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H4.SMR/638-34

College on Medical Physics:
Imaging and Radiation Protection

31 August - 18 September 1992

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PROGRAMME ACTIVITIES OF THE IAEA RELATED TO RADIATION PROTECTION IN MEDICINE FOR DEVELOPING MEMBER STATES

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INTERNATIONAL ATOMIC ENERGY AGENCY/DIVISION OF NUCLEAR SAFETY
V I E N N A / A U S T R I A

1. Introduction

The International Atomic Energy Agency (IAEA) is an organization within the United Nations family, with the objective to expand the contribution of atomic energy to peace, health and prosperity throughout the world.

The application of ionizing radiation in medicine for both diagnostic and therapeutic purposes is a significant part of the IAEA programme. In fact, in a number of developing Member States, Medicine is one of the principal applications of ionizing radiations. A brief introduction to the IAEA's Radiation Protection-Radiation Safety programmes is necessary in order to explain the Agency's approach to radiation protection in medicine.

The increased efforts by the Agency on radiation safety systems are a direct, immediate response to requests from more than 60 developing Member States for assistance in this area. Many of these Member States still rely entirely on the Agency's support and co-operation in establishing a solid infrastructure for carrying out programmed activities in radiation safety that are required at a national level. There are rapidly growing needs for applications of ionizing radiation and radioactive sources in medicine, industry, agriculture, mining, environmental control, research and teaching in most developing Member States, but often these needs can be neither properly absorbed nor co-ordinated, due to inadequate radiation safety infrastructures. In practical terms, this is reflected by insufficient financial and manpower resources, deficiencies in/or lack of legislation on radiation protection, as well as by poor or non-existant programmes of radiation safety services, and/or organization of regulatory practices (licensing and inspection). In this perspective very little attention, if any, is paid to quality control and maintenance programmes and it is known that much of the equipment provided to developing countries, does not function properly or is out of order within a short period of time.

2. Radiation Protection Advisory Team

The IAEA first offered the service of Radiation Protection Advisory Team (RAPAT) in 1984, and to date 54 missions have been completed. Each RAPAT consists of three to four experts on different aspects of radiation protection and associated areas, who are recruited both from the IAEA staff and externally (including WHO). The duration of a mission is normally one week. The purpose of RAPAT is to make a general assessment of the the radiation protection infrastructure in the Member State visited. The RAPATs make recommendations to the ministries and to the authorities in the country and to the Agency in order to define immediate needs and long-term strategies for technical assistance and co-operation in radiation protection. The RAPAT recommendations should be considered as an umbrella for radiation protection aspec
Inter alia, medical application of ionizing radiations is given particularly careful consideration in all RAPAT missions.

A number of group training activities, both at regional and national levels, was organized within the RAPAT follow-up programme.

3. Technical Co-operation Projects

The technical assistance and co-operation programme is a major instrument of the IAEA. Under this programme the Agency has, among other things, provided developing countries with X-ray machines, gamma cameras, cobalt units, accelerators and radioactive sources for medical purposes, the benefits of which, are well known, but the application presents a radiation hazard if the equipment is not properly used and maintained. Consequently, programmes on radiation protection, quality control and maintenance are introduced as an integral part of the technical co-operation programme.

The technical co-operation activities are divided into the following main regional projects:

ARCAL is a regional project including 12 latin american countries. In 1981 the countries asked the IAEA to assist them in co-ordinating their efforts. At present there are 10 sub-projects within the ARCAL programme, the participation of the countries in any given project is entirely voluntary. The project on radiation protection (ARCAL I) has high priority.

RCA is a regional co-operative agreement in Asia and the Pacific with 13 participating countries. One of the projects is devoted to the development of radiation protection infrastructure and facilities. The activities under this project have focused upon training courses in radiation protection and intercalibration of personnel and environmental monitoring instruments.

RER refers to the region of Europe and the Middle East. Two regional projects on radiation protection are found within the RER programme.

RAF stands for Regional Africa. Under RAF there is a project on "Radiation Protection Development" covering radiation protection in general. African Member States are given expert advice on radiation protection legislation and administration, and receive equipment and training on practical topics such as personnel dosimetry, environmental measurements and quality control of equipment.

In conjunction with technical projects the IAEA is supporting developing countries in the following ways:

i) Training Courses

The Agency supports training courses at the interregional level (for all developing Member States), or on a regional and national basis. Training courses and workshops related to radiation protection and quality assurance of medical equipment using ionizing radiation are part of this scheme.

ii) Experts

Short-term experts are an important tool for the IAEA in realizing its assistance programmes, and they are used in all fields and stages of project development where particular know-how is needed. The duration of expert services varies normally from a week to several months.

iii) Fellowships

The purpose of fellowships is to train candidates from developing countries in their special fields, the duration is rarely more than 12 months. Fellowship training is provided by a host country which is often an industrialized one; but efforts are being made to support training centres within the region, whenever possible.

4. Dosimetry

Through its technical assistance programme, the Agency has supplied several Member States with complete personnel dosimetry laboratories, including dose recording system. In special situations personal dosimetry is also carried out directly by the IAEA.

Other specialized projects on clinical Dosimetry, Radiotherapy, Nuclear Medicine etc. are carried on in co-operation with the Division of Life Sciences.

5. Co-ordinated Research Programmes

Co-ordinated research programmes (CRP) can be launched by the IAEA. One of the goals of the IAEA's CRPs is to network institutes. Valuable opportunities are offered to researchers in developing countries to meet and exchange experiences. They are particularly effective when operating parallel with other forms of technical aid provided by the IAEA, or other international organizations. A typical contract runs for three to five years. The result of a CRP are often published by the IAEA as a TECDOC and distributed, on request, free of charge.

6. Conclusions

Within the IAEA, the activities regarding the medical applications of ionizing radiations are carried out by various departments: (1) Technical Co-operation, (2) Nuclear Energy, (3) Research & Isotopes. Each department has its own approach but actions are well integrated, co-operation and exchange of information are satisfactory. The projects awarded by the IAEA

are very wide and comprehensive, from the assessment of radiation protection infrastructure to the purchasing of sophisticated equipment. Training courses and workshops are integrate parts of the assessment of radiation protection infrastructure. When new equipment is provided, quality control and maintenance are addressed as part of the initial training on equipment; in the field of maintenance follow-up support is feasible also when the project has come to an end.

Collaboration amongst international bodies working in medicine is very important, in order to avoid repetition and co-ordinate efforts. Collaboration with WHO is particularly important, but there are also projects currently running in co-operation with other international organizations such as the Commisssion of the European Communities (CEC) and the United Nations Industrial Development Organization (UNIDO).