

# RADIATION SAFETY

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### PROGRAMME OBJECTIVE

To promote radiation safety through the establishment of relevant safety standards, the application of these standards, the implementation of the Agency's radiation protection rules and requirements, as well as the provision of advice and services to Member States in the framework of the technical co-operation programme and the Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

### OVERVIEW

The radiation safety programme has two complementary objectives: development of a unified set of safety standards based on consensus; and provision for the application of these standards in Member States and through other international organizations. In order to achieve these objectives, the programme emphasized a number of areas of work covering the relevant research, the development of requirements level consensus documents and supporting guides, and the preparation of practical manuals and other documents to assist in standards implementation by regulatory authorities. Many of these documents provide the technical underpinning for technical co-operation projects, including the Model Project on strengthening radiation and waste safety infrastructures in over 50 Member States. In addition, considerable effort was devoted to emergency response activities, including servicing of the Conventions on Early Notification of a Nuclear Accident and Assistance in the Case of a Nuclear Accident or Radiological Emergency. To support these activities, research programmes, training courses, conferences and other information exchange meetings were organized through the technical co-operation programme.

## RADIATION PROTECTION

In order to quantify the progress achieved so far under the technical co-operation Model Project on upgrading radiation protection infrastructures, a representative group of 14 participating States was visited by Peer Review Teams during the second half of 1999. The teams evaluated the adequacy of the legal and regulatory framework, the empowerment of the regulatory authority to enforce legislation and regulations, the system of notification, authorization and control of radiation sources, existing financial and human resources, and the number of adequately trained personnel. The results from these peer reviews will determine the way forward with respect to the conduct of the Model Project.

As part of a technical co-operation project, software for the Regulatory Authority Information System (RAIS) was translated from English into Arabic, French, Russian and Spanish, and distributed to more than 40 Member States. The software is composed of five modules: inventory of radiation sources and installations; the authorization process, inspection and enforcement; dosimetry of occupationally exposed personnel; and performance indicators for individual installations as well as for the overall regulatory programme.

A new regional technical co-operation project on improving occupational radiation protection in nuclear power plants in the Asian region, together with a similar project for the European region and the Information System on Occupational Exposure (ISOE), are part of an integrated strategy to strengthen the optimization of radiation protection in nuclear power plants, focusing on information exchange and training. Participation in the ISOE — which is administered by a joint secretariat from the Agency and the OECD/NEA — is steadily increasing. By the end of November 1999, ten utilities in nine countries (representing 31 nuclear power reactors) and seven regulatory authorities were members. The Asian project included preparation of a syllabus for training on optimization of radiation protection and training workshops for managers as well as health physicists.

Radiation protection in medical applications is an area of increasing interest. An Agency Safety Guide on radiation protection in medical exposure is being prepared, and reports on medical exposure, prepared in conjunction with WHO, PAHO and the European Commission, have been finalized. A regulatory guidance document on radiation protection and safety in radiotherapy has also been completed. These documents are being published by WHO.

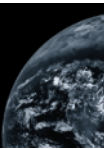
The Y2K computer problem is of particular concern in the medical area in view of the

***“An action plan was prepared that spells out a programme of measures aimed at improving the control of radiation sources.”***

large number of locations around the world using equipment that could be affected, and the amount of non-standard software known to be in use. As part of the Agency's programme of work to address the Y2K problem, two reports were prepared (and made available through the Agency's *WorldAtom* Internet site) on measures to address the problem in medical facilities. A workshop was held in Vienna and two assistance missions were carried out, to Bolivia and Costa Rica, on this subject.

## SAFETY OF RADIATION SOURCES AND SECURITY OF RADIOACTIVE MATERIAL

In response to the persistent occurrence of incidents involving radiation sources that, for a variety of reasons, were not kept under proper control, an action plan was prepared that spells out a programme of measures aimed at improving the control of such sources. Work was also started on the categorization of sources, an issue which was identified as being of primary importance.



Another area in which the Agency has been active for some years is the investigation of accidents. Recent accidents in Georgia, Turkey, the Islamic Republic of Iran and the Russian Federation were investigated and a database is being developed to bring together the information gathered on the causes and consequences of all of these events. Safety Reports were also finalized on the feedback from operational experience in handling radiation sources, and on lessons learned from accidents in radiotherapy.

The work described above is aimed primarily at dealing with accidental events resulting

***“A major revision of the Agency’s emergency response procedures and associated training was carried out and tested during an international exercise.”***

from carelessness, equipment failure, and lack of knowledge or training. However, the possibility of the deliberate misuse of sources or radioactive material is also a concern.

Under the terms of a Memorandum of Understanding signed by the Agency and WCO in 1998, increased co-operation was recommended in such areas as information exchange and training. A Joint Technical Committee meeting was conducted in July to review overall progress and to plan further co-operative efforts by the two organizations.

The laboratory testing of border monitoring equipment at the Austrian Research Centre, Seibersdorf, was completed. The selected systems are now being installed at the Austrian/Hungarian border and at Vienna international airport for field testing. On the basis of the laboratory test results, internationally agreed minimum requirements for border monitoring systems were drafted. The main results of this project will be to assist States in selecting, installing and operating detection equipment for land border, seaport and airport monitoring.

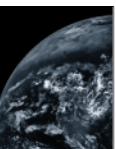
In co-operation with WCO and INTERPOL, a five day awareness training course for customs and police investigators on combating nuclear smuggling was held in Vienna in September. Additionally, a joint training course which also included participation by the European Commission, was held for customs and border control officials in Malta in November.

The Secretariat, working in close co-operation with WCO and INTERPOL, drafted a Safety Guide on preventing, detecting and responding to illicit trafficking in radioactive materials. The regulations, controls and methods described in this Guide are intended to assist customs officers, border police and other law enforcement officers, as well as regulatory authorities and other relevant bodies in Member States, in their efforts to deal with illicit trafficking in radioactive materials. Co-operation with Member States in implementing the recommendations in the Safety Guide will focus on procedures for the detection of radioactive materials crossing borders, as well as on response measures in the event of illicit trafficking incidents.

The Agency’s efforts to improve the security of radioactive material included assistance to a Member State to detect lost sources and store them properly after they have been found. This assistance was provided under a technical co-operation project.

## **SAFE TRANSPORT OF RADIOACTIVE MATERIAL**

A new service, the Transport Safety Appraisal Service (TranSAS), was introduced by the Agency to provide reviews, on request, of national implementation of the Agency’s Regulations for the Safe Transport of Radioactive Material (the ‘Transport Regulations’). The first mission was to Slovenia in June–July 1999. The review appraised Slovenia’s legislative framework for the transport of radioactive material and the associated division of responsibilities among the competent authorities, the approval procedures, and inspection and emergency preparedness arrangements.



The requirements contained in the Transport Regulations are being incorporated into the regulations of other international organizations, such as the Recommendations on the Transport of Dangerous Goods Model Regulations of the United Nations, the European road and rail regulations, the International Civil Aviation Organization's Technical Instructions, and the International Maritime Organization's International Maritime Dangerous Goods Code. To encourage and simplify this process, the Transport Safety Advisory Committee approved a new review cycle for the Transport Regulations that is harmonized with the revision cycles of other United Nations organizations. Under the new cycle that starts in 2000, the Regulations will be reviewed every two years and a revised edition produced if necessary.

## RADIATION EMERGENCIES

Work continued on a set of revised safety standards on emergency preparedness and response. Particular efforts are being made to secure co-sponsorship of these standards by other relevant international organizations, in order to promote coherence and consistency in the handling of emergencies. A technical document on emergency monitoring procedures was issued during the year and, together with standard training material, formed the basis for two workshops for some 22 countries on emergency monitoring in the Chernobyl 30 km exclusion zone.

A new service, Emergency Preparedness Review (EPREV), was initiated in 1999. A methodology was developed and a first pilot mission using the approach was carried out to Indonesia. The experience gained is being fed back into a revision of the draft implementing procedures.

A major revision of the Agency's emergency response procedures and associated training was carried out and subsequently tested during an international exercise hosted by Canada. A feasibility study for use of the Internet for emergency information exchange was performed, and a detailed proposal developed for an Emergency Response Network

describing performance requirements for States wishing to offer assistance under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency.

The Agency provided assistance on three occasions during 1999 in response to radiological emergencies:

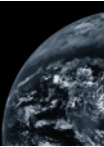
- To Turkey, to advise on the treatment of people overexposed to a cobalt-60 source removed from a container sold as scrap metal, and to assist in locating a possible second source;
- To Peru, to provide medical advice on the treatment of a welder exposed to an unshielded iridium-192 source;
- To Ghana, to assist in returning a jammed industrial radiography iridium-192 source to its container.

In addition, the Agency continued to provide assistance to Georgia in the development of plans to locate and make safe sources abandoned in the country after the breakup of the Soviet Union.

The Agency's Emergency Response System was activated as a result of the criticality accident at the nuclear fuel facility in Tokaimura, Japan. The immediate response was limited to collecting information and disseminating it to Member States, as Japan did not request Agency assistance in dealing with the emergency. A preliminary fact finding mission did, however, visit Japan two weeks after the accident to compile information and to prepare a report on the immediate causes, consequences and aftermath of the accident.

## OPERATIONAL SERVICES FOR RADIATION MONITORING AND PROTECTION

The demand for radiation monitoring and protection services for staff of the Agency and technical co-operation experts continued to increase. A total of 445 staff and more than 250 technical co-operation experts were monitored by November 1999, representing an increase of 11 and 25%, respectively, over the last reporting period.



In order to promote the accurate assessment of occupational exposure, the Agency organized international and regional intercomparison exercises. The Agency's dosimetry laboratories were also involved as participants in several intercomparison exercises on individual monitoring, and in a field exercise for mobile monitoring units held in the Chernobyl exclusion zone.

Technical support, through national and regional technical co-operation projects related

to radiation safety, was provided in terms of expert advice and the organization of training courses and workshops in individual monitoring, intercomparison exercises, quality assurance for radiation protection laboratories and internal dosimetry. Close co-operation was established with other international standards organizations such as the International Organization for Standardization and the International Electrotechnical Commission. Technical support was also provided to emergency missions and field operations, as necessary.

