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OVERVIEW OF RADIOACTIVE WASTE MANAGEMENT
for Presentation at the 17th Annual ASME Symposium on Nuclear Waste

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I appreciate the opportunity to serve as your moderator today. Mr. Barnes asked me to take about 15 minutes to present an overview of radioactive waste management to "set the stage" for the five speakers who will be discussing various aspects of the waste management program in the U.S.A.

The question of what to do with radioactive wastes has been an issue for decades, although it has been only in recent years that the issue has escalated to the point that its rapid resolution is vital to the future of nuclear power as an energy source. Unless we resolve the issue soon, the public will demand that nuclear power plants be shut down and that no new plants be built.

The Federal government, which has given itself the responsibility to resolve the issue, has been unable to consistently proceed towards a resolution. There have been many changes in direction during the past several years which have resulted in prolonging the solution to the problem. In recent years, due to increasing pressure from the nuclear industry and the public, the government has increased spending markedly. The FY-1980 budget authority ($557 million) for all waste management activities is about $50 million more than in FY-1979, and the budget for FY-1981 is about $160 million larger than FY-1980.

Two very significant events have occurred during the past two years which established the current direction of the Carter Administration in resolving the waste management issue. The first was the issuance of a report in March 1979 by the Interagency Review Group and the second was the issuance in February 1980 of the President's policy statement.

President Carter in March of 1978 created an Interagency Review Group (IRG) on Radioactive Waste Management to formulate recommendations leading to the establishment of a National policy for managing radioactive waste. The IRG was chaired by the Secretary of Energy and was composed of representatives from all the agencies of the Federal government which would have a part in managing radioactive wastes. A draft report was published in October 1978 and over 15,000 copies were distributed to the public and industry. Written comments were solicited and several public meetings were held. In March 1979 the IRG issued its final report, which was revised based upon comments received from State governments, industry, environmental groups, universities, and the general public.

The principal technical findings of the IRG report are as follows:[1]

1. Present scientific and technological knowledge is adequate to identify potential repository sites for further investigation.

No scientific or technical reason is known that would prevent identifying a site that is suitable for a repository provided that the systems view is utilized rigorously to evaluate the suitability of sites and designs, and in minimizing the influence of future human activities.

2. A systems approach should be used to select the geologic environment, repository, site and waste form. A systems approach recognizes that, over thousands of years, the fate of radionuclides in a repository will be determined by the natural geologic environment, by the physical and chemical properties of the medium chosen for waste emplacement, by the waste form itself and other engineered barriers.

3. The feasibility of safely disposing of high-level waste in mined repositories can only be assessed on the basis of specific investigations at and determinations of suitability of particular sites.

4. Some uncertainty about repository performance will always exist. Thus, in addition to technical evaluation, a societal judgment that considers the level of risk and the associated uncertainty will be necessary.

5. Detailed studies of specific, potential repository sites in different geologic environments should begin immediately. Generic studies of geologic media or risk assessment analyses of hypothetical sites, while useful for site selection, are not sufficient for some aspects of repository design or for site suitability determination. Although most is known about the engineering aspects of a repository in salt, on purely technical grounds no particular geologic environment is an obvious preferred choice at this time.

6. The actinide activity in transuranic wastes and high level wastes suggest that both waste types present problems of comparable magnitude for the very long term (i.e., greater than a thousand years).

7. The degree of long-term isolation provided by a repository, viewed as a system, and the effects of changes in repository design, geology, climate, and human activities on the public health and safety can only be assessed through analytical modeling.

8. Because it is not possible to predict or to restrict the activities of future generations, site selection guidelines, site suitability criteria, and repository design criteria must be developed in such a way as to minimize potential deleterious effects of human activities.

9. Reprocessing is not required to ensure safe disposal in appropriate chosen geologic environments. Repositories can be designed to receive either solidified reprocessed waste or discarded spent fuel.

While the IRG report does provide a framework for implementation of a comprehensive waste management program, it failed to recognize other important factors. First, the report takes a neutral position on the relationship of nuclear power and waste management; whereas, as mentioned earlier, the two

issues cannot be separated and the failure to resolve the waste issue will foreclose the nuclear option. Second, the IRG report fails to provide perspective on the hazards of nuclear waste compared with other materials. Third, the report fails to emphasize the need for proceeding with urgency in selecting the initial waste repository site.

The President issued his long-waited policy statement on Radioactive Waste Management in February 1980 based largely on the IRG report.[2] The most significant elements of his policy statement are as follows:

1. A State Planning Council was established with Governor Richard W. Riley of South Carolina as Chairman. The purpose of the Council will be to "advise the executive branch and work with the Congress in finding better ways to address radioactive waste management issues." John V. Evans of Idaho, Dixy Lee Ray of Washington, Robert List of Nevada and Peter MacDonald of New Mexico were named to represent the western states. Financial and technical assistance will be provided to states in review and licensing proceedings.

2. An interim planning strategy to place high level and transuranic wastes in a mined geologic repository was proposed. Immediate attention will be to focus on R&D at four or five sites having diverse rock types and geologic environments. One or more sites will be selected after these sites have been evaluated and found potentially suitable. A site selection should be made by 1985 with the first demonstration repository in operation by the mid-90's. The Waste Isolation Pilot Plant (WIPP) project was cancelled. The project as currently scoped was inconsistent with President Carter's policy that all repositories for highly radioactive waste be licensed, and accept both defense and commercial wastes.

3. While storage of spent fuel is primarily the responsibility of the utilities, a limited amount of storage will be provided by the Federal government. Thus, DOE will design, acquire or construct one or more away-from-reactor storage facilities.

4. DOE is to work jointly with states and other governmental agencies in developing plans to establish regional disposal sites for commercial low level wastes.

5. Federal programs to regulate radioactive waste storage, transportation and disposal must be improved. The NRC will be given authority to license spent fuel storage and disposal of transuranic waste and non-defense low level waste in new government facilities. Methods to speed up licensing need to be implemented.

6. The public and technical community must be given the opportunity to participate in the waste management program in order to fulfill NEPA requirements.

7. Bilateral and multilateral efforts with other nations will be encouraged.

In addition the DOE will prepare a National Plan for Nuclear Waste Management in draft in 1980 with a final plan to be issued in 1981.

As might be expected, many points in President Carter's policy are controversial. His decision to delay selecting a site for the first repository until 1985 is probably the most troublesome to nuclear industry personnel as well as many members of Congress. Also, the President's decision to cancel WIPP as currently scoped is meeting with strong opposition. Many Congressmen, and nuclear industry representatives, feel that an unlicensed program to demonstrate disposal of defense high level wastes should proceed as quickly as possible. Senator Goldwater has proposed legislation calling for six unlicensed demonstration repositories for defense wastes to be built by 1990 (the first two to be identified by 1981 and to become operational in 1986). Thus, the President's new policy is encountering strong opposition and may not be implemented as formulated.

Until the President and the Congress agree on a comprehensive policy, we can expect that the waste management issue will not be easily resolved. I hope, however, that agreement will be forthcoming so that progress towards resolving this most important nuclear issue will move forward rapidly before the other shoe (TMI being the first) falls.

References:

1. "Report to the President by the Interagency Review Group on Nuclear Waste Management," March 1979 (TID-29442).

2. Statement from the Office of the White House Secretary, M-80-004, PID-125, February 12, 1980.