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MEMORANDUM FOR: James H. Sniezek, Deputy Executive Director
for Nuclear Reactor Regulation
Regional Operations and Research

FROM: Robert M. Bernero, Director,
Office of Nuclear Material Safety
and Safeguards

SUBJECT: NEW POLICY ON REGION MEETINGS WITH NEWS MEDIA - BRIEFING PAPER ON HIGH-LEVEL RADIOACTIVE WASTE

As requested in an October 25, 1991 memorandum from James M. Taylor, Executive Director for Operations, to all Office Directors, enclosed is "Briefing Paper 14 - High-Level Radioactive Waste."

If you require additional information, you may contact Mr. B. J. Youngblood of my staff at X23404.

(Signed) Robert M. Bernero

Robert M. Bernero, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure:
As stated

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High-Level Radioactive Waste

Background:

High-Level radioactive waste (HLW) means (1) irradiated (spent) reactor fuel, (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, and the concentrated wastes from subsequent extraction cycles, in a facility for reprocessing irradiated reactor fuel, and (3) solids into which such liquid wastes have been converted. HLW is primarily in the form of spent fuel discharged from commercial nuclear power plants; it also includes some reprocessed HLW from defense activities, and a small quantity of reprocessed commercial HLW. Current plans for management of HLW call for the development of a monitored retrieval storage facility (MRS) by 1998, and a permanent HLW repository deep beneath the surface of the earth by the year 2010. The United States Department of Energy (DOE) has the responsibility for disposing of HLW. The United States Environmental Protection Agency (EPA) is responsible for developing appropriate environmental standards for HLW. The United States Nuclear Regulatory Commission (NRC) has the licensing authority for the disposal and storage of HLW.

High-Level Radioactive Waste:

This country's policies governing the permanent disposal of HLW are defined by the Nuclear Waste Policy Act of 1982 (NWPA) and the Nuclear Waste Policy Amendments Act (NWPAA) of 1987. To provide the long-term permanent isolation required, the NWPA specifies that HLW will be placed in deep-underground geologic repositories to be built and operated by the DOE. To this end, DOE is developing a waste management system consisting, in part, of a geologic repository in which HLW can be permanently isolated deep beneath the surface of the earth, and a monitored retrieval storage facility (MRS) in which waste can be stored prior to permanent disposal. NRC has the licensing and related regulatory authority for both the MRS and high-level waste geologic repository.

An MRS facility is an integral part of the waste management system being proposed by DOE for achieving timely acceptance of spent fuel. NWPA allows a dual approach to MRS siting: (1) siting by the DOE, through a process of survey and evaluation, and (2) siting through the efforts of the Nuclear Waste Negotiator.

Through the NWPAA, Congress designated the Yucca Mountain site in Nevada as the single candidate site for characterization as a potential geologic repository. The Yucca Mountain site has not been selected for a repository; rather, it has been chosen as the only site to be characterized at this time.

Site characterization is a program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions and the ranges of those parameters at a particular site. Site characterization includes borings, surface excavations, excavation of exploratory shafts or ramps, limited subsurface lateral excavations and borings, and insitu testing at depth to determine the suitability of the site for a geologic repository.

Regulations:

The NRC's requirements governing the disposal of HLW in a geologic repository are contained in Title 10 Code of Federal Regulations, Part 60 (10 CFR Part 60). These requirements govern prelicensing activities, authorization for DOE to begin construction of the facility, authorization for DOE to receive and place the wastes in the facility and authorization for DOE to close the facility (license termination).

The NRC's requirements governing the storage of HLW in an MRS facility are contained in Title 10 Code of Federal Regulations, Part 72 (10 CFR Part 72). These requirements establish requirements, procedures, and criteria for the issuance of licenses to receive, transfer, and possess power reactor spent fuel and other radioactive material associated with spent fuel storage.

The EPA's requirements for the disposal of HLW in a geologic repository are contained in Title 40 Code of Federal Regulations Part 191 (40 CFR Part 191). These requirements establish generally applicable environmental standards for the management and disposal of spent nuclear fuel and other HLW. The NRC is responsible for implementing these standards.

Current status:

Currently, the repository program is focused on prelicensing site characterization activities. In the prelicensing phase, one of NRC's primary responsibilities is to review the DOE's site characterization plan and associated activities and to provide comments to DOE identifying any specific concerns. In addition, NRC staff observes various site characterization activities in the field and also observes DOE quality assurance audits. All prelicensing consultation activities are open to participation by the State of Nevada, affected Indian Tribes and units of affected local governments.

The DOE completed its site characterization plan for the Yucca Mountain site in December 1988. The NRC staff completed its review of that document in July 1989, and concluded that overall it was a usable plan for site characterization. However, in specific areas, the staff identified two objections to DOE starting site characterization. One objection concerns the DOE quality assurance program, and the other is related to the process for designing the shaft to be used for underground exploratory work. In addition, 196 concerns in the form of comments and questions were raised.

DOE is presently making progress to resolve NRC's site characterization objections and concerns. Regarding our QA objection, DOE has been making considerable progress towards resolution. There has been partial closure on several particulars involving the QA objection. For example, the NRC staff has concurred with DOE's findings that several DOE contractor programs are acceptable for new site characterization work. With respect to the objection concerning the exploratory studies facility, DOE has conducted a study of alternatives for conducting underground exploration and based on NRC/DOE interactions in 1991, it appears that DOE is adequately considering NRC's concerns. Finally, on the basis of DOE responses, 59 of the 196 other concerns have been closed to date.

Within the last few months, the State of Nevada has granted DOE air quality and water injection permits, thereby allowing DOE to proceed with surface based site characterization activities.

The current DOE MRS strategy for meeting the 1998 date called for in the NWPA for accepting spent fuel from utilities is to rely on the Nuclear Waste Negotiator for siting an MRS. The Office of the Nuclear Waste Negotiator was established by the NWPAA to find a state or Indian Tribe willing to host a repository or MRS at a technically qualified site. To date interest has been expressed in evaluating the feasibility of an MRS by the Mescalero Indian Tribe in New Mexico, and Grant County in North Dakota.

EPA developed generally applicable environmental standards in 1985. These standards were remanded in 1987 due to inconsistencies with other standards with respect to individual and ground-water protection. Revised standards are scheduled to be released for public comment in 1992.

Contact:

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HIGHLIGHTS OF HIGH-LEVEL RADIOACTIVE WASTE (HLW)

- NWPA (1982) and NWPAA (1987) lay out a national program for disposal of HLW in a deep geologic repository and possible interim storage in an MRS
- NWPAA designated Yucca Mountain, Nevada for characterization as a potential repository site
- NRC requirements for the interim storage of HLW are contained in 10 CFR Part 72
- NRC requirements for the disposal of HLW are contained in 10 CFR Part 60
- EPA standards for the disposal of HLW are contained in 40 CFR Part 191
- NRC is currently involved in prelicensing interactions and review of DOE HLW repository site characterization activities
- NRC is currently involved in prelicensing interactions and review of DOE MRS activities
- DOE to submit to the NRC an MRS application to construct and operate a facility in 1995
- DOE to begin waste acceptance at an MRS facility in 1998
- DOE to submit to the NRC a HLW repository license application for construction authorization in 2001
- DOE to begin waste emplacement in a HLW repository in 2010
- All prelicensing consultation activities are open to participation by the State of Nevada, affected Indian Tribes and units of affected local governments