

# Radiation and Transport Safety

## Objective

*To achieve global harmonization and raise the levels of protection of people against radiation exposure and of safety and security of radiation sources, and to ensure that the Agency properly discharges its health and safety responsibilities with regard to its own operations.*

## National and Global Infrastructure Enhancement for Radiation and Transport Safety

Many States have engaged in extensive programmes to enact legislation and establish a regulatory infrastructure that take into account the relevant IAEA Safety Standards and international legal instruments.<sup>1</sup> The importance of the Agency's role in supporting the development of national infrastructures for radiation safety, and in particular national regulatory infrastructures, was highlighted in a number of General Conference resolutions going back to 1999.

A prominent example has been the technical cooperation model project on upgrading radiation protection infrastructure. The total number of Member States participating in projects in their region increased to more than 90 by December 2004. By the end of 2004, 48 participating States (55%) had established a regulatory framework and control of occupational exposure control. In most participating Member States, however, substantial work is still required to establish medical and public exposure

control, and emergency preparedness and response capabilities.

The Agency is substantially strengthening its activities for promoting regulatory infrastructure in Member and non-Member States (mainly using extrabudgetary resources). This is being done primarily through the Radiation Safety Infrastructure Appraisal (RaSIA) service, the Regulatory Authority Information System (RAIS 3.0), training packages for regulators in the most relevant medical and industrial practices, and establishment of the Radiation Safety Regulators Network. Also, an Internet based system to promote the pooling and sharing of radiation safety information among national regulatory authority experts is now operational. RaSIA missions were conducted in 21 States in 2004, and 3 regional workshops on the use and maintenance of RAIS were organized in the African, European and East Asian regions.

After many years of deliberations, international consensus was reached with the publication of a Safety Guide on the application of the concepts of exclusion, exemption and clearance. This publication establishes levels of radionuclide activity concentrations in materials below which regulatory controls need not apply.

## Information and Communication Networks for Radiation and Transport Safety

To promote the sharing of knowledge and expertise on nuclear safety, the Agency is assisting in the establishment of regional nuclear and radiation

### *The Agency's Safety Standards: A Status Report*

The following safety standards dealing with radiation and transport safety were published during 2004:

- Regulatory control of radiation sources (co-sponsored by FAO, ILO, PAHO, WHO) (GS-G-1.5);
- Application of the concepts of exclusion, exemption and clearance (RS-G-1.7);
- Regulations for the safe transport of radioactive material 1996 edition (as amended 2003) (TS-R-1).

<sup>1</sup> INTERNATIONAL ATOMIC ENERGY AGENCY, *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*, IAEA Safety Standards Series No. 115 (1996); *Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety*, IAEA Safety Standards Series No. GS-R-1 (2000); *Code of Conduct on the Safety and Security of Radioactive Sources*, IAEA/CODEOC/2004, special publication, (2004).

safety networks, such as the Ibero-American Radiation Safety Network. In 2004, a preliminary structure for this network was developed and tested.

An inter-centre network to facilitate communication and information exchange among the Agency's regional, national and collaborating training centres is now in operation. Validated training packages, documents, and reports from member training centres are available to the members of this network on its web site.

## Occupational Radiation Protection

In September 2003, the Board of Governors approved an *Action Plan for Occupational Radiation Protection*, developed by the Agency in cooperation with the ILO. In addition to assisting States in establishing, maintaining and, where necessary, improving programmes for the radiation protection of workers, the Action Plan includes activities related to exposure to enhanced natural radiation in the workplace. Follow-up activities in 2004 by the Agency and ILO included the convening of the first meeting of a steering committee in Vienna in February to set priorities, with further meetings planned at 12–18 month intervals. In addition, a Safety Reports Series publication on *Occupational Radiation Protection in the Mining and Processing of Raw Materials*, co-sponsored by the Agency and ILO, was published.

In addition, the Agency provided substantial technical support to more than 90 Member States in establishing their occupational exposure control programmes, mainly through its technical cooperation Model Project on upgrading radiation protection infrastructure. More than 80% of the participating States had established a system for individual monitoring that covers workers with the highest exposure risk.

## Radiological Protection of Patients

At its 2004 meeting, the steering panel overseeing the Action Plan on the Radiological Protection of Patients decided that the Internet should be used to disseminate patient radiation protection information to those prescribing and using radiation in medical applications. The Agency thereafter developed a prototype web site that will include training material for health professionals. This prototype will be discussed with other international organizations and professional bodies, whose involvement is seen as essential for its success.

In a series of meetings of experts, manufacturers and representatives of the International Electrotechnical Commission, a document was drafted that defines what is needed to standardize, display and record data on patient doses for computed tomography, fluoroscopy and interventional techniques. Other work in the area of radiation protection included:

- Development of a methodology for establishing local guidance (reference) levels for diagnostic radiology, and its application in a regional project involving 11 Latin American Member States.
- Launching of pilot projects on image quality improvement and patient dose reduction in Jordan, Kazakhstan, Kuwait and the Republic of Moldova;
- Convening of a workshop for cardiologists to raise awareness of the importance of managing the high dose procedures involved in interventional radiology;
- Provision of training packages on radiation protection in all medical applications of radiation;
- Research on the proper balance between image quality and patient dose in interventional procedures, digital radiology and computed tomography.

## Control of Radioactive Sources

By the end of 2004, 70 States had expressed their support for and intent to work towards following the Code of Conduct on the Safety and Security of Radioactive Sources. One section of the Code is devoted to the import and export of high activity radioactive sources. Guidance on this issue was approved by the Board of Governors in September 2004.

Also in 2004, the Commission on Safety Standards approved a Safety Guide on the categorization of radioactive sources. This categorization had been used as the basis of the Code of Conduct. In September 2004, the Board of Governors approved an Agency policy for promoting effective and sustainable national regulatory infrastructures for the control of radiation sources.

Orphan radioactive sources have caused fatal or serious injuries to the unknowing individuals who have found them. This problem, along with concerns that orphan or vulnerable sources might be acquired for malicious purposes, has led many countries to consider making concerted efforts to improve control over them. An Agency technical document (IAEA-TECDOC-1388) provides an

appropriate methodology for strengthening control over radioactive sources in authorized use and in regaining control over orphan sources. The Agency is assisting Member States in applying this methodology to develop their national strategies for improving control over radioactive sources, including orphan sources. In this regard, missions visited Bolivia, Kazakhstan, Lithuania, Panama, Ukraine and Uruguay in 2004. Follow-up work for earlier missions, such as the provision of technical assistance to secure vulnerable sources, focused on the Philippines and the United Republic of Tanzania.

Under the 'Tripartite Initiative' between the Agency, the Russian Federation and the USA on securing and managing radioactive sources:

- Vulnerable sources were dismantled and transported in safe and secure storage in Estonia, the Republic of Moldova and Tajikistan;
- Technical designs and preparations for similar work were completed in Azerbaijan, Belarus, Kazakhstan and the Republic of Moldova;
- A fact-finding mission was conducted in Uzbekistan.

## Safety of Transport of Radioactive Material

In March 2004, the Board of Governors approved an Action Plan for the Safety of Transport of Radioactive Material, which provides direction for the Agency's transport safety activities over the next five years. Action areas include review and revision of the *Regulations for the Safe Transport of Radioactive Material* (Transport Regulations), refining of the review process, compliance and quality assurance considerations, the issue of denial of shipments, emergency response, liability and communication. A number of activities have already taken place under the Action Plan. With regard to the issue of denial of shipments, a fact-finding forum was held in July to identify the reasons and possible solutions. In September, a panel to review the Transport Regulations had its first meeting.

During 2004, a Transport Safety Appraisal Service (TranSAS) mission was completed in France. A

preparatory mission to Japan was also undertaken for a TranSAS mission to be carried out in 2005.

In November, the Board of Governors approved the 2005 edition of the Transport Regulations.

## Preparedness for and Response to Nuclear or Radiological Emergencies

The Agency provides a number of services to assist Member States with emergency preparedness and response. It also participates in the Joint Radiation Emergency Management Plan of the International Organizations. In 2004, a new edition of the plan was issued.

The Agency was informed of 38 events involving, or suspected to involve, ionizing radiation in 2004. In 19 of these cases, States notified the Agency of the event, requested that official information be provided, or requested assistance pursuant to the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Assistance Convention). In the other 19 cases, individuals or the media informed the Agency. In all cases, the Agency carried out the appropriate actions, such as verifying the information, providing official information or assistance to the requesting party, or offering the Agency's good offices. In one case, specialized medicine was provided urgently for the treatment of a victim of an incident at Lia, in Georgia, in response to a request made under the Assistance Convention.

At the second meeting of competent authorities for the Convention on Early Notification of a Nuclear Accident and the Assistance Convention, participants highlighted the need to harmonize communication and assistance among States to allow for the best use of technologies and capabilities. The competent authorities agreed to work with the Secretariat to develop an action plan. Subsequently, such a plan — entitled Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies — was approved at the June meeting of the Board of Governors. ■