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**“Scientific, Legal, and
Socio-Political Dimensions in Radioactive Waste
Management”**

**Remarks of
Greta Joy Dicus, Commissioner
United States Nuclear Regulatory Commission**

at the

International Conference on the Safety of Radioactive Waste Management

**March 13 - 17, 2000
Cordoba, Spain**

Good afternoon everyone. It's such a pleasure for me to be in Cordoba, a place that houses such great beauty and a warm Spanish culture. I would like to begin by first extending my appreciation to the Spanish Government for hosting this very important conference, and second, to welcome all experts participating in this week's events. With the number of Member States present here today, as well as those States that are not present, but are contracting parties to this Treaty, it is clear that the international nuclear community has a sincere collective interest in establishing and implementing a sound infrastructure to safely manage our legacy and future spent nuclear fuel and radioactive waste inventories. We are all here because we recognize that it is our international responsibility to safely manage radioactive wastes in a way that reasonably assures adequate protection to our workers, our public, and our environment for our present and future generations.

Of equal importance, we are also here to discuss the fundamental infrastructure essentials for establishing, implementing, and integrating related policies, laws, technology, and science, as well as socio-political aspects, such as public outreach, public confidence, and transparency. We've had the pleasure today of hearing from several distinguished presenters on portions of these very issues, and my particular topic, "**Scientific, Legal, and Socio-Political Dimensions in Radioactive Waste Management,**" provides a comprehensive programmatic roadmap that addresses the essential fundamental elements for developing and implementing a technically sound, open, and objective radioactive waste management program.

Since the beginning of the twentieth century, research and development in the field of nuclear science and technology has led to wide scale applications in research, medicine, industry and in the generation of electricity by nuclear fission. In common with certain other human activities, these practices generate waste that requires management to ensure protection of human health and the environment now and in the future, without imposing undue burdens on future generations. Radioactive waste may also result from the processing of raw materials that contain naturally occurring radionuclides. To achieve the objective of safe radioactive waste management requires an effective and systematic approach within a legal framework within each of our countries, in which the roles and responsibilities of all relevant parties are defined. Each Member State needs to have a national framework that sets forth the necessary and sufficient elements and requirements for radioactive waste management.

As a contracting party to the Joint Convention, Member States in which radioactive waste exists shall have a national policy for the management of this waste to ensure that acceptable levels of protection for human health and the environment, now and in the future can be adequately achieved without imposing undue burdens on our future generations. National strategies to implement this policy also will need to be developed and will depend on related national circumstances, structures, and priorities, and the diversity in the types of radioactive waste. The objective of these strategies is to ensure that within the Member State, the components of a comprehensive radioactive waste management system are established. This should include both an operational capability for dealing with the waste and an independent regulatory capability for controlling the way in which it is dealt with. For the operational capability, appropriate facilities and operators are required. For the regulatory capability, a Member State must have a legal framework and a regulatory body to enforce compliance with legal requirements. The use of the term "system" does not necessarily imply a single centralized system within the Member State. It is a summation of all individual components, such as, laws, policies, strategies, regulatory organizations, facilities, and operators, that are required in order to comprehensively manage these wastes.

However, it is recognized that the extent to which the components of a national radioactive waste management system are developed will vary from country to country depending upon national needs, and parts of that system may be implemented in cooperation with other countries and international organizations, but the essential requirements of a radioactive waste management system should include the following:

- ❑ identification of the parties involved in the different steps of radioactive waste management, including waste generators and their responsibilities;
- ❑ a rational set of safety, radiological, and environmental protection objectives from which standards and criteria may be derived within the regulatory system;
- ❑ identification of existing and anticipated radioactive wastes, including their location, radionuclide content, and other physical and chemical characteristics;
- ❑ control of radioactive waste generation;
- ❑ identification of available methods and facilities to process, store, and dispose of radioactive waste in an appropriate time-frame;
- ❑ taking appropriately into account, interdependencies among all steps in radioactive waste generation and management;
- ❑ appropriate research and development to support the operational and regulatory needs; and
- ❑ the funding, structure, and allocation of resources that are essential for radioactive waste management, including decommissioning, and where appropriate, maintenance of repositories and post-closure surveillance.

Additionally, Member States must also address needs for public information and consider issues related to public consultation with respect to the overall management and disposition of these wastes.

As I've just summarized the global framework of the Joint Convention infrastructure, I'm now going to discuss these same elements on an individual basis, and with respect to radioactive waste management responsibilities associated with a State Party to the Joint Convention. The detail provided in each element is not an item-by-item delineation of what requirements are specifically needed by all Member States, but an overview of fundamental essentials that should be considered when developing and implementing a comprehensive waste management program.

1. Establishing and Implementing a Legal Framework

Radioactive waste should be managed within an appropriate national legal framework including clear allocation of responsibilities and provision for independent regulatory functions. The legal framework consists of the necessary laws and subsidiary legal requirements, such as regulations for example. The specific components of this framework will vary from country to country depending on the political structure, governmental organizations involved, national legislation, regulatory practices, types and amounts of radioactive waste, and the level of technical development. The national government or the government of a sub-national region should take direct responsibility for some or all of the related waste management activities. To achieve safe radioactive waste management, the legal framework should include the following:

- ☞ safety, radiological, and environmental protection objectives;
- ☞ a regulatory system, including licensing or other authorizations, as appropriate;
- ☞ an appropriate level of institutional control;
- ☞ enforcement of legal requirements;
- ☞ definitions and classifications of radioactive wastes;

- ☞ quality assurance;
- ☞ documentation and reporting;
- ☞ emergency planning; and
- ☞ appropriate public information and consultation.

2. **Establishing a Regulatory Body**

A regulatory body should be established or designated that has the responsibility for independently carrying out the regulatory function with regard to safety and the protection of human health and the environment. This body should be empowered to enforce legal requirements related to all aspects of radioactive waste management in cooperation with other government agencies or departments where appropriate, and also be empowered to issue, amend, renew, suspend or cancel licenses or authorizations, or to recommend such actions to the government. An important condition for the proper exercise of the regulatory function is its effective independence from operating organizations, designers, vendors, and constructors involved in waste management activities. This is necessary so that regulatory judgements may be made, and enforcement actions taken, without influence from interests that may compete with safety.

The organizational structure and size of the regulatory body will typically take into account the following elements:

- ☞ the legal and administrative system of the Member State;
- ☞ the amounts and types of radioactive waste;
- ☞ the complexity of nuclear applications;
- ☞ the requisite technical disciplines to adequately evaluate proposed nuclear applications resulting in waste generation;
- ☞ the organization and structure of waste generators and operators of radioactive waste management facilities; and
- ☞ the need to ensure the independence of the regulatory body.

3. **Defining Responsibilities of Waste Generators and Operators of Radioactive Waste Management Facilities**

The roles and responsibilities of waste generators and operators that process, transport, store, or dispose of radioactive waste need to be clearly defined. The responsibility for the safety of these waste management activities should be assigned to the waste generators and operators.

Interdependency among all involving waste generation and management should be appropriately taken into account. The basic interdependent steps included in radioactive waste management, depending on the type of waste, are pretreatment, treatment, conditioning, storage, and disposal. It is essential that those responsible for a particular waste management process step or operation adequately recognize interactions and relationships, so that overall safety and waste management effectiveness can be balanced. This also includes taking into account waste stream identification, characterization, and transport implications. Conflicting requirements that could compromise operational and long-term safety should be avoided, and as far as reasonably practicable, the effects

of future radioactive waste management activities, particularly disposal, should be taken into account when any one waste management activity is being considered.

4. Providing for Adequate Resources

Appropriate steps should be taken to ensure that adequate financial, human, and technical resources are made available or will be provided to support the radioactive waste management system, so that it can operate in an orderly, effective, and efficient manner.

5. Enforcing Compliance with Legal Requirements

It is the responsibility of the regulatory body to monitor and enforce compliance with the established legislative and statutory framework for safety and environmental protection. No other responsibility assigned to the regulatory body should jeopardize or conflict with this mission. In fulfilling this responsibility, the regulatory body should implement the licensing process and in cooperation with other government agencies or departments, conduct the following, as appropriate:

- ☞ develop and update rules, criteria, guidelines, and other related documentation that are required to implement the legal framework;
- ☞ take appropriate steps to ensure that activities generating radioactive waste will not be started without provisions for suitable and sufficient storage capacity on an appropriate time-scale;
- ☞ ensure that financial resources are made available for future decommissioning and restoration activities;
- ☞ develop a system of technical performance indicators that encompasses safety thresholds and non-compliance situations; and
- ☞ take the necessary steps to ensure that adequate records of radioactive waste management facilities or sites are maintained for an appropriate period of time.

6. Implementing the Licensing Process

The regulatory body has the responsibility to review, approve, or reject applications and to issue, amend, modify, suspend, cancel, or otherwise act upon plans, licenses, or other authorizations, or to recommend such actions to the government. Licenses or other authorizations should include clear, unambiguous, and technically sound and legally enforceable requirements and conditions governing the established radioactive waste management activities. In implementing the licensing process the regulatory body should consider the following:

- ☞ reviewing environmental impact and safety related documentation, such as preliminary and final safety analysis reports, for example;
- ☞ implementing a comprehensive and complementary inspection program for monitoring and evaluating licensee or operator performance, and for enforcing regulatory and license

- requirements ; and
- ☞ requiring operators or licensees to take compensatory or corrective measures when necessary and in an appropriate time-frame.

It is important that the license approval, amendment, modification, and cancellation process, as well as the inspection program be implemented in a fair, consistent, and independent manner.

7. Advising the Government

Where appropriate, the regulatory body should make recommendations to the relevant governmental authority regarding the development and implementation of national policy, strategies, laws, and objectives to ensure consistent and continuous safe radioactive waste management.

8. Managing Radioactive Waste Safely

Waste generators and operators of waste management facilities should keep the generation of these wastes to the minimum practicable. Suitable facility and process design, operation, decontamination, and decommissioning activities are essential for establishing and implementing a safe, sound, and efficient waste management program. Interdependencies among all process or operation steps should be appropriately considered. Overall safety rests with the operator's and/or licensee's who have the responsibility to address and are accountable for the following:

- ☞ performing safety and environmental impact assessments;
- ☞ demonstrating the required level of safety, to ensure adequate protection of the workers, the general public, and the environment, including emergency plans and procedures;
- ☞ ensuring that suitable staff, equipment, facilities, and training and operating procedures are available to safely perform essential operations;
- ☞ establishing and implementing a quality assurance program;
- ☞ establishing and maintaining records of appropriate information regarding the generation, processing, storage, disposal, and transaction inventories of all radioactive wastes;
- ☞ providing surveillance and control as required by the regulatory body;
- ☞ collecting, analyzing, and, as appropriate, sharing operational experiences to ensure continued safety improvements; and
- ☞ conducting or otherwise ensuring appropriate research and development to support operational needs.

9. Public Consultation and Participation

The regulatory body should include those public citizens who have a vested interest, as well as other interested parties, in the overall regulatory development and licensing process, and make available to the general public, all related non-secure or sensitive licensing, inspection, and enforcement information. The objective of this important step is not try and please every individual, but to demonstrate that the regulatory body and process operates in a fair, objective, and independent manner, and can reasonably ensure adequate protection of public health and safety, and

the environment. This approach will help build public trust, gain public confidence, and demonstrate that the regulatory process is being carried-out in a transparent manner. Establishing and implementing formal public participation mechanisms, such as public meetings and workshops, addressing and reconciling public concerns in a fair manner and with an open mind, using plain language and terminology that is generally understood or recognized, and including external and world recognized expert body's to review, evaluate, and address public health, safety, and environmental issues, will not only help to establish public trust and confidence, but to maintain it as well. Clearly communicating our thoughts and processes to the public, involving them through formal participation mechanisms, and demonstrating a general effort to be open to constructive criticism, are elements that are essential to effective and successful regulation and program implementation. These interactions with vested parties and members of the public will provide early signals regarding dominant interests and concerns of those individuals and communities that will be directly or indirectly impacted by the action. By remaining receptive and responsive to those signals, one can continue to improve their credibility as an open minded, objective regulator, while at the same time, ensuring a predictable and stable regulatory framework that is protective of the worker, the public, and the environment. To be effective and successful in the radioactive waste management industry, our actions must be such that the public, those we regulate, and other international communities have respect for and confidence in not just one piece of, but the overall legal, administrative, and regulatory framework.

As I hope my presentation has made clear, the regulator in today's environment must not only have a sound technical basis for its regulatory requirements, but must also ensure that these requirements are understood and are reasonably acceptable to the public, whose safety is our first priority. I hope that the insights and examples I've shared with you today provides a clear picture of what essential fundamentals should be considered in order to develop and implement a technically sound, open, and objective radioactive waste management program. Let us never forget our international responsibility to safely manage and dispose of these wastes in a manner that protects our current and future generations.