Radiation and Transport Safety

Objective

To achieve global harmonization of the development and application of the Agency's radiation and transport safety standards. To increase the safety and security of radiation sources and thereby raise the levels of protection of people, including Agency staff, against the harmful effects of radiation exposure.

Radiation Protection Issues in the Control of Foodstuffs and Drinking Water

The application of harmonized standards for the control of foodstuffs and drinking water contaminated as a result of a nuclear or radiological emergency was an issue of concern after the accident at the Fukushima Daiichi nuclear power plant in 2011. The Agency established a working group of international organizations to review the current international standards in order to identify any gaps or inconsistencies in these standards and to make recommendations on how they might be addressed. Participants in the working group, which met in Vienna in May and October, include the European Commission, FAO, the OECD/NEA and WHO, with the International Commission on Radiological Protection (ICRP) participating as an observer. In 2013, the working group focused on documenting the various existing standards for foodstuffs, issued by international organizations, as well as the basis on which they were derived and the circumstances in which they are intended to be used, with a view to facilitating the harmonization of these standards.

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Radiation Protection of Patients

Cumulative radiation exposure is an important concern for patients and health care professionals. In recent years, individual patient exposure from radiological procedures using ionizing radiation (including procedures for children) has been increasing. In part, this increase is due to multiple procedures resulting in substantial cumulative effective doses. In this regard, the Agency held a Technical Meeting on Justification of Medical Exposure and the Use of Appropriateness Criteria, in Vienna in March. The Agency also established the Smart Card/SmartRadTrack project to develop methods to track the radiation exposure of patients. At a Technical Meeting on Patient Radiation Exposure Tracking: Progress Assessment and Development of Further Actions, held in Vienna in September, ten steps for advancing individual exposure tracking (i.e. a history of the radiological examinations a patient has undergone) and patient dose tracking in Member States were identified. A number of the steps involve developing consensus — for example, on the naming of radiological examinations, and on dose metrics and methods for determining cumulative risk. Others involve using the data as a basis for improvements in radiation protection, and developing training materials on patient exposure and dose tracking as well as strategies to educate patients and other stakeholders[1].

Occupational Radiation Protection

The Agency and OECD/NEA jointly operate the Information System on Occupational Exposure (ISOE) to enhance the radiation protection of workers at nuclear power plants worldwide. In 2013, the Agency helped to strengthen the work of the ISOE Technical Centre by participating in meetings of the ISOE Bureau and providing support to participating Member States. In August, the Agency supported the ISOE International ALARA symposium, held in Tokyo. More than 100 experts from over 30 Member States exchanged occupational radiation protection experience at the symposium. Occupational radiation protection achievements and regulatory experience from utilities and regulatory and governmental bodies were presented. The radiation protection situation in Fukushima was reported on, as were a number of potential developments in radiation protection. For example, colloid filters used in a nuclear power plant in the USA were found to reduce the source term in the plant, and a newly developed gamma imaging system with spectrum function was introduced which promises to be useful for radiation protection in the areas of nuclear security and safeguards.

The Agency assisted the China Institute of Atomic Energy and Nuclear and Radiation Safety Centre in organizing the Seventh International Symposium on Naturally Occurring Radioactive Material — NORM VII, held in Beijing in April. The symposium attracted nearly 150 participants from 32 countries and international organizations. It highlighted several challenges in managing exposure to NORM, including those related to implementing the graded approach to regulation, assessment of occupational and public exposures, residue management, remediation of legacy sites, communication and involvement of interested parties.

The Information System on Uranium Mining Exposure (UMEX) was initiated in 2013. As a first step, a survey of occupational exposures in the uranium mining and

[1] See: *https://rpop.iaea.org/*.

processing industry was carried out, covering nearly 90% of the uranium mining industry worldwide.

The Agency's Occupational Radiation Protection Appraisal Service (ORPAS) focuses on end users and service providers, and operates upon the request of Member States. Three ORPAS pre-mission visits, to Peru, the United Republic of Tanzania and Venezuela, were carried out in 2013. The missions identified areas of focus for the full scope missions, practices where occupational radiation protection is to be implemented, and the scope for improvement of occupational radiation protection in accordance with the Agency's safety standards.

Regulatory Infrastructure

The Agency organized several regional training courses for regulators on the authorization and inspection of radiation sources and national self-assessment seminars. Development began on new training materials and guidance on authorization and inspection of uranium mining and milling activities, authorization of proton therapy facilities, and the organization, management and competence of regulatory bodies. To provide assistance to Member States in drafting radiation safety regulations, the Agency holds schools for nuclear experts from both the technical and the legal areas. In 2013, schools were held in Asia in January, with participants from 11 Member States, and in Africa in December, with participants from nine Member States.

More than 300 participants from nearly 90 Member States and six international organizations attended the International Conference on the Safety and Security of Radioactive Sources: Maintaining the Continuous Global Control of Sources throughout their Life Cycle, held in Abu Dhabi in October. Participants reviewed current successes and challenges in ensuring the safety and security of radioactive sources, and identified means of maintaining the highest possible levels of safety and security from manufacture to disposal. Among the topics discussed were ways of better controlling the movement of radioactive sources throughout the world, including import and export controls, and the return and repatriation of disused sources, as well as global industry practices and trends with regard to the design, use, recycling and disposal of radioactive sources.

The third open-ended meeting of technical and legal experts on the development of a Metal Recycling Code of Conduct was held in February. Representatives of 55 Member States, one non-Member State and the European Union, and seven observers from the metal recycling industry, attended the meeting. The General Conference, in resolution GC(57)/RES/9, did not address the future development of such a code of conduct, but instead encouraged the Secretariat to make the results of the discussions conducted on this issue available to Member States in a Technical Document.

Transport Safety

Under the framework of a regional project for Africa on Strengthening Effective Compliance Assurance for the Transport of Radioactive Material, 20 countries completed the Self-Assessment of Regulatory Infrastructure for Safety (SARIS) questionnaire on transport in 2013. Corresponding peer review meetings are being held to validate national responses regarding the application of transport regulations. SARIS is an electronic tool provided to Member States as part of the Agency's self-assessment methodologies. It incorporates questions designed to address aspects of regulatory infrastructure related to both compliance and performance, and references the associated Agency Safety Requirements and Safety Guides. Carrying out a SARIS is both preparation for, and a prerequisite to, an IRRS mission.

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As part of a technical cooperation project, the Agency held a course in Beijing on Compliance Assurance for Safe Transport of Radioactive Material. Participants from ten Member States in the Asia–Pacific region attended the one week course and received guidance on applying the *Regulations for the Safe Transport of Radioactive Material: 2012 Edition* (the Transport Regulations) (IAEA Safety Standards Series No. SSR-6) in their respective countries.

A second workshop, on Licensing and Safety Assessment of Dual Purpose Casks and Safety Assessment of Type B(U) Packages, was held at the request of Pakistan (Fig. 1). This was the second such workshop held for Pakistan at their request.

The Working Group on Best Practice Guidelines for Voluntary and Confidential Government to Government Communications on the Transport of MOX Fuel, High Level Radioactive Waste and, as appropriate, Irradiated Nuclear Fuel by Sea, chaired by Norway, provided their report to the delegates of the 57th General Conference.

FIG. 1. Transport packages for radiation sources under preparation.

Education and Training in Radiation Safety

The Agency continued to offer its postgraduate educational course (PGEC) in Radiation Protection and the Safety of Radiation Sources. In 2013, this half-year course was offered in Algeria, Argentina, Belarus, Ghana, Malaysia and Morocco.

The Agency provided Member States with support and guidance aimed at building sustainable competence through the establishment of national strategies for education and training in radiation, transport and waste safety. Regional workshops were organized in Africa (in Ghana and Morocco); Europe (in Belarus and Greece); Asia (in Malaysia); and Latin America (in Cuba).

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Guidance on the Education and Training Appraisal (EduTA) service was updated, taking into account Member State needs for more direct support in the establishment of a national strategy. Initiatives were undertaken to support Member States in strengthening their human resources in the field of radiation, transport and waste safety. For example, a syllabus was drafted for a master's level PGEC on radiation protection. In addition, a pre-training course on radiation protection was adapted for an e-learning format; a pilot version was made available to participants in Ghana's PGEC on radiation protection, which began in November.

Radiation Safety Infrastructure Information Management

The Agency's Radiation Safety Information Management System (RASIMS) is a collaborative, web based platform designed to assist Member States in monitoring the status and implementation of their radiation safety infrastructure in line with the Agency's safety standards on radiation safety. The Agency also uses RASIMS as a decision aiding tool when evaluating requests for procurement of radiation sources for use in Member States, as well as prior to submitting technical cooperation projects to the Agency's Policy-making Organs for approval.

Further improvements to RASIMS's functionality were made throughout 2013. For example, an e-learning module was developed to improve user interaction with the RASIMS system[2]. A total of 90 Member States accessed RASIMS in 2013 to update their radiation safety infrastructure profiles. In addition, 102 Member States have now appointed RASIMS coordinators to promote national ownership of RASIMS information and to provide a local focal point for all national stakeholders.

[2] Available at: *http://rasims.iaea.org*.