International Conference on the Safety of Radioactive Waste Disposal

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Colleagues and friends:

It is a particular pleasure to welcome you to Tokyo and the IAEA/NEA International Conference on the Safety of Radioactive Waste Disposal. And to thank the Japanese government, NISA and JNES in particular for agreeing to host this important meeting. My opening address will be a somewhat longer than normal. Unfortunately one of our keynote speakers, who was to have provided the international perspective of radioactive waste safety issues, had to cancel at the last moment. So, I will both welcome you to the conference and provide this international perspective.

As Professor Ishigure has just mentioned, the conference could not be held in a more appropriate region of the world or at a more appropriate time. The world is experiencing record high energy prices, economic growth rates in the Asian region and associated energy demands are at unprecedented levels and concern continues to grow globally over the rate of emissions to the environment from the burning of fossil fuels for energy generation.

The increasing use of nuclear energy is becoming a reality. The Russian Federation intends to double its nuclear generating capacity by 2020; China plans nearly a six-fold expansion in capacity by the same date; and India anticipates a ten-fold increase by 2022.

Excellent progress has been made in upgrading safety of nuclear installations and their safety management since the unfortunate events at Three Mile Island and Chernobyl. To the extent, in many countries nuclear power stations are now being accepted as familiar industrial facilities.

Nevertheless, with this increasing utilization of nuclear energy comes the increased generation of radioactive waste. The generation of radioactive waste is not a new phenomenon, and the nuclear industry has been managing radioactive waste for over half a century. Yet the question continues to be asked by society at large:

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Can radioactive waste be managed and disposed of safely?

The concern remains over management of waste arising from normal operations, the ability to safety decommission facilities as well as the safety of disposal. These issues continue to give rise to societal concerns that must be addressed before people at large will feel comfortable with the large scale adoption of nuclear power and so the debate remains.

This conference will explore the question with a view to identifying what needs to be done further, at both national and international levels to ensure, and to provide assurances to all concerned parties, that the answer to this questions is undeniably,

Yes, radioactive waste can be safely managed and disposed of!

Provided of course that all the safety requirements are met.

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The conference will address the key issues related to the safety of radioactive waste management, including International and national perspectives and the Global [Waste] [Nuclear] Safety Regime, such as the Joint Convention, the International Radioactive Waste Safety Standards and national policies and strategies and their supporting legal and regulatory frameworks, safety cases.

It will look at disposal options and their safety, including near surface, geological and intermediate depths. It will also look at regulatory control, including the setting of standards, evaluating safety arguments and supporting safety assessments, establishing conditions of authorization, inspection and enforcement.

Finally, it will look at communicating safety by engaging the stakeholders, including academia, politicians, the media, environmental interest groups and the general public.

Based on the responses to these questions and the concrete findings of the conference on these issues, the Agency will review it’s programme of work and revise it’s action plan in the area of radioactive waste safety.

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So where does the IAEA fit in all of this? The Agency has three main roles. First, it provides secretariat support for the

international safety conventions. Second, it develops international safety standards and third, it assists Member States in the use and application of these safety standards. I will describe each of these in turn.

Since Chernobyl, everyone has recognized the importance of international cooperation in nuclear safety. The Agency continues to support a global nuclear safety regime based on both binding and non-binding international legal instruments, the IAEA Safety Standards and strong national safety infrastructures.

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One of the prime roles of the Agency in support of the Global Safety Regime is to administer the international safety conventions. These include the Convention on Nuclear Safety, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management or the Joint Convention, the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and the Convention on the Physical Protection of Nuclear Material.

The conventions are formal mechanisms with clear binding commitments and obligations, but also provide forums for expert communities to come together to contribute and enhance to the knowledge network on the safety of radioactive waste management.

The last 12 months have seen changes to many of these Conventions. With India’s accession to the Convention on Nuclear Safety, all countries operating nuclear power plants,

as well as many neighbouring countries, are now parties to the Convention.

The Competent Authorities for the Early Notification and Assistance Conventions met in July and agreed on important improvements, and the diplomatic conference on amendments to the Physical Protection Convention has resulted in profound changes, which will provide a solid basis for the future.

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More recently, internationally agreed instruments of a legally non binding nature have been introduced, such as the Code of Conduct on the Safety and Security of Radioactive Sources in 2003 and its related guidance on import and export in 2004, and the Code of Conduct on the Safety of Research Reactors in 2004. Due to their non-binding nature, Codes of Conduct may be introduced much faster than Conventions, as consensus can often be achieved without the prolonged and difficult negation process normally associated with the development of binding international conventions. However, with political commitment, a solid scientific basis and an open and transparent process for reaching consensus, and by the very character of their voluntary nature they can be just as effective at improving the level of safety everywhere.

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The Joint Convention was developed as a sister convention to the one on nuclear safety. The Chernobyl accident in 1986 had

so highlighted the global nature and importance of nuclear safety that countries involved and concerned with the nuclear industry had come together, negotiated and agreed to the Convention on Nuclear Safety: a commitment to achieve and maintain high levels of safety worldwide through international cooperation, and which came into force in 1994. The countries also agreed that the safety of radioactive waste, because of its potential long term and trans national safety implications, should also be the subject of a similar international treaty. Nevertheless they also agreed that such a treaty could not be formulated until there was international consensus on the fundamental safety principles for radioactive waste management.

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Adoption of the Radioactive Waste Safety Fundamentals in 1995 paved the way for such a development and negotiations started in the same year, 1995, culminating in adoption of the Joint Convention in 2001.

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The Joint Convention calls for a high level of safety to be achieved in the management of radioactive waste and spent nuclear fuel. It calls for safety to be assessed and for periodic peer review between countries that are members of the Convention.

Whilst the Joint Convention is a sister convention to the Convention on Nuclear Safety with many similarities, there are also some important differences.

Although only 30 Member States have operating nuclear power reactors, virtually all countries generate radioactive waste, which they must manage safely. This makes the Joint Convention relevant for all States, not only in terms of committing to the safe management of such waste, but also in enhancing the opportunities to assist, particularly developing countries, in all matters related to waste safety.

Another important difference is that the Joint Convention makes more specific reference to international safety standards. As such the Joint Convention has brought increasing attention to the waste safety standards as an international point of reference, particularly in respect of assessing the safety of radioactive waste management activities and facilities, including waste disposal facilities.

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The Joint Convention came into force June 2001 and is legally binding but incentive in nature, with a commitment to high levels of safety for individuals, society and the environment — now and in the future — in a sustainable manner. It is concerned with siting, design, development and operation. The Joint Convention requires assessment and demonstration of safety for both existing and new facilities and requires national regulatory control and international peer review.

The 1st Review Meeting of the Joint Convention took place November 2003 in Vienna and was attended by 350 persons from 33 countries.

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The review meeting revealed a wide variety of long term spent fuel and radioactive waste management policies, also legal and regulatory differences, and some concerns over regulatory resources and independence. It also identified some particular areas where international standards are still needed, with most countries supporting their use as a point of reference for interpreting the Articles of the Convention.A number of areas were identified for improvement by Contracting Parties for their waste safety programmes, including:

- Regulations
- Disposal facilities and long term strategies
- Improved control over disused sealed sources
- Addressing legacy waste and site remediation
- Improvements to storage facilities
- Improvements to existing disposal facilities

This November, the organizational meeting for the 2nd Review Meeting of the Joint Convention next May will be held in Vienna. The meeting will be preceded by an extraordinary meeting of the Contracting Parties in order to agree to amended rules for the administering the Convention. This reflects the efforts to improve the Conventions on an ongoing basis, where areas identified for improvement from the 1st Review Meeting and from the meetings of the Convention on Nuclear Safety are being addressed. Among the areas

considered to be of prime importance is the need to maintain the Conventions as “living” conventions between three yearly formal Review Meetings. Although this does require significant commitment of resources from both Contracting Parties and the Agency, the results can only be of benefit in assuring society at large that we are collectively fulfilling our commitments to the safety of nuclear facilities and in particular to the safe management of radioactive waste.

I remain concerned over the number of countries involved in the Joint Convention. Presently only 34 countries are contracting parties, although we are aware that Russia, China and South Africa are about to become Contracting Parties. This low level of participation level is difficult to rationalize since virtually every Member State must deal directly with radioactive waste and therefore has an interest in the safety of radioactive waste management. I urge representatives from countries which are not party to the Joint Convention to discuss with me or my staff possible assistance from the Agency in moving toward accession to the Convention.

The safety conventions provide the overarching commitment to nuclear safety on a global scale. However, this commitment must be realized in a coherent and consistent manner by all parties. Even before the advent of the safety conventions, the need for and potential usefulness of international safety standards as a global point of reference was recognized by the countries that established the IAEA. The Agency’s founding statute includes a mandate for the Agency 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.”

The process of developing safety standards for the management of radioactive waste started in the late 1950's and has evolved and developed continuously since that time. The evolution has reflected developments in the nuclear industry, sociopolitical developments and the increasing sophistication of the underlying philosophies on safety and risk management, together with ever increasing and improving scientific knowledge and technological development.

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The first waste safety standards published by the IAEA was "Radioactive Waste Disposal into the Sea", published in 1961. Many developments have taken place since that time.

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In 1972, the world community decided to stop disposal of radioactive waste into the sea in terms of the so-called "London Convention." Land-based disposal has become the adopted technological approach.

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Over one hundred near surface radioactive waste disposal facilities for shorter lived low and intermediate levels waste have been developed and operated throughout the world some are tens of metres below the surface.

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Considerable amounts of uranium mine tailings have been stabilized, often in situ, but in a few instances they have been moved to other locations before stabilization.

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Extensive research and development has taken place into geological disposal as an option for the disposal of long lived and high activity waste and a number of projects to excavate and operate such facilities are underway or in planning. One facility for long-lived waste has been developed and operates in the United States — the WIPP facility.

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Of significance in the development of safety standards, and not only in respect of waste safety but also for nuclear, radiation and transport safety, was the rationalization of the safety standards structure in the late 1980s. This led to the adoption of a hierarchy of standards headed by ***Safety Fundamentals***: basic safety principles, ***Safety Requirements:*** regulatory imperatives and ***Safety Guides:*** recommended good practice.

In the aftermath of the Chernobyl accident significantly more attention was given to the international safety standards and much more formal processes were adopted for their overall structure and for their development and approval. These

processes have not been static and indeed the past few years have seen in depth review of the standards and their use. This has led to the Board of Governors endorsing a vision and strategy for their future development and use in 2003.

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Achieving international consensus on the safety principles for radioactive waste management proved to be a long and difficult process. Nevertheless when agreement was reached and the ***Radioactive Waste Safety Fundamentals*** were adopted in 1995, it led to some developments that were to be of great significance.

First and foremost, the Safety Fundamentals provided a logical and coherent basis for future development of all the radioactive waste safety standards — the supporting Safety Requirements and Safety Guides.

As previously mentioned, it also enabled the process of establishing the Joint Convention to commence.

The suite of safety standards for the safety of radioactive waste management is well developed, but not yet fully complete. A recent significant achievement actually last month was the approval and adoption of the Safety Requirements for Geological Disposal by the Agency's Board of Governors and the Steering Committee of the NEA, a cosponsor of this standard. The Joint Convention has certainly focused attention on the waste safety standards leading to considerable improvements in their quality and usefulness. A full report on the waste safety standards will be presented later in the morning.

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The Agency undertakes a number of activities to assist countries with the use and application of safety standards for radioactive waste safety. Many of these activities provide for the development, expansion and management of knowledge on the safety of radioactive waste management by providing knowledge networks for the expert communities involved. In particular these activities involve arranging international coordination projects such as the development of safety assessment methodologies, organizing international conferences, workshops, symposiums, seminars, and presentation of training courses on waste safety and providing assistance to Member States in support of their radioactive wastes safety programmes and activities and conducting international peer reviews. The conduct of international peer review of the safety of radioactive waste management activities and facilities is one of the most powerful tools in safety assurance. A tool that can be employed both by organizations developing and operating facilities and by regulatory authorities.

Throughout the period when the Joint Convention was under negotiation and beyond, the Agency continued to support related developments in the waste safety area.

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In 2000 an international conference was convened in Cordoba, Spain, to consider issues that needed to be addressed at an

international level pending the Joint Convention coming into force,

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followed up by the Vienna Conference in 2002 and the Cordoba Symposium 2004.

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The conclusions from Cordoba 2000 led to the International Radioactive Waste Safety Action Plan, which was endorsed by the Member States of the IAEA at the 2002 General Conference and updated in 2003.

The Action Plan addresses the need for a common framework to provide a logical and coherent linkage of all radioactive waste types with disposal options, respecting international safety standards, technological realities, regulatory requirements and national policies. It also addresses the particular need linked to the common framework to identify suitable disposal options for disused sealed sources, waste with low levels of activity, long lived non-heat generating waste and waste containing naturally occurring radionuclides – and the possibility of regional solutions.

The plan also considers the need to address the implications of extended storage of radioactive waste, particularly the issues of safety and sustainability and the need to gain international consensus on the safety standards for Geological Disposal of

radioactive waste, which as I mentioned a few moments ago was finally achieved last month.

The plan addresses the need to develop a structured and systematic way ensure worldwide adoption and use of the international safety standards and the need to develop mechanisms to identify and preserve knowledge and information important to the safety of radioactive waste disposal, and to pass the information in to succeeding generations.

Finally, the plan addresses the need to involve all parties with a genuine interest in the safety of waste management facilities and activities in the decision-making processes on their development and operation.

Another group of activities undertaken by the Agency in support of the radioactive waste safety standards is the coordinated projects dealing with safety assessment methodology and its application.

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The 1990s saw a number of intercomparisons of safety assessment methodology, with widely differing outcomes. As a result projects, such as the Improvement of Safety Assessment Methodology or ISAM, were formulated to develop harmonized approaches to safety assessment for near surface radioactive waste disposal facilities. Following the successful development of consensus on safety assessment methodology in this area a follow up project, Application of Safety Assessment Methodology or ASAM, was put in place and is presently addressing issues such as application of safety

assessment methodology to heterogeneous waste, including disused sealed sources, mining waste, existing facilities, regulatory review and decision making, and common aspects such as uncertainty, limited data and the performance of engineered barriers.

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Here are some of the activities that are currently underway or foreseen in the near future. *[Note to TT. Pause to allow audience to read]*

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Here are some more activities. If we look at the Asia Pacific region, we can see progress in Australia, Republic of Korea, China and Japan. *[Note to TT, pause to allow audience to read]*

Nevertheless with society in general the question remains:

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Can radioactive waste be safety managed and disposed of?

The conference will explore the various dimensions of the question and hopefully we can all take away from the conference ideas to ensure that we are able to provide the positive answer that is needed in response to this broad societal concern.

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In particular we must consider the International/national perspectives and the Global Waste Safety Regime. What are their status value and benefit? Are they good enough? How can they be improved?

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We must consider disposal options and their safety. How should be design them? How do we provide for and demonstrate their safety? Is this good enough?

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We must look at regulatory control. Is the evidence available to convince the regulator? Does the regulator have the tools and resources?

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We must look at communicating safety. What has worked? What has not? How can we judge the adequacy? Are there some universal aspects, or is everything country specific?

The ambitious objective of this conference is to generate ideas on what we all can do to provide positive answers to all these questions. I give you my word that the Secretariat will give careful consideration to the outcomes and conclusion of the conference and these will focus our work programmes.

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In conclusion, I would like to wish the conference every success and I look forward to discussing the outcome and conclusions of the conference with you on Friday. I cannot end without mentioning that Tokyo is my home city and that I hope you manage to find some time to discover some of its highlights.

Thank you for your kind attention.