

SD 901-1



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DOCKET NUMBER **PR-60 (20)**
PROPOSED RULE **(45 FR 31393)**



Secretary
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

ATTENTION: Docketing and Service Branch

SUBJECT: Technical Criteria for Regulating Geologic Disposal, High-Level
Radioactive Wastes

Dear Sir:

This is in response to your advance notice of proposed rulemaking 10CFR Part 60, "Technical Criteria for Regulating Geologic Disposal High-Level Radioactive Waste."

Westinghouse has the following general comments on the specific questions raised in the "Supplementary Information" section:

- a. Instead of focusing on performance of the repository system (NRC Consideration 1), the draft criteria specify performance standards for major components of the system (NRC Consideration 2). These component performance standards should be eliminated. We believe it is essential that the criteria focus on performance of the overall system and on protecting current and future generations.
- b. The list of considerations should be expanded to acknowledge that the draft technical criteria apply to a repository which will not be operational before 1997, according to latest Administration schedules. The initial rule should develop performance goals and requirements for the overall system. The current draft criteria incorrectly specify engineering design requirements. Instead, the criteria should provide the future designer and analyst with guidelines that allow the latitude necessary to accommodate repositories in various geologic media, advances in technology, and the influence of complementary regulations such as EPA Standards. We do not believe that these aspects have been thoroughly considered. For instance, paragraph 60.132 "design requirements" are too specific in addressing shaft and borehole sealing, conveyance design, and water control requirements.

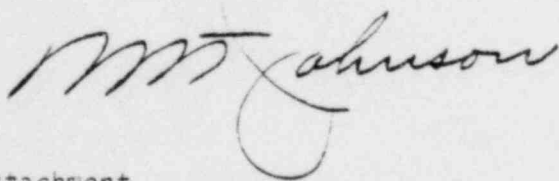
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In being so specific, they arbitrarily constrain the benefit of future research and development or suitability of a specific site. Paragraph 60.111 refers to as yet unestablished EPA performance standards but is very specific in defining release rates for the repository. Conversely, the technical criteria also contains words like significant, optimized, reasonable, likely, etc. when addressing other issues. These areas must be kept to a minimum to discourage future conflicts in interpretation.

- c. The Commission should consider requiring the Department of Energy to conduct early demonstrations of repository disposal systems in various geologic media such as those proposed in House Bill H.R. 7418. This would allow the Commission to develop the 10CFR60 regulations in conjunction with the design, construction, and operation of the required system demonstrations.
- d. Many of the draft technical criteria are not reasonable or realistic, and as such do not deal with the issues in an appropriate manner. In addition to specifying engineering design requirements (see comment b above), many of the numerical criteria appear to be arbitrarily selected. For example, this sense of arbitrary requirements exist in sections dealing with retrievability and resource assessment. It should also be recognized that numerical criteria apply to unique conditions which may not be generically applicable.
- e. The planned NRC environmental impact statement should justify proposed numerical criteria with cost/benefit analyses as required for such statements.

Additional detailed comments are provided in the attachment. Westinghouse fully recognizes the national importance of nuclear waste management, and is prepared to assist in any way possible in the resolution of our comments.

Very truly yours,

A handwritten signature in cursive script, appearing to read "M. Johnson". The signature is written in dark ink and is positioned below the "Very truly yours," text.

Attachment

ATTACHMENT - DETAILED COMMENTS ON ADVANCE NOTICE
OF PROPOSED RULEMAKING

1. General - As noted in our comment letter, we believe that many of the draft technical criteria are not reasonable or realistic, and as such do not deal with the issues in an appropriate manner. We recommend the following significant changes:
 - a. Component performance standards should be eliminated. Instead, the criteria should focus on the performance of the overall system and on protecting current and future generations.
 - b. The considerations should acknowledge that these draft criteria apply to a repository which will not be operational before 1997. Engineering design requirements should be deleted from the criteria. This is needed to provide the latitude to accommodate advances in technology, and future knowledge gained on various geologic media.
 - c. Numerical criteria should be justified by both technical analyses and by cost/benefit analyses.
2. General - Based on comment 1 above, significant changes will be required in the technical criteria. Our additional comments, listed below, are provided as illustrative examples. These do not represent a complete set of detailed comments on the draft technical criteria.
3. Considerations (6) Retrievability - The time period for retrievability of 50 years after decommissioning seems excessively long. When coupled with up to a 40-year repository operational period, it could require that some mined portions of the repository remain fully operational for 90 years. To design and construct the repository openings for this period of time and to maintain them for this period of time could add very considerable expense to the repository. It would seem appropriate and reasonable to require a shorter retrievability period after start of waste emplacement (10 to 15 years) in which the major concerns about long term effects are reasonably answered and confirmed. After this point in time, going back in for retrieval could require some remining and additional operations. However, the potential for having to perform those operations is quite small. It would be better to face the small potential of these costly operations than to require the expensive, very long retrieval period be designed into every repository.

4. 60.2 - Under definitions, the definition of "barrier" should be expanded to include materials or structures which function to reduce corrosion and modify or exclude groundwater and thus prevent anything from getting to the radioactive waste to move it outward. As written, the barrier function only covers retardation of radionuclide movement outward.
5. 60.101 (e) - We believe the first sentence of this subparagraph should state that the "subsequent sections assume that disposal will not be in saturated media".
6. 60.111(a)(2) - This subparagraph refers to as yet unestablished Environmental Protection Agency performance standards which will apply to radioactive waste releases to the accessible environment after repository decommissioning. As such, it seems premature to specify an annual release rate (10^{-5} of 1000 year inventory per year) without guidance from the EPA.
7. 60.111(a)(3) - The last sentence requires that retrievability be accomplished in about the same period of time as that during which the wastes were emplaced. There is no technical justification for this requirement. The designer should estimate the time required for retrieval and design the underground structure to permit retrievability to be accomplished over the estimated time period. Since retrieval is not expected to occur, the design of the waste package should not be unnecessarily influenced by the time required for retrieval, which could be the case if a specified time requirement is imposed.
8. Paragraph 60.111, item (c) (1) and (2) - The footnote to these subparagraphs notes that these sections apply only to HLW. In fact, the entire regulation applies only to HLW and, as such, item (c) (3) should not distinguish between HLW and TRU waste. If a distinction is necessary, reference should be made in item (c) (3) (ii) to long-lived actinides contained within HLW such that the applicability of this regulation would not be confused.

9. 60.111(c)(1) - The beginning of this paragraph states that the waste packages shall be designed so that radionuclides will be "contained". Referring to the definitions of 60.2, "containment" means keeping radioactive waste within a designated boundary. In the case of the 60.111(c)(1) requirement, what is the designated boundary? One would assume that the designated boundary is the boundary of the waste package, but does this include the retrievable package or all components emplaced (such as a liner that might be preplaced)? This should be clarified.

This subparagraph also requires waste packages to contain all radionuclides for at least 1000 years given expected processes and events as well as various water flow conditions. These two requirements are not compatible. The assumption of full or partial saturation as part of expected processes and events is overly conservative and unreasonable. These types of conditions would most likely occur only as a result of gross failure of the geologic environment and all engineered systems, the very conditions against which the geologic environment and engineered systems were selected.

10. 60.111(c)(2)(ii) - This subparagraph requires the design of the underground facility to contain all radionuclides within the first 1000 years after decommissioning. In addition to expected processes and events, it requires the assumption that "some of the waste dissolves soon after decommissioning". This assumption appears overly conservative. Major efforts and expense are going into waste package design to contain all wastes for at least 1000 years so an assumption that some dissolves immediately after decommissioning is inconsistent.

Also, what is the "designated boundary" for containment? It cannot be the boundary of the underground facility since, after decommissioning, the boundary is not longer definable. What is important is that radionuclides not reach the accessible environment for 1000 years. This is accomplished by providing a waste package that will last for 1000 years and, in case of failure of the package, a geologic barrier that provides a radionuclide travel time of 1000 years as required by 60.111(c)(4)(iii).

11. 60.111(c)(3) - The title of this section should be "Overall Performance of the Engineered System After the Containment Period."
12. 60.121(c) - The last sentence indicates that institutional controls should not be assumed to persist for more than 100 years. Based on past history, this assumption is unnecessarily conservative. Also, the time assumed for institutional controls to exist should be specified to start after decommissioning.
13. 60.122(a)(2)(i) - The 100 kilometer radius specified for investigations has no technical basis. The area surrounding the repository site should be investigated to the extent required to characterize the principal features of the geologic regions in which the repository will reside. The extent of this area is site specific.
14. 60.122(a)(7) - This paragraph requires continuous verification and assessment of changes in site conditions. This is impractical if the word "continuous" is interpreted literally. Furthermore, there is no indication of how long this should be carried out.
15. 60.122(a)(8) - This paragraph requires estimates of all resources. This can be an endless job depending on the interpretation of "all" and the definition of a "resource."
16. 60.122(a)(9) - Many of the properties and characteristics required to be determined by the subparagraphs of this section are impossible or impractical to obtain in the implied detail without adversely affecting the future integrity of the repository. Also, use of field tests in lieu of on site in-situ tests and off site in-situ test where appropriate, should be allowed.
17. 60.122(b) - The applicability of this section should refer to Paragraph 60.122(a)(9), (2 kilometers from the limits of the repository) rather than item (a)(8), (within 100 kilometers of the site).

18. 60.122(b)(1) - In the draft technical criteria, paragraph 60.122(b)(1) "Potentially adverse human activities" the repeated use of the word "reasonable" when assessments are made may well lead to significant controversy. Better definitions would be appropriate and quantification best, if such were possible.
19. 60.122(b)(1)(iii) - This subparagraph indicates that the presence of economically exploitable resources would disqualify a site. This is overly restrictive since it will be difficult to find a site where no resources exist (again, what is the definition of resource). This restriction makes some sense in the case of a rare commodity, but not in the case of a commodity that is widely available since the probability of that commodity being sought for at the precise location of the repository is low.
20. 60.122(b)(1)(iv) - Resource assessments should be limited to the net comparative value of the resource since this value and not the gross value will determine the probability of recovery.
21. 60.122(b)(4)(1) - This paragraph is confusing and appears to be unnecessary.
22. 60.132(b)(2) - The option to overpack rather than decontaminate retrieved waste should be maintained.
23. 60.132(c)(2)(i) - The second sentence of this paragraph states, "The Department shall include an identification and a comparative evaluation of alternatives to the major design features that are provided to enhance radionuclide retardation and containment." It is reasonable to describe alternatives that have been considered, but as stated, this requirement implies a never ending search for perfection when the objective should be to exceed the performance requirements. Looking at all possible alternatives will not help in performing this function.

24. 60.132(c)(2)(iv)(a) - It is unclear what the phrase "sealed along their entire length" requires. It may not be desirable to provide a continuous seal from the repository level to the surface in lieu of a series of seals separated by backfill of the host rock. The criteria borehole plugging methods and their anticipated performance prematurely.
25. 60.132(c)(2)(iv)(a) - This subparagraph should be deleted. It is up to the designer, not the regulator, to determine how the shafts and boreholes should be sealed as long as the seals meet the performance criterion which is stated in the following subparagraph. Furthermore, the time of sealing will be dictated by operational considerations and should not be specified by the regulator. Subparagraphs (c) and (d) are redundant to the basic criterion of subparagraph (b).
26. 60.132(c)(2)(vi) - This subparagraph is incorrectly designated as (iv).
27. 60.132(c)(4)(ii) - This subparagraph indicates that the design of openings shall be "optimized". What is the meaning of "optimized"?
28. 60.132(c)(6)(ii), (iii), and (iv) - Criteria of this type should generically address the issue. It is up to the designer to develop a satisfactory means of meeting the criteria.
29. 60.132(c)(9)(iv) - This subparagraph talks about control of water from waste emplacement areas. Is the concern that the water might be contaminated? If so, it should be stated.
30. 60.132(c)(9)(v) - This is too specific. The concern should be specified along with a requirement that a means be provided to ameliorate the concern. It is up to the constructor to determine if pregrouting is appropriate.
31. 60.133(a)(1) - The comments on 60.132(c)(2)(i) and 60.132(c)(4)(ii) also apply here with regard to "comparative evaluation" and "optimization".

During the design process, it can be expected that a number of designs will be developed and evaluated. However, this is an evolutionary process aimed at achieving a balanced design to accommodate all the applicable functional requirements and performance objectives, some of which might be conflicting (for example, the desire to design a package to contain radionuclides for as long as possible is contradictory with the requirement for retrieval; that is, the package cannot be designed with such high integrity that it cannot be taken apart again). Making design comparisons solely for the purpose of comparison is not productive.

32. 6.133(a)(5) - Testing to show compliance with 60.133(a)(1) has no meaning. Testing should be directed toward supporting the basis for concluding that the performance objectives of 60.111 will be met.
33. Paragraph 60.133(c)(3) - Surface contamination limits should not be referenced to an exposure criteria but rather should relate to the waste package content such as the DOT regulations do.
34. 60.135 - The comment to 60.111(a)(3) also applies here with regard to the time period in which the waste must be retrieved.