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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

HQZ.870302
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December 20, 1983

Mr. William J. Dircks
Executive Director for Operations
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Dircks:

SUBJECT: COMMENTS ON DOE GENERAL GUIDELINES FOR RECOMMENDATION OF SITES FOR NUCLEAR WASTE REPOSITORIES (10 CFR 960)

Enclosed for your information are comments on the above subject report which have been prepared by our Subcommittee on Waste Management. These comments are based on discussions held by the Subcommittee members with representatives of the Department of Energy during a meeting on December 2, 1983.

Although the Committee has not reviewed this matter, the members have endorsed forwarding these comments to you for your consideration.

Sincerely,

J. J. Ray
Chairman

Enclosure:
Comments on DOE General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories, ACRS Subcte. on Waste Management, 12/3/83

Reference:
DOE Final Guidelines, "General Guidelines for Recommendation of Sites for Nuclear Waste Repositories," dated November 18, 1983

cc: Chairman Palladino
Commissioner Gilinsky
Commissioner Roberts
Commissioner Asselstine
Commissioner Bernthal
W. Bennett, DOE
C. George, DOE
C. Hanlon, DOE

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Comments on
DOE General Guidelines for the
Recommendation of Sites
for Nuclear Waste Repositories
(10 CFR Part 960)

Subcommittee on Waste Management
Advisory Committee on Reactor Safeguards
December 3, 1983

General:

1. We were pleased to note (a) the care with which our previous comments had been addressed and (b) the technical expertise of the DOE Staff engaged in the development of these Guidelines. We were also impressed by the efforts of the DOE Staff to assure compatibility of the Guidelines with the NRC regulations, 10 CFR 60.

2. Although we understand the objectives being sought, we believe that the "favorable" conditions, specified for evaluating each of the characteristics of a proposed site, tend to be so stringent that they may result in no single site being able to meet more than one or two of them. If this proves true, such a situation may provide too restrictive a view of what is required for a site to be judged acceptable. We suggest that the criteria used in developing the "favorable" conditions be reassessed.

3. Before these Guidelines are completed, we believe it is important that DOE solicit and carefully consider comments and suggestions from appropriate state officials and environmental groups. It is assumed that a similar opportunity for comment is being provided to the technical staff within NRC as well as other federal agencies such as the U.S. Environmental Protection Agency.

4. We found it difficult to follow the organization of the report. The paragraphing should be arranged so as to clearly distinguish the sections from the subsections. The relationship between "Technical Guidelines" and "System Guidelines" in Subsection 960.3-1-4, "Basis for Site Evaluations," was particularly difficult to comprehend. Since both of these terms are important, they should probably be included in the definitions at the beginning of the report.

Specific:

1. Although the definition of "high-level radioactive waste," as given in the Guidelines is identical to that specified in the Nuclear Waste Policy Act of 1982, the question remains whether wastes containing radionuclides, such as ^{14}C and ^{129}I, must be placed in a repository. This should be clarified.

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2. We believe that the 200 meter minimum depth for a repository should be clearly tied into the criterion for avoiding subsequent erosion by surface streams. Much deeper depths would generally be preferred. It is clear that, in no case, should locations subject to flooding be selected even if dikes or flood walls for flood protection are proposed. This is due to the improbability of estimating maximum flood levels correctly over the projected life of the repositories. Even though a greater depth, such as 300 meters, may be adequate on the basis of rates of nonglacial erosion, it is not sufficient if erosion by glaciation in a valley bottom site is considered. Neither is 300 meters a sufficient depth to provide adequate protection against unknowing penetration by people in future generations.

3. The definition of "cumulative releases of radionuclides" now refers to the total release during any 10,000 year period in the life of a repository. Clarification should be sought from the U.S. Environmental Protection Agency to determine if this should apply only to the first 10,000 years after closure of a repository.

4. We found the third sentence in Section 960.3-1 difficult to understand. The implication is that only sites with several geologic media would be considered acceptable. Clarification would be appropriate.

5. Section 960.4-2-1, Subsection (b)(4). Subcommittee members had difficulty understanding the phrase, "effective porosity." Some clarification may be appropriate.

6. Section 960.4-2-3, Subsection (b)(1). We suggest that this be reworded to say: "A host rock that is strong, stable, preferably dry, and sufficiently thick...."

7. Section 960.4-2-5, Subsection (b)(3). We suggest this be reworded to say: "Site conditions such that waste exhumation by natural processes would...."

8. There is a need for insertion of restrictive or clarifying adjectives in a few sentences, particularly in the sections specifying qualifying or favorable conditions for a repository. There also appears to be a lack of sufficient emphasis on the importance of the qualities of the host rock and the geographic locations of repositories. Specific suggestions on these matters are provided in the accompanying comments prepared by Dr. Shailer Philbrick, ACRS Consultant.

Attachment:
Comments by ACRS Consultant, Shailer S. Philbrick dated 12/1/83, "Comments on DOE General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories (10 CFR Part 960)"

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COMMENTS ON DOE GENERAL GUIDELINES FOR THE RECOMMENDATION OF SITES FOR NUCLEAR WASTE REPOSITORIES (10 CFR PART 960)
BY ACRS CONSULTANT SHAILER S. PHILBRICK - 12/1/83

Page 11 The engineered barrier system required by 10 CFR 60 for "the containment of waste will be substantially complete during the first 300 to 1000 years after closure." What is the desired and required time span?

Page 18 Geohydrology 960.4-2-1-(b)-(iv) - Instead of "high effective porosity" why not a much more usual expression "high permeability?"

Page 19 960.4-2-1(c)-(2) - "Human consumption without treatment." Probability is that if used as public water supply, treatment will be required anyway.

Page 21 960.4-2-3-(b)-(1) Insert "strong, stable, preferably dry, and sufficiently thick ...." Add, "the rock shall be suitable for safe excavation with adequate standup time, and require minimum roof support and lateral restraint. The rock shall be suitable for conventional boring to form holes for receipt of waste packages."

Page 22 Climatic changes - 960.4-2-4-(b)-(1) - The site should be located in a place where it will be unaffected by changes in the surface water system resulting from expected climatic cycles of the next 100,000 years.

Page 23 Erosion 960.4-2-5-(b)-(1) - A depth of 300 meters may be adequate somewhere but not in the Finger Lakes Region of central New York state where glacial erosion in the valleys has been on the order of 200 meters. Considering human intervention, 300 meters is much too little. It should be on the order of 1000 meters.

Page 24 Tectonics 960.4-2-7-(a) - Insert, "the DOE will consider the geomorphic, structural, stratigraphic ...."

Page 25 960.4-2-7-(c) - Add (7) "Evidence that any likely tectonic activity or events would disturb the ground surface at the site."

Page 27 Please explain why so little emphasis is placed on the feasibility of constructing a safe repository to serve the desired purpose of this effort. If such a repository can't be constructed, the rest is a waste of time.

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Page 33 950.5-2-7-(b)-(1)-(iii) - Rewrite to read, "Major cuts and fills, or tunnels, or bridges are not required."

Page 37 950.5-2-10-(b)-(2) - Locate the site above the maximum flood level and don't fool around with dikes and flood walls which can and will be overtopped because someone will build them to a lower than maximum flood level on a decision based on flood frequency studies.

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