

## Programme L. MANAGEMENT OF RADIOACTIVE WASTE

**Rationale:** Radioactive waste is an unavoidable remnant from the use of radioactive substances and nuclear technology. It has been produced by beneficial practices such as the generation of nuclear energy and the use of radioactive materials in medicine, research and industry, and from industrial activities using natural occurring radioactive material, such as the mining and milling of naturally radioactive ores. A distinctive cause of radioactive waste is the safe disposal of disused radioactive sources. Radioactive waste has also been generated by military activities.

As with all radiation sources, radioactive waste is potentially hazardous to health and must therefore be managed in order to protect humans and the environment. A relatively small fraction of radioactive waste is routinely released into the environment in the form of discharges that need to be properly controlled; some amounts may remain in the habitat as radioactive residues, particularly after the termination of practices and the decommissioning of installations, which may require restoration of the affected environments; finally, the main bulk of radioactive waste must be rendered into a solid form and safely stored or directly disposed of into repositories isolated from the human habitat. Thus radioactive waste management requires safety standards and provisions for their application and the implementation of appropriate technologies.

As radioactive waste is a source of radiation exposure, the Agency's statutory radiation safety functions — i.e. establishing safety standards for the protection of health and providing for the application of these standards at the request of a State — are applicable. In addition, several international undertakings and agreements place obligations on the Agency related to the safety of radioactive waste management, namely the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention), the Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Materials (the London Convention, 1972), the United Nations Conference on Environment and Development (UNCED or Rio Declaration), and the United Nations Global Plan of Action for Protection of the Marine Environment from Land-based Activities. Other regional international undertakings apply to the control of radioactive wastes in the environment and may be expected to involve the Agency in the near future. These include the Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention), the Convention on Environmental Impact Assessment in a Transboundary Context (the

Espoo Convention), and the Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (the Aarhus Convention). A number of General Conference resolutions have stressed the importance of the Agency's activities to resolve radioactive waste management issues (GC(XXXVII)/RES/614, GC(XXXVIII)/RES/6, GC(40)/RES/12 and GC(44)/RES/12).

Appropriate technologies to cope with the radioactive waste generated by the use of nuclear energy are also required in order to meet some of the obligations relating to the management of radioactive waste placed on the Agency and Member States by the international undertakings and agreements mentioned above. In addition, appropriate technologies are also required in order to satisfy the various needs of Member States commensurate with the extent of their applications of nuclear technology. Many developing countries lack the technological and organizational infrastructures to properly and safely manage radioactive waste, including disused sealed radiation sources, and they need assistance in building the necessary capacity. Industrialized countries, on the other hand, look for a means of exchange of technical information and national experiences, particularly on matters related to the geological disposal of high level waste. The Agency's Medium Term Strategy (MTS) reflects the priorities that must be given in the programme to the activities that address these needs. One priority is the promotion of technological solutions by facilitating information exchange among Member States on treatment, storage and disposal of high, intermediate and low level wastes and spent fuel (in objective B.4 of the MTS). Another priority is the building of international consensus on solutions for the safe, environmentally acceptable and efficient management of radioactive wastes from both nuclear power and non-power sources (in objective A.2 of the MTS).

Finally, in the framework of the recommendations of the Rio Conference on Environment and Sustainable Development (Agenda 21), the Agency has been entrusted with the task of developing Indicators for Radioactive Waste Management in the context of sustainable development.

The beneficiaries of the programme are national bodies charged with radioactive waste management responsibilities. This includes in particular competent authorities for regulating and controlling the safety of radioactive waste management, organizations operating radioactive waste management facilities or facilities generating radioactive waste, environmental protection agencies responsible for controlling the

discharges of radioactive materials to the environment, and to some extent health authorities, as well as — if applicable — relevant international organizations. Derived beneficiaries are members of the public and society at large.

**Objective:** To increase global harmonization in the policies, criteria, standards and provisions for their application, as well as in methods and technologies, for achieving safety in radioactive waste management, in order to protect humans and their environment against potential health effects attributable to actual or potential radiation exposure to radioactive waste.

Outcomes
<ul style="list-style-type: none"> <li>— International consensus achieved on Agency radioactive waste safety standards.</li> <li>— Corrective actions taken — by Member States which requested Agency services and received training — on targeted strengthening of their radioactive waste safety infrastructure.</li> <li>— Use by Member States of radioactive waste management technologies and strategies as documented in Agency publications and reports or as a result of taking part in Agency activities.</li> <li>— Exchange of information and experience on radioactive waste management, particularly on enhancing information to concerned parties.</li> <li>— Confidence and competence in waste safety methods, techniques and technologies as recommended by the Agency in Member States.</li> </ul>
Performance Indicators
<ul style="list-style-type: none"> <li>— Availability to Member States of radioactive waste safety standards.</li> <li>— Availability in Member States of qualified personnel.</li> <li>— Percentage of Agency recommendations implemented.</li> <li>— Number of Member States using Agency guidance on technologies for the management of radioactive waste, decommissioning of facilities and restoration of sites.</li> <li>— Number of Member States participating in information exchange and using information, advice and peer reviews provided under Agency aegis in the area of radioactive waste, decommissioning and restoration of sites.</li> </ul>

**Programme changes and trends:** The combining of the former Programme J and subprogramme B.2 into this joint single programme on radioactive waste management should improve both the effectiveness and the efficiency of the Agency's work in this area. In 2001, the Joint Convention entered into force and is expected to give rise to some new emphases in the Agency's waste management programme. The generally recognized need to involve a broader spectrum of society in matters related to radioactive waste management is reflected in the current programme proposals. Greater emphasis is being placed on the provision of services in radioactive

waste management to Member States with the intention of improving safety in some important areas. Increased emphasis will be placed on potential demonstrations of waste management technologies (including international projects in underground installations to demonstrate geological disposal technologies) and improvement of disposal technologies on the basis of disposal experience to increase wider acceptance of the disposal concepts. To reflect the increasing age of a number of nuclear installations, increased attention is being given to technologies for decommissioning. Arrangements for information collection and dissemination related to radioactive waste, including radioactive discharges, are being strengthened and more closely co-ordinated. Increased international concern over the state of the environment has led to initiatives in relation to the development of criteria for protecting flora and fauna as well as humans against the effects of ionizing radiation, which in turn could have implications for international policies on discharge control. Greater attention will be given to the management of disused sealed radioactive sources as part of the Action Plan (see also Programme K).

#### Subprogramme L.1. Radioactive Waste Safety Standards and Provisions for their Application

**Problems and issues to be addressed by the Agency:** Agreed international standards of safety on the management of radioactive wastes are needed as a basis for establishing national laws and regulations. At present the corpus of international standards in this area is incomplete, especially those for radioactive waste disposal and environmental restoration. For the standards of safety to become effective in a State, it is essential for there to be: an appropriate national infrastructure for radiation safety, comprising legislation and regulations; a regulatory authority empowered to authorize and inspect regulated activities and to enforce the legislation and regulations; sufficient resources; and adequate numbers of trained personnel.

The Agency has a statutory role in this area and is complying with its obligations by creating a comprehensive set of safety standards in its Radioactive Waste Safety Standards (RADWASS) Programme. The Agency is encouraged to develop these standards in Chapter 22 of Agenda 21 of the United Nations Conference on Environment and Development, and in the United Nations Global Programme of Action for Protection of the Marine Environment from Land-based Activities. In providing for the application of its standards of safety as required by its Statute, the Agency is contributing to the improvement of national arrangements for waste safety by providing education and training, fostering information exchange and encouraging research and development. The Agency has been assigned to provide the secretariat for the Joint

Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management and also any other services that may be requested by contracting parties to the Convention.

**Objective:** To harmonize internationally standards for the safety of radioactive waste management and to unify and strengthen waste safety regulatory infrastructures in Member States, thereby improving the safety of radioactive waste management.

Outcomes
<ul style="list-style-type: none"> <li>— International consensus achieved on Agency radioactive waste safety standards.</li> <li>— Corrective actions taken — by Member States which requested Agency services and received training — on targeted strengthening of their radioactive waste safety infrastructure.</li> </ul>
Performance Indicators
<ul style="list-style-type: none"> <li>— Availability to Member States of radioactive waste safety standards.</li> <li>— Availability in Member States of qualified personnel.</li> <li>— Percentage of Agency recommendations implemented.</li> </ul>

**Programme changes and trends:** Progress has been made towards completing the Fundamentals and Requirements documents of the RADWASS programme. In this period of the programme, the main effort will be directed towards the standards on geological disposal. Increased emphasis will be given to strengthening regulatory infrastructures in Member States.

**Resource changes and trends:** The proposed resources for this subprogramme represent increases of \$119 000, or 21.4%, in 2002 over 2001, and in 2003, of \$109 000, or 16.1%, compared to 2002. The increase is largely attributable to the new programme structure, which provides a more transparent presentation of the resources allocated to the organization of the Waste Safety Standards Committee (WASSC) and its associated responsibilities. In addition, the new structure highlights the resources required for the harmonization of technical support for the provision of Agency technical assistance in waste safety to Member States. The budget increase in 2003 at the subprogramme level results from the expenditures required for the Review Meeting of Contracting Parties to the Joint Convention.

#### Financial resources

	2001	2002	2003
Reg. budg.	556 000	675 000	784 000

#### **Project L.1.01: Establishing standards of waste safety**

**Main outputs:** This project will result in the endorsement by WASSC and CSS, and approval by the Board as appropriate, of Safety Standards in the RADWASS programme.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo (mandatory)

#### **Project L.1.02: Providing for the application of radioactive waste safety standards**

**Main outputs:** This project will result in the harmonization of the technical support for the provision of Agency technical assistance in waste safety to Member States. Peer reviews on the waste safety situation in selected countries will be performed as appropriate in order to verify achievement, and the relevant reports will be issued. Standardized education and training packages and manuals of the programme will be issued.

**Duration:** 2002–2004

**Ranking:** 1 ex æquo (mandatory)

#### **Project L.1.03: Servicing the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management**

**Main outputs:** This project will ensure that the Agency's obligations to serve the Joint Convention are properly discharged. A Review Meeting of the Contracting Parties to the Joint Convention will be organized in 2003, and all preparatory arrangements will be made in 2002.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo (mandatory)

Subprogramme L.2. Safety of Disposable Radioactive Waste: Managing Non-Reusable Radioactive Materials and Arranging for their Disposal

#### **Problems and issues to be addressed by the Agency:**

The safe disposal of low level radioactive waste has been achieved in many Member States but for high level radioactive waste, progress has been slow. Part of the problem stems from the difficulties in providing convincing arguments to show that the proposed solutions are safe. Many of the issues are generic in nature and can be addressed at the international level by seeking agreed strategies, policies and principles. Emphasis is being placed on reaching an international agreement on the means for

establishing the safety of geological repositories and on building on the existing consensus on criteria and methods for achieving safety in predisposal management and near surface disposal management of radioactive waste. The International Conference on the Safety of Radioactive Waste Management held in Córdoba, Spain, in March 2000 drew attention to a number of safety issues which should be resolved, preferably by international actions. These include: establishing the standard of assurance to be expected in safety cases for licensing geological repositories; establishing a coherent policy for the disposal of all types of radioactive waste; reaching international agreement on the reliance to be placed on institutional control as a safety measure in the long term; and determining the safety implications of providing for retrievability from geological repositories. In addition, the Conference drew attention to the importance of engaging all concerned parties in the decision process related to waste management projects.

**Objective:** To improve the capability of Member States to safely manage the pre-disposal and disposal of radioactive waste.

Outcome
— International consensus achieved on safety standards for predisposal management, geological disposal and near surface disposal of radioactive waste as well as on technical and societal issues.
Performance Indicator
— Availability to Member States of radioactive waste safety standards on disposable waste.

**Programme changes and trends:** In the past, the main emphasis was on the preparation of safety standards for predisposal and near surface disposal of radioactive waste. With the finalization of these tasks, emphasis will be directed towards reaching consensus on the safety standards for geological disposal of radioactive waste and at the same time furthering the development of the consensus which exists on predisposal and near surface disposal.

**Resource changes and trends:** The proposed resources for this subprogramme represent a decrease of \$90 000, or 11.5%, in 2002 over 2001, and in 2003, a decrease of \$68 000, or 9.8%, over 2002. Resources have been reduced in order to accommodate new waste safety activities within the constraints of a zero real growth budget at the programme level. It is hoped that extrabudgetary funds for activities related to building consensus on principles and criteria for the safety of geological repositories will be provided.

#### Financial resources

	2001	2002	2003
Reg. budg.	781 000	691 000	623 000

#### ***Project L.2.01: Developing safety guidance for the predisposal management of radioactive waste***

**Main outputs:** A Safety Guide will be issued on QA in predisposal waste management, and Safety Reports on safety considerations for the surface storage of radioactive waste and characterization/assaying of radioactive waste will be published.

**Duration:** 2002–2004

**Ranking:** 1 ex æquo (mandatory)

#### ***Project L.2.02: Building consensus on principles and criteria for the safety of geological repositories***

**Main outputs:** Safety Requirements for the geological disposal of radioactive waste will be finalized, and Safety Guides on the safety assessment and on operational and post-operational safety of geological repositories will be published. A conference on issues and trends in radioactive waste management, covering both safety and technology issues, will be organized in 2002 (see also L.8.02).

**Duration:** 2002–2004

**Ranking:** 1 ex æquo (mandatory)

#### ***Project L.2.03: Developing guidance for assuring the safety of near surface disposal facilities***

**Main outputs:** Safety Reports on the safety evaluation of options for disposal of disused sealed radioactive sources will be published and a Safety Guide on compliance monitoring of near surface repositories will be developed. A CRP on improving approaches for the safety assessment of near surface repositories for radioactive waste will be initiated.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo (mandatory)

#### ***Project L.2.04: Evaluating the safety of new radioactive waste management approaches***

**Main outputs:** A Safety Report will be published on the safety implications of the retrievability option in underground waste repositories. A Safety Guide will be produced on establishing principles and criteria for safe disposal in boreholes of disused sealed radioactive sources and other small volume radioactive material. Reports on the implementation of the GC resolution GC(44)/RES/12 on the Córdoba Conference on the safety of management of radioactive waste will be prepared.

**Duration:** 2002–2003

**Ranking:** 4

### Subprogramme L.3. Technologies for Disposable Radioactive Waste Management

#### **Problems and issues to be addressed by the Agency:**

Considerable experience has been gained in the predisposal management of radioactive waste of all types but the nature of some waste types makes them difficult to manage. Low and intermediate level short lived radioactive waste has been disposed of in near surface repositories in many countries. However, experience shows that the methods used in the past can be improved and, in order to accommodate new waste types arising from decommissioning and site remediation, new approaches are needed. Therefore, safe and cost effective technologies for the predisposal and for the near surface disposal management of radioactive waste have to be developed.

The Agency in its statutory role of fostering information exchange is facilitating the dissemination of information of approaches to the management of disposable radioactive waste and is, in addition, assisting Member States in waste management. Actual experience of the geological disposal of high level radioactive waste does not exist, so the Agency is contributing towards improving the situation through international projects to demonstrate or verify the technology. The Agency has been encouraged to place emphasis on programmes in this area, and especially in relation to geological disposal, by several programme peer reviews, advisory committees and international conferences.

**Objective:** To increase the capability of Member States to implement safe and cost effective technologies for the pre-disposal and for the near-surface disposal management of radioactive waste and to build confidence in technologies for geologic disposal of high level waste.

Outcome
— Improved radioactive waste management capabilities in States as a result of taking part in Agency programmes.
Performance Indicator
— Number of Member States using Agency advice, guidance and recommendations for methods for processing and disposal of radioactive waste.

**Programme changes and trends:** Increased emphasis will be placed on demonstrating proven processing technologies for managing waste. To help in establishing confidence in proposed repositories for geological disposal of waste, the Agency has started to support underground laboratory projects aimed at testing repository technology.

**Resource changes and trends:** Reflecting the high priority given to the management of radioactive wastes, the level of effort in this subprogramme remains relatively constant in the period 2002–2003. The decrease in 2002 (4.1%) reflects the completion of a co-ordinated research project. The increase in 2003 (3.6%) results from the initiation of a new co-ordinated research project.

#### **Financial resources**

	2001	2002	2003
Reg. budg.	1 372 000	1 316 000	1 363 000

#### **Project L.3.01: Transferring technologies for the predisposal management of radioactive waste**

**Main outputs:** A technical report on selecting efficient radioactive waste processing technologies will be published in 2002, and a report on management of organic radioactive waste, as well as a report on membrane technologies for liquid radioactive waste processing will be published in 2003. A technical document on radioactive sodium treatment and conditioning and another dealing with on site handling of stored radioactive waste preparatory to conditioning, will be published in 2003. A technical document reporting on research on combined methods of liquid radioactive waste treatment will be published in 2002. Also in 2002, the syllabus and scope of the programme for practical demonstrations of predisposal waste management technologies will be upgraded to include training on quality management of radioactive waste from nuclear applications, and in 2003 a number of practical demonstrations will be conducted in regional facilities, the number of which will depend on Member State requests and availability of demonstration teams.

**Duration:** 2002–2005

**Ranking:** 2

#### **Project L.3.02: Building confidence in geological disposal of radioactive waste**

**Main outputs:** A technical document explaining the scientific and technical basis for geologic disposal of radioactive waste, and another on the framework for developing and implementing interregional and regional repositories will be published in 2003. A technical document reporting on research on anthropogenic analogues for geologic disposal of high level waste will also be published in 2003. A draft report on the technological implications of safeguards requirements for waste disposal will be prepared. International co-operative projects to demonstrate disposal of high level waste in existing underground research laboratories will be conducted and reported on.

**Duration:** 2002–2005

**Ranking:** 1

**Project L.3.03: Transferring technologies for the near surface disposal of radioactive waste based on operating experience**

*Main outputs:* A technical report describing factors and approaches for developing repositories for short lived low and intermediate level waste, and a second on the effects and impacts (environmental, technical, infrastructural socio-political, etc.) of near surface disposal on communities will be completed in 2003. A technical document on the scientific and technical basis for disposal of low and intermediate level waste will be published in 2002, and a document dealing with QA for the design of low and intermediate level waste disposal facilities will be published in 2003. A technical document reporting on research on long term behaviour of low and intermediate level waste packages under repository conditions will be published in 2002.

*Duration:* 2002–2005

*Ranking:* 3

Subprogramme L.4. Safety of Dischargeable Radioactive Waste: Protection of the Public and the Environment

**Problems and issues to be addressed by the Agency:**

Because of the potential for transboundary and transgenerational impacts of discharges of radioactive materials, it is important to have internationally agreed policies and criteria for the control of discharge, including discharge limits, assessment procedures and compliance monitoring methods. In addition, increased information on the sources of discharges and inputs of radioactive materials to the environment is needed to serve various related conventions.

As part of its statutory obligations to establish standards of safety, the Agency has for many years had the leading international role in establishing standards on the control of radioactive discharges for the purpose of the radiation protection of the public. In 1994, in approving the BSS, the Board established basic requirements for public exposure. As a follow-up, detailed guidance related to radiation protection of the public is being prepared. However, all these activities were concerned largely with the protection of individual members of the public and humanity as a whole. They were based on the assumption that if human beings were adequately protected as individuals, other living things in the environment will be adequately protected as a species. This assumption is being challenged and there is a growing demand for a new ethic on the radiation protection of the environment as such. The basis for this ethic is given by the UNCED or Rio Declaration.

In the context of the London Convention 1972, the Agency has the role of international competent body with regard to radioactive materials and is regularly requested by the parties to the convention to provide advice on matters concerned with the discharge and disposal of radioactive materials at sea. Moreover, within the United Nations Global Plan of Action for the Protection of the Marine Environment from Land based Activities (GPA), the Agency has been designated as the lead agency for providing guidance and information on radioactive substances and has been tasked with acting as an international clearing house for its dissemination. New regional and international undertakings, such as the OSPAR Convention, the Espoo Convention and the Aarhus Convention may be expected to involve the Agency in the near future.

**Objective:** To strengthen Member States' ability to control discharges of radioactive materials to the environment.

Outcome
— International consensus achieved on safety standards, information on discharge control and a framework for the protection of the environment.
Performance Indicator
— Availability to Member States of radioactive waste safety standards on dischargeable waste.

**Programme changes and trends:** While the control of discharges for the purpose of the radiation protection of the public is reaching maturity, the implications for the Agency of the recent development of international undertakings concerned with protection of the environment from pollutants, including radioactive waste, are being reviewed. New political developments are forcing reconsideration of discharge policies in some parts of the world — for example, through the OSPAR Convention. Furthermore, while present discharge policies are based on ensuring the protection of humans, increased concern for protecting flora and fauna prompted by the 1992 UNCED or Rio Declaration implies that future discharge policies will have to be more broadly based.

**Resource changes and trends:** The proposed resources for this subprogramme represent a decrease of \$127 000, or 15.4%, in 2002 over 2001, and in 2003, an increase of \$14 000, or 2%, over 2002. Resources have been reduced in 2002–2003 in order to accommodate new waste safety activities within the constraints of a zero real growth budget at the programme level. This has primarily been achieved by reducing the activities throughout the subprogramme. An example of this is the CRP on improving and testing environmental assessment model predictions which for the biennium could only be included as a CAURB: this would be the follow-

up activity to the current CRP on the International Biosphere Modelling and Assessment (BIOMASS) project.

#### Financial resources

	2001	2002	2003
Reg. budg.	823 000	696 000	710 000

#### ***Project L.4.01: Developing guidance for limiting discharges of radioactive substances to the environment***

*Main outputs:* A Safety Guide on the strategy for monitoring the environment will be developed, and a Safety Report will be prepared on establishing discharge limits and secondary environmental standards. The current prototype of an information system on discharges of radioactive material to the environment will be further developed and made available on the Internet. The output of the information system will serve as the authoritative input to UNSCEAR. A status report will be prepared on the radiological impact of worldwide radioactive discharges to the environment along with inventories of these discharges. Training courses and workshops on discharge control and environmental monitoring will be organized.

*Duration:* 2002–2004

*Ranking:* 1 ex æquo (mandatory)

#### ***Project L.4.02: Developing guidance and criteria for the protection of the environment***

*Main outputs:* A Safety Guide on the principles and criteria for the protection of flora and fauna and a Safety Report on environmental assessment methods for application to its protection will be developed. A conference will be organized in 2003 on the protection of the environment from the effects of ionizing radiation.

*Duration:* 2002–2005

*Ranking:* 3

#### ***Project L.4.03: Supporting the implementation of the London Convention 1972 and other relevant international undertakings related to the environment***

*Main outputs:* A “clearing house” mechanism for information on the discharges of radioactive substances to the marine environment from land based activities will be established, and by the end of 2002, integrated into the present system. This will allow the Agency to comply with its responsibilities under the United Nations Global Action Plan for Protection of the Marine Environment from Land-based Activities. The technical support required of the Agency by international undertakings, including the London Convention 1972, and eventually the OSPAR, Aspoo and Aarhus Conventions, will be provided through the Information system. In addition,

the Agency will continue to fulfil its formal obligations to such international undertakings by issuing the required documents on specific technical issues.

*Duration:* 2002–2004

*Ranking:* 1 ex æquo (mandatory)

Subprogramme L.5. Safety of Residual Radioactive Materials: Termination of Practices, Decommissioning of Installations and Restoration of Sites

#### ***Problems and issues to be addressed by the Agency:***

Practices involving the use of radioactive materials will eventually be terminated and their installations need to be decommissioned. In fact, many nuclear installations are already reaching the end of their active lives. There are no comprehensive international standards governing the safe termination of practices and decommissioning of installations. Therefore, there is a lack of agreed international principles and criteria relating to the removal of controls from commodities, materials and equipment to be released into the public domain. This was addressed by General Conference resolution GC(44)/RES/15.

In addition, several areas in the world have been seriously affected by radioactive residues from past nuclear activities and many of them are now unsuitable for permanent habitation. There are no comprehensive international standards for the restoration of sites contaminated with radioactive materials and for subsequent human resettlement. In 1994, in approving the BSS, the Board established basic requirements for chronic exposure situations involving members of the public; however, these requirements were quantified only for exposure to radon. The ICRP has recently issued recommendations on the protection of the public in prolonged exposure situations that have to be interpreted and transformed into international standards by the Agency.

Safety standards to address these matters are being established within the Agency’s Radioactive Waste Safety Standards (RADWASS) Programme as part of its statutory obligation to establish standards of safety, but have yet to achieve consensus.

A large amount of radioactive residues around the world are the result of military activities. In 1995, the General Conference — in resolution GC(39)/RES/23 — called on “all States concerned to fulfil their responsibilities to ensure that sites where nuclear tests have been conducted are monitored scrupulously and to take appropriate steps to avoid adverse impacts on health, safety and the environment as a consequence of such nuclear testing”. Moreover, in 1998, the Conference on the Radiological Situation at the Atolls of Mururoa and Fangataufa called upon all

States which had conducted nuclear weapon tests or in whose territories nuclear weapons have been tested to request the Agency to carry out assessments of the current radiological situation at all former test sites and to provide for the application of international radiation protection standards. The Agency has been receiving such requests.

**Objectives:** To achieve safe termination of practices involving the use of radioactive materials and the safe decommissioning of nuclear power and research reactors; to achieve safe transfer of commodities, materials or equipment containing radioactive materials, from previously controlled or restricted areas into the public domain; to reduce the number of areas in the world seriously affected by radioactive residues from past nuclear activities.

Outcomes
<ul style="list-style-type: none"> <li>— International consensus achieved on safety standards for the safe termination of practices and on commodity regulation.</li> <li>— Action taken by Member States which requested Agency assistance on decommissioning safety.</li> </ul>
Performance Indicators
<ul style="list-style-type: none"> <li>— Approval by the Commission on Safety Standards of Safety Guides on these subjects.</li> <li>— Percentage of Agency recommendations implemented.</li> </ul>

**Programme changes and trends:** It is expected that there will be an increased demand for advice and guidance related to the safe termination of practices and decommissioning of installations. Particular attention will be paid to the decommissioning of research reactors, which may be expected to present problems because of the lack of expertise in many of the countries where they are located. Subsequently there will be increased demands for environmental restoration of sites. Moreover, in order to avoid unnecessary restrictions in international trade, it will be essential to derive intervention exemption levels so that any restrictions applied to goods below these levels could be regarded as artificial barriers to trade.

**Resource changes and trends:** The proposed resources for this subprogramme represent an increase of \$84 000, or 13.6%, in 2002 over 2001, and in 2003, a decrease of \$50 000, or 7.1%, below 2002. Essentially the same resources as in 2001 have been allocated for the development of guidance and criteria for the safe termination of nuclear practices, including the organization of a conference on the subject in 2002. Additional resources are required for a new project on developing requirements for the release into the public market of commodities, materials and equipment from areas affected by radioactive residues.

#### Financial resources

	2001	2002	2003
Reg. budg.	618 000	702 000	652 000

#### ***Project L.5.01: Developing guidance and criteria for the safe termination of nuclear practices***

**Main outputs:** Safety Reports will be developed on the safe transformation of an operating nuclear facility to a safe shutdown state awaiting dismantlement, and on safety related decommissioning documentation. In 2002, a conference on the safe termination of practices involving the use of radioactive material will be organized. A technical document on status and issues related to the decommissioning of nuclear submarines will be prepared. The Agency will continue to provide assistance in decommissioning, particularly for the BN-350 reactor, and in the form of advisory services at the request of Member States.

**Duration:** 2002–2004

**Ranking:** 1 ex æquo (mandatory)

#### ***Project L.5.02: Developing requirements for the release into the public market of commodities, materials and equipment from areas affected by radioactive residues***

**Main outputs:** A Safety Guide will be published on the regulation of commodities originating from areas with radioactive residues moving between countries in the public market, and a Safety Report on monitoring procedures for commodities, including food, wood products, metals and concrete, from areas affected by radioactive residues will be developed.

**Duration:** 2002–2003

**Ranking:** 1 ex æquo (mandatory)

#### ***Project L.5.03: Developing guidance for the safe restoration of sites affected by radioactive residues***

**Main outputs:** This project will result in the preparation of Safety Reports on a methodology for establishing derived secondary standards for guiding the restoration of contaminated environments, and on guidance on monitoring for compliance with cleanup criteria for areas containing residual radioactivity. International assessments of areas affected by radioactive residues, including areas affected by former uranium mining and milling activities, will be performed at the request of Member States.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo (mandatory)

## Subprogramme L.6. Technologies for the Decommissioning of Installations and Restoration of Sites

### **Problems and issues to be addressed by the Agency:**

Residual radioactive materials are being accumulated from a range of nuclear activities, including the decommissioning of nuclear sites and installations and from the environmental restoration of sites affected by previous nuclear activities. These areas, facilities and materials must be managed in ways which remove potential sources of risk from the immediate human environment by means of state-of-the-art, efficient and cost effective technologies and methods.

This is a comparatively new area and methods and approaches are still being developed. The Agency, in its statutory role of fostering the exchange of scientific and technical information (Article III.A.3), is disseminating information to Member States on the most efficient, cost effective and environmentally sound strategies and techniques for management of the residues.

**Objective:** To provide Member States with up-to-date information on methods and technologies for application in the fields of decommissioning, environmental remediation and disposition of resulting residual radioactive materials and to provide advice and assistance where appropriate.

Outcome
— Strengthened capability in Member States to decommission nuclear facilities and to manage the cleanup of radioactively contaminated sites on their territory.
Performance Indicator
— Number of Member States using technologies and methods for decommissioning and cleanup recommended by the Agency.

**Programme changes and trends:** This is a new subprogramme that has been established for the 2002–2003 biennium in recognition of the fact that increasing numbers of Member States are now in the position of having to develop policies and strategies for managing residual materials.

**Resource changes and trends:** The area of decommissioning remains a high priority. However, significant savings occur in 2002 (11.6%), owing to a reduction in large cost-intensive meetings.

### **Financial resources**

	2001	2002	2003
Reg. budg.	559 000	494 000	496 000

### **Project L.6.01: Facilitating the transfer of sustainable technologies for decommissioning of facilities**

**Main outputs:** A technical document will be published in 2002 to assist developing Member States in decontamination and decommissioning of small medical, industrial and research facilities. A report on record-keeping criteria and experience for decommissioning purposes will be published in 2002, and another on post-shutdown, pre-decommissioning activities will be published in 2003. A technical document describing operating experience and lessons learned in planning and management of decommissioning of nuclear facilities, and a second technical document concerning re-use of decommissioned sites for new purposes, will be drafted during the biennium. A database of information on nuclear power plants will be expanded to include shutdown and decommissioned facilities.

**Duration:** 2002–2005

**Ranking:** 1

### **Project L.6.02: Promoting technologies for restoration of contaminated sites**

**Main outputs:** A technical document describing environmental restoration practices as determined by land use, costs, public perception and other factors will be published in 2002, and a technical document on the extent of environmental contamination by naturally occurring radioactive materials and relevant abatement measures will be published in 2003. These documents are intended to assist Member State decision making regarding environmental restoration. During the period, a technical document on remediation of sites with low levels of disperse radioactive contamination, and a second technical document on remediation of sites contaminated with both hazardous and radioactive residues, will be drafted.

**Duration:** 2002–2005

**Ranking:** 2

## Subprogramme L.7. Management of Disused Sealed Radioactive Sources

### **Problems and issues to be addressed by the Agency:**

While sealed radioactive sources have many beneficial applications in medicine, science and industry, when no longer in use they must be safely managed and disposed of. There are shortcomings in the implementation of safe and cost effective technologies for the management and disposal of disused sealed radiation sources. Numerous radiation accidents have been caused by the inadvertent misuse of such sources and this has led to the establishment

of the Action Plan. As one part of the Action Plan, the Agency is advising on and assisting Member States to manage disused sealed radioactive sources safely. The Agency is carrying out these activities in compliance with its statutory roles of providing for the application of its safety standards and fostering the exchange of scientific and technical information.

**Objective:** To increase the capability of Member States to implement safe and cost effective technologies for the management of disused sealed radiation sources and to assist in the application of the technologies.

Outcome
— Improved management of disused sealed radioactive sources.
Performance Indicator
— Number of Member States with disused sealed radioactive sources which have been conditioned.

**Programme changes and trends:** Emphasis will shift from the conditioning of radium sources to the conditioning of other high radiation and long lived sources as the conditioning of national inventories of radium sources is completed. Increased emphasis will be placed on training specialists in Member States in order to build national capacities to manage disused sealed radiation sources while maintaining a direct assistance service for disused source conditioning.

**Resource changes and trends:** There is an increase in 2002–2003 in order to give greater emphasis to this high priority subprogramme, which responds to a General Conference resolution and is part of the Agency’s Action Plan.

**Financial resources**

	2001	2002	2003
Reg. budg.	211 000	290 000	269 000

**Project L.7.01: Conditioning disused sealed radioactive sources**

**Main outputs:** This project will result in the issue of a manual covering technical and administrative aspects on providing direct assistance to condition long lived sources and in the conditioning of all radium sources remaining in national inventories.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo

**Project L.7.02: Building capacity in Member States to manage disused sealed radioactive sources**

**Main outputs:** Two documents will be prepared on the management of high activity spent sealed sources and on the conditioning and storage of long lived spent radioactive sources.

**Duration:** 2002–2005

**Ranking:** 1 ex æquo

**Subprogramme L.8. Radioactive Waste Management Information**

**Problems and issues to be addressed by the Agency:**

An authoritative source of information and data on waste management is needed by waste management organizations, government bodies and individual scientists in Member States, as well as by other United Nations organizations. Also, many Member States rely for their national planning and reporting to international organizations on waste management and related issues on a reliable, robust and consistent body of information. No globally comprehensive source of such information exists at present. The Agency is therefore gathering, on a global scale, data on research, inventories, facilities and management practices on radioactive and other wastes for analysis and dissemination to its Member States and other interested parties, using up-to-date Internet technology. Improvement in waste management can be achieved by the use of appropriate technology and by facilitating the exchange of information and expertise on the various issues involved, for instance by advisory missions, expert contact groups and international peer reviews of waste management programmes and practices and by organizing and co-operating in conferences and symposia on important waste management issues. The Agency is uniquely placed to acquire and disseminate information on radioactive waste management through co-operation with its Member States. Furthermore, Article III.A.3 of its Statute authorizes it to foster the exchange of scientific and technical information, and it has been assigned the responsibility within the United Nations system to develop and report on indicators for sustainable development for radioactive waste management in accordance with Chapter 22 of Agenda 21, “Safe and Environmentally Sound Management of Radioactive Wastes.”

**Objective:** To improve the safety of radioactive waste management by facilitating the transfer of technology and information exchange.

Outcome
— Increased exchange of information, experience and transfer of technologies among Member States on waste management.
Performance Indicator
— Number of Member States using Agency’s information systems, advisory and peer review services on radioactive waste management.

**Programme changes and trends:** This is a new subprogramme that strengthens and reflects the increased importance given to information collection and dissemination on radioactive waste management and builds upon past activities related to providing

advice and facilitating exchange of expertise on waste management issues.

**Resource changes and trends:** There is an increase of 3.4% in 2002 over 2001 resulting from increased staff costs associated with maintaining radioactive waste management systems and a decrease of 2.7% in 2003 below 2002 due to the finalization of the development of a database in 2002.

#### Financial resources

	2001	2002	2003
Reg. budg.	862 000	891 000	867 000

#### **Project L.8.01: Maintaining radioactive waste information systems**

**Main outputs:** An improved Waste Management Data Base will make information on radioactive waste amounts, infrastructures, management practices and facilities readily available on the Internet. Periodic reports will be provided to Member States on global radioactive waste management status and trends and to the United Nations system regarding indicators of sustainable development for radioactive waste management. A revised draft of the indicators of sustainable development for radioactive waste management will be developed by 2003 and the results of the testing and evaluation programme thereof will be published. A report to the United Nations system on progress will be drafted, containing the results of country testing and recommendations for country implementation. Annual reports of waste management research in Member States will be prepared and made available on the Internet. The sealed sources information

system, to allow ready identification of “orphan” sources, will be maintained and updated throughout the period, as part of the Action Plan GC(43)/RES/10. Software will be developed for maintaining an inventory of radioactive wastes from nuclear applications and distributed to Member States for their use by 2003. Mechanisms, methods and formats will be updated for maintaining a waste management database and international radioactive waste inventory and making it available on the Internet.

*Duration:* 2000–2003

*Ranking:* 1 (mandatory)

#### **Project L.8.02: Facilitating exchange of waste management information and expertise**

**Main outputs:** Expert peer reviews and advisory missions on radioactive waste management programmes and activities in Member States will be organized on request. Support will be provided to scientists in developing Member States to present papers for publication at international meetings in which the Agency is involved. A conference on issues and trends in radioactive waste management will be held in 2002 and the proceedings will be published in 2003. Within the framework of providing secretarial support to the Contact Expert Group (CEG), information on co-operation projects between the Russian Federation and CEG members will be updated and a CEG meeting report will be issued.

*Duration:* 2002–2003

*Ranking:* 2