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JUN 28 1999

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ADJUDICATION

25 June 1999

U.S. Nuclear Regulatory Commission
Office of the Secretary
Attention: Rulemakings and Adjudications Staff
Washington, DC 20555-0001

Subject: Comment on Proposed Part 63 to Title 10, CFR, "Disposal of High-Level Radioactive Wastes in a Proposed Geological Repository at Yucca Mountain, Nevada: Proposed Rule", Federal Register Vol. 64, No. 34, pages 8640 ff., February 22, 1999

Dear Sirs:

The draft version of NRC's proposed Part 63 to Title 10 contains some words about defense-in-depth that seem to me ambiguous concerning its potential role in the overall regulatory approach. The principal discussion is found in the "Supplementary Information", Section VIII, "Multiple Barriers and Defense in Depth", page 8647 ff., Federal Register of February 22, 1999. Here NRC describes how it has decided to back away from the subsystem performance requirements of the old Part 60, based on advances in analysis technology and certain other considerations that are discussed extensively. The text cites the ACNW's recommendation on this question as follows: "....the ACNW recently recommended that the Commission implement the concept of defense in depth by ensuring that the effectiveness of individual barriers be identified explicitly in the total system performance assessment (TSPA), but specifically did not endorse the establishment of rule-based subsystem requirements for Yucca Mountain." The NRC then goes on essentially to endorse this ACNW recommendation, and seems to ask the applicant (DOE) only to "....demonstrate that the natural barriers and the engineered barrier system will work in combination to enhance overall performance of the geologic repository." Specifically, "....the Commission is now proposing to require that DOE evaluate the behavior of barriers important to waste isolation in the context of the performance of the geologic repository. The Commission does not intend to specify numerical goals

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for the performance of individual barriers The Commission proposes to incorporate flexibility into its regulations by requiring DOE to demonstrate that the geologic repository comprises multiple barriers but not prescribe which barriers are important to waste isolation or the methods to describe their capability to isolate waste."

So far, so good -- this text is quite clear to me. But then, at the very end of this Section VIII, comes the kicker: "The proposed requirements will provide for a system of multiple barriers and an understanding of the resiliency of the geologic repository provided by the barriers important to waste isolation to ensure defense in depth and increase confidence that the postclosure performance objective will be achieved." [emphasis added].

The thrust of this comment is an inquiry as to the operational meaning of those words, in the context of NRC's upcoming review of how DOE accomplishes "defense in depth" in the Yucca Mountain license application.

One interpretation of how NRC will review the Yucca Mountain design vis-a-vis defense-in-depth is that the DOE design for Yucca Mountain absolutely must take defense-in-depth into account (somehow! -- apparently DOE gets to decide how!), and if it does not do so then a license will not be granted even if the other requirements are met. A second and alternate interpretation is that, if DOE can demonstrate that the repository design can meet the probabilistic criteria (the vehicle for such a demonstration would be a high-quality probabilistic performance assessment), then meeting those probabilistic criteria would be sufficient, without the need to demonstrate the efficacy of any specific design features to address defense-in-depth. In this latter interpretation, the defense-in-depth "requirement" might be met by the rather simple observation that both engineered and natural "barriers" will exist (as they manifestly do -- several of each!) at Yucca Mountain, but the regulations would not demand any specific performance from any of the specific barriers. This would mean, in effect, that defense-in-depth would be formally cited as an important part of the regulatory philosophy underlying Part 63, but would be accorded only "lip service" in the actual implementation of the regulation itself, given the observation that the Yucca Mountain design will surely have both several engineered barriers and several natural barriers.

The two above interpretations aren't all that different in practice, although in philosophy they are quite different. In either of them, no further regulatory guidance from the NRC staff is apparently needed: DOE will simply need to show that several barriers exist, and will need to analyze the effectiveness of each, but will not need to compare them to any criteria, fixed or floating. Thus, either way, as a practical matter DOE could not "flunk" this defense-in-depth "requirement."

Still a third possibility is that NRC will specify later (through regulatory guides, branch technical positions, etc.) an acceptable way for DOE to address defense-in-depth, but that as of now the specific details of such a future NRC staff position have not yet been worked out. The text of draft Part 63 hints at this, in a way, but gives no clue as to which of the two possible approaches I mentioned above will govern as a matter of philosophy, and also doesn't indicate whether the philosophy to be used will have any practical impacts during NRC's regulatory review.

I cannot resolve this dilemma myself: no amount of staring at the conflicting sections of NRC text vis-a-vis the proposed Part 63 has been sufficient. I decided, therefore, to write in this public comment to ask for clarification.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Robert J. Budnitz". The signature is written in a cursive style with a prominent flourish at the end.

Robert J. Budnitz