

October 17, 1996



Mr. John C. Hoyle
Secretary of the Commission
United States Nuclear Regulatory Commission
Attn: Chief of Docketing Service Branch
Washington, DC 20555-0001

Subject: Comments on Strategic Assessment Paper DSI 6: Recommended actions if the Commission continues to favor Option 3, maintaining the current NRC HLW program

Dear Mr. Hoyle:

In response to the NRC's request for comments on its Strategic Assessment Issue Papers, I am submitting two comment letters on Paper DSI 6, "High-Level Waste and Spent Fuel." This letter describes actions that the NRC should take if the Commission continues to favor Option 3, maintaining the current NRC program. The other letter describes what I believe the NRC *should* do as a participant in the US HLW program.

I was involved in the NRC's HLW program for 15 years and my comments are strongly influenced by my participation in that program and my observations of the national HLW program. The opinions expressed in these comments are mine and are not meant to represent the opinions of my current or past NRC organizations.

Major Issues That Should Be Addressed under Option 3

If the Commission continues to prefer Paper DSI 6's Option 3, maintaining the current NRC HLW program, the most important issues that it should address are 1) NRC's management of its HLW program, 2) the role of research in the program, and 3) possible modifications to 10 CFR Part 60. The NRC should address each issue to make improvements to its continuing to operate under Option 3.

NRC's Management of Its HLW Program

The present Key-Technical-Issue system of managing the NRC HLW program has two flaws that should be corrected. First, there is very little HLW work that the Center for Nuclear Waste Regulatory Analyses is doing that the NRC HLW staff cannot do. Limiting the CNWRA's HLW work in this makes the CNWRA extremely vulnerable to additional budget cuts.

Second, the KTI system of managing and prioritizing NRC HLW work is predicated on the assumption that sensitivity analyses using performance assessment tools provide a sufficient means for guiding the NRC's technical work on HLW regulation. This assumption is illogical and dangerous to the NRC HLW program. The HLW field is an evolving field technically and PA cannot possibly capture the field's current state of the art. PA is at best an encapsulation of a less-than-current state of the art of mathematical representations of processes affecting the release and transport of HLW's radionuclides to the biosphere. Using a current PA methodology as a management tool to address KTIs that require additional development of the state of the HLW art may result in the NRC's missing new issues that are important to its HLW regulatory mission. Using PA as a primary decision-making tool also may undermine or circumvent staff judgments that are based on information that PA does not accommodate.

A fundamental assumption that went into the NRC's KTI planning was that experimental work, especially field work, was so risky that it should be avoided. Without an independent experimental program, the NRC's HLW-related PA and other technical assessment capabilities lack a fundamental basis of support for their credibility.

Role of Research in the NRC HLW Program

Due to the severe budget cuts that were imposed on the NRC HLW program in FY 1996, the NRC HLW research program was nearly eliminated. The lost research was a necessary complement and support to the NRC's PA and other HLW technical assessment capabilities. These capabilities need research support, especially experimental research support.

The research component of the NRC HLW program could, and should, be reestablished at a significant fraction of its FY 1995 level and the NRC could continue to operate its overall HLW program with the funds currently allocated to it. This course of action would be feasible if the NRC HLW staff took onto itself the full load of work that it now assigns to the CNWRA but could do itself. The CNWRA would then become primarily a research organization with respect to HLW matters, concentrating on laboratory and field work that is now missing almost entirely from, and needed badly by, the NRC HLW program.

The restoration of needed HLW research to the CNWRA could protect the CNWRA from further budget cuts because it would be doing work that NRC needs but cannot do. The restoration also would be consistent with the CNWRA's being a Federally Funded Research and Development Center.

Possible Modifications to 10 CFR Part 60

Paper DSI 6 states that, under Option 3, the NRC would modify its HLW regulation, "Part 60 of Title 10 of the Code of Federal Regulations (10 CFR Part 60)[.] to add a new regulation (e.g., Part 60a) specifically applicable to Yucca Mountain as required by the Energy Policy Act of 1992 (ENPA)." My understanding of this effort is that Part 60a would be "performance-based" and that the explicit multiple-barrier requirements and siting and design requirements appearing in Part 60 would not appear in Part 60a. Preliminary plans for Part 60a that I have seen state that the multiple-barrier approach would be retained in some implicit way. The only explicit performance measure would be the new Yucca-Mountain-specific performance standard that the ENPA requires from the Environmental Protection Agency.

I do not think that it is necessary for the NRC to issue a Part 60a specific to Yucca Mountain. Part 60 can be modified to accommodate the new EPA Yucca-Mountain-specific standard and continue to serve as a generic regulation for any future repositories. The modifications can be done in such a way that several outstanding Part-60 issues can finally be closed and the NRC can avoid the possibility of wasting the multi-million-dollar effort that was spent in preparing its HLW License Application Review Plan, NUREG 1323, and the "Format and Content for the License Application for the High-Level Waste Repository," Draft Regulatory Guide DG-3003.

The multiple-barrier concept should remain explicit in Part 60 in the form of performance objectives on waste package containment, controlled release from the engineered barrier system, and waste-isolation capability of the natural barrier system. Each performance objective should be specified as a recipe for the particular barrier to meet the overall performance objective and any other desirable objectives. For example, the waste packages alone should meet the overall performance objective and be designed to outlast fission products and the thermal pulse from emplaced HLW. By specifying that the waste packages

should meet the overall performance objective, the NRC would allow the HLW licensee some tolerance for early waste package failures and a means for developing a clear quantitative definition of "substantially complete containment," something that has eluded the NRC for about 14 years. The natural-barrier performance objective should state that the natural barrier alone will meet the overall performance objective. Rather than being specified as simply a groundwater travel time, the natural barrier performance objective should allow the HLW licensee to use all beneficial aspects of the natural barrier to meet the objective and require the licensee to show how any adverse effects of the natural barrier on performance are offset. This broadened objective would put to rest the NRC's more-than-ten-year effort to articulate what groundwater travel time means. Siting and design criteria should remain in Part 60 to guide the HLW licensee toward good sites and designs.

If the suggested modification of Part 60 is done carefully, revisions to NUREG-1323 and DG-3003 should be minimal. The NRC staff published these documents several years after the two-stage promulgation of Part 60: Part 60's procedural and technical rules were published in 1981 and 1983, NUREG-1323 was published in 1994, and DG-3003 was published in 1990. Replacing Part 60 with a Part 60a could leave the NRC without coherent review plans and corresponding guidance for compliance for a very long time into the future.

Viability of Option 3

The comments in this letter, all on Paper DSI 6's Option 3, will be of no use if Option 3 is not viable. Given the current state of flux of the national HLW program, it may be necessary for the NRC to approach the Congress and Administration to suggest ways to stabilize the national HLW program before the suggestions in this letter can be used. My other comment letter on Paper DSI 6 encourages the NRC to approach the Congress and Administration to recommend ways to stabilize the national HLW program.

Thank you for this opportunity to comment on the NRC Strategic Assessment effort.

Sincerely,

John D. Randall