

**Summary of the Conference,
President , Professor K. Ishigure (Japan)**

BACKGROUND

Since 2000, the International Atomic Energy Agency (IAEA) has organized a series of conferences and symposia on the safety of radioactive waste management. They have addressed the safety of radioactive waste management (Cordoba 2000), issues and trends in radioactive waste management (Vienna 2002) and the disposal of low activity radioactive waste (Cordoba 2004). This Tokyo conference is the latest in the series and the first held in Asia that focuses on the safety of radioactive waste disposal.

In the following, I will try to summarise the highlights of the Tokyo conference with special attention to evidence of progress and to international aspects.

THE GLOBAL RADIOACTIVE WASTE SAFETY REGIME

The entry into force of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management in 2001 was an important step forward in raising the importance of the subject at the international level. By becoming Contracting Parties to the Convention, countries have given legally binding commitments to manage their radioactive waste safely and in accordance with internationally established principles.

Participants at this conference discussed the benefits to be obtained from being part of the Convention and ways in which more countries could be encouraged to join - so that the Convention could become truly global and able to properly fulfil its objectives. The existing Contracting Parties and the IAEA were encouraged to be inventive and flexible in looking for ways to attract new countries.

There has been good progress, in the last year, in the development of international safety standards - with the publication of the long awaited standards addressing the subjects of (i) clearance of materials containing low levels of radionuclides from regulatory control and (ii) the safety of geological disposal. It was noted that the ways in which the standards are used by countries varies; some countries use the standards directly and incorporate them into their own regulations, while others use them as a basic reference for developing their regulations. The standards are increasingly seen as representing best practice in the field rather than as, often in the past, the lowest common denominator.

Various regional initiatives were seen as evidence of movement towards a global approach to safety, for example, the information networks established in Asia and Latin America and the increasing use, by countries, of the peer review services of the international organizations. In this regard, the proposal of Japan to expand the Asia Nuclear Safety Network to include radioactive waste management was welcomed by the conference.

INTERNATIONAL AND REGIONAL STRATEGIES

The most appropriate disposal solutions for the different types of radioactive waste vary depending on the nature of the waste and range from disposal on, or near, the surface to disposal deep underground. This is reflected in the IAEA's 1994 Classification of Radioactive Waste. However, the 1994 classification is far from being comprehensive and omits several important waste types; it is therefore scheduled for updating. As described at the conference, an input to this process, a common framework project has been under way for some time at the IAEA. It is aimed at determining, mainly from the perspective of hazard, the most appropriate disposal solution for each major waste type.

Many countries have comparatively small volumes of intermediate- and high-level radioactive waste. It would be disproportionately costly for each of them to develop its own geological repository. For this reason, studies have been initiated at a regional level, supported by the European Union, to examine the feasibility of a regional repository in which the waste from several countries could be placed. However, no potential site has yet been identified. The issue is sensitive for some countries because it is considered that it might undermine their own national disposal projects. On the other hand, regional repositories could be attractive from nuclear safeguards and security perspectives (and in line with such initiatives at the IAEA). The discussions at the conference reflected the division of opinion on this subject.

GEOLOGICAL DISPOSAL

The main popular focus continues to be on the geological disposal of high-level waste. The good progress of recent years towards achieving operational geological repositories is continuing in several countries and reports from three of them were made at the conference.

The technical discussions at the conference focussed on some of the remaining philosophical difficulties. In the context of geological disposal, because of the long timescales involved, it is not possible to demonstrate safety directly and recourse must be made to other, less direct, evidence. The approaches being used to make the "safety case" for these repositories and to improve confidence in it were discussed.

Providing for protection of the public at long timescales, far beyond the lifetimes of current generations, requires the use of predictive models and stylised scenarios to show compliance with radiological criteria. The subject is difficult and the existing international radiological guidance is being variously interpreted in different countries. The subject would therefore benefit from further international guidance.

NEAR SURFACE DISPOSAL

More than one hundred repositories of the near surface type are in existence in the world and they account for the main part, by mass and volume, of the disposed radioactive waste. They are used mainly for the disposal of low- and intermediate-level waste of short radioactive half-life. They vary in quality and some are currently being upgraded to bring them into compliance with modern standards.

The approach for designing near surface repository systems to achieve safety is well established. For such systems, compliance with the international radiological protection criteria can be achieved by a combination of engineered barriers and institutional controls to prevent inadvertent intrusion into the waste. This contrasts with the situation at the sites at which large volumes of waste from the mining and milling of radioactive ores or from other industries producing waste containing natural radionuclides have been deposited on the earth's surface. At these sites, the radiation exposure of local populations is often in excess of radiation protection limits for members of the public. Because of the large volumes, the practical protection measures which can be taken are limited. The international guidance on their safe management is not yet adequate and it was recommended that it should be improved based, in the first instance, on the experience described in one of the presentations at the conference.

INTERMEDIATE DEPTH DISPOSAL

Work on some types of disposal at intermediate depths (typically 50 to 100metres) was presented. It was emphasised that the safety principles and methods for assessing safety are no different from those used for other types of disposal.

Ongoing international projects to help remove the global problem of disused sealed radiation sources by the technique of borehole disposal were described. Although the approach promises to be much less costly than alternatives, such as near surface and geological disposal, it was stressed that safety would not be compromised and that international standards would be respected. An important next step for the general acceptance of the technique is for a borehole system to be licensed and then operated in one or more countries. There was general support for the approach as having the potential to solve a real problem existing in many countries in the world.

COMMUNICATING ON THE SAFETY OF RADIOACTIVE WASTE DISPOSAL

A lesson learned from the early years of radioactive waste disposal is that it is difficult to make progress with the development of repositories, and especially high-level radioactive waste repositories, without involving those who may be affected in the decision-making process. Several experiences of how the communications with affected parties have been managed in national projects were described during the conference. From these it is clear that it is now generally recognised that openness, trust and participation are all essential in such communication. The importance of using all available approaches and techniques for communication was also emphasised.

CLOSING REMARKS

At this conference a first attempt was been made to involve the public in an event of this type; the public have been allowed to attend in the sub-hall and, in addition, the events in the main conference hall have been made available on the Internet. However, to be honest, I don't think that many ordinary members of the public would be able to understand our discussions. Even the experts in this room feel the need to have a common and clear definition of terms, for instance "the safety case". I would like to point out that it is becoming more important for us to develop and use a special "language" or "languages" for communication with the public, with scientists and engineers of "the third body", as well as between ourselves. We also need to establish and train a group I will call "interpreters" or experts in communication with the public.

I believe that the discussions at this conference have been fruitful and that the exchange of information between you, the participants, will prove to be very useful for your future work. The conference has allowed us to review the current world situation in the field of radioactive waste disposal and to become aware of the progress and changes that have occurred in recent years. As a result of the discussions, some gaps and areas for improvement have emerged which have led to suggestions being made to the international organizations for additional work and guidance.

I think from this report it can be seen that, overall, it is a positive story; progress is being made – and soon, perhaps, radioactive waste will no longer be seen as an 'intractable problem'.

As you will be aware, radioactive waste disposal is a very important subject for Japan and you will have seen from the papers presented this week that a lot of work is going on here. Those of you who are going on the visits later today and tomorrow will be able to see some aspects of the work.

We have been very happy to host the conference in Japan and are pleased that it has been such a success.

Lastly, I would like to thank all participants, in particular the chairpersons, the keynote speakers and the panelists for their active contributions to the conference.

I would like to express my special thanks to Dr. Francois Besnus, who is the Chairman of the Programme Committee, and Mr. Yutaka Kawakami of Japan Nuclear Energy Safety Organization, who is the Chairman of the Local Organizing Committee, for their excellent preparation of the conference.

And also, I would like to express my special thanks to Mr. Phil Metcalf, Mr. Jan-Marie Potier and Mr. Mike Davies of the International Atomic Energy Agency and to Mr. Gordon Linsley, for their excellent secretariat work and to Ms. Hilde Schmid and Ms. Karen Morrison for their careful organization of the details of the conference.