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NOTE TO EDITORS:

The Nuclear Regulatory Commission has received from its Advisory Committee on Nuclear Waste the attached letter-type report on possible impacts of the Energy Policy Act of 1992 on ongoing NRC initiatives in the high-level radioactive waste program.

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Attachment:
As stated

March 3, 1993

The Honorable Ivan Selin, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Selin:

SUBJECT: POSSIBLE IMPACTS OF THE ENERGY POLICY ACT OF 1992 ON NRC ACTIVITIES TO ADDRESS ONGOING NRC INITIATIVES IN THE HIGH-LEVEL RADIOACTIVE WASTE PROGRAM

During its 51st meeting, February 24-26, 1993, the Advisory Committee on Nuclear Waste (ACNW) met with the NRC staff to discuss its response to the Commission request for the staff's views on the possible impacts of the Energy Policy Act of 1992 on ongoing NRC initiatives in the high-level radioactive waste (HLW) arena. The staff was to pay particular attention to the impacts on activities to identify the regulatory uncertainties in 10 CFR Part 60. The discussion focused on the potential impacts of the outcome of the charge within the Act that the U.S. Environmental Protection Agency (EPA) request the assistance and guidance of the National Academy of Sciences (NAS) in developing a set of generally applicable standards for the proposed Yucca Mountain repository.

A key factor to keep in mind is that the EPA standards (and 10 CFR Part 60) will primarily be used as guides for the design of the proposed HLW repository. We concur, as stated by the Executive Director for Operations (EDO) in his memorandum of February 9, 1993, that the most immediate impact, regardless of changes to the EPA standards, is the necessity for significant interactions by the NRC staff with both the NAS and EPA as each organization moves forward with the responsibilities assigned to it by the U.S. Congress.

Possible NAS Recommendations to EPA

In preparing its response, the NRC staff hypothesized four recommendations that the NAS could make. These were designed to span the range of likely impacts of the NAS recommendations (and subsequent EPA standards) on the NRC HLW program. We believe the four alternatives bound the range of possibilities. These alternatives, with modifications suggested by the ACNW, can be stated as follows:

1. Retain the 1985 cumulative radionuclide release limits, but support them with a rationale based on doses to individual members of the public.

2. Extend the individual protection requirements of the 1985 EPA standards to 10,000 years.

3. Add a "health-based standard" or "risk-based standard," delete the cumulative radionuclide release standard, and add the use of institutional controls to prevent human intrusion.

4. Combine Alternatives 2 and 3 and add the use of institutional controls to mitigate the effects of radionuclide releases caused by natural events.

Impacts of the Alternatives on Regulatory and Technical Uncertainties

In order to assess the impacts of these alternatives, it would have been helpful if the staff had included the portions of the Systematic Regulatory Analysis that relate to the Commission's question. Nevertheless, our review of the report prepared by the NRC staff indicates that the various alternatives would have the following possible impacts on the regulatory and technical uncertainties in the NRC program:

1. Alternative 1 would result in essentially no changes to the regulatory uncertainties facing the NRC; standards as outlined in this alternative are substantially the same as those promulgated earlier by EPA.

2. Alternatives 2 and 3 would require projections of individual dose rates far into the future, and this would presumably increase the associated uncertainties. The extent of these uncertainties, however, may be reduced by focusing on an average member of the "critical group," as previously recommended by the ACNW.

3. As noted by the NRC staff, Alternative 3 would negate any need to evaluate either human intrusion or its associated uncertainties. We believe, however, that there would still be a need to characterize the natural resource potential of the Yucca Mountain site. The NRC staff has not presented a compelling argument to support its contention that this alternative would require deletion or modification of 10 CFR 60.122 or changes in the subsystem requirements of 10 CFR 60.113.

4. Adoption of an individual dose standard (under Alternative 3) would probably require additional site characterization by the U.S. Department of Energy (DOE). For example, it would be necessary to estimate more accurately the concentrations, rates, and timing of projected radionuclide releases. This could increase the associated uncertainties. This would also increase the corresponding review efforts by the NRC staff. In addition, such a change would require extending the associated performance assessment models to include specific dose pathways.

5. The existing EPA standards are based on what is technically achievable. Use of a health-based standard could result in standards that are less stringent and therefore more readily subject to confirmation of compliance. This should reduce the associated regulatory uncertainties.

6. Alternatives 3 and 4 require that prolonged institutional controls be developed to prevent human intrusion and to mitigate the effects of radionuclide releases that occur as a result of natural events, respectively. Both of these necessitate that 10 CFR Part 60 be supplemented with more detailed requirements relative to associated repository monitoring. These requirements would have associated technical and regulatory uncertainties. Such a monitoring program would also have to be supervised by the NRC staff, and its implementation would negate the staff's desire to terminate the repository license once the HLW had been emplaced and the facility had been sealed.

7. Alternative 4 would also necessitate a major revision in the nature and purpose of the siting and design requirements of 10 CFR Part 60 to reflect the use of institutional controls and possible engineered systems to mitigate the effects of radionuclide releases caused by natural events. This would result in major changes to the Format and Content of the

License Application for the High-Level Waste Repository, the License Application Review Plan, and related assessment requirements. Alternative 4 may also require additional site characterization, design, and assessments by DOE for mitigating the effects of natural events. As a result, the staff would need to conduct additional reviews and quality assurance activities in all of these areas. These changes would involve additional technical and regulatory uncertainties.

Summary

It appears that the NRC staff (consistent with our understanding of the charge given to it) has addressed most of the regulatory and technical uncertainties associated with the anticipated range of impacts of the EPA standards, as they would be revised for the proposed Yucca Mountain HLW repository. The key items with which we disagree or that we have added to those enumerated by the NRC staff are summarized below.

1. Although the application of institutional controls to prevent human intrusion would negate any need to evaluate associated radionuclide releases or the related uncertainties, the natural resource potential of the Yucca Mountain site would still need to be characterized.

2. The NRC staff has not presented a compelling argument to support its contention that prevention of human intrusion would require deletion or modification of 10 CFR 60.122. Similarly the staff has not supported its contention that adoption of a risk-based standard would necessitate changes in the subsystem requirements of 10 CFR 60.113.

3. Application of the critical group concept may reduce the extent of the regulatory and technical uncertainties associated with estimating individual dose rates.

4. The requirement for long-term monitoring after repository closure will negate the ability of the NRC to terminate its involvement with the licensee; it will also require that the NRC staff develop regulations for such monitoring.

We trust these comments will be helpful. We will continue to interact with the NRC staff as it follows these developments.

Sincerely,

Dade W. Moeller, Chairman
Advisory Committee on
Nuclear Waste