

strategies for Nuclear Safety

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Rarely in the history of the IAEA has radiation-based technology provided so much opportunity and presented such great risk. The harsh reality is that broader distribution of radioactive materials and sources makes more sources available to more people, thereby increasing the probability of incidents and accidents. As human beings derive greater benefit from ionizing radiation, they also stand a higher risk of being exposed to its harmful effects.

Several factors make this a particularly urgent issue. New nuclear technologies are constantly being developed and deployed. Environmental concerns related to future energy supplies, greenhouse gas emissions and climate change are renewing interest in large-scale nuclear energy production. Geo-political instability creates a black market for radioactive materials, and some States seem to persist in their attempts to acquire or develop capacity in nuclear weapons.

To realise the potential of radiation-based technologies for peaceful purposes, we must confront the associated challenges. On one hand, the nature of today's global environment is that a significant risk can arise virtually any time, anywhere. On the other, Member States are more cognizant of the responsibilities associated with deployment of nuclear technology. Thus, there is a pressing need to strengthen the safety network at every level. This can only be achieved by sharing knowledge, expertise and resources between Member States and the IAEA, and—increasingly—amongst Member States and with other interested parties. Fortunately, both Member States and the IAEA are better prepared than ever to operate in this way.

Over the past ten years, the IAEA's technical cooperation programme undertook a massive effort to empower developing nations to realise social and economic goals through the application of radiation-based technologies. The *Model Project on Upgrading Radiation Protection Infrastructure* (the Model Project) represented a significant shift in priori-

ties in that the aim was not to deliver technology *per se*, but rather to ensure that Member States acquired the capacity to self-manage all related aspects of radiation protection.

Without question, the project keeps achieving a great deal. Virtually all participating countries are making significant progress in establishing a basic safety infrastructure; many also are developing the human resources required to tackle the issues of exposure control and emergency preparedness.

This strengthened capacity enables Member States to realise more benefits from radiation-based technology more quickly. Moreover, through the knowledge and experience gained, more countries are reaching a level of maturity where they recognize that they hold responsibility for the radioactive sources and materials found within their borders.

In addition to achieving its goal of strengthening the radiation protection infrastructure, the Model Project effectively creates a network of peers—each Member State is better equipped to make its own decisions about technology needs and is empowered to manage the related safety and security issues. Radiation-based technologies will continue to evolve, as will the safety standards that underlie their application. Thus, it is imperative to find ways to increase knowledge sharing and to impress upon Member States that there is no “end point” to any area of radiation protection; each aspect must keep pace with technological evolution.

With these considerations in mind, the Department of Nuclear Safety and Security and the Department of Technical Cooperation took the decision (January 2005) to keep pursuing the Model Project goals under the umbrella of five Thematic Safety Areas while also emphasizing a more regional approach. This new strategy is based on growing recognition that each region—Africa, Asia and the Pacific,

Europe and Latin America—faces specific challenges. It also acknowledges that the acquisition of radiation-based technologies can deliver social and economic benefits for a group of neighbours, just as the impacts of radiological incidents can quickly spread across national borders.

Perhaps most importantly, this new strategy encourages Member States to pool limited resources and expertise, to create opportunities for information sharing and even to pursue inter-State technology transfer, all of which can be critically important to small countries. Strong regional networks also have a spill-over effect: they can contribute indirectly to improving safety in Member States that currently lack the resources to fully participate in IAEA activities and, perhaps to a lesser degree, in non-member States.

The enhanced national radiation protection capacity creates an opportunity for the IAEA to better fulfil its primary mandate of developing and issuing safety standards for radiation-based technologies. The IAEA must ensure that its efforts to keep pace with technological advances are coupled with initiatives to improve standards. We recognize that it is no longer sufficient for the IAEA to rely solely on its own resources and expertise, or those of a few countries. All Member States, both developed and developing, must be well represented and involved in the drafting process to ensure that standards adequately reflect the reality of the environments in which they are to be applied—and, indeed, to gain broad support for their application.

This poses a serious demand that the IAEA and its Member States must address. Member States now actively support the role of nuclear scientists, regulatory bodies and other counterparts on the domestic level; they also recognize the value of the work carried out by the Secretariat.

However, Member States do not always see the need (or in some cases, have the resources) for these offices or individuals to participate in IAEA activities. At present, most IAEA expert and user committees are composed primarily of experts from developed countries; developing nation representation is often less than 15%. The IAEA must recruit qualified individuals from developing nations to these committees and must also convince governments to enable their experts to contribute fully, primarily by providing the financial resources required.

Following an IAEA Board decision (September 2005), one of the most stimulating tasks will be to develop standards in the area of environmental protection. This decision reflects growing recognition amongst the global science community that contamination of air, water and soil can have both direct and indirect impacts on human and environmental health. Protecting the environment is a further affirmation of the IAEA's philosophy that radiation exposure is a long-term, wide-reaching issue; we must protect both the planet

and the people of today and preserve the Earth's life-support systems for future generations.

This also relates to the particular focus on developing countries, many of which have already shown a strong commitment to integrating environmental issues into social and economic development strategies. In addition, increased use of radiation-based technologies in general will result in increased radioactive waste, necessitating improved control for the storage and transport. Clearly, these countries will need to have a strong voice in preparing the radiation protection standards that will ultimately have an impact on development at the global scale.

The achievements to strengthen radiation protection over the past ten years are truly remarkable. But it must never be taken for granted that safety and technology transfer remain inseparable: without safety, transferred technologies can do more harm than good.

Today's social, political and economic climates make all networks and partnerships more important than ever. The IAEA must strengthen its departmental efforts to attract the 40-plus countries that are not yet Member States and continue to work with Member States—in both developing and developed countries—that have not yet fully established a solid radiation protection infrastructure.

At the same time, the IAEA must forge stronger links within the international community. As radiation-based technology makes inroads into more sectors, it will be increasingly important to work more closely with organizations such as the United Nations Environment Programme (UNEP), the World Health Organization (WHO), and the International Labour Organization (ILO).

Without question, the future challenges are great. But the results of the Model Project create a new confidence. The Model Project set out to build individual infrastructures; in fact, it spawned what one might call a radiation protection "super-structure" and strengthened the global safety regime. The capacity to apply radiation-based technologies for peaceful purposes and to minimize threats of exposure now exists in a knowledge base that spans the globe. Perhaps it is cliché, but we believe that there is safety in numbers—even for nuclear technology.

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