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BEN C. RUSCHE  
DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
UNITED STATES DEPARTMENT OF ENERGY

BEFORE THE

PEACEFUL USES OF NUCLEAR ENERGY  
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SPENT FUEL AND HIGH-LEVEL RADIOACTIVE WASTE STORAGE AND DISPOSAL  
PROGRAM IN THE UNITED STATES

It is a pleasure to have this opportunity to address the important challenges facing us in the area of radioactive waste management and to report on the United States' waste management program.

Radioactive waste management may be one of the most important world-wide issues relating to the future viability of nuclear power today. Because nuclear energy remains vital to future energy needs and economic growth in many countries, the design and implementation of radioactive waste disposal systems are of major concern to the international community involved in the generation of nuclear power.

On an international basis, countries are addressing the waste disposal issue with varying degrees of priority. Some countries have deferred the decision to proceed with the development of permanent disposal systems. Some have decided to continue studies before making a choice. Still others, among them the United States, have decided to pursue, on a particular timetable, specific plans for the permanent geologic disposal of spent nuclear fuel and high-level radioactive waste. For many of these latter countries, there are often common challenges and goals in the management of their radioactive wastes. These same challenges and goals provide an opportunity to bring together technical and institutional solutions that could lead to safe and socially acceptable methods for long-term disposal of spent nuclear fuel and high-level waste.

Today, nuclear power produces more than 17 percent of the electricity in the United States. Although there have been no new orders for nuclear plants in the United States since 1978, more than 100 commercial reactors are licensed to operate and about 25 more are under construction.

After years of public debate and scientific studies, the United States established a national policy for the safe and permanent disposal of spent nuclear fuel and high-level radioactive waste through the passage of the Nuclear Waste Policy Act of 1982 (the Act). The Act provides a mandate and procedures for identifying and selecting a site for the Nation's first repository. It mandates a schedule and a step-by-step process by which the President, the Congress, the States, affected Indian Tribes, the Department of Energy (DOE), other Federal agencies, and the public can work together in the siting, design, constructing, licensing, and operation of geologic repositories for the disposal of radioactive waste. The primary responsibility for the establishment and implementation of the waste management system was assigned to the DOE.

The approach we are taking to implement the Act is based on the following major policy goals:

- protection of the public health, safety, and environment;
- establishment and maintenance of technical excellence;

- conduct of the waste disposal program to neither subsidize nor penalize nuclear power as an energy source; and
- carrying out the responsibilities in a cost-effective manner, with full cost-recovery from the owners and generators of spent nuclear fuel and high-level waste.

The program objectives which evolve from these policy goals are:

- to site, obtain a license for, construct, and operate geologic repositories such that the transportation of radioactive waste to, and disposal of the wastes in, the repositories can be accomplished in a manner that is safe and environmentally acceptable;
- to submit a proposal to Congress to develop one or more facilities for monitored retrievable storage; and
- to ensure the acceptance of waste for disposal on a timely basis.

I would like to briefly share with you the progress we have made in implementing the directives of the Act.

#### PROGRAMMATIC AND TECHNICAL PROGRESS

In May 1986, the President approved the Secretary of Energy's recommendation of three sites for detailed site characterization as candidates for the Nation's first geologic repository. The three candidate sites are in Nevada, Texas, and Washington State.

This milestone follows many years of scientific research, field study, data collection, and analysis, and hundreds of thousands of pages of documentation based on standards and criteria established as a result of the Act.

Reaching this stage of determination permits us to thoroughly investigate, evaluate, and compare geologic, environmental, transportation, and safety factors at each of the three sites. With approval by the President of the three sites to characterize, we have finally passed beyond the crucial decision of where to focus our repository siting efforts.

The main purpose of site characterization is to determine whether a candidate site is suitable for a repository and to provide the bases for the selection of the first repository site and to obtain the construction authorization from the Nuclear Regulatory Commission -- tasks that have never been done before. Answering unresolved questions are the main focus of site characterization work.

Also in May 1986, following the announcement of the President's approval of three sites to characterize as candidates for the first repository, the Secretary announced that, based on progress in selecting a first repository, we had reassessed the timing of the Department's activities toward identification of candidates for a second repository and decided to postpone indefinitely plans for any site-specific work related to a second repository.

We have not abandoned a second repository; we are continuing studies for a second repository as required by the Act. These studies focus on technical issues and include non-site-specific studies of potential host rocks in alternative geologic media, such as crystalline rock, to determine its suitability for hosting a second geologic repository; and, the development of analytical approaches to evaluate possible geologic settings in terms of potential performance in waste isolation.

A significant portion of these studies is expected to involve cooperative effort with other countries through continuation of the current program of international cooperation. For example, we are currently participating with Canada in the extension of the depth of the shaft at their Underground Research Laboratory (URL) in Manitoba.

International cooperation is essential and beneficial to the United States, and we believe this is true for other nations as well. However, before I discuss international cooperation in more detail, I would like to briefly discuss two other important and integral components of the U.S. waste disposal system: Monitored Retrievable Storage and transportation.

#### MONITORED RETRIEVABLE STORAGE

We continue to believe that a Monitored Retrievable Storage facility (MRS) should be an integral part of the waste management system. We stand ready to submit the proposal to Congress for their consideration as soon as we are legally permitted to do so.

We believe that an MRS centrally located to the majority of the spent fuel generation would enhance the disposal system by receiving and consolidating the spent fuel rods into packages prior to bulk shipping to the repository. Such a surface facility would not replace the need for deep, geologic disposal, but would enhance the disposal system by making transportation of spent fuel more efficient. We are proposing, if Congress approves such a facility, the MRS would not be licensed to begin receiving spent fuel until construction authorization for the first repository is received and that the capacity of the MRS be limited to an amount equivalent to about 5 years of spent fuel accumulation.

#### TRANSPORTATION

Another integral part of our disposal system is one that affects more people than any other component of the system -- transportation. Whether a State or community has a nuclear power plant with spent fuel, a facility with high-level waste, or is chosen to host either a repository or a MRS, it is likely that spent fuel or high-level waste will pass near its residents during transport.

We are actively identifying transportation institutional issues and working with many interested parties around the country to address these issues. In addition, transportation casks must be designed,

tested, and fabricated so that we will have the equipment as well as operational procedures in place when we begin receiving waste for disposal.

#### INTERNATIONAL COOPERATION

As I mentioned at the outset, the storage and disposal of radioactive waste is a world-wide concern. Over 30 countries presently have nuclear power stations either in operation or under construction, and others are planning to undertake nuclear power projects. All face the need for permanent disposal of their radioactive wastes. Many nations and international agencies agree that radioactive waste can be disposed of safely in a properly designed geologic repository. Some nations are proceeding with repository safety assessment and siting programs that are similar to the U.S. program.

It has been U.S. policy for many years to exchange information and to cooperate with foreign countries and international organizations to further the technology for storage, transportation, and disposal of spent nuclear fuel and high-level radioactive waste. Several nations and organizations maintain sophisticated waste management programs that can enhance our awareness of technical developments in the radioactive waste management field. Consequently, active participation in cooperative activities has been and will continue to be of mutual benefit to the United States and other

members of the international community in their respective waste management programs.

By recognizing the incentives for cooperating in the development of radioactive waste disposal systems, nations can:

- exchange experimental data, repository siting technology, and experience with test equipment;
- develop an international consensus that analytical methods are accurate and reliable and thus improve confidence in the safety of each national disposal system; and
- share the high cost of underground test programs.

To foster exchange of technology with other countries, we have established bilateral and multinational agreements to provide for cooperation. To date, we have cooperative agreements with agencies in nine countries and the Commission of the European Communities. We also maintain an active membership in the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development, and participate, as appropriate, in their various projects, studies, and meetings. Our direct interactions with countries and our participation in the activities of various international agencies are producing important exchanges of information on many issues of mutual concern. Participation in these cooperative activities is beneficial and

important to the geologic disposal program because the collective effort represents the work of over 20 participating nations faced with many of the same technical conditions and challenges.

We also participate in meetings of the IAEA Technical Review Committee on Underground Disposal and help prepare IAEA criteria and standards, safety documents, and technical reports. These documents are important because they provide internationally accepted guidance on waste disposal and spent fuel storage. Meetings are convened annually to assist the Agency in reviewing criteria and standards, safety documents, and technical reports in the area of waste management technology and practice.

To date, we have focused our efforts on underground research laboratory projects with other nations to obtain experience in site-specific operations and to develop tools and procedures. This experience is being used in exploration and characterization of sites in the United States for geologic disposal. Activities also include exchange programs for gathering and reviewing information pertinent to the establishment of repositories in crystalline rock and salt rock environments.

#### SECTION 223 ACTIVITIES UNDER THE NUCLEAR WASTE POLICY ACT

Another means of technology transfer takes place under Section 223 of the Act. Section 223 authorizes the DOE and the Nuclear Regulatory Commission (NRC) to offer technical assistance to

nonnuclear-weapons states (NNWS) in power-reactor spent-fuel storage and disposal. More specifically, this includes assistance in the fields of at-reactor spent-fuel storage; away-from-reactor spent-fuel storage; monitored retrievable spent-fuel storage; geologic disposal of spent fuel; and the health, safety, and environmental regulation of such activities.

To implement the requirements of Section 223, we have developed guidelines to assure responses to requests:

-- We will respond to the NNWS requesting assistance, initially in the form of information packages or through the conduct of briefings, seminars, consultation, and review of the requesting NNWS's technical plans.

The NRC will provide information on health, safety, and environmental regulation.

-- We will provide specific technical information included within the scope of Section 223.

-- Technical briefings, seminars, and consultations will be provided consistent with the capability of ongoing programs to accommodate the requested visit.

-- All requests will be treated equally, and information given to one requesting NNWS will be made available to another if requested.

Section 223 also requires that the DOE and the NRC publish a joint notice each year through 1988. This notice states that the

United States is prepared to cooperate with and provide technical assistance to qualified NNWS in the fields of spent fuel storage and disposal, and the regulation of these activities. Following publication of this annual joint notice, the Secretary of State informs the governments of these states and, as feasible, the organizations operating nuclear power plants in these states that the United States is prepared to cooperate and provide technical assistance as set forth in the joint notice.

To date, we have responded to representatives of 11 NNWS to describe the U.S. program and commercial resources, as well as to define additional technical assistance. In response to specific requests, technical briefings on our programs have been provided, including tours of selected facilities. In response to requests, copies of technical reports and information on the overall waste management plan being pursued by the United States have been provided.

#### CONCLUSION

If the United States and other members of the international community are to succeed in their respective national radioactive waste disposal programs, we must continue to recognize the mutual benefits of international cooperation and technical information exchange. Cooperation is essential in our search to find solutions to the important programmatic, technical, and institutional challenges in the field of radioactive waste management.

We, the United States Department of Energy, will continue to pursue international cooperation and international approaches as an integral part of the United States radioactive waste management program.

Thank you for this opportunity to speak before you today.