



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

DOCKETED  
USNRC

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April 11, 2002 (7:45AM)

OFFICE OF SECRETARY  
RULEMAKINGS AND  
ADJUDICATIONS STAFF

DOCKET NUMBER  
PROPOSED RULE ~~FR 63~~ APR 10 2002  
(67FR 03628)

OFFICE OF  
AIR AND RADIATION

Annette L. Vietti-Cook  
Secretary  
U.S. Nuclear Regulatory Commission  
Rulemakings and Adjudications Staff  
Washington, DC 20555-0001

Dear Ms. Vietti-Cook:

I am submitting the Environmental Protection Agency's (EPA) comments on your proposed rule entitled *Specification of a Probability for Unlikely Features, Events and Processes* found at 67 FR 3628 (January 25, 2002).

In this rulemaking, the Nuclear Regulatory Commission (NRC) is proposing to amend its regulations for Yucca Mountain (10 CFR Part 63) to develop a quantitative definition for the term "unlikely" that would be used to determine which features, events, and processes (FEPs) would be excluded from certain required performance analyses. As you noted, EPA's Yucca Mountain standards (40 CFR 197.36) specified that the NRC has the responsibility for assigning a probability value to "unlikely" FEPs. Quantification of the term "unlikely" is crucial in defining the scope of performance assessments to be conducted in support of any license application. In practice, the probability "cut-offs" are used in screening FEPs for consequence assessments which then determine which FEPs are included in the disposal system performance assessments.

The EPA standards (40 CFR Part 197) did not define a "likely" category of FEPs and, consequently, there is not an exact probability limit separating "likely" from "unlikely" FEPs. However, there is an implied demarcation at an annual probability level of  $1 \times 10^{-4}$ , in that FEPs at this level and higher are nearly certain to occur within the 10,000-year regulatory compliance period, and would be included in performance assessments unless a strong argument can be made that their consequences are insignificant. Defining the probability limit for "unlikely" FEPs is then a question of selecting an appropriate level below the  $1 \times 10^{-4}$  probability level, for screening lower probability FEPs.

We recommend that "unlikely" be defined as an annual probability of  $1 \times 10^{-6}$ . We believe that this level is appropriate for the following reasons:

- With a spread of four orders of magnitude between the probability of near certainty (annual probability of  $1 \times 10^{-4}$ ) and very unlikely FEPs (annual probability of  $1 \times 10^{-8}$ , as defined in 40 CFR 197.36), it appears more reasonable to assign the "unlikely" demarcation line to the middle of the range. Placing the cut-off closer to either end of the range could be perceived as biased, either too liberal or too conservative, whereas the middle of the range avoids those implications.
- The factor of 10 reduction (from the  $1 \times 10^{-4}$  annual probability level) proposed by NRC can be perceived as an arbitrary selection. While a one-in-one hundred thousand chance of occurrence may be considered "unlikely" by some, it will certainly be considered too high by others. A one-in-one million chance of occurrence is likely to be more widely accepted and, therefore, more easily defended.
- Considering the significant uncertainty in determining the probability of FEPs, it would appear that  $1 \times 10^{-6}$  annual probability would provide greater confidence that the probability is within the range. Also, it assures that a reasonably conservative approach is taken to screening the FEPs. The EPA standards and NRC's 10 CFR Part 63 provide ample justification for excluding FEPs that have no significant impact on performance assessment results, so there is no need to be restrictive about the probability limits imposed on the initial screening of FEPs.
- Yucca Mountain dose assessments almost always show at least two orders of magnitude variation between high (95%) and low (5%) bounds, and often the variation is much wider. With this much variation in the assessments, it would be unreasonable to impose an order of magnitude less discrimination on the initial screening of the FEPs.
- The selection of the probability demarcation limit should be essentially divorced from site conditions and the decision made for the reasons given above. The site-specific components in evaluating FEPs are in the determination of the actual FEP probability levels and their uncertainties, and the assessment of their consequences in performance assessments.

We believe that this approach, would bring more confidence to the safety case in support of a licensing decision, and also would assure that regulatory resources will be used to evaluate the significant FEPs.

Editorial comment

Footnote 1, page 3629: The first *Federal Register* reference to EPA's Yucca Mountain standards should cite June 13, 2001, rather than June 12, 2001. Also, the word "intrusion" should be "intrusion."

Thank you for your consideration of these comments. If you have any questions, please contact Ray Clark or Ken Czycinski of my staff at 202-564-9310.

Sincerely,



Frank Marcinowski, Director  
Radiation Protection Division