REGULATORY ANALYSIS

10 CFR PART 63: DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN A PROPOSED GEOLOGIC REPOSITORY AT YUCCA MOUNTAIN, NEVADA:

PROPOSED AMENDMENT TO IMPLEMENT A DOSE STANDARD AFTER 10,000 YEARS

1.0 Introduction

The Energy Policy Act of 1992, Public Law 102-486 (EnPA) mandates that the U.S. Nuclear Regulatory Commission's (NRC's) regulations governing the disposal of high-level radioactive wastes in a proposed geologic repository at Yucca Mountain, Nevada be consistent with U.S. Environmental Protection Agency standards for Yucca Mountain. EPA is proposing to revise its standards to add a peak dose standard for the period after 10,000 years and through 1 million years. NRC must revise its regulations consistent with EPA's standards.

1.1 Background:

On November 2, 2001, NRC published its final rule, 10 CFR Part 63, governing disposal of HLW in a potential geologic repository at Yucca Mountain, Nevada. DOE must comply with these regulations for NRC to authorize construction and license operation of a potential repository at Yucca Mountain. In particular, DOE must show that it complies with an individual dose standard during operations, and after closure of the repository, for a period of 10,000 years. To demonstrate compliance with post-closure, individual dose standards, DOE must conduct a performance assessment, subject to specified requirements.

As mandated by the Energy Policy Act of 1992, Public Law 102-486 (EnPA), NRC's final rule was consistent with the radiation protection standards issued by EPA at 40 CFR Part 197. EPA developed these standards pursuant to Congress' direction, in Section 801 of EnPA, to issue public health and safety standards for protection of the public from releases from radioactive materials stored or disposed of in a potential repository at the Yucca Mountain site. Such standards were to be "based upon and consistent with" the findings and recommendations of

the National Academy of Sciences (NAS). The NAS issued its findings and recommendations in a report entitled *Technical Bases for Yucca Mountain Standards*, on August 1, 1995.

The State of Nevada and other petitioners challenged both the EPA standards and the NRC regulations in court. On July 9, 2004, the United States Court of Appeals for the District of Columbia Circuit upheld both EPA's standards and NRC's regulations on all but one of the issues raised by the petitioners. The court disagreed with EPA's decision to adopt a 10,000-year period for compliance with the standards and NRC's adoption of that 10,000-year compliance period in NRC's implementing regulations. The court found that EPA's 10,000-year compliance period was not "based upon and consistent with" NAS' findings, as required by Section 801 of EnPA. The NAS recommended that a standard be developed that would provide protection when radiation doses reach their peak within the limits imposed by long-term stability of the geologic environment. In addition, the NAS found no scientific basis for limiting application of the individual-risk standard to 10,000 years. Thus, the court vacated EPA's rule at 40 CFR Part 197 to the extent that it specified a 10,000-year compliance period. The court also vacated NRC's rule at 10 CFR Part 63 insofar as it incorporated EPA's 10,000-year compliance period.

In response to the remand, EPA issued its proposed revised standards on **[FRN DATE of EPA Std]**. To comply with EnPA and the court's remand, NRC must now revise 10 CFR Part 63 to be consistent with EPA's revised standards.

1.2 Objective of the Proposed Rule (Purpose and Need)

NRC is proposing to amend its regulations governing the disposal of HLW in a proposed geologic repository at Yucca Mountain, Nevada. The primary purpose of these amendments is to implement EPA's proposed standards for doses that could occur 10,000 years after disposal, but within the period of geologic stability. The NRC proposal also specifies a value to be used to represent climate change after 10,000 years, as called for by EPA, and specifies that calculations of radiation dose for workers use the same weighting factors EPA is proposing for calculating individual doses.

2.0 Identification and Analysis of Alternative Approaches

According to statute (EnPA), NRC must adjust its regulations for a geologic repository at Yucca Mountain to be consistent with final EPA standards. Thus, many of the normal alternatives considered in a regulatory analysis, such as the "no-action" alternative, are not available to NRC and are not part of this regulatory analysis. Also, because of the statutory directives in EnPA, NRC does not have the option of examining and selecting appropriate types and levels of public health and safety standards. For this reason, this analysis does not examine the costs or benefits of varying the type and level of repository performance standards.

NRC's guidance on preparation of a regulatory analysis provides for a more limited analysis in special cases such as this.[1] This Regulatory Analysis examines the alternatives that are open to NRC in carrying out the statutory directive of EnPA. Based on this, NRC has considered alternatives only for its proposal for the calculations of radiation doses for workers. These alternatives are as follows:

Alternative 1:
Do not permit the use of the weighting factors proposed by for calculating individual doses, when calculating radiation doses for workers.

In this alternative, calculations of radiation doses for workers would use different, less current weighting factors than those EPA proposes for calculating of individual doses. The use of two different sets of weighting factors may be confusing to stakeholders and potentially inefficient for the preparation of the license application and NRC's review.

Alternative 2:
Amend 10 CFR 63.2 to include a definition for "weighting factor" that would specify that calculations of radiation doses for individuals and workers should use the same weighting factors that EPA proposes for calculating individual doses.

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[1] "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," NUREG/BR-0058, Revision 4, 2004, p. 5.

This alternative would clearly specify use of a single set of weighting factors when calculating dose received by individuals and workers. This avoids confusion and would likely be more efficient. Finally, the weighting factors proposed by EPA reflect the more recent recommendations of the International Commission on Radiological Protection and represents an improved scientific basis for the weighting factors.

Alternative 3:

Amend Part 63 to provide DOE with the flexibility to calculate worker doses using either the existing weighting factors for calculating worker dose or those factors proposed by EPA for calculating individual doses.

This alternative would leave open the decision on weighting factors until submission of the license application. If DOE elected to use two sets of weighting factors, the NRC review process may be less efficient because of the added complication of reviewing calculations that rely on two sets of weighting factors. While a relatively minor, practical consideration, the use of two sets of weighting factors could be difficult to explain to stakeholders.

Regardless of the alternative selected, minor resources (estimated to be 0.1 full-time equivalent) will be necessary to revise the regulations for calculating radiation doses for workers.

Decision Rationale

Alternative 2 -- a single set of weighting factors -- has been chosen as the preferred alternative. NRC believes that it would be in the interest of an efficient licensing process that a single set of weighting factors be used in dose calculations for individuals and workers. This would help NRC in reviewing a DOE license application and would also benefit other parties to the licensing proceeding by avoiding the unnecessary complication imposed by requiring two sets of weighting factors. As noted above, the weighting factors proposed by EPA reflect the more recent recommendations of the International Commission on Radiological Protection and represents an improved scientific basis for the weighting factors. Public confidence in NRC's

regulatory decisions should be enhanced when the scientific basis for dose calculations is improved.

Implementation:

NRC's schedule for completion of a final rule to amend Part 63 calls for publication early in 2006. Necessary guidance material for implementation -- "The Yucca Mountain Review Plan, Revision 2" -- would be revised as needed.

6.0 References:

Code of Federal Regulations, 10 CFR Part 63, "Disposal of High-Level Radioactive Waste in a Proposed Geologic Repository at Yucca Mountain, Nevada, Final Rule" (63 FR 55731; November 2, 2001).

Code of Federal Regulations, 40 CFR Part 197, "Public Health and Environmental Radiation Standards for Yucca Mountain, NV; Final Rule" (66 FR 32100; June 13, 2001).

U.S. Congress, Energy Policy Act of 1992, Public Law 102-486.

National Academy of Sciences, Technical Bases for Yucca Mountain Standards, National Academy Press, Washington, DC, 1995.