



## REGULATORY INFRASTRUCTURE IN EAST AND WEST ASIA: PRESENT STATUS AND PERSPECTIVES

B. DJERMOUNI

Department of Technical Co-operation,  
International Atomic Energy Agency,  
Vienna

**Abstract.** A detailed assessment carried out by the IAEA showed that five Member States in East Asia (Bangladesh, Mongolia, Myanmar, Sri Lanka, Vietnam) and nine Member States in West Asia (Jordan, Kazakhstan, Lebanon, Qatar, Saudi Arabia, Syria, United Arab Emirates, Uzbekistan, Yemen) did not have an adequate radiation and waste safety infrastructure in general and a basic regulatory infrastructure in particular. This indicated the partial or complete lack of control of radiation sources, i.e. location, identification, registration, licensing & inspection. Since 1996, these countries have been participating in the Model Project on Upgrading Radiation and Waste Safety Infrastructure with the primary objective of establishing or upgrading their basic regulatory infrastructure. The results achieved in the establishment/upgrading of this infrastructure and the follow-up and extension to other Member States are presented in this paper.

### INTRODUCTION

For many years, the IAEA has provided assistance to the Member States in radiation protection and radioactive waste management, through national technical co-operation projects, regional and interregional activities and co-ordinated research projects. Two advisory programmes have been established by the IAEA: Radiation Protection Advisory Teams (RAPAT) and Radioactive Waste Management Programme (WAMAP), to assist Member States in reviewing and assessing their ongoing activities in these fields and identifying priorities and needs for their future development and to make recommendations for their future assistance.

Building on this experience and subsequent policy reviews, the IAEA took steps to evaluate the needs for technical assistance more systematically in nuclear and radiation safety. The outcome was the development of an integrated system designed to more closely assess national priorities and needs for upgrading their infrastructures for radiation and waste safety.

The work draws upon the IAEA's long record of safety assistance through avenues of technical co-operation and assistance. By its Statute, the IAEA is authorized to establish or adopt safety standards for the protection of health and the minimization of danger to life and property, and to provide for the application of these standards to its own operations as well as to operations making use of materials, services, equipment, facilities, and information made available by the IAEA or at its request or placed under its control or supervision. The safety standards which are being promoted are the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS), which are described in this paper.

Regarding technical assistance to be provided in the next cycle, the IAEA Board of Governors, in its report GOV/1999/67 — "Progress Report on the Implementation of the Model Project on Upgrading Radiation Protection Infrastructure (INT/9/143)" — recommended in para. 21 (a) that "Member States which are unlikely to have completed the activities relating to *milestones 1* and *2* by the end of the year 2000" should be informed that

“TC projects involving the use of radiation sources will be submitted to the Board for approval only after they have attained those milestones”.

With this perspective, this paper reviews the IAEA’s integrated management approach and establishment of a TC Model Project to upgrade radiation and waste safety infrastructures in its Member States, and in particular, the basic regulatory infrastructure. The project today assists 51 countries, 14 of which are in East and West Asia.

## STATUS

The Model Project on Upgrading Radiation and Waste Safety Infrastructure, and in particular the basic regulatory infrastructure, in East and West Asia was started in 1996–1997 by the gradual establishment of the common ground and understanding between the IAEA and the 14 participating Member States on:

- the status of the radiation and waste safety infrastructure in each Member State, taking into consideration the previous experience of assistance provided by the IAEA;
- the aim of the project;
- the design of the project.

### *Status:*

Assessment of the status of the radiation and waste safety infrastructure for each Member State has been carried out through the five milestones identified by the IAEA on the basis of the International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources (BSS).

This assessment identified where States fall short of the milestones, i.e. do not meet the requirements of the BSS.

### *Aim:*

The aim of this project is that all Member States involved will have a radiation and waste safety infrastructure in accordance with the BSS.

### *Design:*

This project has been designed on the basis of the above assessment, which identified deficiencies in the 14 States’ radiation and waste safety infrastructures. The infrastructures needed to be established or upgraded to comply with the BSS. These 14 Member States are:

**East Asia:** Bangladesh, Mongolia, Myanmar, Sri Lanka, Vietnam

**West Asia:** Jordan, Kazakhstan, Lebanon, Qatar, Saudi Arabia, Syria, United Arab Emirates, Uzbekistan, Yemen

The implementation of the project began by setting up individual workplans based on the initial needs assessment. The workplans were prepared, finalized and approved by the participating countries and the IAEA during 1996–1997.

In order to achieve the project objectives and to undertake the appropriate actions, the nature and number of radiation sources and the main users in each participating country were identified.

- **Medical practices:** radiodiagnosis, radiotherapy and nuclear medicine in public hospitals, private hospitals and clinics represent 80–90 % of the practices in each Member State.
- **Industrial and research practices:** NDT sources, irradiators, gauges and well-logging, research reactors, neutron generators, cyclotrons, isotope production, mining and milling used in national agency or commissions or in the mineral industries represent 10–20 % of the practices in each Member State.

The workplans prepared and approved by Member States cover activities related to the five milestones:

- Milestone 1:** **Establishment of a regulatory framework** covering radiation safety law, regulations, system of notification, authorization and control of radiation sources, including inventory of radiation sources;
- Milestone 2:** **Establishment of occupational exposure control**, i.e. individual workplace monitoring (including dose assessment);
- Milestone 3:** **Establishment of medical exposure control**, i.e. controlling exposure of patients in radiodiagnosis, radiotherapy and nuclear medicine;
- Milestone 4:** **Establishment of public exposure control**, i.e. registration control and safe disposal of radioactive waste, control of consumer products, environmental monitoring;
- Milestone 5:** **Establishment of emergency preparedness and response capabilities.**

The implementation of the five milestones, and in particular Milestone 1, involved two main parties:

**The regulatory authority** with a mandate to implement the law, regulations (radiation protection, waste management and transport regulations), system of notification, authorization, inspection and enforcement (including the inventory of radiation sources and radiation workers); and

**The users** with responsibilities to prepare, implement and manage the radiation protection programme to comply with the above requirements (law, regulations).

One of the main difficulties encountered in the implementation of the project in the participating countries was the lack of compliance with the obligation, as described in the Preamble of the BSS, to establish an adequate national infrastructure which included:

- an appropriate national legislative and regulatory framework (law, regulations, codes of practice, guidelines, etc.);
- a regulatory body empowered and authorized to inspect and to enforce the legislation and regulations;
- an adequate number of qualified staff; and
- sufficient resources.

As a result of the above, the role and responsibilities of the regulatory authority or the acting regulatory authority and the users were either not identified or were not clearly defined.

In order to resolve difficulties and to speed up the implementation of the project:

- The five milestones were prioritized in order to facilitate the monitoring of progress and the optimization of resources;
- firm commitments were obtained from all participating countries to comply with their obligations as described in the BSS through the approval of the workplans which took place at the beginning of the project in each Member State (1996–1997);
- an integrated and synchronized approach was established in terms of actions to be taken by the Member States and the assistance to be provided by the IAEA.

Milestone 1 was given top priority in order to establish a basic regulatory infrastructure in each participating Member State, which should result in the control and safe use of radiation sources through an adequate system of notification, authorization, inspection and enforcement and a continuously updated inventory of radiation sources and radiation workers.

The establishment or the upgrading of this milestone required:

- a legal framework, including radiation safety legislation;
- regulations, codes of practice, etc.; and
- procedures for notification, authorization and enforcement.

The legal framework should be implemented and managed through an adequate regulatory programme for which there was a need to establish/strengthen a regulatory authority. Adequate resources in terms of premises, equipment (vehicles) and qualified professionals should be provided to this body.

In order to achieve the above, actions to be undertaken by the Government, the counterpart and the IAEA were clearly defined in the workplans for each Member State, involving close partnership between the IAEA and the counterpart(s). The IAEA through the Regional Manager, had to carry out the actions at two levels: that of high-level decision-makers at the operational level.

At the first level, the Regional Manager had to meet Prime Ministers, Ministers (Ministries of Health, Justice, Science & Technology, etc.), Chairmen or Directors General of National Atomic Energy Commissions, Members of Parliament, etc. Additionally, high-level decision-makers seminars were organized with IAEA assistance in the People's Republic of China in 1998 and in Malaysia in 1999.

The purpose of these two actions was to make Member States aware of the importance of a basic regulatory infrastructure and to get their commitment and continuous support for the achievement of the goals of the project.

At the operational level, the IAEA assisted each Member State with the following provision of:

- model radiation safety law, model radiation protection, waste management and transport regulations, model guidelines prepared by the IAEA and also similar documents from Member States in the region with the same practices;
- expert services for reviewing, drafting and finalizing the national legal framework;
- expert services in order to prepare, together with the counterpart, a regulatory programme involving procedures for an adequate system of notification, authorization, inspection and enforcement for radiation sources;
- on-the-job training and scientific visits for all Member States. A total of 200 people benefited from on-the-job training and scientific visits were provided to Member States in the East Asia region and 160 in the West Asia region;
- regional and national training events which involved 660 participants in the East Asia region and 500 participants in the West Asia region.

All these actions involved the regulators as well as the users. Particular emphasis was always put on the definition of their role and duties with regard to the establishment and management of regulatory controls.

Furthermore, special assistance was provided to main medical practices through the establishment of national programmes on radiation protection and quality assurance in radiodiagnosis, radiotherapy and nuclear medicine, implemented by the Ministry of Health with the assistance of the regulatory authority through an appropriate operational unit, which had been or would be established. This approach was intended to establish of a partnership between the regulatory authority and the main users in order to clarify their roles and duties.

The programme of implementation was monitored on a regular basis by the Regional Manager through field missions, the annual appraisal meeting organized by the IAEA and through five Peer Review Missions conducted in 1999 and four in 2000.

The lack of qualified staff in the regulatory authority and also with the users was the main obstacle encountered during the implementation of the project in the fourteen Member States. The majority of the existing staff received short-term on-the-job training in the past as also under the Model Project. This approach alone did not lead to the establishment of the professionals needed for the sustainability of activities which have to be carried out in different aspects of radiation and waste safety.

Therefore, there was an urgent need to assist these countries in the establishment of the minimum critical mass of professionals required for the organization, management and sustainability of an adequate radiation and waste safety infrastructure in particular for the basic radiation safety infrastructure. This could only be done through appropriate long-term training in a specialized centre. In keeping with the recommendation made by the decision makers of the fourteen participating Member States during their last appraisal meeting held in Kuala Lumpur, Malaysia, in June 1999, one-year postgraduate diploma training courses in

radiation protection were established by Syria and Malaysia during the year 2000. Participants from Model Project countries who were selected to attend these courses, were supported by the IAEA.

To a large extent, this progress has been the result of good co-operation between the IAEA and participating Member States. However, vital assistance was also given by other Member States (including Australia, the Czech Republic, France, Germany, India, Japan, Malaysia, Pakistan, Sweden, the United Kingdom) by providing expert services, and hosting on-the-job training, scientific visits and training courses.

In conclusion, it can be said that progress has been made in upgrading the radiation and waste safety infrastructure in the fourteen participating Member States, particularly in the regulatory framework, including a system for notification, authorization and control of radiation sources which includes the inventory of radiation sources and radiation workers.

The status of the System of Control of Radiation Sources can be summarized as follows:

<b>Region</b>	<b>a</b>	<b>b</b>	<b>c</b>
East Asia	3	3	–
West Asia	3	3	3

**a: in place, b: being implemented, c: Law and/or regulations in final stage of promulgation**

It is expected that the majority of the Member States participating in the Model Project will establish a regulatory authority with a regulatory programme at different stages of implementation.

### **REGULATORY INFRASTRUCTURE IN EAST & WEST ASIA: PERSPECTIVES**

Taking into account the recommendations of the Board of Governors (GOV/1999/67, para. 21 (c)), namely, to adapt this model approach to other national and regional projects on radiation protection and waste safety, TC assistance will be provided in the 2001–2002 cycle through a new regional project, “National Regulatory Control Framework and Occupational Radiation Protection”.

The objective of the project is to establish or improve the regulatory framework for radiation protection in all East and West Asia Member States and to harmonize and streamline regulatory controls.

Member States expected to participate in this project are:

- those which did not complete Milestone 1 and those which need to finalize and issue waste management regulations, transport regulations and codes of practice; and
- those which are not participating in the present Model Project and for which establishing/strengthening the basic regulatory infrastructure has either been requested by the Member State or identified by the IAEA.

The Member States which are likely to participate in the project are:

**East Asia:** Bangladesh, China, Indonesia, Malaysia, Mongolia, Myanmar, Pakistan, Philippines, Singapore, Sri Lanka, Vietnam

**West Asia:** Iran, Jordan, Kazakhstan, Kuwait, Lebanon, Qatar, Saudi Arabia, Syria, Uzbekistan, United Arab Emirates, Yemen.

The new project will be integrated and harmonized under the radiation protection programme, i.e., national projects, regional agreements, regional projects, etc., to be implemented in each region.

## **CONCLUSIONS**

Considerable progress has been achieved in the establishment/upgrading of the basic regulatory infrastructure in the 14 Member States participating in the Model Project on Upgrading Radiation and Waste Safety Infrastructure. This successful experience will be extended to other Member States in the East and West Asia region in order to achieve the objective of the Agency which is to ensure that all Member States should have an adequate radiation protection infrastructure in the near future.