

**International Conference on
Remediation of Land Contaminated by Radioactive Material Residues**

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Opening remarks by
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Your Excellency, Mr Minister, Mr Mayor, On behalf of all of us I would like to thank you very much for the warm welcome that we have received coming to Astana this week and for the excellent preparations for this International Conference.

Ladies and Gentlemen. Dear Colleagues. We have come to Astana to discuss the challenges involved in the remediation of lands contaminated with radioactive residues, which is an international problem. In the past many industries, such as uranium mining, were often developed without deep consideration of environmental issues in the overall planning and implementation of their operations.

Many of these industries operated in an environment that did not have appropriate or effective environmental laws and regulations. As a result, many contaminated sites have been created. Other nuclear activities, e.g. defence programs and the Cold War legacy, as well as nuclear and radiological accidents, such as Chernobyl and Goiania, also created important legacy sites.

Such sites can lead to undesired health effects for members of the public and the environment. The objective of environmental remediation is to mitigate the radiation exposure from existing areas of contaminated land to reduce exposures now and in the future. The main goal is, if possible, to release the land for unrestricted use, which means the total removal from the regulatory control.

However, there are situations in which the removal from regulatory control cannot be practically achieved. Once the cause of unacceptable risks to man and environment are removed, restrictions on access and use of the area shall be established and long-term stewardship schemes need to be put in place. It is important to remember that remediation can be done not only by removing the contamination itself but also through other actions that prevent the contamination to influence human and non human biota.

From the perspective of Radiation Safety two main principles govern the decision making of any remediation program. Firstly, the **justification**, the implementation of the remediation program shall produce more good than harm; and secondly the **optimization**, working to ensure that the residual doses will be as low as reasonably achievable, social and economical factors taken into account. Therefore when selecting an optimized remediation option, a wide variety of factors need to be considered.

The need to address radiological liabilities has gained considerable momentum since the end of the Cold War. However, in many Member States remediation programmes have made little progress beyond the assessment and/or planning stages. One reason for this is that the costs of remediating contaminated sites can be very high and in many cases these costs cannot easily be met, even by the State. Just to give you an example of the costs involved on environmental remediation projects in the USA more than \$ 5 billion are spent per year on activities related to environmental remediation.

In many cases remediation might require that resources would need to be diverted from other priority actions for improving the environmental conditions of a particular site or region. It is thus critical to develop remediation projects together with all interested parties and in particular with the local communities.

Today with increasing activity in uranium production the challenge for the international community will be to avoid that new legacy sites are created. This can be achieved through the development of sustainable good practices and stewardship principles throughout the global uranium production industry. There is a need for active promotion of the concept of lifecycle planning at the early stages. This is valid for all projects be they remediation of legacy sites, establishment of new developments, such as uranium mines and NORM industries or, re-development of legacy sites for renewed production of radioactive minerals that has become an option in the current upsurge of uranium mining activity. Also the development of a widespread safety culture and the building of infrastructures and competences are key factors.

The present situation in the Central Asian countries is an illustrative example. One of the reasons that this conference is taking place in Kazakhstan is to highlight the need to find a viable and effective architecture to address the remediation of the existing legacy sites, which have resulted from the inappropriate development of several uranium mining and milling operations. The mining enterprises that extracted uranium and rare earth elements for over 50 years in Central Asia left behind very large amounts of industrial waste, including radioactive residues.

Recent initiatives by the IAEA for the former uranium mining and production activities in Central Asia include cooperation and communication with other international organisations. We expect that improved coordination among affected countries and international organizations could result in a regional initiative to tackle health and environmental consequences of these legacies.

Meanwhile, the IAEA provides comprehensive assistance at both national and regional levels with the aim of upgrading institutional capabilities. So far, the main focus of this assistance is on upgrading regulatory control, and expanding environmental monitoring and laboratory analysis capabilities in full compliance with the International Safety Standards. In the future the emphasis will shift to helping the States to fully implement environmental remediation programs.

Another very important case of environmental remediation deals with the Chernobyl accident that took place in 1986. It resulted in a vast release of radionuclides to the environment. The Chernobyl Forum, which was an initiative grouping together the 3 affected countries and 8 United Nations organizations, completed its tasks in 2005 and issued consensus reports on health, environmental, social and economic consequences of the Chernobyl accident. The forum also provided direction for future actions and in particular for the remediation of contaminated territories, decommissioning of the Chernobyl NPP and management of radioactive waste resulting from these operations. As a follow up, the IAEA started a regional programme of technical cooperation on the remediation of agricultural land and supports the Ukraine in decommissioning planning and radioactive waste management.

As we all know, there have been other activities that resulted in contamination of extensive areas. Former nuclear weapons testing programmes have radiologically contaminated large portions of territories in many places. Here, in Kazakhstan, there are still 16,000 km² where public use is restricted. The IAEA has provided an independent assessment of the radiological situation of some of these former test sites and is prepared to continue to support its Member States in assessing present and future radiological threats and in planning the remediation of these sites.

The IAEA has thus been working worldwide to assist Member States with their efforts to come to grips with the important task of remediating radioactively contaminated sites. A range of activities are ongoing, primarily national and regional Technical Cooperation projects. However, the IAEA is not alone in working to alleviate this situation. Other agencies and organisations have also been working on these same issues. In recent times there has been a major effort for Central Asia to bring all these players together and work with all the affected nations to better coordinate and complement the many aspects of the several programmes involved. This will culminate in a series of meetings later this year with the objective of producing a Framework Document that will bring all the issues together in one place so that a common approach can be taken to obtain the necessary funding for the remediation of these sites.

But, let us remember that environmental remediation programs are not only constrained by the lack of financial resources. Technical and Non-Technical factors including appropriate program management, socio-economic issues and changing regulatory regimes have also contributed to the slow pace at which clean-up projects are being implemented. The lesson learned is also that strong involvement at government level is essential.

From the regulatory perspective, legal instruments applicable to clean-up requirements for groundwater and soil are evolving. One needs to keep track of these changes as new regulations or improved international standards may affect the selection of clean-up strategies and techniques. Legal requirements will determine the standards and levels of compliance to be achieved. Such standards need to take into account updated scientific evidence. The policies and regulatory frameworks are essential to provide assurance to members of the public that they are being adequately protected. This will be discussed in Session 3.

Technologies must continuously evolve to bring solutions to existing problems in a cost-effective way and to achieve compliance with regulatory standards. Some of the commonest technologies used can be ineffective in meeting modern regulatory standards. A close follow-up of the performance of innovative technologies is thus essential. But it should also be noted that remediation implementers are sometimes reluctant to promote innovative technologies on a commercial scale, partly owing to the risk that innovative technologies may fail to perform as predicted. Session 4 will provide some good illustrations.

Every remediation project is composed of separate tasks which are prioritised to assist in planning and to optimise use of resources. These tasks will vary significantly in size and scope. It may be, from time to time, efficient to catch the less costly “low hanging fruits” first to bring immediate relief to the most important problems, without impacting the long term objectives. It is important to ensure in the planning that the best will not become the enemy of the good.

For these and other reasons, the involvement of different stakeholders in the decision making process has become more and more relevant. Stakeholders may include local communities, NGO's with national, regional or international outreach, in addition to regulatory authorities and other relevant authorities. Failing to obtain complete stakeholder involvement in environmental remediation programs will usually result in unnecessary delays and higher costs in project implementation. Session 5 will touch upon these aspects.

The scope of environmental remediation has increased dramatically lately. A series of study-cases will be presented during Sessions 6 and 7 and in the Poster Session, to give you an overview of various environmental remediation programs in different countries, representing different regions in the world. It is not only uranium mining, weapons testing and nuclear scientific applications that have given us the contaminated sites. Some radiological problems may have arisen as a consequence of non-nuclear activities, for example as a result of the so called NORM-industries.

What is the role of the IAEA in all this? The key role of the Agency is to assist Member States with the planning, development, implementation, maintenance and continuous improvement of programmes and activities. The IAEA provides support in the form of guidance documentation, technical advice and training. The guidance may be found in the IAEA documents including Safety Standards and Safety Reports, Technical Reports and TECDOCS. The technical advice and training is mainly provided through Technical Cooperation Programmes or bi-lateral assistance agreements. By taking full advantage of these opportunities a Member State should be able to avoid creating new legacy sites as well as achieving a significant decrease in the costs associated with extensive and long lasting environmental remediation programs.

The IAEA recognizes however that new mechanisms and means of experience exchange and information transfer must be put in place. For this reason the IAEA is establishing

networks in different areas such as decommissioning, waste disposal and specifically in the scope of this conference, environmental remediation – *The ENVIRONET* – will be presented during Session 8.

This conference creates a good opportunity to discuss the relevant issues relating to the environmental remediation of radioactively contaminated sites. It follows on from the environmental remediation conference that took place 10 years ago in Arlington, USA and will allow you to discuss the achievements, the successes, the failures and the lessons learned, as well as the new challenges that have emerged since that time.

The conference will also provide a forum for discussions on financing mechanisms and support for international or multi-lateral organization of environmental remediation programmes; regulatory and safety issues; mature and innovative technologies; life-cycle planning and non-technical issues in environmental remediation;

As a result, it is expected that the conference will encourage and assist the establishment of different partnerships; reveal synergies that can help in the full implementation of environmental remediation projects; and provide a forum for improved coordination among the international organizations that support environmental remediation programs, especially in this region.

Finally, the conference will allow the IAEA to collect ideas for its programme and for the assistance the IAEA gives to its Member States.

I wish you all a fruitful and rewarding conference with good and intensive discussions both here and in the coffee breaks.