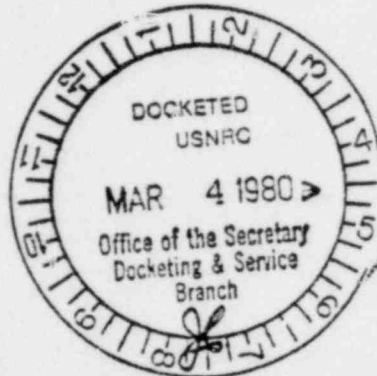


ENERGY RESOURCES CONSERVATION  
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March 3, 1980

DOCKET NUMBER  
PROPOSED RULE PR-2141  
(PR 70408)Secretary of the Nuclear  
Regulatory Commission  
Washington, D.C. 20555Attn: Docketing and Service  
Branch

Dear Mr. Secretary:

The proposed licensing procedures for disposal of high-level radioactive waste in geologic repositories (Federal Register, December 6, 1979) are a significant improvement over the proposed general statement of policy which the U.S. Nuclear Regulatory Commission (NRC) issued in November 1978. The current proposal demonstrates this improvement in two ways. First, the Supplementary Information indicates NRC's recognition that an understanding of the fundamental scientific questions associated with long-term geologic isolation from the biosphere of nuclear wastes is the key to a successful licensing program. Second, it provides a framework within which the necessary information may be gathered as a basis for determining whether a specific repository design at a specific site will provide "reasonable assurance" that radioactive wastes can be disposed of without "unreasonable risk to the health and safety of the public."

We commend NRC's efforts toward structuring a workable licensing procedure, and support the basic approach embodied in these proposed regulations. In general, we agree with the statement on page 7041 of the Supplemental Information that:

"The technical criteria against which the license application will be reviewed are still under development. However, the scope of the technical criteria is regarded as being sufficiently developed to determine an appropriate licensing procedure for their implementation." (Emphasis added)

We do not believe, however, that the current proposal contains all the procedural steps which our understanding of this scope implies are necessary to make licensing decisions. Several aspects of the regulations are vague; we believe they can be improved by making changes consistent with the following discussion.

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### Site Characterization

Site characterization is the foundation of the licensing process; it provides the data on which the licensing decision will be based. Similarly, a key feature of site characterization is the investigation of alternative sites and media.

NRC appears to agree with this view. Footnote seven on page 70411 of the Supplemental Information states that NRC expects the U.S. Department of Energy (DOE) to submit a "wider range of alternatives" than what is considered a minimum: three sites representing a minimum of two geologic media. The "significance of the decision selecting a site for a repository" is cited as justification for expecting DOE to exceed the minimum requirements.

We have two concerns about this approach. First, our interpretation of the significance of repository selection is such that two media should be investigated at a minimum of two sites per medium. Second, NRC's intent with respect to considering alternatives is not reflected in the regulations. There is no requirement for DOE to submit more than one site characterization report or to characterize more than one site. Furthermore, the Environmental Impact Statement (EIS) filed with the license application may have to be site specific to fulfill the requirements of sections 51.5 and 60.21. We suggest that the regulations specify more explicitly the requirements for site characterization and the contents of the site characterization report. Alternatively, an EIS could be required for the site characterization process. In addition, the proposed regulations do not provide for adequate consideration of either NRC's or the public's comments on site characterization reports. The regulations should specify that DOE must respond to issues raised in the site characterization report.

The process for implementing the technical criteria is also vague. The draft regulations indicate that the hydrology, geochemistry, geology, etc., of the proposed sites must be explored. They also indicate that these features need to be explored through a series of tests, including in situ testing at depth. The data obtained from these tests would then be compared against the yet-to-be-developed technical criteria. We envision these criteria to be such things as, for example, tolerance limits for thermal response of the host rock, leach rate limits for the in situ waste form, and ion migration rates under conditions of repository failure. Since the technical criteria are nonexistent, however, the regulations lack an important step; that is, a matching of technical criteria with the specific test or tests which will prove that these criteria can be satisfied by the proposed repository site. Although such a matching is impossible to complete without technical criteria, it can be approached by specifying certain experiments which absolutely must be performed. These experiments can be specified using the current scope of understanding of the technical aspects of repository design, and without obligating NRC to issue a license once the experiments are done. The California Energy Commission has done extensive

work in this area and has discussed these experiments in public documents. For example, in addition to the requirements for alternative site and media investigations mentioned above, we recommend that thermal experiments be run at well above design base heat loads to determine if unexpected effects occur and to our ability to predict thermal response. In situ tests should also include radionuclide or stable element migration over reasonable ranges of water temperature, pressure, Eh, and pH to examine actual geochemical, diffusion and waste-rock interactions under natural conditions.

Thus, NRC could currently specify within the procedural element of the proposed regulations, a number of specific experiments which would aid in the successful licensing of a repository. Doing so would demonstrate the good faith of NRC to address the scientific issues, including the most basic issue: Are the technical criteria adequate to assure isolation? Furthermore, specifying such experiments is a necessary step if NRC views the licensing process as a means for developing technical criteria.

#### License Application and Construction Authorization

Section 60.21(c)(13) requires DOE to specify in its license application--that is, after site characterization and before construction authorization--"those structures, systems, and components of the geologic repository, both surface and subsurface, which require research and development to confirm the adequacy of design." A time scale is required for resolving issues related to items "important to safety."

Although this language describes a procedure which is common in reactor licensing, repository licensing differs from the former in at least one critical aspect. As noted in the Supplemental Information section, under Site Characterization Review (page 70409), the two processes differ in "the extent to which engineered features can be relied upon to accommodate deficiencies in site characteristics." Obtaining such information for geologic repositories has been an elusive goal in the past, and there is little certainty about how quickly such information can be gathered in the future. Therefore, if critical, unanswered scientific and engineering questions are identified as requiring further research and development, and construction is authorized on this basis, there is a possibility that the licensing process and construction may have to be terminated at a later date--at a great cost. There is also a possibility that the project will acquire sufficient momentum that, except in the event of highly visible failure, termination will be ruled out. The regulations therefore should specify criteria which must be met prior to NRC's authorizing construction.

The most important criterion to be met concerns the geologic disposal concept itself. Our first concern is that the proposed regulations do not address adequately the contribution which geology makes to successful isolation. None of the criteria for site characterization includes provisions for locating a geologically stable site which provides assurances for predicted stability over the life of the repository. Site studies which do not consider geologic history may neglect adverse future changes in the ability of a site to isolate wastes for thousands of years. Therefore, we recommend that the proposed rule adopt the following guideline which was discussed in the NRC conference on

State Review of Site Suitability Criteria for High-Level Radioactive Waste Repositories which was held in Denver, New Orleans, and Philadelphia during September, 1977:

"The repository site should be shown to be geologically stable, i.e., it shall not have experienced geological events during the past 10<sup>7</sup> year period of a type and magnitude such that the long-term effectiveness of the repository could be compromised were similar events to occur at some future time."

In addition, we recommend that the geology of a proposed site be classified as "important to safety."

Second, the generally accepted view is that the geologic disposal concept has not been verified as a method which will assure long-term isolation of high-level radioactive wastes. This view is reflected in the Interagency Review Group's (IRG) report and in President Carter's recent statement on nuclear waste disposal. The licensing regulations therefore should require NRC, prior to authorizing construction, to 1) hold a formal proceeding and 2) make a specific finding on the feasibility of geologic disposal at the proposed site.

Deferring detailed consideration of decommissioning until all wastes have been emplaced (Section 60.51) is inappropriate. On p. 70409, it was noted that improper evacuation of an exploratory shaft could make the repository unsealable. The NRC cannot make a decision as to whether the repository can be sealed unless the methodologies for sealing are set forth and demonstrated prior to drilling the first shaft. Although relevant information will be acquired during the operational period and should be used at the time of the issuance of a license amendment, detailed plans should be in hand well before then to assure long term isolation.

#### State Participation

Support C -- Participation by State Governments -- does not meet what we see as the necessary criteria for state involvement in the siting, construction and decommissioning of a repository. Although the proposed regulations offer the state an opportunity to participate, and allow states to specify the scope of their concerns, the NRC is given the authority to make the ultimate decision on what issues states will and will not be able to review in a specific licensing proceeding, as well as the level of funding for review of approved state proposals. In addition, there is no process through which states can appeal an NRC decision on the scope of state involvement.

We realize that DOE bears a large portion of the responsibility for State participation and that NRC's proposal for State participation in the licensing process may be limited for that reason. What DOE proposes for State participation is unclear, however. It is therefore important for the licensing process to provide the basis for meaningful State review. Moreover, the comprehensive nature of the current proposal provides a framework for implementing necessary State participation processes.



The fundamental shortcoming of the current proposal is the lack of a mechanism for states, whether potential host states, or adjacent states, to halt the repository siting process when their concerns are not resolved. Interested states (i.e., states which have a generic interest or a policy concerned with nuclear waste) also have concerns which must be met through specific procedures; the scientific questions in repository development are the same for host, adjacent, and interested states. Section 60.62(b), which contains the undefined term "affected (states)," may eliminate input from interested states.

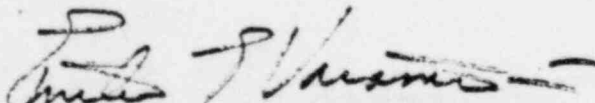
One mechanism for state involvement which has received a good deal of attention, most recently by the Interagency Review Group (IRG), is consultation and concurrence. While the Nuclear Fuel Cycle Committee of the Energy Commission is not tied to this specific terminology, we do support the concept which is embodied in the terminology. Consultation implies an absolute requirement for the federal government to meet, interact, and exchange information with states. Moreover, the idea of concurrence necessarily includes the possibility of nonconcurrence. The proposed licensing regulations appear to bypass entirely the latter concept.

The essential role of a potential host state under current scientific conditions and state-of-the-art should be to participate in the fundamental scientific verification program, even prior to a project being initiated within the state. This role means not only some form of consultative type interaction between the state and the federal government, but also that the state itself should be able to issue a series of concerns or scientific questions and have those questions resolved by its own experts by means of literature searches and informational hearings.

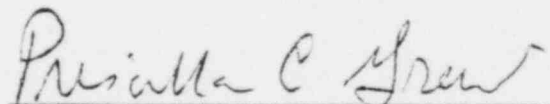
Normally the potential host state role is defined as either having a veto or some form of "cooperative" interaction with the capability to stop the project. This essentially anticipates a subordinate role. In terms of development and in terms of verification prior to licensure, a potential host state should have a capability of interacting on the project and halting the project at any phase of its development if the state is not satisfied that the project is moving forward with a reasonable and predictive set of methodologies. Of course, a mechanism must also be specified for arbitrating cases on non-concurrence and for an ultimate federal override if arbitration fails.

We offer these comments as constructive criticism of the proposed licensing regulations. We hope you give them serious attention.

Very truly yours,



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NUCLEAR FUEL CYCLE COMMITTEE  
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