

Radiation and Transport Safety

Objective

To achieve global harmonization of radiation and transport safety standards and for the safety and security of radioactive sources and thereby to raise the levels of protection of people, including Agency staff, against radiation exposure.

Revision of the Basic Safety Standards

The Agency, in cooperation with the co-sponsoring international organizations,¹ completed its review of the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (BSS). The first technical meeting for the revision of the BSS will be held in July 2007 and will involve all Member States, co-sponsors and international professional organizations so as to allow wide participation. The meeting will consider the new Safety Fundamentals and take account of the latest data from UNSCEAR on the health consequences of radiation exposure, the new recommendations of the ICRP, and recent international instruments such as the Code of Conduct on the Safety and Security of Radioactive Sources and its associated import/export guidance. This will ensure that the BSS continues to be regarded as the global point of reference for standards for protection against ionizing radiation.

Assisting Member States in Improving their Safety Infrastructures

In 2006, the Agency introduced a revised approach for its assistance programmes to Member States seeking to improve their national radiation, transport and waste safety infrastructures. The main aspects of this more proactive approach are the thematic safety areas, the key requirements and their assessment criteria. Tools for facilitating the process include radiation and waste safety infrastructure profiles, now available for more than 100 Member

States, a quantitative assessment scheme with performance indicators, generic action plans, and eligibility criteria. This use of this new approach in the technical cooperation programme resulted in the approval of 24 new radiation protection regional projects covering various thematic safety areas in different regions.

Recovery of Radioactive Sources

There are many powerful radioactive sources that are no longer in use in Member States after past applications. During the year, the Agency assisted a number of Member States in decommissioning and transporting these sources to safe and secure storage facilities. For instance, in Bulgaria, sources from three large irradiators of Russian origin were discharged and transported for interim storage at the Novi Han national radioactive storage facility (Fig. 1). In Kyrgyzstan, sources from two temporary source stores were characterized, packaged and transported to the national radioactive storage facility. These operations featured extensive international cooperation and in-kind and financial support from Canada, the European Union and the Russian Federation. Similar projects were completed in Armenia and Croatia.

The Agency also assists countries in developing capabilities to screen and search for orphan radioactive sources, i.e. sources that either have never been under regulatory control or have been abandoned, lost, misplaced, stolen or transferred



FIG. 1. An old irradiator with caesium-137 sources in Bulgaria before decommissioning.

¹ The co-sponsoring organizations are: FAO, ILO, OECD/NEA, PAHO and WHO.

without proper authorization. Through its technical cooperation programme, and also with the support of donors such as the USA and the European Union, 'Orphan Source Search and Secure' projects were initiated in 17 Member States in Europe and Central Asia. For instance, in Bosnia and Herzegovina, the updating and verification of the national source inventory resulted in the verification of more than 1000 sources, of which about 400 were orphans. In Georgia, a search team, which included an Agency technical officer, found a powerful source in a derelict factory and a smaller source in a house. Both of these dangerous sources were recovered and transported to a safe and secure storage facility.

Radiological Protection of Patients

Ionizing radiation is used extensively in medicine. Worldwide, about 2000 million diagnostic X ray examinations and 32 million nuclear medicine procedures are carried out annually. Of about ten million new cancer patients each year, 40–50% receive radiotherapy.

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Even so, there is considerable scope to reduce the dose in diagnostic radiology without loss of diagnostic information. In addition, radiation injuries in interventional radiology and accidental exposures in radiotherapy have been reported. The challenge is to ensure that radiological safety regulations and guidance do not impair medical care, while maintaining the focus on performance and flexibility in achieving the desired outcomes. Health professionals involved in diagnosis and treatment are the critical link. To provide the very large number of such professionals with up to date information on the radiological protection of patients, the Agency launched a new web site in September 2006 (<http://rpop.iaea.org>) (Fig. 2). Between the launch and the end of the year, the web site received more than 300 000 visits.

Many doctors, such as urologists, gastroenterologists, orthopaedic surgeons, gynaecologists and surgeons, are increasingly using radiation in fluoroscopic procedures, but do not have training in the specific protection techniques associated with this mode of treatment. Following implementation of training for cardiologists, the Agency in 2006 launched a new training programme for these types of doctors, with the first regional training course being held in Auckland, New Zealand.

For the first time a unified action plan on patient dose management and avoidance of accidental exposure in medical procedures was established in more than 78 Member States. These States were given the option to choose at least two out of seven tasks that pertained to optimization in radiological protection in radiography, interventional procedures, mammography, computed tomography, nuclear medicine and radiotherapy. Preliminary results indicate significant progress in assessing the causes of poor quality and increased patient doses, in designing a quality control programme to suit the local situation and in documenting optimization to achieve patient dose reduction. Some Member States have established, or are establishing, radiation safety offices in their health ministries.

Safe Transport of Radioactive Material

As part of the Action Plan for the Safety of Transport of Radioactive Material, the Agency held a seminar in Vienna in January 2006. Experts discussed various aspects of the transport of radioactive material, including regulatory programmes, transport standards, implementation of these standards at the national and international levels, and cooperation between national competent authorities on international transport matters. There were also reviews of Member State experiences with maritime shipments, risk analyses, emergency response arrangements, and denial of shipments, as well as of the Agency's Transport Safety Appraisal Service (TranSAS) programme.

Denial of Shipments of Radioactive Material

The transport of radioactive material for use in public health and industry is governed by national and international regulations which are based on

the Agency's Regulations for the Safe Transport of Radioactive Material.² If applied, these regulations, developed by experts around the world, ensure high standards of safety. However, even when complying with them, there are still instances where shipments have been denied or delayed. In some cases the denial results in hardships to recipients, such as patients who cannot avail themselves of radiotherapy. In other cases, essential commodities from the nuclear fuel cycle and other industries cannot reach their destinations in a timely manner.

To increase transparency, seek effective solutions and permit the participation of interested parties, the Agency in 2006 formed an International Steering Committee on Denials of Shipments of Radioactive Material. The committee's mandate is to coordinate international efforts at determining solutions to issues related to the denial of shipments and to facilitate the coordination of a comprehensive international work plan of activities. The actual work will be done by the organizations represented on the committee. Other tasks for the committee will be to oversee training courses and the publication of information brochures and other mechanisms of public awareness, as well as working with regulatory authorities and industry to minimize the number of denials caused by excessive or duplicative regulations and other requirements. The Agency plans to convene regional workshops to raise public and governmental awareness about problems related to the denial of shipments.

² INTERNATIONAL ATOMIC ENERGY AGENCY, *Regulations for the Safe Transport of Radioactive Material, 2005 Edition*, IAEA Safety Standards Series No. TS-R-1, IAEA, Vienna (2005).

Quality Management Systems in Support of Member States

Following implementation of a quality management system in the Agency's Radiation Protection Monitoring Service, it was decided to pursue accreditation of the service to the international standard ISO-17025 for testing laboratories. The Austrian Accreditation Authority issued such accreditation in 2006 — the first for an Agency service — which is recognized worldwide through the mutual recognition agreements with the European Co-operation for Accreditation and the International Laboratory Accreditation Cooperation.

The Agency used the knowledge gained during the accreditation process to create a training course for Member States to help their laboratories implement a quality management system and achieve officially recognized proficiency. An added benefit of this initiative is the harmonization of measurement methods and result reporting schemes worldwide.

Strengthening Radiation Protection

The 50th General Conference encouraged the Agency to support and participate actively in the 12th International Congress of the International Radiation Protection Association (IRPA 12), scheduled to be held in October 2008 in Buenos Aires. Consequently, the Secretariat has become a member of the IRPA 12 Programme Committee, together with representatives from other major international organizations (such as ILO, PAHO, UNSCEAR and WHO) and professional bodies (ICRU and ICRP). In this context, the Secretariat will disseminate information related to radiation, transport and radioactive waste safety. ■



FIG. 2. The Agency's web page on the radiological protection of patients.