



Radiation protection services: The IAEA's global role

In a variety of ways, international experts are assisting countries to build or improve their infrastructure for radiation protection

by P. Strohal and R. Ouvrard

Nearly every IAEA Member State uses ionizing radiation to some extent for social, health, or economic benefit. A number of X-ray machines are used for medical purposes even in the least developed countries of the world. This fact alone suggests a continuing need for national and international activities in the field of radiation protection.

At the same time, some recent events, such as the Chernobyl nuclear plant accident in 1986, have added an element of urgency to various aspects of radiation protection. For instance, many food-importing developing countries have pursued efforts to determine levels of radioactivity in foodstuffs and to elaborate national regulations to guide governmental actions concerning food contamination (the term "derived intervention levels" is frequently used in this connection). Such needs, of course, spur the development of radiation protection.

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Not surprisingly, the IAEA has received an increasing number of requests from Member States for assistance in these and other areas of radiation protection. The requests indicate that in various geographic regions or sub-regions most requirements are similar or almost identical. This has influenced the Agency's creation of several regional programmes and activities in the area of radiation protection. Unfortunately, however, many of the problems addressed cannot be solved overnight: Building up radiation protection infrastructures and manpower development are time-consuming processes.

Scope of IAEA's services

Radiation protection services provided by the Agency can be grouped into four general areas:

- Operational radiation protection (regarding the Agency's laboratories, installations, and/or personnel involved in working conditions where they may be exposed to ionizing radiation)

Photo on top: Manpower development is one of the most important radiation protection services needed in developing countries. Shown here is an IAEA training course for participants from the African region.

- Personnel dosimetry services (for external experts recruited to work, assist, or advise on the implementation of various technical co-operation projects)
- Training in radiation protection (for new IAEA staff working at the Agency's laboratories or in activities involving ionizing radiation, and for participants in IAEA training courses conducted either at the Agency's laboratories or in Member States)
- Advisory support services (such as providing radiation protection assessments or recommendations regarding specific radiation protection matters).

Services for Member States

In most cases, developing countries need to build-up or improve their radiation protection infrastructure. For this purpose, establishment of a national competent authority, promulgation of radiation protection legislation, establishment of (at the minimum) personnel monitoring services, licensing and inspection procedures, and manpower development are needed. A programme for radiation protection development, based on a national strategy for the use and application of radionuclides and/or machines producing ionizing radiation, is the first step in a systematic approach to develop and improve radiation protection activities. Such programmes are specific to each country and need to be tailored to meet national needs and resources and to be harmonized with the scope of the national programme.

Advisory services. IAEA advisory services in radiation protection include expert missions on various topics. These include the implementation of the *Basic Safety Standards for Radiation Protection*; creation of radiation protection infrastructure; legislation (including laws, ordinances, codes of practice, rules, and procedures); internal and external personnel monitoring; occupational radiation protection; radiation protection in specific activities such as mining and milling; handling of radiation sources; radiation protection aspects of radioactive wastes; radiation protection of the general public and the environment; transport of radioactive materials; planning and preparedness for radiological emergencies; and handling and early diagnosis of over-exposed individuals. These services may be performed either by the Agency's staff or by recruited qualified external experts. Although many advisory missions have been performed by Agency staff, the majority are covered by external experts. In this connection, the IAEA's radiation protection services' staff is consulted to identify tasks and select the most appropriate expert for a given project; it also takes part in briefing and debriefing before and after the assignment.

Other types of advisory services include assisting Member States to prepare a programme for a specific radiation protection activity; advising the competent authority on required actions in a specific practice; assisting in the implementation of a project; and providing individual training on the use or operation of an instrument.

Historical notes

Radiation protection services were established in the early stages of the IAEA.

The IAEA's Statute itself refers to health and safety measures in several of its Articles. For example, Article III A.6 states that the Agency is authorized to establish or adopt standards of safety for protection of health and minimization of danger to life and property and to provide for the application of these standards to its own operations as well as to the operations performed at its request or under its control. Article XI E.3 specifies that before approving a project, the Board of Governors shall give due consideration to the adequacy of proposed health and safety standards for handling and storing material and for operating facilities.

In the IAEA's early years, radiation protection services were limited to providing personnel dosimetry services for IAEA laboratories where ionizing radiation was used and for staff (mostly safeguards inspectors) who could be exposed to radiation during expert visits or inspections in Member States.

Later on, as peaceful applications of ionizing radiation became more widespread in developing countries, the need to provide a wider range of radiation protection services arose. New approaches were thus needed to assist countries in building a national infrastructure to meet their radiation protection requirements and to harmonize these requirements with the *Basic Safety Standards for Radiation Protection* jointly issued by the IAEA, International Labour Organisation (ILO), World Health Organization (WHO), and Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (NEA/OECD).

Ten years ago, in 1979, the IAEA established the present radiation protection services section in the Division of Nuclear Safety.

Training. Manpower development is one of the most important services needed in developing countries. Adequate infrastructure and staffing to run national radiation protection activities are necessary for the creation, organization, and implementation of any programme. Highly aware of these needs, the IAEA offers various types of training activities and assistance in this field.

The Agency has published a technical report on training in radiation protection covering training strategy and course syllabi.* However, most IAEA training activities are initiated following direct requests by Member States. Apart from interregional training courses which are typically aimed to train the trainers, most training activities are of short duration and directed at selected topics or techniques. Through its technical co-operation programme, the IAEA organizes training courses in all geographic regions. Yet most training activities are in

* *Training Courses on Radiation Protection*, Technical Reports Series No. 280 — STI/DOC/10/280, IAEA, Vienna (1988).



At its headquarters in Vienna, the IAEA maintains a laboratory for personnel dosimetry services.

the hands of national authorities, and IAEA staff can assist in preparing the syllabus and providing outside lecturers. In some countries without an adequate infrastructure for radiation protection, training activities may be organized within the framework of a technical assistance project.

A number of short training courses or workshops on certain topics are organized on a regional basis. These include training courses on radiation protection services for the African region; workshops on derived intervention levels, industrial radiography, radiation protection in nuclear medicine, radiotherapy, and X-ray diagnosis in the Middle East; workshops on strengthening radiation protection infrastructure for Asia and the Pacific region; and a number of general workshops for the Latin American region.

The Agency has also organized a 5-week practical training course in Vienna for personnel responsible for

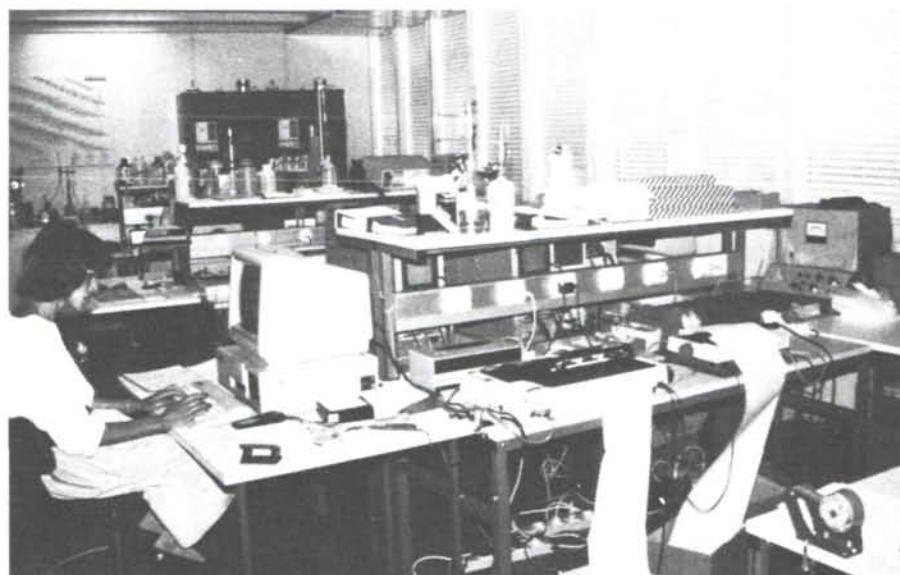
national radiation protection services. Action for a systematic approach to radiation protection training has been undertaken since needs for training are increasing.

The Agency also provides on-the-job training in various areas of personnel dosimetry. It also assists in arrangements for such training in all areas of radiation protection in specialized institutions of its Member States.

RAPAT missions

In 1984, the IAEA established a programme to assist developing countries in reviewing and assessing their radiation protection activities, identifying priorities in this field, and recommending a long-term radiation protection programme in co-operation with the Agency. The Agency offers to send to requesting Member States a Radiation Protection Advisory Team (RAPAT) composed of three to four highly qualified experts with extensive experience in radiation protection. During the mission, they visit competent authorities and institutions where radiation protection activities exist or are needed. Discussions focus on radiation protection problems and activities, including the national infrastructure related to radiation protection practices, operational and planned programmes on radiation protection, available manpower, laboratories, equipment, and services. On that basis, and by taking full account of views expressed by the host country's representatives, the RAPAT experts determine immediate and future radiation protection needs, including the formulation of possible long-term technical co-operation and assistance by the IAEA in radiation protection.

Such a systematic assessment of national activities in the area of radiation protection also is valuable for adjusting the IAEA's programme and technical co-operation activities to meet the needs of Member States in this area. Collected information also helps in the selection of radiation protection topics for various regional activities.



The IAEA's services in radiation protection include a dosimetry data processing system.