OPENING ADDRESS

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It is my pleasure, on behalf of the Director General, to welcome you to Athens and to formally open the International Conference on Lessons Learned from the Decommissioning of Nuclear Facilities and the Safe Termination of Nuclear Activities.

I am pleased that about 300 participants from 50 Member States are demonstrating interest and attending this conference.

I wish to use this opportunity to express the appreciation of the International Atomic Energy Agency (IAEA) to the Government of Greece, the Greek Atomic Energy Commission and the city of Athens for organizing and hosting this important international event and to Professor Camarinopolous for accepting the Presidency of the conference.

I would also like to thank the European Commission, the Nuclear Energy Agency of the OECD and the World Nuclear Association for their cooperation in the preparation of this conference.

This conference is being convened as a follow-up to the International Conference 'The Safe Decommissioning of Nuclear Activities', which took place in Berlin in 2002. That conference led to the approval of the International Action Plan on Decommissioning of Nuclear Facilities by the IAEA Board of Governors in 2004.

This year, the IAEA marks its 50th anniversary, which corresponds to the 50th anniversary of the peaceful use of nuclear technology in many IAEA Member States. Therefore, as mentioned by the Director General Dr Elbaradei during his opening statement at the General Conference in September this year, this is a time for reflection on international achievements and for the sharing of knowledge, experience and lessons learned. It is also a time to reflect on the continuing need for the enhancement of a common safety culture among all parties involved in the lifecycle of nuclear facilities.

With the end of life approaching for many facilities, the development and implementation of a holistic approach to decommissioning and the termination of nuclear activities is essential, not only for large nuclear facilities, but also — and in particular — for small facilities, for which resources and safety and security measures are limited. The holistic approach refers not only to the time dimension of the lifecycle of a specific facility, but also to the long-term sustainability of the whole system in the country and the region, including the possible recycling of material and multinational or regional cooperation. It should also comprehensively cover the technical, financial, social and political aspects of decommissioning.

For these reasons, it is extremely important to increase the awareness of operators, regulators, and governmental organizations of the lessons learned to date to ensure that the responsibilities for safe decommissioning and termination of activities are implemented until the release of sites from regulatory control. This is also of particular importance for legacy sites where clean-up is needed and often has to be implemented at times long before decisions are made about the release of the sites from regulatory control and about appropriate arrangements for radioactive waste management.

The decommissioning of facilities using radioactive material has been undertaken for more than 40 years and considerable experience has been accumulated. Decommissioning is the last step in the lifecycle of a facility, which — contrary to the previous steps of siting, design, construction, commissioning and operation — does not evoke a positive reaction in facility staff, nor often in other interested parties, due to the association with reduced employment opportunities and the generation of radioactive waste and spent fuel, with the concurrent need for their long term management.

Increased public awareness and the growing concern for safety and protection of the environment have amplified these issues and it is therefore not only important to demonstrate the safe decommissioning of facilities and termination of licences, but also to incorporate the lessons learned during the decommissioning in the design, construction and operation of new facilities, to communicate with the public and media, and to involve the stakeholders.

During the past few years we have also observed strong emerging signs of high expectations for the future nuclear power developments, often referred to as ‘nuclear renaissance’. However, I prefer to use the phrase ‘vita nuova’ from the first Anthology of Dante, written in his national language. Vita nuova may better reflect the new global dimension; improved technologies and new countries that will be involved, hence requiring new ways of thinking and meeting new challenges.

Furthermore, an increasing number of power stations are planned for construction and operation in the near future in countries with existing nuclear programmes, such as, Canada, China, Finland, France, India, Japan, the Republic of Korea, the Russian Federation and the United States, and new research reactors in Australia and China.

Uranium mining activities are increasing worldwide, for example, in Australia, Canada, Kazakhstan, Namibia, Niger, the Russian Federation and Uzbekistan. More than ten countries are planning to expand or resume uranium mining in the future.

It is vitally important that these plans for a new and re-invigorated nuclear power development worldwide are complemented by equally ambitious plans for establishing and enhancing effective and sustainable safety and security infrastructures, which include proactive measures to assure the safe decommissioning and termination of nuclear activities.

Decommissioning gives rise to particular safety and security concerns, and the importance of adequate planning, funding, regulatory control and measures to ensure safety and security during and after decommissioning become increasingly important as the number and types of facilities undergoing decommissioning increase.

Of the 442 nuclear power reactors in the world, 88 have been in operation for 30 to 40 years, 200 for 20 to 30 years, 109 for 10 to 20 years and 45 for less than 10 years. This means that 209 power reactors, about two-thirds of them, are expected to exceed their original 30 year design lifetime in ten years time.

At present, several large facilities are undergoing decommissioning in a number of countries; including Germany, Japan, Spain, the United Kingdom and the United States. Also, several nuclear power plants are to be decommissioned as a result of the end of their lifetime; for example in the Russian Federation, or as a result of their early shutdown in Bulgaria, Lithuania, Slovakia and Sweden.

Decommissioning is not only a matter for the organizations directly responsible, it is a shared responsibility with governments, communities and public officials. The timeframes involved can be decades, emphasising the importance of knowledge preservation and the transfer of knowledge to future generations. The removal of large amounts of material from sites for disposal as radioactive waste or through clearance mechanisms for recycling and free release also poses a significant challenge to all the parties involved.

Decommissioning activities

In recent years, a significant increase in decommissioning projects and activities has been observed, together with significant progress in those projects. In the United States alone, there are currently 16 nuclear power and early demonstration reactors, 14 research and test reactors, 32 materials facilities, 3 fuel cycle facilities and 12 uranium recovery facilities in different stages of decommissioning under Nuclear Regulatory Commission jurisdiction.

The picture in other countries is similar:

- The decommissioning of uranium production, enrichment and fuel fabrication facilities is underway in a number of countries, including:
  - The KAERI (Korea) uranium conversion plant;
  - The UK's Capenhurst diffusion plant;
  - The Siemens Fuel Element Facility in Hanau, Germany.
- Recent nuclear facility decommissioning activities include:
  - The US Department of Energy Rocky Flats Facility was decommissioned and closed in 2005 to become a wildlife refuge;
  - The decommissioning of the Maine Yankee pressurized water reactor in US was completed in 2005;
  - The José Cabrera-1 NPP Spain was shut down this year with plans to undertake preparatory activities for decommissioning;
  - The decommissioning of the Greifswald WWR NPP in Germany is continuing with the target date for completion in 2010;
  - The Stade PWR NPP in Germany has entered the second dismantling phase in February 2006;
  - An application has been made for a licence for the decommissioning of the Tokai Magnox NPP in Japan; and
  - Regulatory consent was given for decommissioning of the Dungeness Magnox NPP in UK.
- Notable progress in the decommissioning of research reactors has been achieved during the last year:

- Decommissioning of the 2000 W research reactor (DR-1) in Denmark was completed at the end of 2005;
- Two TRIGA type research reactors located at the German cancer research centre in Heidelberg were completely decommissioned and released from regulatory control in 2006;
- A licence application is being prepared for the immediate dismantling of the research reactor FRJ-2 at Jülich (Germany); and
- The decommissioning of the CIEMAT Research Centre is being planned, including the research reactor JEN-I, a pilot reprocessing plant, a fuel fabrication facility, a conditioning plant for liquid waste and a liquid waste storage facility.

- Decommissioning of many small facilities has also taken place. Examples of recently finalised projects can be found:
  - In France this year after successful decommissioning of the Cadarache irradiator installation, the facility was released from regulatory control, and
  - In 2005 in the USA the NRC completed decommissioning actions at seven non- reactor materials sites.
- Developments have also taken place in recent years on national policies and strategies for decommissioning in several countries; including:
  - The French nuclear regulatory authority is fostering immediate dismantling as the preferred option, which has resulted in reconsideration of the planned decommissioning activities for nine of the EDF reactors expected to be decommissioned before 2025;
  - In 2005, the Nuclear Decommissioning Authority was established in the UK with responsibility for managing all nuclear legacy sites;
  - The regulatory approach in France as revised in 2003 has been implemented this year in the licensing of the decommissioning of the Brennilis 70 MWe heavy water reactor and the decommissioning of the first French PWR prototype of 350 MWe reactor (Chooz A). At present only one licence for decommissioning is required in France, while in the past a separate licence was required for each decommissioning phase;
  - The Ukrainian Council of Ministers issued a decree establishing a national fund for decommissioning of its WWER reactors which will facilitate the early planning and future safe termination of these facilities;
  - Canada has taken a decision to invest over 500 million USD during the next five years in the cleanup of legacy sites where research and development activities have taken place, some which dated from the period 1940-1960; and
  - The Russian Federation is also planning to spend several billions of USD on the decommissioning of nuclear facilities between 2008 and 2015. More than 100 nuclear facilities in Russia have already been shut down for various reasons and are awaiting decommissioning.

So what have we gained from all these experiences of the past forty years? In the words of the Greek philosopher Aristotle “What we have to learn to do, we learn by doing”. Indeed the experience and knowledge gained during the implementation of these and other

decommissioning projects worldwide is a valuable source of knowledge that can be gathered and shared among experts from operating organizations and regulatory authorities in order to improve decommissioning projects and increase protection of workers, the public and the environment for ongoing and planned future decommissioning projects. Experience, both good and bad, provides an opportunity for learning, particularly in respect of how to:

- Increase safety during decommissioning;
- Improve processes for the clearance of material from regulatory control;
- Improve site clean-up activities and facilitate the re-use or release of sites from regulatory control;
- Improve the selection of appropriate decommissioning technologies; and
- Incorporate lessons learned from decommissioning in new designs and operation of nuclear facilities.

The IAEA has been assisting Member States around the world in sharing their practical experience and the lessons learned from decommissioning projects at facilities with different designs, complexities and hazards, using different decommissioning strategies and within different legal and regulatory frameworks. The IAEA technical reports have documented decommissioning experiences since the 1970s.

The increase in these activities in recent years has resulted in the development of internationally agreed safety standards, the application and use of these standards in national decommissioning programmes, and more recently, the establishment of international legally binding instruments such as the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention).

Recent developments in international safety standards

With regard to the recent developments in the safety standards relevant to decommissioning, a major milestone in 2006 was the publication of the new 'Fundamental Safety Principles'. It states that the fundamental safety objective is "to protect people and the environment from harmful effects of ionizing radiation". The fundamental safety objective applies to all circumstances that give rise to radiation risks. It also stipulates ten associated safety principles, and briefly describes their intent and purpose. The safety principles are applicable, as relevant, throughout the entire lifecycle, including decommissioning, of all existing and future facilities and activities.

The safety fundamentals are complemented by a new Safety Requirements 'Decommissioning of Facilities Using Radioactive Material' that was published just one month ago. This standard establishes clear requirements for the planning, implementation and termination of decommissioning activities. It applies to all facilities and decommissioning strategies — immediate dismantling, deferred dismantling and entombment. It recommends immediate dismantling as the preferred option, recognising, nevertheless, that for some countries deferred dismantling is a justified option. It requires development of a final decommissioning plan at least two years prior to the planned shutdown. The existing safety guides on decommissioning of nuclear power plants, research reactors, fuel cycle facilities, and research facilities are planned to be revised in the near future, based on the new safety requirements.

A new Safety Guide on the 'Release of Sites from Regulatory Control on Termination of Practices' was published in November 2006. It provides guidance on the release from regulatory control of land, together with associated buildings and structures, for either unrestricted or restricted use. It provides recommendations for the cleanup of sites, where this is necessary, prior to site release. The guide also provides recommendations on the introduction of a new practice on a previously released site. This guide complements the Safety Guide on 'Application of the Concepts of Exemption, Exclusion and Clearance' that was published in 2004.

The only safety standard related to decommissioning that is presently under development is entitled 'Safety Assessment for Decommissioning of Facilities Using Radioactive Material. This guide provides specific recommendations on the approach for the development and review of safety assessments.

Application of the safety standards

According to its statute, the Agency also provides assistance to Member States in the use and application of safety standards through a number of mechanisms, including appraisal services, training, research and development, technical cooperation and exchange of information. From the implementation of these mechanisms in the field of decommissioning of various facilities worldwide, a number of lessons have been learned:

Specific areas where assistance is still needed by Member States are:

- The establishment of national policies and selection of strategies for decommissioning;
- Ensuring a proper interface between site specific strategies for management of spent fuel, waste management and site release and national policy;
- The development and review of decommissioning plans for existing and new facilities;
- The establishment of adequate and effective funding mechanisms and performance of cost estimates for decommissioning;
- The implementation of decommissioning strategies in the absence of waste management options and capacities;
- The development and review of safety assessments;
- Human resource development and project management, particularly in countries with limited human and financial resources;
- The maintenance and preservation of knowledge on safety aspects related to the transition from operation to decommissioning, and also during and after decommissioning; and
- The development, implementation and review of security measures.

The IAEA is working both at national and regional levels to enhance safety during decommissioning in Member States through its regular programme, its technical cooperation programme and also through a number of relatively new international projects. These projects

are supported by participants from a large number of countries willing to share their experience and knowledge on decommissioning. In particular these programmes include:

- The project on Evaluation and Demonstration of Safety during Decommissioning of Nuclear Facilities (DeSa) that started in 2004;
- The Research Reactor Decommissioning Demonstration Project (R^2D^2P) in the Philippines that commenced in June 2006; and
- The decommissioning of the Former Nuclear Complex in Iraq.

The IAEA is also considering the establishment of a network of decommissioning centres in different regions as a tool for sharing of knowledge on decommissioning.

The Joint Convention

It is important to note that the Joint Convention, as a legally binding international instrument, is relevant to decommissioning. In particular Article 26 requires that:

"Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility."

Such steps shall ensure that qualified staff and adequate financial resources are available; the provisions with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied, the provisions with respect to emergency preparedness are applied; and records of information important to decommissioning are kept."

During the Second Review meeting of the Contracting Parties that took place in May 2006 in Vienna, 41 Contracting Parties discussed the status of waste, spent fuel and decommissioning safety in their countries. As a result of these discussions, several conclusions related to decommissioning were outlined in the President's report:

- "All Contracting Parties are committed to address spent fuel and waste management in a comprehensive manner. Many Contracting Parties have already developed, or are currently developing, spent fuel and waste management strategies based on increasingly comprehensive inventories, including spent fuel and waste arising, or to arise, from decommissioning.
- Many Contracting Parties, especially those having nuclear power plants, have established funding schemes for decommissioning.
- Contracting Parties' strategies vary from immediate decommissioning (i.e. starting from 0 to about 10 years after final shutdown) to delayed decommissioning after a long safe enclosure phase. Keeping the knowledge and memory of the installation (normal operation, modifications, incidents, etc.) was recognized as being of crucial importance, especially in the case of delayed decommissioning.
- The subject of exemption and waste clearance was discussed. There is, for the time being, no international consensus on the use of clearance levels. Many Contracting Parties are implementing clearance criteria on a generic basis or on a case-by-case basis. Public acceptance and a clear radiation protection concept are key issues for the success of using clearance levels."

I am pleased to inform you that since the Second Review Meeting, China and South Africa deposited their instruments of accession on 13 September and 15 November 2006, respectively and the number of Contracting Parties to the Joint Convention at present is 43. However, there remain more than 100 Member States that are not yet party to the Joint Convention. All Member States would greatly benefit from sharing experience and enhancing cooperation in the areas of decommissioning through participation in the Joint Convention. I strongly urge those countries that are not part of the Joint Convention to take necessary measures to do so.

International Action Plan on Decommissioning of Nuclear Facilities (2004)

Providing for the exchange of information and knowledge sharing, including that from decommissioning projects, are important activities of the IAEA. The Berlin Conference of 2002 provided an opportunity for the discussion of various safety aspects concerned with the decommissioning of different types of facilities, and at the same time it identified areas where the IAEA could assist Member States in the decommissioning and termination of practices.

A number of issues identified at the Berlin conference were reflected in the International Action Plan on Decommissioning of Nuclear Facilities that was approved by the IAEA Board of Governors in June 2004. Since then, the IAEA has been working on the implementation of the ten main areas:

- Review of the magnitude of future decommissioning activities;
- Safety standards on decommissioning;
- Safety assessment for decommissioning;
- Decommissioning of research reactors;
- Management of decommissioning waste;
- Information exchange of lessons learned from decommissioning;
- Funding mechanisms for decommissioning;
- Release and reuse of material, sites and buildings;
- Long-term preservation of information; and
- Addressing stakeholder involvement and social issues.

Progress will be reported during this conference.

The deliberations of the conference this week are important for the identification of additional potential areas for action related to decommissioning and, for example, I have already noted the importance of using the feedback from decommissioning experience to influence and improve the future design, construction, operation, maintenance and security of facilities. The results of the conference will be taken into account in the review and revision of the International Action Plan next year.

Main objectives and expectations from the Athens conference

Based on the wide range of completed, ongoing or planned decommissioning projects worldwide, and international activities related to decommissioning undertaken at national and international levels, extensive experience has been accrued; lessons have been learned and feedback has been obtained from the planning, implementation, regulation and termination of decommissioning activities.

The IAEA, together with the European Commission, Nuclear Energy Agency of the OECD, World Nuclear Association and the Government of Greece, has organized this international conference to share experience and the lessons learned with the objectives of improving, facilitating and increasing safety and also of improving ongoing and future decommissioning projects.

More specifically, during this week we aim to discuss experience in a number of sessions covering:

- Global Overview – Harmonisation of decommissioning approaches *(Session 1)*
- Regulation of decommissioning activities *(Session 2)*
- Planning of decommissioning activities (*Session 3)*
- Implementation of decommissioning activities (*Session 4*)
- Management of waste and material from decommissioning projects (*Session 5*)
- Decommissioning technologies (session 6)
- Social and economic aspects (*Session 7*)
- Decommissioning of small facilities (*Session 8*).

As one of the contributed papers appropriately quoted, the Mediterranean philosopher Galileo Galilei said “You cannot teach people anything. You can only help them discover it themselves.” This conference aims to help each one of us to discover the optimum and most adequate way to the safe decommissioning of nuclear facilities and the safe termination of nuclear activities. I expect that the findings of this conference will lead to the revision of the International Action Plan, reflecting the latest knowledge and rich experience accumulated and giving a clear direction for future international cooperation in the field of decommissioning in the coming years. They may also provide useful guidance for a more effective peer review process of the Joint Convention in the area of decommissioning.

Before concluding, I would like to thank the speakers, panellists, chairmen, rapporteurs, and all participants for attending this important conference and to wish all of you success.