

SD 901-1

823 Del Ganado Road
San Rafael, California 94903

June 26, 1980

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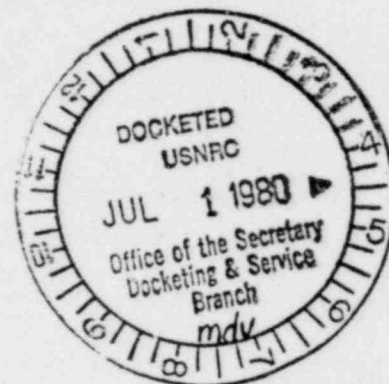
PROPOSED RULE

PR-60 (10)
(45 FR 31393)

Secretary
Nuclear Regulatory Commission
Washington, DC 20555

Attention Docketing and Service Branch

Dear Mr. Secretary:



40 CFR Part 60, Technical Criteria for
Regulating Geologic Disposal of
High-Level Radioactive Waste

This letter is written in response to your Advance Notice of Proposed Rulemaking on the above subject.

I would first like to generally concur and offer my compliments to your staff for an excellent development of the logic relative to a very difficult subject.

Next, I would like to offer the following major comments which I believe to be related to an omission rather than a comment on any one of the proposed criteria. This omission deals with the fact that it is fundamentally wrong to imply that we can predict everything that will occur, or all new factors or phenomena that we will ever discover during the radioactive decay period. However, such a problem is not new to the scientist, or engineer, except to the degree of time involved. The normal engineering solution to such a problem falls into two broad categories. The first category is to provide in the design, and in the construction of a facility, added margins of safety, or spare back-up equipment, which can be utilized when and if necessary. This first category is generally recognized in your criteria. The second category involves incorporation in the basic design, starting at its concept selection, of adequate bases by which future changes can be made to the facility to take care of any reasonably projected possible new factors or phenomena. As examples, the designer of a facility leaves adequate room so that a piece of equipment can be replaced — even though it may not be deemed important enough to have provided a spare, or to even have provided the needed crane. Thus, the distinction is the consideration of, and preservation of, possible future options as contrasted with those which should be fully incorporated into the facilities from the start.

L-4-1, Pt. 60

Acknowledged by card. 7/1/80. mdv.

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This logic leads one to further consideration at the concept selection stage of such future options as the reasonableness of diverting future groundwater flows, should they be found to occur, further sealing components that may have not been effectively sealed, and even the longer term recoverability concepts under extreme conditions. (It is also recognized that a strong emphasis on this latter item would lead in the direction of selecting a concept which makes such recoverability easier — i.e., probably the use of less depth, or even a surface final disposition concept. For this reason, I also would not favor the 300-meter minimum depth criteria.)

As a general strategy, I also believe that we ought not to be considering the subject as "disposal", which has a finality connotation that the above logic acknowledges we cannot accept, and which has a growing disfavor with the public. A more responsible scientific and engineering position to take is that we are providing for the "disposition" of wastes in a manner which will adequately store them until their inherent potentially harmful characteristics disappear. I would strongly recommend substitution of the word "disposition" for "disposal".

I also would like to offer the following more detailed comments:

- (1) The criteria acknowledges the need to avoid resources that are economically exploitable, and includes as such a resource "... a high and anomalous geothermal gradient relative to the regional geothermal gradient". However, we also should acknowledge that the placement of heat-producing materials in a repository will build up the surrounding temperatures to a level that might be interpreted by a future explorer as just such an anomalous geothermal gradient. Thus, we must conclude that we can have administrative controls for longer than 100 years, or we must not entice the explorer by allowing temperatures to rise to the level that he might interpret as being of interest.

In this regard, it is perhaps important to categorize the wastes by a thermal characteristic, as well as the radioactive characteristics, with the distinction being the time period during which the surrounding media temperature will be increasing (due to a heat generation rate that is greater than the heat dissipation rate) and a time period after which the surrounding media will have essentially returned to normal background temperatures. (It always will be somewhat above ambient.)

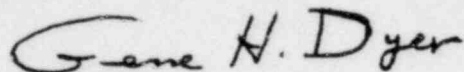
- (2) The requirement that radioactive waste "... can be retrieved for a period of 50 years after termination of waste emplacement operations, if the geologic repository operations area has not been decommissioned" and that they be able to be retrieved "... in about the same period of time as that during which they were emplaced" is a good general concept but likely will lead to problems as specifically worded.
- (a) It is possible that a decision might be made to retrieve only a portion of the wastes, since over the emplacement period differing materials and techniques are likely to evolve.
 - (b) If the repository is decommissioned immediately after the placement of the first waste package, then there is no retrieval requirement. Further, if it is intended to accomplish such early decommissioning, then the requirement to design and construct a retrievability capability could be construed to not be required. This logic could be further extended all the way out to just short of the 50-year period.
 - (c) This requirement makes more difficult the backfilling of emplacement tunnels immediately after emplacement — say, with salt being excavated in other portions of the facility.
 - (d) I do not have facts, but I suspect removal will be considerably more complicated than placement and will require more time, especially if backfilling is conducted prior to decommissioning.
 - (e) To what extent must retrievability be achieved? Should there be a specification on residual radioactivity in the event of a waste package failure?
 - (f) What minimum conditions would lead to a requirement to conduct a retrieval operation, and who decides, etc.?
 - (g) In summary, while agreeing with the retrievability concept, I believe it important to recognize the dynamic nature of the emplacement operations, and to couple the retrievability requirement to them, rather than have a single simple 50-year rule.

Secretary, NRC - 4
June 26, 1980

- (3) The requirement relative to the TRU waste release rate does not specify from where, or to where. Does the definition include the engineered barriers, or just the geologic barrier?

Thank you for the opportunity to offer these comments.

Very truly yours,

A handwritten signature in cursive script that reads "Gene H. Dyer". The signature is written in dark ink and is positioned above the typed name and title.

Gene H. Dyer
PE, Nuclear-234, California