7/9/02
67FR 15257
(10)

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

JUL 3 2002

OFFICE OF
AIR AND RADIATION

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Rules and Directives Branch

Dear Mr. Lesar:

In response to your request for comments (67 FR 15257), I am submitting the Environmental Protection Agency's (EPA) comments on the Yucca Mountain Review Plan (NUREG-1804, Revision 2). Our interest in the Review Plan is focused on the implementation of our 40 CFR Part 197 standards, and we have reviewed this revision of the Review Plan mainly from that perspective. The Review Plan is exhaustive in its listing of information expected in the license application. However, while the Plan is exhaustive in listing the amount and type of information expected, there is very little information given on how to judge the adequacy of that information for the purposes of making a licensing decision. The remainder of our comments are enclosed. Thank you for the opportunity to comment on the Review Plan.

Sincerely,

Scott Monroe, Acting Director
Center for Federal Regulation

Enclosure

Template = ADM-013

E-RIDS = ADM-03
Add = J. Ciocco (JAC3)
H. Beranek (HFB)

EPA COMMENTS ON
THE YUCCA MOUNTAIN REVIEW PLAN (NUREG-1804, REVISION 2)

1. We are aware of the extensive pre-licensing interactions between the Nuclear Regulatory Commission (NRC) and the Department of Energy (DOE) on the technical issues involved in the Yucca Mountain Project. These interactions have been built around a framework of key technical issues (KTIs). However, the Review Plan makes no mention of these KTIs, how they are integrated into the Review Plan structure, or how they relate to the 14 abstraction models used to determine compliance with the 10 CFR Part 63 requirements for post-closure performance. It is, therefore, unclear how the pre-licensing interactions, in general, and the KTIs, in particular, will be considered in the application review process.

2. The Review Plan section on post-closure safety requirements is organized around 14 model abstractions. The Review Plan needs to explain how these NRC model abstractions correspond to the structure of the analysis and process model reports used by DOE to support their total system performance assessments.

3. The "Review Method" sections are written in a general style that in some cases may overlook critical elements of the review for the particular model under consideration. For example, the representative volume (RV) discussion (Section 4.2.1.3.12) does not mention the two most important ground water system parameters for radionuclide transport modeling, viz., the mixing depths below the repository where radionuclides enter the saturated zone, and the longitudinal and transverse dispersion values assumed in the saturated zone. These parameters ultimately control the size and configuration of the contamination plume, which is the key consideration in selecting the calculational approach for using the RV in the compliance demonstrations for the ground-water- and individual-protection standards. Specification of the parameters that will be the focus of critical review, when they are known, and the intent of the model would be more direct and useful. (More comment on the RV is in Comment 6 below.)

4. Page 3-33, Section 3.5.2, bullet near the top of the page: The second sentence states "...inasmuch as the location and characteristics of the reasonably maximally exposed individual are already specified in the regulation...." This statement is incorrect: the specific and complete set of characteristics and the geographic location of the reasonably maximally exposed individual were not fully specified in 40 CFR Part 197, but must be proposed by DOE in the license application. In particular, the location of the RMEI is likely to be dependent upon the size and location of the controlled area and the final determination of the ground water flow path.

In a separate but related point, we found no mention in the Review Plan of the size and location of the controlled area. Specification of the controlled area is a key factor in the licensing process and must be included in the license application and the NRC review.

5. Pages 4.2-2 - 4.2-3, Section 4.2.1: Further discussion in this section regarding conservative modeling approaches is warranted, specifically the treatment of conservatism in model development and performance assessments. In 40 CFR 197.14, we use the term "reasonable expectation" to describe the approach to demonstrating compliance. While our reasonable expectation concept does not preclude a conservative approach, an important aspect is the understanding of the degree of conservatism in developing models, framing performance scenarios, and conducting performance assessments. Knowing the degree of conservatism in compliance assessments is important to judge properly the degree of confidence that can be placed in them for regulatory decision making, in keeping with our concept of reasonable expectation. In this part of the Review Plan, if NRC encourages the use of conservative models and assessments, it should also require the applicant to present its best estimates of the degree of conservatism in the assessment results.

6. Sections 4.2.1.3.12 and 4.2.1.4.3.2: These sections imply that the applicant is expected to provide information and assessments to justify the size of the RV. Since the RV size has a fixed value in the NRC regulations (10 CFR 63.312), it is unclear why the applicant should provide information to "ensure that the representative volume is consistent with water usage characteristics of the RMEI" (Section 4.2.1.4.3.2, Review Method 3). Similarly, in Review Method 2 in Section 4.2.1.3.12.2, the need for information from the applicant about how features, events, and processes are incorporated into the abstraction of the RV size calculation is unclear.

The key issue related to the RV is the selection of the method- well-capture zone or slice of the plume (40 CFR 197.31(b)(1) or (2), respectively, as well as 10 CFR 63.332(b)(1) or (2))- used to calculate radionuclide concentrations (40 CFR 197.31 and 10 CFR 63.332). However, the Review Plan does not detail what information and analyses are expected to provide support of the applicant's choice of method and how NRC will evaluate that choice.

7. Page 4.2-11, Section 4.2.1.2.2.1, Review Method 2: The wording of the first sentence in the first paragraph could be misleading: "Evaluate whether the probability estimates for events applicable to Yucca Mountain are based on past patterns of natural events in the Yucca Mountain region, or are consistent with the design of the proposed repository system." This sentence suggests that the probabilities could be based upon either factor – an approach that should not be allowed. For clarity, the points should be stated separately: "Evaluate whether the probability estimates for natural events applicable to Yucca Mountain are based on past patterns of natural events in the Yucca Mountain region. Evaluate whether the probability of human-caused events are based on the design of the proposed repository system."

8. Page 4.2-131, Section 4.2.1.4.2.2: Review Method 2 states that if the intrusion occurs within the 10,000-year regulatory limit, the assessment should be done separately from the performance assessment for the individual-protection requirement. The human-intrusion performance assessment should be done separately regardless of the estimated time of the intrusion. The Review Plan should also mention that, if the projected doses from an intrusion reach the RMEI after the regulatory time period, the assessments are to be presented in the Yucca Mountain Environmental Impact Statement. Further, the Review Plan does not call for the identification by the applicant of the transport mechanism for radionuclide transport from the breached waste package to the saturated zone. This is the most important of the details that we left for NRC to define during its implementation of our human-intrusion standard and needs to be clearly explained.