal concept.*

23. A safety guide covering the design and operation of borehole disposal facilities is being developed. A first draft was discussed in March 2004 at a WASSC meeting, where it was agreed that the safety guide should focus on intermediate-depth narrow-diameter boreholes intended primarily for the disposal of disused sealed sources. The draft is being revised accordingly. A complementary safety report on the generic safety assessment of borehole disposal facilities is also being developed.