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USNRC

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DOCKET NUMBER
PROPOSED RULE NO. 63
(10FR 53313)

Comments on:
10 CFR Part 63
RIN 3150-AH68
Implementation of a Dose Standard
After 10,000 Years
AGENCY: Nuclear Regulatory
Commission.
ACTION: Proposed rule.
NRC/ EPA Conclusion

I have two major concerns with the proposed rule. The first concern is with the regulatory decision to ignore changes in climate, the factor perhaps most critical to the performance of the repository and the one which leads to the greatest risk to the public.

5. Values Used To Project Climate Variation After 10,000 Years
EPA proposes that DOE should assume that the effect of climate variation, after 10,000 years, is limited to the results of increased water flowing through the repository. EPA also proposes that NRC specify, in regulation, steady-state (constant-intime) values that DOE should use to project the long-term impact of climate variation after 10,000 years. This approach focuses on "average" climate conditions over the long term rather than on time-varying aspects of climate (e.g., timing, size, and duration of shortterm variations) that can be both uncertain and speculative. The NRC has considered what parameter or parameters would represent the average climate conditions. Precipitation and temperature are the most readily identified parameters, associated with climate, that directly influence the amount of water, or deep percolation, flowing to the repository horizon. It is the rate of deep percolation, however, that directly influences repository performance. Therefore, the NRC proposes to specify use of the deep percolation rate to represent the effect of future climate in performance assessments after 10,000 years.

One critical or controlling factor for repository performance is the transient behavior of the repository and natural barriers system. The DOE Total Systems Performance Assessment (TSPA) has been put together in a manner which minimizes the real importance of transients and episodic behavior in affecting performance. This occurs in many separate portions of the analysis and probably reflects the naivety of individual analysts rather than a conscious plan. Throughout

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past performance assessments one can find a persistent effort to over estimate the rate of infiltration and seepage in the system; with most analysts believing, falsely, that such assumptions are conservative.

Beginning with the Engineered Barriers, consider waste package corrosion. In the past several years DOE has taken much credit for a limited window where localized corrosion could occur; namely when relative humidity is low. If low relative humidity is a causative factor for localized corrosion then it follows directly that critical factors for performance include any features, events, and processes which will lower relative humidity in the system. The overwhelming bias toward over estimating the amount of water in the system and failing to evaluate features, events, and processes leading to dryer than anticipated conditions, such as natural breathing of the mountain, is nonconservative.

Peak dose is most likely to occur when a wet period follows a long period of unusually dry conditions. Where in the TSPA documents are unusually dry periods evaluated? By ignoring unusually drying FEPs and by forming the TSPA predominantly from scale up of steady state processes; transients in the system, the critical factor for performance, are under represented. Even though the TSPA analysis is designed to largely under estimate the real importance of transients, a highly damped representation of their likely true importance is apparent in past DOE analyses extending out to one million years.

This is shown clearly in past performance assessments by DOE where peak predicted dose occurs as a result of the shift from lower to higher infiltration with a change in climate. A proper analysis of climate change, which would acknowledge that dry periods are as important to performance as wet ones, would give even clearer impacts upon peak dose.

A second problem with the proposed regulation is the recommended treatment of spatial variability in the repository. The proposed regulation recommends that spatial variability in infiltration rates be sampled spatially but that spatial variability be constant in time. This is exactly wrong. There will be spatial variability and it should be represented in the TSPA, but a major flaw in the TSPA analysis is that the change in (for example) the number of containers receiving seepage through time, is underrepresented. Many more waste packages are likely to see seepage during wet periods than during dry ones. The assumption that the number of containers receiving seepage remains relatively constant over time is nonconservative and unrealistic. NRC regulations should not encourage regulated entities to make nonconservative and misleading assumptions.

The proposed NRC regulation, by edict, eliminates one of the most critical factor for performance from consideration – climate induced transients. This is bad public policy and will do little to ease public fears that the nuclear industry is some type of conspiracy. I believe the Yucca Mountain site, either with current design or with improved design, can meet reasonable regulations. Deceiving the public by artificially hiding one of the critical factors for performance is not the way to revitalize nuclear power, a critical component of our energy future.

As one who believes nuclear power is vital to our energy future, I am disturbed by unneeded, counterproductive regulations which serve to mislead the public. Please consider revising the regulation to put in a set of climatic conditions that represent a more realistic scenario and which include both dry and wet periods. The future climate will not be constant and the peak dose from the repository will not be properly estimated using steady infiltration rates.

Sincerely,

John C. Walton

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