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Secretary of the Nuclear
Regulatory Commission
Washington, D.C. 20555

Attn.: Docketing and Service
Branch

Dear Mr. Secretary:

The California Energy Commission (CEC), Nuclear Fuel Cycle Committee, submits the following comments on the Draft Technical Criteria for Regulating Geologic Dosposal High-Level Radioactive Waste 10CFR60, Subparts E and F (45FR31393).

With two exceptions, the draft technical criteria identify what appear to be the important technical issues relevant to the performance of a geologic repository for HLW. But identifying technical issues is different from resolving them. The discussion of uncertainty in the Supplementary Information accompanying these draft technical criteria indicates that the Nuclear Regulatory Commission (NRC) understands this difference. The NRC also appears to understand that efforts to resolve the outstanding technical issues through rigorous scientific investigation have begun only recently; otherwise the notion of uncertainty probably would not occupy the prominent position it does in these draft technical criteria. It is therefore difficult to determine whether the technical issues are identified "adequately and fully." (p. 31398) Some technical issues may of wider scope than is currently believed. New issues may also arise as investigations continue.

The first exception concerns the importance of in situ testing as a necessary step in determining how the physical and chemical properties of a proposed site affect transport of radionuclides. Although Section 60.122(a)(9)(iii-vi) requires in situ investigation, there is no discussion of what constitutes an in situ test. Moreover, it is unclear whether these in-situ investigations are necessarily site specific or whether generic test data for a particular medium are acceptable. The CEC recommends that in situ testing be performed at repository depth and under conditions which are as close as possible to the actual repository environment. The acceptability of generic and site specific in situ testing data should also be clarified. For example, generic in situ testing data may be acceptable in conjunction with additional site characterization criteria to assure that the properties of a particular site do not vary significantly from those in which the generic data were obtained.

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The second exception is more fundamental. It concerns the basic approach to scientific investigation which is embodied in the draft technical criteria.[1] The content of the draft technical criteria indicates that the CEC and the NRC have fundamentally different conceptions of what it means from a scientific standpoint to "reasonably deal with issues in an appropriate manner." (p.31398)

The CEC's position is best explained by considering, first, that the goal of nuclear waste management is to isolate wastes from the biosphere during the period of hazard; and second, that the scientific feasibility of isolating radioactive wastes in geologic media remains to be established.[2,3] These two factors imply not only that a basic understanding of the processes in a loaded repository is necessary in order to be confident that the stated goal can be achieved, but that current scientific knowledge falls short of that basic understanding.

The flaw in the draft technical criteria is that they do no establish a minimum of scientific knowledge which is necessary for licensing. In fact, these are not licensing criteria at all but categories of information which must be addressed to an unspecified extent in an effort to hedge against technical uncertainty. Thus, instead of assuring that a licensing decision will be based on an understanding of the repository environment, the draft technical criteria would simply use whatever body of scientific knowledge exists at the time a licensing decision is made. Although the draft technical criteria provide a framework within which the knowledge base could be advanced to the point of understanding the repository environment, the current proposal lacks sufficient clarity to be even an effective hedge against uncertainty. For example, as stated above, there is no definition of what constitutes an "in situ determination." What does it mean that the "Department (of Energy) shall validate analyses and modeling of future conditions and changes in site characteristics using field tests, in situ tests, field-verified laboratory tests, monitoring data, or natural analog studies." (p. 31401) What constitutes validation?

The CEC's position on the technical basis for a licensing decision is that a predictive capability must be demonstrated. Experiments must be performed whose anticipated results are matched by empirical data. This approach is stated more clearly in the CEC's Statement of Position in the NRC's Waste Conference Rulemaking (44FR61372). Until a predictive capability has been achieved, no hedging strategy can presume to assure isolation of radionuclides from the biosphere.

Although the draft technical criteria represent a serious effort to come to grips with the problems of licensing a repository, the criteria are premature. The qualitative, philosophical approach embodied in these

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[1] The "basic approach to scientific investigation" should not be confused with the approach to licensing in the procedural element (44FR70408).

[2] California Energy Resources Conservation and Development Commission, Nuclear Fuel Cycle Committee, Status of Nuclear Fuel Reprocessing, Spent Fuel Storage, and High-Level Waste Disposal, January 11, 1978.

[3] Report of the Interagency Review Group on Nuclear Waste Management, March 1979, p. 42

criteria is an indication of how little unambiguous data currently exists on repository performance. This approach simply does not provide confidence in licensing decisions. Moreover, the formal criteria which do exist are not well conceived.

For example, the criteria provide no containment standard applicable to the geologic barriers. Section 60.111(c)(1) directs that waste packages should provide reasonable assurance of complete containment for the first 1000 years after decommissioning. Section 60.111(c)(2) requires only the same 1000-year containment, as does 60.111(c)(3) pertaining to overall performance of the engineered system. In other words, the criteria do not require the geologic media to provide any containment whatsoever. Under this approach to isolating wastes, it is not likely that investigations of the physical and chemical properties of host media will be performed adequately.

Furthermore, how can the NRC have confidence that the current proposal will meet the Environmental Protection Agency's radiation protection standards when those standard do not yet exist?

The draft technical criteria nevertheless serve the purpose of demonstrating that the NRC is aware of the technical issues relevant to repository licensing and is proceeding as rapidly as possible toward useful technical criteria under the constraints of an incomplete data base. We applaud this current effort and hope our comments will be useful in focusing additional efforts.

Sincerely,

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