

October 22, 1979

SECY-79-580

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COMMISSIONER ACTION

For: ~~The Commissioners~~

From: R. B. Minogue, Director
Office of Standards Development

Thru: Executive Director for Operations *[Signature]*

Subject: PROPOSED NEW 10 CFR PART 60, "DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES - PROCEDURAL ASPECTS"*

Purpose: To consider publication for public comment of that portion of a new Part 60 and related amendments to Parts 2, 19, 20, 21, 30, 40, 51, and 70 dealing with the procedures for licensing geologic disposal of high-level radioactive wastes.

Category: This paper involves a major policy question.

Issue: Whether to depart from the proposed General Statement of Policy on licensing disposal of high-level radioactive wastes in light of comments received, further staff reflection on the procedures, and information gained from studies and discussions with earth science experts.

Discussion: In November 1978, the Commission published for comment a proposed General Statement of Policy which set forth procedures for licensing geologic repositories for the disposal of high-level radioactive wastes (HLW). The Policy Statement called for a four-step approach -- review of DOE site selection, review of repository development, repository licensing, and repository decommissioning -- which provided for State and public involvement in the licensing process beginning at the earliest stage and continuing through decommissioning of the repository. The proposed rulemaking which is the subject of this paper generally comports with the licensing procedures described in the proposed Policy Statement.** As with the Policy Statement, the procedures of the proposed rule are divided into four steps: an early review prior to receipt of an application, a licensing review prior to construction, a second licensing review prior to receipt of wastes, and a final review with decommissioning. However, as explained below, the proposed rule does depart from the specific procedures of the proposed Policy Statement with respect to the nature and extent of exploratory activities which can be

* This paper discusses the procedural aspects of licensing geologic disposal of high-level radioactive wastes. The technical requirements, in the form of an Advanced Notice of Proposed Rulemaking, will be presented to the Commission within a few weeks.

** Under the Policy Statement and the proposed rule, the license applicant would be the Department of Energy, itself, and not a DOE prime contractor.

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carried out at a site prior to authorization of construction. Moreover, unlike the Policy Statement, the proposed rule provides for such activities at a number of sites prior to final selection of a site for a repository.

✓ This change is based upon the following considerations which the staff found to be controlling. First, no commenters on the Policy Statement questioned either the appropriateness of or need for the degree of confidence in the ability of the proposed repository to isolate radioactive wastes reflected by the finding proposed in the Policy Statement as needed to authorize construction.* Second, in light of further study, the NRC staff now considers that the surface geophysical exploration and limited borings--all that was permitted under the Policy Statement--in most cases will not yield sufficient detailed information to support that degree of confidence.

Insofar as subsurface geology and hydrology are concerned, the investigations permitted under the Policy Statement would have provided substantial information regarding the stratigraphy and hydrogeology of the site. While this information is obviously relevant and extremely important in evaluating a site, the data needed to establish the ultimate suitability of the site will be obtained only through exploration and in situ testing at depth, i.e., in the proposed host rock unit.

✓ Exploration and testing are needed not only to determine whether serious but not readily observed defects are present, but also to determine specific properties such as homogeneity, porosity, the extent of fracturing and jointing, and the thermal response of the rock including expansion, fluid migration and decrepitation. Of course, the kinds of defects--fractures, breccia pipes, etc.--will vary from one kind of medium to another, and from site to site, as will the properties which are key to isolation of the wastes. But the important point is that without exploration and in situ testing in the proposed host rock unit, neither the defects nor the key parameters can be determined with confidence. Hence, the staff now believes that the results of exploration and in situ testing within the rock unit in which the wastes might be placed will be necessary to support the "reasonable assurance...without unreasonable risk" finding.

Support for the staff's revised position on exploration and testing prior to construction is bolstered not only by comments received on the Policy Statement but also by many in the earth science community with whom we

* Specifically, under the procedures set forth in the Policy Statement, the Commission could authorize construction if it found that "there is reasonable assurance that the types and amounts of wastes described in the application can be stored in a repository of the design proposed without unreasonable risk to the health and safety of the public...".

have discussed this matter, including members of the U.S. Geological Survey staff (see Enclosure "C", p. 3). These experts agree that exploration and testing at depth should be performed if sufficient data are to be obtained to determine whether the surrounding geology will retard waste migration and to make meaningful comparisons among alternatives. Further, the importance of exploration at depth has been cited by both the IRG report (Appendix A) and the recent National Academy of Sciences report, "Implementation of Long-term Environmental Radiation Standards: The Issue of Verification" (Committee on Radioactive Waste Management, 1979).

Exploration at depth is not without some liability, however. As discussed in Enclosure "C", exploration and testing at depth involve considerable costs. The staff has estimated these costs to be in the neighborhood of \$20 million.* Moreover, it has been argued in comments on the Policy Statement that once access is gained to the potential host formation, DOE is committed and may press relentlessly to develop that site. Finally, exploration and testing at depth not only have some environmental impact, but also must be carefully done if the potential suitability of the site is to be protected.

Thus, costs, impacts, implications relative to the ultimate safe disposal of HLW, and the possibility of premature commitment to a site by DOE, all accrue from exploration and testing at depth. Hence, it seems reasonable that the NRC as the licensing agency would wish to be in a position to review and influence the DOE exploration and testing program as early as possible.

Given that a program of exploration and in situ testing at depth is likely to be necessary to obtain the information needed to support a construction authorization finding, and given the desirability of NRC involvement as the licensing agency in reviewing and influencing that program, the question is whether the procedures of the Policy Statement will assure both that DOE will be able to carry out an appropriate program of exploration and testing, and that NRC will have a meaningful role of review and influence during that program.

Decision
Criterion:

The procedure which the Commission adopts ought to (1) assure an effective review of DOE's exploration and testing program, (2) assure that the information necessary to authorize construction is obtained in an efficient manner, (3) avoid premature and unwarranted commitments by either DOE or NRC, and (4) provide for meaningful participation in the decisionmaking process by the public, the States, and other Federal agencies.

*The conservatively estimated cost for site characterization contained in Enclosure "C" is around \$10 million. However, the excavation costs are based upon typical mining practice. The special care of excavation required at a repository might double those costs. Moreover, more extensive testing at depth might be necessary than that presently anticipated in Enclosure "C". For these two reasons, the staff believes a figure of \$20 million to be a safe upper bound.

Alternatives: Four alternatives are available to resolve the issue stated above:

- a. Implement the Policy Statement as is.
- b. Require a lesser licensing decision than that authorizing construction, to permit exploration and testing at depth at a site.
- c. Provide close but informal NRC involvement during exploration and testing.
- d. Require a limited licensing decision on DOE's program for site selection, exploration, and testing, prior to permitting exploration and testing to proceed.

Alternative a. Implement the Policy Statement as is. That is, propose a rule in exact conformance with the proposed General Statement of Policy as published for comment in November 1978.

Requiring a regulatory action early in the development of a repository has the appealing feature that decisions can be made before there is substantial commitment to a site or expenditure of resources. Moreover, this alternative provides a fall-back position, via the provisional construction authorization, which allows an incremental increase in the level of commitment and expenditure of resources if sufficient confidence is not present to support full authorization of construction.

However, the Policy Statement would not allow the exploration at depth which the staff now believes is necessary to obtain the information with which to support authorization of construction.

The fall-back provisional construction authorization contained in the Policy Statement may not solve the problem. First, the Policy Statement appears to exclude authorization of any activity other than sinking the main repository shaft alone. As discussed in Enclosure "C", this is little better than sinking another borehole unless accompanied by lateral boring and testing at depth. Second, the provisional construction authorization assumes that the environmental issues can be resolved and the site selected prior to sinking of a shaft, despite the deficiency of geologic and hydrogeologic data. Hence, the Policy Statement neither anticipates nor provides for development of comparable data from shaft sinking at the alternative sites. Third, the wording of the Policy Statement requires a finding to support granting of a provisional construction authorization that seems to be comparably stringent to the finding required for authorizing full construction.

Alternative b. Require a lesser licensing decision than that authorizing construction, to permit exploration and testing at depth at a site. That is, propose a rule that requires a licensing decision on environmental and safety issues prior to allowing DOE to proceed with exploration and in situ testing at depth. The finding necessary to that decision would be a lesser finding than the provisional construction authorization finding

of the Policy Statement. The finding would be based upon relatively complete environmental data, but could include only geologic and hydrogeologic information available prior to exploration and testing at depth. Consequently, the licensing decision would not authorize construction. However, the decision would result in the selection of a site and permit further collection of information necessary to make the decision to authorize construction at that site.

This alternative has the clear advantage of satisfying the concern regarding insufficient technical information to support authorization of construction inherent in alternative a., while providing for early public, State, and NRC input through a licensing decision made before any substantial commitment of resources by DOE to a particular site. In fact it may be argued that the Policy Statement as currently written does not exclude this approach, but that would be determined on a case-by-case basis.

Adoption of this alternative would establish the provisional construction authorization as a mandatory licensing step rather than as a licensing board option. It would assure that a regulatory decision, albeit preliminary, will be made prior to a major commitment of resources by DOE. It would also assure that further exploration is performed under the licensing and inspection auspices of NRC. This is important since excavation at depth may compromise the integrity of the site if not properly done.

However, a licensing decision that selects a site, even for the limited purpose of further exploration, before sufficient information is available to establish that there is reasonable assurance that the site can safely host disposal of HLW could only be inconclusive with respect to safety. Such a decision only assures that nothing objectionable so far has been unearthed.* Thus, the proceeding would be of limited value because of its narrow scope. Moreover, several sites would need to be considered for exploration at depth to develop sufficient alternatives for review of DOE's choice as to its preferred site at the time that construction authorization is considered. Hence, none of the several hearings which would follow from this alternative would be as well-focused as a single hearing dealing with the Department's proposed site after it and alternatives had been identified in a license application. This would tend to make the entire process leading to construction authorization cumbersome and inefficient.

Public Participation through licensing hearing.

Q- Is licensing decision on environmental safety issues an irrevocable commitment to develop that site?

*Of course, obviously flawed sites can be rejected by an early decision, but considering the magnitude of the project and the effort expended in simply identifying areas to explore further, it seems highly unlikely that DOE would propose a site which can be rejected with what is rather preliminary information.

Alternative c.

Provide close but informal NRC involvement prior to and during exploration and testing. That is, propose a rule that (1) allows DOE to proceed to characterize sites by techniques which may include exploration and in situ testing at depth, subject to the review and comment of the Director, NMSS, with opportunity for public comment, but without a licensing decision; and (2) avoids premature commitment to a particular site and medium by requiring site characterization at more than one site at different locations and in different geologic media.*

This alternative is proposed as one fix to the problem of not having sufficient information to provide the confidence in the proposed repository needed to authorize construction. By adopting this alternative, the Commission would better assure that the prescribed finding for authorizing construction shall be a realistic finding supportable by the information available at the time the finding is being made. The price of this alternative is the considerable time and monies which will be committed before a regulatory decision is made.

To guard against DOE's making a premature and preemptive commitment to a particular site in a particular medium and to assure an appropriate consideration of alternatives under NEPA, this alternative approach provides for characterization of a number of sites at different locations and in different media.** Although this adds expense to the development of a repository, the expense is not exorbitant when compared with the overall cost of a repository. The cost of site characterization is on the order of \$20 million per site. This should be compared with the overall cost of geologic disposal: the department has estimated the cost to construct a repository alone to be in the range of 1-3 billion dollars.*** Moreover, the environmental impacts of site characterization should not be generally significant, as shown in Enclosure "E"; and, in any event, would need to be evaluated by

* Under this alternative, site characterization means the program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions and the ranges of those parameters of a particular site relevant to the Commission's licensing procedures. Site characterization includes borings, surface excavations, excavation of exploratory shafts, limited subsurface lateral excavations and borings, and in situ testing needed to determine the suitability of the site for a geologic repository, but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken. The intent of permitting these activities is to allow the timely gathering of information needed both to characterize a site and for a meaningful comparison of alternatives.

** Although in order to satisfy NEPA the application for construction authorization will likely need to reflect the results of characterization of a minimum of three sites in two media; however, due to the significance of the decision which selects a repository site, the staff expects that DOE will characterize as many as five sites.

*** Draft Environmental Impact Statement, "Management of Commercially Generated Radioactive Waste," p 3.1.133, table 3.1.26, U.S. Department of Energy, DOE/EIS-0046-D, April 1979.

DOE in accordance with NEPA. Finally, since site characterization would proceed at a number of sites, both the quantity and quality of data available would permit the Commission to review a site, compare it with alternatives, and authorize construction subsequently in an informed and well-reasoned manner.

Adoption of this alternative would pose two major difficulties. First, despite regulatory leverage attained through the spectre of future denial of a license, NRC cannot exercise formal authority until an application is submitted by DOE. What this means is that if DOE chooses to ignore NRC suggestions, requests, and admonitions during site characterization, NRC may have only one enforcement tool at its disposal--to deny the application when submitted.* In practice, this may be very difficult because of the pressing need to "solve the problem," especially if DOE can make a case of "no harm done." However, the staff believes that the characterization of several sites will minimize the buildup of momentum by avoiding commitment to any one site. Further, onsite inspection can be made by NRC staff as site characterization work is being done. The second difficulty is tied to the perception of the first. By waiting until considerable work is performed by DOE at the site before NRC begins formal review, the Commission is open to criticism that it has denied the States and the public effective participation in the decision process. But this criticism would be unfounded: public meetings and opportunity for comment on both DOE's site characterization report and the staff analysis of the report will provide ample opportunity for effective State and public participation in the early stages. Finally, it should be remembered that through this alternative we attempt to further the purpose of NEPA by assuring our ability to evaluate alternatives. This alternative has the further benefit of facilitating consideration of a ready alternative in the event that the NRC finds it necessary to reject the proposed site.

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Alternative d.

Require a limited licensing decision on DOE's program for site selection, exploration, and testing, prior to permitting exploration and testing to proceed. That is, propose a rule that requires the issuance of a license to proceed with exploration and testing at depth at a number of sites. The license would be issued if the Commission finds that: (1) the Department's methods and criteria for site selection will result in a slate of sites to be characterized which are among the best available; (2) the Department's program for site characterization reasonably can be expected to yield the scientific and technical data to support an application for construction authorization without compromising the ability of sites to isolate wastes; and (3) that the benefits in terms of the resulting ability to support authorization of construction and to make a reasoned choice among alternatives outweigh the environmental impacts associated with the site characterization program.

*Of course, NRC may also require DOE to engineer fixes; but, owing to the nature of a geologic repository, this may be neither practical nor possible.

With this alternative, the review of the Department's site characterization report would become a licensing action. Exactly the same issues and information considered under alternative c would be addressed. However, the Director of NMSS would not issue an opinion on the site characterization report. Rather, the above stated licensing finding would be made prior to allowing the Department to proceed with its site characterization program. Safety issues and environmental concerns relevant to specific sites would be addressed at the construction authorization stage.

This alternative has three advantages. First, there would be early, formal, public involvement in the decision process through attendant licensing hearings. Second, since a license would be issued, the NRC will be able to exercise directly its inspection and enforcement prerogatives during site characterization. Third, in contrast to alternative c, there would be no perception that NRC was authorizing DOE to proceed with the site characterization program or to become committed to a particular site without formal NRC involvement.

However, because site suitability questions would not be addressed and the finding would be limited to the adequacy of the Department's site characterization program, the action taken at this point would not be especially significant with respect to licensing disposal of HLW. A significant potential for delay would be introduced as a result of a formal proceeding at this point, however. Moreover, this delay would affect not a single site or licensing action but, rather, the Department's entire program for geologic disposal of HLW. Further, as with any hearing, this action can be expected to absorb considerable NRC resources. There is some question as to what would be the scope of issues required to be addressed at this point under NEPA. This last question is a source of potential litigative risk. Finally, this alternative also raises the legal issue of whether the Commission has the authority to develop licensing procedures applicable to a Department program, as opposed to a site-specific application.

Recommendations:

That the Commission:

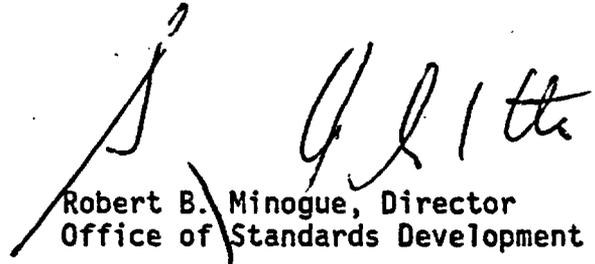
1. Approve publication for comment of a rule that (1) allows DOE to characterize sites by techniques which may include exploration and in situ testing at depth, subject to the review and comment of the Director, NMSS, with opportunity for public comment, but without a licensing decision; and (2) avoids premature commitment to a particular site and medium by providing for site characterization at a number of sites at different locations and in different geologic media, as presented in Enclosure "A" (alternative c).

2. Note

- a. That the staff believes both alternatives c and d to be equally workable, open, and effective. However, alternative d is not recommended because it is the staff's present judgment that the value of a formal public licensing proceeding limited to the adequacy and appropriateness of the Department's site characterization program--the assessment of which can be made by the Director with formal public and State comment--is outweighed by the delay and potential for halting altogether without significant cause the Department's program for geologic disposal of HLW. Moreover selection of alternative c avoids the legal issues that would arise if the Commission were to extend its regulations to a DOE program as opposed to a site-specific application.
- b. That the proposed rule supersedes the proposed General Statement of Policy.
- c. That the proposed rule presented in Enclosure "A" requires a detailed site report which includes a description of DOE's site characterization plans and provides for onsite inspection of excavations and borings conducted as part of site characterization activities.
- d. That a value/impact assessment for this action is attached as Enclosure "B".
- e. That a discussion of data and costs for site characterization is contained in Enclosure "C".
- f. That responses to comments on the proposed General Statement of Policy are contained in Enclosure "D".
- g. That no environmental impact statement need be prepared in connection with this action. An environmental impact appraisal has been performed for those requirements which might have an environmental impact. However, the impacts were found not to be significant. The appraisal is attached as Enclosure "E".
- h. That the Subcommittee on Energy and the Environment and the Subcommittee on Nuclear Regulation will be informed of this action.
- i. That a public announcement such as that attached as Enclosure "F" will be issued upon filing of the notice of proposed rule making with the Office of the Federal Register.

Coordination:

The Office of Nuclear Material Safety and Safeguards concurs in the recommendations of this paper. The Executive Legal Director has no legal objection. The draft public announcement was prepared by the Office of Public Affairs.

 10/18/79
Robert B. Minogue, Director
Office of Standards Development

Enclosures:

- "A" - Notice of Proposed Rulemaking ✓
- "B" - Value/Impact Assessment
- "C" - Site Selection and Development
- "D" - Response to Comments received on
the proposed General Statement
of Policy
- "E" - Environmental Impact Appraisal
- "F" - Draft Public Announcement

EDO NOTE: Resource/cost data is being developed and will be forwarded as a supplement shortly.

Commissioners' comments should be provided directly to the Office of the Secretary by c.o.b. Friday, November 2, 1979.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT October 29, 1979, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

DISTRIBUTION

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ENCLOSURE A

NUCLEAR REGULATORY COMMISSION
[10 CFR PARTS 2, 19, 20, 21, 30, 40, 51, 60, AND 70]
DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES
IN
GEOLOGIC REPOSITORIES
Proposed Licensing Procedures

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed Rule.

SUMMARY: This notice invites public comment on a proposed rule for licensing the receipt and disposal of high-level radioactive wastes (HLW) at geologic repositories. The proposed rule sets forth requirements applicable to the Department of Energy (Department) in submitting an application for a license for such activities and specifies the procedures which the Commission will follow in considering such an application. The proposed rule also sets forth provisions for consultation and participation in the license review by State governments.

DATE: Comments must be received by _____*.

ADDRESS: Send comments to: Secretary of the Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch. Copies of comments may be examined in the U.S. Nuclear Regulatory Commission Public Document Room, 1717 H Street, NW., Washington, D.C.

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Date to be 90 days after publication in the Federal Register.

FOR FURTHER INFORMATION CONTACT: I. C. Roberts, Assistant Director for Siting Standards, Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 443-5985.

SUPPLEMENTAL INFORMATION:

Background

In November of 1978, the Nuclear Regulatory Commission published for comment a proposed General Statement of Policy outlining procedures for licensing geologic high-level radioactive wastes (HLW) repositories to be constructed and operated by the Department of Energy. At the same time, a draft rule to implement the policy was circulated to State governments for review. Comments on the Policy Statement were received from thirty groups and individuals. Fourteen States commented on the draft rule. The rule that is presently being proposed reflects a change in our earlier views, stimulated in part by those comments and by a somewhat different appreciation of the quality and quantity of information needed to select a site for a repository. The Commission is withdrawing the proposed General Statement of Policy as being superseded by this action.

Authority and Rationale

Sections 202(3) and (4) of the Energy Reorganization Act of 1974, as amended, provide the NRC with licensing and regulatory authority regarding Department of Energy facilities used primarily for the receipt and storage¹ of high-level radioactive wastes resulting from activities licensed under the Atomic Energy Act and certain other long-term, high-level waste storage facilities of the Department of Energy. Pursuant to that authority,

¹The Commission interprets "storage" as used in the Energy Reorganization Act to include disposal.

the Commission is developing procedures and criteria appropriate for licensing geologic disposal of HLW by the Department. The requirement contained in the instant proposed rule that the Department submit a site characterization report in advance of performing exploration which may include in situ testing at depth also implements Section 14(a) of the NRC Authorization Act of 1979 (P.L. 95-601).²

Alternatives to rulemaking that were considered included the issuance of regulatory guides and NUREG reports, which would be applied in the context of other, existing, parts of our regulations. However, the considerable differences between a geologic repository and other licensed facilities, particularly in view of the significance of a repository with respect to the health and safety of future generations, make it desirable to develop rules specifically tailored to geologic disposal of HLW. Moreover, the rulemaking proceeding should provide the Commission the broadest opportunity to receive and consider the views of the public.

Comments

Comments on the Policy Statement touched upon many issues. Some of the comments dealt with details of implementation that are being addressed for the first time in these proposed rules. The principal comments of a

²Section 14(a) reads as follows: Any person, agency, or other entity proposing to develop a storage or disposal facility, including a test disposal facility, for high-level radioactive wastes, non-high-level radioactive wastes including transuranium contaminated wastes, or irradiated nuclear reactor fuel, shall notify the Commission as early as possible after the commencement of planning for a particular proposed facility. The Commission shall in turn notify the Governor and the State legislature of the State of proposed situs whenever the Commission has knowledge of such proposal.

policy nature related to the timing and scope of the Commission's initial review, opportunities for State and public participation, and the respective NEPA responsibilities of the Commission and the Department of Energy.

Comments about the initial review straddled the position set forth in the Policy Statement. Some commenters urged the Commission to schedule hearings early in the Department's site selection process; others recommended that hearings be deferred until construction has been completed and an application to receive waste is filed. The Commission has undertaken a thorough review of the matter and now proposes a more extensive informal involvement during early phases of site characterization³ and a deferral of formal proceedings until site characterization has been completed. The scope of the review procedures would be expanded, as urged by several commenters, to include an assessment of site characterization data for multiple sites. The reasons for the modifications are explained in the text below.

The proposed rules also provide detailed provisions to ensure extensive opportunities for State and public participation. We have not made specific provision for funding of intervenors, as requested by some commenters. This question may be addressed separately in the context of

³Note: Site characterization means the program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions and the ranges of those parameters of a particular site relevant to the procedures under this part. Site characterization includes borings, surface excavations, excavation of exploratory shafts, limited subsurface lateral excavations and borings, and in situ testing needed to determine the suitability of the site for a geologic repository, but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken. The intent of permitting these activities is to allow the timely gathering of information needed both to characterize a site and for a meaningful comparison of alternatives.

rulemaking applicable to various adjudicatory proceedings. Provisions for State participation would be reviewed in the light of any pertinent statutory changes that may be enacted.

The proposed regulations do not explicitly address the NEPA responsibilities of the Commission regarding matters within the scope of the Department's generic environmental impact statement on the management of commercially generated radioactive wastes. The possibility of adopting the Department's statement may be considered by the Commission, as suggested in comments, at an appropriate time.

Departure from the General Statement of Policy

The procedures delineated in the proposed rule depart from those set forth by the proposed General Statement of Policy in three ways. These departures all bear on the initial stages of the licensing process. First, it is clearly stated that review of the Department's plans for site characterization as well as the site selection methods and criteria to be used by the Department is required in advance of site characterization and that the Director of NMSS will issue an opinion on the basis of that review. Second, the review does not presume that the Department has selected a repository site, but only that it has identified a number of sites in appropriate media to undergo site characterization. The third departure from the Policy Statement is the elimination of the provisional construction authorization and expansion of the concept of site characterization. These changes are being proposed to reflect our current appreciation of the quality and quantity of information needed to bring the licensing proceeding to an appropriate conclusion.

Site Characterization Review

The provision for early review of the Department's site characterization plans will provide an opportunity for the Director to point out those aspects of a location which in the judgment of the staff require special attention or present special problems, and to indicate particular items of information needed for the Commission to make licensing decisions with respect to the sites being considered. Moreover, the Director will be able to consider the methods and procedures of exploration contemplated for use by the Department. The opportunity to review those methods and procedures is valuable because if the process of characterizing a site to obtain information necessary to determine if a site is suitable for a repository is not carefully done, it may render the site unusable for a repository. For example, an excessive number of bore holes or improper excavation of an exploratory shaft or drift could make the repository unsealable. Presumably, this concern for possible exploration-induced damage is one reason that some commenters on the Policy Statement suggested a multi-step review process begun before commencement of site exploration. This factor and the desirability of evaluating whether the Department's program will generate data suitable to support a Commission licensing decision are reasons that the Commission regards some provision for pre-application review to be appropriate. Further, early guidance on development and consideration of alternative sites will help to avoid later delay caused by inadequate discussion of alternatives as required by NEPA.

In addition to providing for the early review of the Department's site characterization and site selection programs, the submittal of a site

Public Participation

characterization report assures an early opportunity for other Federal and State agencies and the public to become involved in the decisionmaking process with respect to those programs. The opportunity for involvement is provided through publication of the Department's site characterization report and the Commission staff assessment of same and by means of meetings between the Commission staff and State officials, residents of the areas near the sites to be characterized, and other interested persons. Furthermore, where other Federal agencies have decisionmaking authority regarding the Department's proposed action, it is expected that they will consider the recommendations of the Director in carrying out their responsibility.

The change is also intended to implement the requirements of P.L. 95-601, as set out above, and to ensure that the notice from the Department will, in fact, initiate a meaningful, substantive review. Although the Commission cannot direct the Department to comply with the provisions for involving it during the site characterization activities, any failure to do so is likely to result in imprudent expenditures and subsequent delays, and ultimately could result in the denial of the application for the proposed site.

In sum, the Commission believes that the required submission of a site characterization report and subsequent public review will achieve early Commission, State and public involvement without undue schedule delays.

Consideration has been given to providing for formal hearings prior to site characterization, with the objective of resolving alternative site issues. Early Site Review (ESR) regulations (10 CFR § 2.600ff) certainly provide a precedent for this approach. However, this is a

reasonable approach for reactors only because of the considerable experience we have had with siting such facilities, the knowledge we have of typical light water reactor designs and characteristic impacts, and the extent to which engineered features can be relied upon to accommodate deficiencies in site characteristics. The situation in the case of geologic repositories is different in each of these respects. With a geologic repository, reconnaissance level data alone will not support a presumption that a site is suitable with respect to safety for a repository. Hence, any decision on alternative site issues at this early point is likely to require reexamination at the construction authorization proceedings and, therefore, would be of questionable value.

However, other findings could be made: the adequacy and appropriateness of the Department's site characterization program, including the development of a slate of alternatives, can be reviewed in a licensing action which would allow the Department to proceed with that program. But, considering the preliminary nature of the geologic and hydrologic data available, the fact that the Director's review of these items as described earlier will include the benefit of public comment, and the relatively insignificant environmental impact of site characterization, the Commission has concluded that the considerable time and effort on the part of the Commission, the Department, and the public demanded by formal proceedings would not be justified.⁴

⁴The principal impact of site characterization at a typical site can be attributed to management of the spoils from excavation of an exploratory shaft. The spoils will be in the neighborhood of 5000 cubic yards which either would be disposed of on site or trucked off site. The volume of these spoils is about 10% of that from excavation of a main shaft for a repository and less than 0.1% of the spoils from total excavation. The absence of formal Commission proceedings, of course, would not excuse the Department from considering this and other environmental impacts associated with major actions which it proposes to undertake.

Provision for Characterizing Several Sites

The revised procedures permit the Department to include exploration and in situ testing at depth as part of its site characterization activities. We anticipate that it will be necessary for the Department to explore at depth more than one site at different locations and in different geologic media. This position follows from consideration of both the long-term performance required of and the technical uncertainties involved in geologic disposal of HLW, and the need for the Commission to discharge its NEPA responsibilities with respect to evaluation of alternatives.

It is expected that each site selected for site characterization and testing will potentially satisfy the technical criteria in 10 CFR 60, i.e., no obvious deficiency will be evident when the site is assessed in terms of NRC's preliminary site review. NRC will examine the Department's site selection process with this in mind, and the results of this review will be reflected in the Director's opinion. Thus, application of the technical criteria will guide the Department toward a slate of candidate sites that are among the best that reasonably can be found. Under this approach, the selection of a proposed site from among the alternatives would be deferred until site characterization of the slate of candidate sites is at least substantially complete.

It can be noted that the procedure here is consistent with the recommendation of the Interagency Review Group on Nuclear Waste Management which calls for simultaneous investigation of several potential sites.⁵

⁵Report of the Interagency Review Group on Nuclear Waste Management, March 1979.

Site Characterization and Authorization of Construction

Under the proposed Policy Statement, only surface exploration combined with some test borings would be permitted prior to the Commission's initial licensing decision - either a construction authorization or a provisional construction authorization. This procedure was intended to allow the Commission to complete a safety and environmental review before the Department undertook a major commitment of resources (money and manpower).

We now perceive two grounds for questioning our previous thinking. First, the quality of the data that will be available before completion of site characterization as currently envisioned is unlikely to provide a satisfactory basis for arriving at the technical judgments reflected in the standards for construction authorization and provisional construction authorization that are contained in the Policy Statement. Second, further study persuades us that the commitment of resources involved is not so great nor the environmental impacts so large as to lead the Commission to exercise its licensing authority in advance of site characterization. Our revised position now more closely resembles an approach presented in comments submitted by the Natural Resources Defense Council, among others, that deferment of some specific safety findings may be desirable in order to avoid decisions based on inadequate information and analyses so long as the increased financial investments and institutional commitments do not thereby reduce the stringency of the subsequent safety reviews.

Support for our revised position is bolstered not only by comments received on the Policy Statement but also by many in the earth science community with whom we have discussed this matter, including members of the U.S. Geological Survey staff. These experts agree that exploration and testing at depth should be performed if sufficient data are to be obtained to determine whether the surrounding geology will retard waste migration and to make meaningful comparisons among alternatives. Further, the importance of exploration at depth has been cited by both the IRG report (Appendix A) and the recent National Academy of Sciences report, "Implementation of Long-term Environmental Radiation Standards: The Issue of Verification" (Committee on Radioactive Waste Management, 1979).

The investigations which the Policy Statement would have allowed prior to construction authorization were limited to surface geophysical techniques such as aeromagnetic and gravity surveys and seismic traverses augmented by a few borings and well logs. Insofar as subsurface geology and hydrology are concerned, such investigation would provide substantial information regarding the stratigraphy and hydrogeology of the site. While this information is obviously relevant and extremely important in evaluating a site, the data needed to establish the ultimate suitability of the site is likely to be obtained only through exploration and in situ testing at depth, i.e., in the proposed host rock unit. This exploration and testing are needed not only to determine whether serious but not readily observed defects are present; but also to determine specific properties such as homogeneity, porosity, the extent of fracturing and jointing, and thermal response of the rock including expansion, fluid migration

and decrepitation. Of course, the kinds of defects--fractures, breccia pipes, etc.--will vary from one kind of medium to another, and from site to site, as will the properties which are key to isolation of the wastes. But the important point is that without exploration and in situ testing in the proposed host rock unit, neither the defects nor the key parameters can be determined with confidence. It might be argued that deferring the initial licensing decision to a later stage in some cases could lead to the expenditure of some resources and the waste of time pursuing projects that might otherwise have been found to be unacceptable on the basis of careful examination of surface reconnaissance data. However, this situation is unlikely for two reasons. First, the process of site characterization is also a process of site elimination. There is no point to proceeding with exploration and testing at depth if the surface reconnaissance data reveal an insuperable defect. Second, under the procedures contemplated by the proposed rule, the Department will augment the site characterization report with semiannual reports to the Director, Office of Nuclear Material Safety and Safeguards. These reports along with any comment by the Director will be made public. If review of a report reveals such a defect, the Director will publicly inform the Department of the problem and, if warranted, could caution the Department from proceeding further with the site. Moreover, in the context of overall project costs for a repository, the incremental site characterization costs are small indeed. Again, it is difficult to generalize since different media and sites will present a variety of factual situations. In our analysis, however, we have determined that total site characterization expenses for a generic hypothetical site could be expected to amount to about \$20 million.

We do not minimize the amount of public funds that we have identified as a reasonable estimate of incremental site characterization costs or the increasing urgency for disposing of the wastes which may accompany any delay in licensing action. These factors should be examined, however, in the light of the requirement discussed above that multiple sites must be characterized. The effect of this change is to decrease, in a highly significant way, the level of commitment of the Department or the Commission to any particular site. Also, the delay will help to assure that the Commission avoids making any improvident, premature commitment to a particular site by making a licensing decision before it has the necessary technical data that would permit it to make a commitment with confidence. Further, this approach could provide a ready alternative for consideration in the event that the Department's proposed site is found unsuitable.

As discussed earlier, it would be possible for the Commission to structure its proceedings so as to provide for formal hearings on limited issues at an early stage in the process. The hearing process has clear advantages as a mechanism for fact-finding. But it can be an inefficient and cumbersome means for arriving at decisions. Moreover, since several sites are to be characterized, hearings would not be so well-focused as they would be after a single site had been identified in a license application.

We are satisfied that the opportunities for public participation and the Commission's staff review that have been included in the proposed rule will provide an acceptable avenue for achieving early identification of relevant issues and concerns. The proposed rule contemplates an opportunity for formal Commission proceedings before construction, before

receipt of radioactive waste, and before and after decommissioning. Each of these decision points may involve issues of great significance to the health and safety of the public. Questions arising during site characterization can be resolved less formally, in our judgment, without jeopardizing public health and safety. Moverover, the independent NEPA obligations of the Department provide additional structured opportunities for evaluation of environmental issues.

Scope of Proposed Rule

The proposed rule addresses only the licensing of geologic disposal of HLW. Alternative methods of disposal are not addressed chiefly because information from the Department indicates that geologic disposal is the only technology likely to be the subject of a license application in the foreseeable future. Some methods are still developing technologies, e.g., transmutation. For others it is not clear what the Commission's licensing authority would be. For example, technical feasibility issues aside, sea bed emplacement or disposal in Antarctic ice sheets would require international arrangements involving legislative action. In general, the Commission does have licensing authority over surface storage and disposal facilities within the United States. However, surface disposal is not anticipated; and surface storage, per se, could be covered under other parts of the Commission's regulations.

The proposed rule contains only the procedural requirements for licensing. 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. This

enables the Commission to propose a procedural rule even though the technical criteria are still under review. In the interest of proceeding with development of the necessary regulatory framework for licensing, these licensing procedures, therefore, are being proposed at this time.

Licensing of a geologic repository would be a major Federal action which requires the preparation of an environmental impact statement by the Commission. While development of disposal technologies and methods is a programmatic activity for which the Department must assume responsibility, issues related to alternative technologies will be considered by the Commission in the context of later decisions.

Procedures

The Commission will participate in four stages in the review of the Department activities involving high-level waste disposal at a particular geologic repository. Although essentially the same features are addressed, with each stage there is a progressive increase in knowledge regarding these features and a corresponding increase in confidence in a decision whether HLW can be disposed of at a repository at the site.

In the first stage when the Department has formulated plans for a prospective repository to the extent that it wishes to begin site characterization, it will be required to submit a site characterization report which contains, among other things, the program plan by which the Department will investigate and characterize sites. The report will address the process by which the media and site(s) were chosen for characterization.

and the Department's program for further development of alternatives.⁶ The report also will contain a description of the media and site(s) to be characterized and the site characterization program. The report will be reviewed by the NRC staff with opportunity for public comment on both the report and a staff analysis of the report. Also, it is anticipated that the Commission will hold local public meetings in the immediate area of the site(s) to be characterized. These meetings will be held both to disseminate information and to obtain public input which will be factored into the final version of the staff analysis. Included in the final analysis will be a statement by the Director expressing his opinion on the site, the site report and the Department's site selection and characterization program. The Department should consider the site characterization analyses before publishing a final environmental impact statement, where such may be required under NEPA for site characterization activities proposed for a particular site. Once site characterization is initiated, the Department should inform the Director by semiannual report of the progress of the site characterization activities and schedules. The Commission staff should be permitted to visit the site and to observe excavation, boring and testing activities. The Director may respond from time to time in writing to the Department to express his current views on questions raised in the semiannual reports or site visits. Inasmuch as the site characterization activities could have an adverse impact upon

⁶Note: This will include the identification and location of other media and sites which the Department considers alternatives to the site being put forth for site characterization and for which the Department intends to submit subsequent site characterization reports.

site safety, i.e., could affect the site's ability to contain the waste, failure by the Department to involve the NRC in the manner described here and to implement the recommendations of the Director could result in denial of the subsequent license application. These procedures will be followed for each of the number of sites in appropriate geologic media which the Department intends to characterize, prior to its selecting a proposed site. We believe that these procedures will provide adequate regulatory participation so that a site will not be made unusable by characterization, and at the same time will assure that the data needed to enable a comparison of alternatives and a reasoned choice in the selection of a site is gathered.

The second stage begins with the submission by the Department of an application for construction authorization at a particular site from among those characterized.⁷ We do not anticipate that action will be taken on an application until the site characterization efforts at several sites are substantially complete.

Subsequent to staff review and preparation of an Environmental Impact Statement, it is anticipated that a licensing board will be appointed and the license application will undergo the first formal review, including public hearings. If the Commission finds after considering reasonable alternatives that the benefits of the proposal exceed the costs under NEPA

⁷To satisfy the requirements of NEPA, the Commission anticipates such characterization at a minimum of three sites representing a minimum of two geologic media. However, in light of the significance of the decision selecting a site for a repository, the Commission fully expects the Department to submit a wider range of alternatives than the minimum suggested here.

and that there is reasonable assurance that the types and amounts of wastes described in the application can be received, possessed, and disposed of in a repository of the design proposed at the site without unreasonable risk to the health and safety of the public or being inimical to the common defense and security, construction of the repository will be authorized.

✓
Stage three is a further review of the application prior to receipt of wastes at the repository. The Commission will issue a license to the Department if it finds, among other things, that the issuance of the license will not constitute an unreasonable risk to the health and safety of the public. The findings would be based upon a review of an update of the application submitted for construction authorization and an updated environmental report if needed. Among items to be considered in the review are additional data acquired during construction, conformance of construction with design, and resolution of questions not answered during the construction authorization review. It is expected that adjudicatory hearings would be held to consider appropriate issues. (All hearings would be conducted in accordance with subpart G of 10 CFR Part 2.)

Once all the wastes have been emplaced, the Department may submit an application to decommission the repository, and the final review of repository activities will begin.⁸ Additional geologic and hydrologic data acquired during the emplacement period as well as the results of test and

⁸Unless expressly authorized in the license to receive and possess HLW, an amendment to that license will be required to allow the Department to conduct partial backfilling in parts of the repository once all the wastes have been emplaced in those parts. (This does not apply to backfilling tests that are described in the license.)

experiments on backfilling and shaft sealing, along with the Department's planned decommissioning program, will be considered by the Commission in determining whether the planned method for decommissioning is adequate. Following decommissioning, DOE may seek an amendment to terminate the license. The Commission may terminate the license if it finds that the final disposition of wastes is in conformance with the Department's license, that the final state of the repository site is in conformance with the requirements of the license, and that termination of the license is authorized under the Atomic Energy Act. Alternatively, the Department may continue to be a licensee of the Commission and conduct such monitoring and exercise such control at the repository as might be appropriate.

State Participation

Beginning of public & state participation

The submittal of a site characterization report by the Department not only begins the Commission's involvement in the planning and development of a geologic repository, but also marks the beginning of State participation in the licensing process. States may submit proposals for participation in the review of the Site Characterization Report and any subsequent license application from the Department. In addition, at that time Commission staff will be made available to discuss with representatives of both State and local governments information submitted by the Department.

States may request to participate in several ways. States could assist the Commission in the review of specific portions of license applications. States could perform other technical assistance work for the Commission, particularly in the area of environmental studies and the like. States might perform environmental and radiation monitoring for the Commission throughout the operational period and perhaps after closure

as well. States could also participate through employment or exchange of State and Federal personnel under the Intergovernmental Personnel Act. In addition, States could participate in hearings on a license application under the applicable provisions of the rules of practice. The Commission intends to develop further guidance to assist the States in planning for such participation.

Besides review of site characterization reports, license applications, and ongoing work in support of the license application, States might also be involved by the Department (in response to the regulations for implementation of NEPA or otherwise) in the site selection process itself. The requirement that the Department must describe in its site characterization report how States were involved in the site selection process reflects the Commission's expectation that the Department will involve State and local governments in its site selection programs. The Commission believes that many issues, including the NEPA questions related to alternatives and alternative sites, will be more easily resolved if State concerns are identified and addressed at the earliest possible time. In any case, these procedures have been designed to allow affected States to participate to the fullest extent possible within the limits of the Commission's authority and the State's own desires and capabilities.

The Commission recently submitted to the Congress a report on "Means for Improving State Participation in the Siting, Licensing and Development of Federal Nuclear Waste Facilities," NUREG-0539, March 1979. The extent of State participation may be affected by legislative action on the matters discussed in that report.

Other Reviews

In addition to reviewing license applications from the Department and materials submitted in support of those applications, the Commission's staff will follow closely the unfolding of the Department's overall program for the disposal of radioactive wastes. The Director will comment from time to time on all matters pertinent and appropriate to the Nuclear Regulatory Commission's role as the licensing agency. The Director also will provide the Department with specific guidance on technical matters relevant to licensing requirements.

Two areas to which the Commission staff intends to pay particular attention are the Department's site screening procedure and its waste form research and development program. Both the screening of sites for site characterization and selection of a waste form are programmatic decisions within the prerogatives of the Department as the agency charged with the responsibilities to dispose of the wastes. However, it is important to the Commission's ability to discharge its licensing responsibilities that the course which the Department follows to select sites is systematic, well-reasoned, publicly accessible, and ultimately will result in a slate of characterized sites whose members are among the best that reasonably can be found. Moreover, because selection of a waste form commits significant resources to the development and production of that waste form, as well as influences repository design, the Commission believes that the Department's research and development program must address and compare alternative waste forms. The Commission also must be familiar with the Department's waste form research and development program so the results of the program can be factored into the licensing process.

The Commission has decided not to prepare an Environmental Impact Statement for the rule here proposed. An Environmental Impact Appraisal setting forth the basis for this decision is available for public inspection in the Commission's Public Document Room.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and section 553 of title 5 of the United States Code, notice is hereby given that adoption of a new 10 CFR Part 60 and the following conforming amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 51 and 70 is contemplated.⁹ All interested persons who desire to submit written comments or suggestions for consideration in conjunction with the proposed amendments should send them to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch by _____.*

Copies of comments received on the proposed amendment may be examined in the Commission's Public Document Room at 1717 H Street, NW., Washington, D.C.

⁹Amendments to 10 CFR Part 51 are pending, 44 Fed. Reg. _____, _____. It is anticipated that rules similar to the ones there proposed will have been issued in final form before the instant amendments have been acted upon. If so, the amendments to Part 51 would be different in form, though not necessarily in substance, from those presently being proposed.

*A date will be inserted 90 days after a publication in the Federal Register.

PART 2

RULES OF PRACTICE

1. 10 CFR 2.101 is amended to add a new subsection (f) to read as follows:*

§ 2.101 Filing of application.

* * * * *

(f)(1) Each application for a license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter and any environmental report required in connection therewith pursuant to Part 51 of this chapter shall be processed in accordance with the provisions of this paragraph.

(2) To allow a determination as to whether the application or environmental report is complete and acceptable for docketing, it will be initially treated as a tendered document, and a copy will be available for public inspection in the Commission's Public Document Room. Twenty copies shall be filed to enable this determination to be made.

(3) If the Director of Nuclear Material Safety and Safeguards determines that the tendered document is complete and acceptable for docketing, a docket number will be assigned and the applicant will be notified of the determination. If it is determined that all or any part of the tendered document is incomplete and therefore not acceptable for processing, the applicant will be informed of this determination and the respects in which the document is deficient.

* As compared to existing text, additions are underscored and deletions are bracketed and lined through.

(4) With respect to any tendered document that is acceptable for docketing, the applicant will be requested to (i) submit to the Director of Nuclear Material Safety and Safeguards such additional copies as the regulations in Parts 60 and 51 require, (ii) serve a copy on the chief executive of the municipality in which the geologic repository operations area is to be located or, if the geologic repository operations area is not to be located within a municipality, on the chief executive of the county, and (iii) make direct distribution of additional copies to Federal, State, and local officials in accordance with the requirements of this chapter and written instructions from the Director of Nuclear Material Safety and Safeguards. All such copies shall be completely assembled documents, identified by docket number. Subsequently distributed amendments, however, may include revised pages to previous submittals and, in such cases, the recipients will be responsible for inserting the revised pages.

(5) The tendered document will be formally docketed upon receipt by the Director of Nuclear Material Safety and Safeguards of the required additional copies. Distribution of the additional copies shall be deemed to be complete as of the time the copies are deposited in the mail or with a carrier prepaid for delivery to the designated addressees. The date of docketing shall be the date when the required copies are received by the Director of Nuclear Material Safety and Safeguards. Within ten (10) days after docketing, the applicant shall submit to the Director of Nuclear Material Safety and Safeguards a written statement that distribution of the additional copies to Federal, State, and local officials has been completed in accordance with requirements of this chapter and written

instructions furnished to the applicant by the Director of Nuclear Material Safety and Safeguards.

(6) Amendments to the application and environmental report shall be filed and distributed and a written statement shall be furnished to the Director of Nuclear Material Safety and Safeguards in the same manner as for the initial application and environmental report.

(7) The Director of Nuclear Material Safety and Safeguards will cause to be published in the FEDERAL REGISTER a notice of docketing which identifies the State and location at which the proposed geologic repository operations area would be located and will give notice of docketing to the governor of that State.

2. 10 CFR 2.103(a) is amended to read as follows:

§ 2.103 Action on applications for byproduct, source, special nuclear material, and operators' licenses.

* * * * *

(a) If the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, finds that an application for a byproduct, source, special nuclear material, or operator license complies with the requirements of the Act, the Energy Reorganization Act, and this chapter, he will issue a license. If the license is for a facility or for receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee, or if it is to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter,

the Director of Nuclear Reactor Regulation or the Director of Nuclear Material Safety and Safeguards, as appropriate, will inform the State and local officials specified in § 2.104(e) of the issuance of the license.

3. 10 CFR 2.104(e) is amended to read as follows:

§ 2.104 Notice of hearing.

* * * * *

(e) The Secretary will give timely notice of the hearing to all parties and to other persons, if any, entitled by law to notice. The Secretary will transmit a notice of hearing on an application for a facility license or for a license for receipt of waste radioactive material from other persons for the purpose of commercial disposal by the waste disposal licensee or for a license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter to the governor or other appropriate official of the State and to the chief executive of the municipality in which the facility is to be located or the activity is to be conducted or, if the facility is not to be located or the activity conducted within a municipality, to the chief executive of the county.

4. 10 CFR 2.105(a) is amended by adding a new subparagraph (3), renumbering existing subparagraphs (3) and (4) as (4) and (5), and amending the subparagraph renumbered as (4) to read as follows:

§ 2.105 Notice of proposed action.

(a) If a hearing is not required by the Act or this chapter, and if the Commission has not found that a hearing is in the public interest, it will, prior to acting thereon, cause to be published in the FEDERAL REGISTER a notice of proposed action with respect to an application for:

* * * * *

(3) A license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter;

~~[(3)]~~(4) An amendment of a license specified in paragraph (a)(1),
~~for]~~ (2), or (3) of this section and which involves a significant hazards consideration.

~~[(4)]~~(5) Any other license....

5. 10 CFR 2.105(e) is amended by replacing the words "will issue the license" with the words "may take the proposed action" following the phrase "...or Director of Nuclear Material Safety and Safeguards, as appropriate," and by adding the words "or other action" following the phrase "...published in the FEDERAL REGISTER a notice of issuance of the license."

6. 10 CFR 2.106 is amended by adding a subsection (c) to read as follows:

§ 2.106 Notice of issuance.

* * * * *

(c) The Director of Nuclear Material Safety and Safeguards will also cause to be published in the FEDERAL REGISTER notice of, and will inform the State and local officials specified in § 2.104(e) of, any action with

respect to an application for a license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter for which a notice of proposed action has been previously published.

PART 19 - NOTICES, INSTRUCTIONS AND REPORTS TO WORKERS: INSPECTIONS

§ 19.2 Scope.

7. 10 CFR 19.2 is amended by adding "60," following "35, 40."

§ 19.3 Definitions.

8. 10 CFR 19.3(3) is amended by adding "60," following "35, 40."

PART 20 - STANDARDS FOR PROTECTION AGAINST RADIATION

§ 20.2 Scope.

9. 10 CFR 20.2 is amended by adding "60," following "35, 40."

§ 20.3 Definitions.

10. 10 CFR 20.3(a)(9) is amended by adding "60," following "30, 40."

§ 20.301 General Requirement.

11. 10 CFR 20.301(a) is amended by adding "60," following "30, 40."

12. 10 CFR 20.407(a) is amended by deleting the word "or" following the phrase "of this chapter;" in subparagraph (a)(3), inserting the word "or" following the phrase "of the following quantities:" in subparagraph (a)(4), and adding a new subparagraph (a)(5) to read as follows:

§ 20.407 Personnel monitoring reports.

* * * * *

(5) Possesses high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter.

PART 21 - REPORTING OF DEFECTS AND NONCOMPLIANCE

§ 21.1 Scope

13. 10 CFR 21.2 is amended by inserting "60," after "35, 40," and after "40, 50,".

§ 21.3 Definitions

14. 10 CFR 21.3(a)(3) (a-1)(1), (a-1)(2), and (k) are amended by adding "60," after "40, 50."

§ 21.21 Notification of failure to comply or existence of a defect.

15. 10 CFR 21.21(b) is amended by adding "60," after "40, 50," in clauses (1)(i) and (1)(ii).

PART 30 - RULES OF GENERAL APPLICABILITY TO LICENSING
OF BYPRODUCT MATERIAL

16. 10 CFR 30.11 is amended by adding a new subsection (c).

§ 30.11 Specific exemptions.

* * * * *

(c) The Department of Energy is exempt from the requirements of this part to the extent that its activities are subject to the requirements of Part 60 of this chapter.

PART 40 - LICENSING OF SOURCE MATERIAL

17. 10 CFR 40.14 is amended by adding a new subsection (c).

§ 40.14 Specific exemptions.

* * * * *

(c) The Department of Energy is exempt from the requirements of this part to the extent that its activities are subject to the requirements of Part 60 of this chapter.

PART 51 - LICENSING AND REGULATORY POLICY AND PROCEDURES
FOR ENVIRONMENTAL PROTECTION

18. 10 CFR 51.5(a) is amended by adding a new paragraphs (10) and (11), and renumbering present paragraph (10) as new paragraph (12) to read as follows.

§ 51.5 Actions requiring preparation of environmental impact statements, negative declarations, environmental impact appraisals; actions excluded.

(a) An environmental impact statement will be prepared and circulated prior to taking any of the following types of action:

* * * * *

(10) Issuance of an authorization for a geologic repository operations area pursuant to Part 60 of this chapter.

(11) Issuance of a license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter.

~~[(10)]~~ (12) Any other action which the Commission determines is a major Commission action significantly affecting the quality of the human environment.

19. 10 CFR 51.5(b) is amended by replacing the period at the end of subparagraph (4)(iii) with a semicolon, adding a new subparagraph (4)(iv), inserting "60," following "40, 50," in paragraph (6), adding a new paragraph (9) and amending paragraph (5) to read as follows:

(4) Issuance of an amendment which would authorize a significant change in the types or significant increase in the amounts of effluents or a significant increase in the potential for accidental releases of a license for:

* * * * *

(iv) The receipt and possession of high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter.

* * * * *

(5) Renewal of licenses to conduct activities listed in paragraph (b)(4)(i)-~~(iii)~~(iv) of this section;

* * * * *

(9) Termination of a license for the possession of high-level radioactive waste at a geologic repository operations area at the request of the licensee.

20. 10 CFR 51.5(d)(3) is amended by adding "60," following "40, 50,".

21. 10 CFR 51.40 is amended by revising subsection (a) to start "Except as provided in paragraphs (b), (c), and (d) of this section,..." and by adding a new subsection (d) to read as follows:

§ 51.40 Environmental reports.

* * * * *

(d) The Department of Energy, as an applicant for a license to receive and possess radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter, shall submit at the time of its application or in advance, and at the time of amendments, in the manner provided in § 60.22 of this chapter, environmental reports which discuss the matters described in § 51.20. The discussion of alternatives shall

include site characterization data for a number of sites in appropriate geologic media so as to aid the Commission in making a comparative evaluation as a basis for arriving at a reasoned decision under NEPA.

22. 10 CFR 51.41 is amended to read as follows:

§ 51.41 Administrative procedures.

* * * * *

Except as the context may otherwise require, procedures and measures similar to those described in §§ 51.22-51.26 will be followed in proceedings for the issuance of materials licenses and other actions covered by § 51.5(a) but not covered by § 51.20 or 51.21. The procedures followed with respect to materials licenses will reflect the fact that, unlike the licensing of production and utilization facilities, the licensing of materials does not require separate authorizations for construction and operation. In the case of an application for a license to receive and possess high-level radioactive waste at a geologic repository operations area pursuant to Part 60 of this chapter, however, the environmental impact statement required by § 51.5(a) shall be prepared and circulated prior to the issuance of a construction authorization; the environmental impact statement shall be supplemented prior to issuance of a license to take account of any substantial changes in the activities proposed to be carried out or significant new information regarding the environmental impacts of the proposed activities.

PART 70 - SPECIAL NUCLEAR MATERIAL

23. 10 CFR 70.14 is amended by adding a subsection (c).

§ 70.14 Specific exemptions.

* * * * *

(c) The Department of Energy is exempt from the requirements of the regulations in this part to the extent that its activities are subject to the requirements of Part 60 of the chapter.

24. A new Part 60 is added to read as follows:*

PART 60 - DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTES IN
GEOLOGIC REPOSITORIES

SUBPART A - GENERAL PROVISIONS

Section

- 60.1 Purpose and scope.
- 60.2 License required.
- 60.3 Definitions.
- 60.4 Communications.
- 60.5 Interpretations.
- 60.6 Exemptions.

* Comparative text is not used for the new Part 60.

SUBPART B - LICENSES
PREAPPLICATION REVIEW

60.11 Site characterization report.

LICENSE APPLICATIONS

60.21 Content of application.

60.22 Filing and distribution of application.

60.23 Elimination of repetition.

60.24 Updating of application and environmental report.

CONSTRUCTION AUTHORIZATION

60.31 Construction authorization.

60.32 Conditions of construction authorization.

60.33 Amendment of construction authorization.

LICENSE

60.41 Standards for issuance of a license.

60.42 Conditions of license.

60.43 License specifications.

60.44 Changes, tests, and experiments.

60.45 Amendment of license.

60.46 Particular activities requiring license amendment.

DECOMMISSIONING

- 60.51 Amendment to decommission.
- 60.52 Termination of license.

SUBPART C - PARTICIPATION BY STATE GOVERNMENTS

- 60.61 Site review.
- 60.62 Filing of proposals for State participation.
- 60.63 Approval of proposals.

SUBPART D - RECORDS, REPORTS, TESTS, AND INSPECTION

60.71 Records and reports.

60.72 Tests.

60.73 Inspections.

Authority: Secs. 51, 53, 62, 63, 65, 81, 161b., f., i., o., p., 182, 183, Pub. L. 83-703, as amended, 68 Stat. 929, 930, 932, 933, 935, 948, 953, 954, as amended (42 U.S.C. 2071, 2073, 2092, 2093, 2095, 2111, 2201, 2232, 2233); Secs. 202, 206; Pub. L. 93-438, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846); Sec. 14, P.L. 95-601 (42 U.S.C. 2021a).

For the purposes of Sec. 223, 68 Stat. 958, as amended, 42 U.S.C. 2273, §§60.71 to 60.73 are issued under Sec. 161o., 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

10 CFR PART 60
DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTES IN
GEOLOGIC REPOSITORIES
SUBPART A - GENERAL PROVISIONS

§ 60.1 Purpose and scope.

This part prescribes rules governing the licensing of the Department of Energy to receive and possess source, special nuclear, and byproduct material at a geologic repository operations area.

§ 60.2 License required.

(a) The Department shall not receive or possess source, special nuclear, or byproduct material at a geologic repository operations area except as authorized by a license issued by the Commission pursuant to this part.

(b) The Department shall not commence construction of a geologic repository operations area unless it has filed an application with the Commission and has obtained construction authorization as provided in this part. Failure to comply with this requirement shall be grounds for denial of a license.

§ 60.3 Definitions.

As used in this part:

(a) "Candidate area" means a geologic and hydrologic system within which a geologic repository may be located.

(b) "Commencement of construction" means clearing of land, surface or subsurface excavation, or other substantial action that would adversely affect the environment of a site, but does not include changes desirable for the temporary use of the land for public recreational uses, site characterization activities, other preconstruction monitoring and investigation necessary to establish background information related to the suitability of a site or to the protection of environmental values, or procurement or manufacture of components of the geologic repository operations area.

(c) "Decommissioning" means final backfilling of subsurface facilities, sealing of shafts, and decontamination and dismantlement of surface facilities.

(d) "Department" means the Department of Energy or its duly authorized representatives.

(e) "Disposal" means permanent emplacement within a storage space with no intent to retrieve for resource value.

(f) "Director" means the Director of the Office of Nuclear Material Safety and Safeguards.

(g) "Geologic repository" means a system which is intended to be used for, or may be used for, the disposal of radioactive wastes in excavated geologic formations. A geologic repository includes (1) the geologic repository operations area and (2) all surface and subsurface areas where natural events or activities of man may change the extent to which wastes are effectively isolated from the biosphere.

(h) "Geologic repository operations area" means a HLW facility that is part of a geologic repository, including both surface and subsurface areas, where waste handling activities are conducted.

(i) "High-level radioactive waste" or "HLW" means (1) irradiated reactor fuel, (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel, and (3) solids into which such liquid wastes have been converted.

(j) "HLW facility" means a facility subject to the licensing and related regulatory authority of the Commission pursuant to Section 202(3) and 202(4) of the Energy Reorganization Act of 1974 (88 Stat 1244).*

(k) "Important to safety," with reference to structures, systems, and components, means those structures, systems, and components that provide reasonable assurance that radioactive waste can be received, handled, and stored without undue risk to the health and safety of the public.

(l) "Public Document Room" means the place at 1717 H Street NW., Washington, D.C. at which records of the Commission will ordinarily be made available for public inspection and any other place, the location of which has been published in the FEDERAL REGISTER, at which public records of the Commission pertaining to a particular geologic repository are made available for public inspection.

(m) "Radioactive waste" means HLW and any other radioactive materials other than HLW that are received for emplacement in a geologic repository.

* These are Department of Energy "facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from activities licensed under such act [the Atomic Energy Act]" and "Retrievable Surface Storage Facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive wastes generated by DOE, which are not used for, or are part of, research and development activities."

(n) "Site characterization" means the program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions and the ranges of those parameters of a particular site relevant to the procedures under this part. Site characterization includes borings, surface excavations, excavation of exploratory shafts, limited subsurface lateral excavations and borings, and in situ testing needed to determine the suitability of the site for a geologic repository, but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken.

(o) "Traceability" means the ability, through the use of container identification and preparation and maintenance of appropriate records, to delineate a step-by-step history of any radioactive waste.

§ 60.4 Communications.

Except where otherwise specified, all communications and reports concerning the regulations in this part and applications filed under them should be addressed to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street, NW., Washington, D.C., or 7915 Eastern Avenue, Silver Spring, Maryland.

§ 60.5 Interpretations.

Except as specifically authorized by the Commission, in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be considered binding upon the Commission.

§ 60.6 Exemptions.

The Commission may, upon application by the Department, any interested person, or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law, will not endanger life or property or the common defense and security, and are otherwise in the public interest.

SUBPART B - LICENSES

PREAPPLICATION REVIEW

§ 60.11 Site Characterization Report.

(a) As early as possible after commencement of planning for a particular geologic repository operations area, and prior to site characterization, the Department shall submit to the Director a site characterization report. The report shall include (i) a description of the site(s) to be characterized; (ii) a description of the site characterization program including extent of planned excavations, plans for in situ testing, investigation activities which may affect the ability of the site to isolate wastes, and provisions to control any adverse, safety-related impacts from site characterization including appropriate quality assurance programs; (iii) the criteria used to arrive at candidate areas; (iv) the method by which the site(s) was selected for site characterization; (v) identification and location of alternative media and sites on which DOE intends to conduct site characterization for which DOE anticipates submitting subsequent site characterization reports; (vi) a description of the decision process by which the site(s) was selected for characterization, including the means used to obtain public and State views during selection; and (vii)

any issues related to the site selection, alternative candidate areas or sites, or design of the geologic repository operations area which the Department wishes the NRC staff to review. The Department may include multiple sites in a single site characterization report. Also included shall be a description of the research and development activities being conducted by the Department which deal with the waste forms which may be considered appropriate for the sites to be characterized, including research planned or underway to evaluate the performance of such waste forms.

(b) The Director shall cause to be published in the FEDERAL REGISTER a notice that the information submitted under paragraph (a) of this section has been received and that a staff review of that information has begun. The notice shall identify the site(s) selected for site characterization and alternate areas considered by the Department and shall advise that consultation may be requested by State and local governments in accordance with § 60.61.

(c) The Director shall make available a copy of the above information at the Public Document Room. The Director also shall transmit copies and the published notice of receipt thereof to the Governor and legislature of the State and to the chief executive of the municipality in which a site to be characterized is located (or if it is not located within a municipality, then to the chief executive of the county) and to the Governors of any contiguous States.

(d) The Director shall prepare a draft site characterization analysis which shall discuss the items cited in paragraph (a) of this section. The Director shall publish a notice of availability of the draft site characterization analysis and request comment in the Federal Register. Copies shall be made available at the Public Document Room.

(e) A reasonable period, not less than 60 days, shall be allowed for comment on the draft site characterization analysis. The Director shall then prepare a final site characterization analysis which shall take into account comments received and any additional information acquired during the comment period. Included in the final site characterization analysis shall be either an opinion by the Director that he has no objection to the Department's site characterization program, if such an opinion is appropriate, or specific objections of the Director to the Department's proceeding with characterization of the named site(s). In addition, the Director may make specific recommendations to the Department on the matters pertinent to this section.

(f) Neither issuance of a final site characterization analysis nor the opinion of no objection by the Director shall constitute a commitment to issue any authorization or license or in any way affect the authority of the Commission, the Atomic Safety and Licensing Appeal Board, Atomic Safety and Licensing Boards, other presiding officers, or the Director, in any proceeding under Subpart G of Part 2 of this chapter. If the Department prepares an environmental impact statement with respect to site characterization activities proposed for a particular site, it should consider NRC's site characterization analyses before publishing its final environmental impact statement with respect to site characterization activities proposed for that particular site.

(g) During site characterization, the Department should inform the Director by semiannual report of the progress of the site characterization and waste form research and development including schedules as appropriate. During this time, NRC staff should be permitted to visit the site(s) and observe excavations, borings, and in situ tests as they are done. Inasmuch

as these site characterization activities could have adverse impact upon site safety, failure by the Department to involve the Commission in the manner described here and to accommodate the recommendations of the Director could result in denial of the subsequent license application.

* (h) The Director may respond from time to time in writing to the Department, expressing his current views on questions raised in the semi-annual reports referred to above. Comments received from States in accordance with § 60.61 shall be considered by the Director in formulating his views. All correspondence between the Department and the NRC including the reports cited in paragraph(g) shall be placed in the Public Document Room.

(i) The activities described in paragraphs (a) through (h) above constitute informal conference between a prospective applicant and the staff, as described in § 2.101(a)(1) of this chapter, and are not part of a proceeding under the Atomic Energy Act of 1954, as amended.

LICENSE APPLICATIONS

§ 60.21 Content of application.

(a) An application shall consist of general information and a safety analysis report. An environmental report shall be prepared in accordance with Part 51 of this chapter and shall accompany the application. Any Restricted Data or National Security Information shall be separated from unclassified information.

(b) The general information shall include:

(1) A general description of the proposed geologic repository identifying the proposed site of the geologic repository operations area, the

general character of the proposed activities, and the basis for the exercise of licensing authority by the Commission.

(2) Proposed schedules for construction, receipt of waste, and emplacement of wastes at the proposed geologic repository operations area.

(3) A certification that the Department will provide at the geologic repository operations area such safeguards as it requires at comparable surface facilities (of the Department) to promote the common defense and security.

(c) The safety analysis report shall include:

(1) A description and analysis of the site at which the proposed geologic repository operations area is to be located with appropriate attention to those features that might affect facility design. The assessment shall contain an analysis of the geology, hydrology, geochemistry, and meteorology of the site and the major design structures, systems, and components, both surface and subsurface, that bear significantly on the suitability of the geologic repository for disposal of radioactive waste. It will be assumed that operations at the geologic repository operations area will be carried out at the maximum capacity and rate of receipt of radioactive waste stated in the application.

(2) A description and discussion of the design, both surface and subsurface, of the geologic repository operations area including: (i) the principal design criteria and their relationship to any general design criteria promulgated by the Commission, (ii) the design bases and the relation of the design bases to the principal design criteria, (iii) information relative to materials of construction (including geologic media, general arrangement, and approximate dimensions), and (iv) codes

and standards that the Department proposes to apply to the design and construction of the geologic repository operations area.

(3) A description and analysis of the design and performance requirements for structures, systems, and components of the geologic repository which are important to safety. The analysis and evaluation shall consider (i) the margins of safety under normal conditions and under conditions that may result from anticipated operational occurrences, including those of natural origin; (ii) the adequacy of structures, systems, and components provided for the prevention of accidents and mitigation of the consequences of accidents, including those caused by natural phenomena; and (iii) the effectiveness of engineered and natural barriers, including barriers that may not be themselves a part of the geologic repository operations area, against the release of radioactive material to the environment.

(4) A description of the quality assurance program to be applied to the design, fabrication, inspection, construction, testing, and operation of the structures, systems, and components of the geologic repository operations area important to safety.

(5) A description of the kind, amount, and specifications of the radioactive material proposed to be received and possessed at the geologic repository operations area.

(6) An identification and justification for the selection of those variables, conditions, or other items which are determined to be probable subjects of license specifications. Special attention shall be given to those items that may significantly influence the final design.

(7) A description of the program for control and monitoring of radioactive effluents and occupational radiation exposures to maintain

such effluents and exposures in accordance with the requirements of Part 20 of this chapter.

(8) A description of the controls that the applicant will apply to restrict access and to regulate land use at the geologic repository operations area and adjacent areas.

(9) Plans for coping with radiological emergencies at any time prior to completion of decommissioning the geologic repository operations area.

(10) A description of the nuclear material control and accounting program.

(11) A description of design considerations that are intended to facilitate decommissioning of the facility.

(12) A description of plans for retrieval and alternate storage of the radioactive wastes should the geologic repository prove to be unsuitable for disposal of radioactive wastes.

(13) An identification of those structures, systems, and components of the geologic repository, both surface and subsurface, which require research and development to confirm the adequacy of design. For systems, structures, and components important to safety, the Department shall provide a detailed description of the programs designed to resolve safety questions, including a schedule indicating when these questions will be resolved.

(14) The following information concerning activities at the geologic repository operations area:

(i) The organizational structure of the Department, offsite and onsite, including a description of any delegations of authority and assignments of responsibilities, whether in the form of regulations, administrative directives, contract provisions, or otherwise.

(ii) Managerial and administrative controls to be used to ensure safety.

(iii) Identification of key positions which are assigned responsibility for safety at and operation of the geologic repository operations area.

(iv) Personnel qualifications and training requirements.

(v) Plans for startup activities and startup testing.

(vi) Plans for conduct of normal activities, including maintenance, surveillance, and periodic testing of structures, systems, and components of the geologic repository operations area.

(vii) Plans for decommissioning.

(viii) Plans for any uses of the geologic repository operations area for purposes other than disposal of radioactive wastes, with an analysis of the effects, if any, that such uses may have upon the operation of the structures, systems, and components important to safety.

§ 60.22 Filing and distribution of application.

(a) An application for a license to receive and possess source, special nuclear, or byproduct material in a geologic repository at a site which has been characterized, and an accompanying environmental report, and any amendments thereto, shall be filed in triplicate with the Director and shall be signed by the Secretary of Energy or his authorized representative.

(b) Each portion of such application and environmental report and any amendments shall be accompanied by 30 additional copies. Another 120 copies shall be retained by the Department for distribution in accordance with written instructions from the Director or his designee.

(c) The Department shall, upon notification of the appointment of an Atomic Safety and Licensing Board, update the application and environmental report, eliminating all superseded information and serve them as directed by the board. In addition, at that time the Department shall serve one such copy on the Atomic Safety and Licensing Appeal Panel. Any subsequent amendments to the application or environmental report shall be served in the same manner.

(d) At the time of filing of an application and environmental report, and any amendments thereto, one copy shall be made available in an appropriate location near the site of the proposed geologic repository (which shall be a public document room, if one has been established) for inspection by the public and updated as amendments to the application or environmental report are made. This updated copy shall be produced at any public hearing on the application for use by any parties to the proceeding.

(e) The Department shall certify that the updated copies of the application and environmental report, as referred to in paragraphs (c) and (d), contain the current contents of such documents submitted in accordance with the requirements of this part.

§ 60.23 Elimination of repetition.

In its application, environmental report, or site characterization report, the Department may incorporate by reference information contained in previous applications, statements, or reports filed with the Commission: PROVIDED, that such references are clear and specific and that copies of the information so incorporated are available in each public document room.

§ 60.24 Updating of application and environmental report.

(a) The application and environmental report shall be as complete as possible in the light of information that is reasonably available at the time of submission.

(b) The Department shall update its application in a timely manner so as to permit the Commission to review, prior to issuance of a license:

(1) Additional geologic, hydrologic, meteorologic and other data obtained during construction.

(2) Conformance of construction of structures, systems, and components with the design.

(3) Results of research programs carried out to confirm the adequacy of designs.

(4) Other information bearing on the Commission's issuance of a license that was not available at the time a construction authorization was issued.

(c) The Department shall update its environmental report in a timely manner so as to permit the Commission to review, prior to issuance of a license, the environmental impacts of any substantial changes in the activities proposed to be carried out or any significant new information regarding the environmental impacts of activities previously proposed.

CONSTRUCTION AUTHORIZATION

§ 60.31 Construction authorization.

Upon review and consideration of an application and environmental report submitted under this part, the Commission may authorize construction if it determines:

(a) Safety: That there is reasonable assurance that the types and amounts of wastes described in the application can be received, possessed, and disposed of in a repository of the design proposed without unreasonable risk to the health and safety of the public. In arriving at this determination, the Commission shall consider whether:

(1) The Department has described the proposed geologic repository including but not limited to (i) the geologic, geochemical and hydrologic characteristics of the site; (ii) the kinds and quantities of radioactive waste to be received, possessed, stored, and disposed of in the geologic repository; (iii) the principal architectural and engineering criteria for the design of the geologic repository operations area; (iv) construction procedures which may affect the capability of the geologic repository to serve its intended function; and (v) features or components incorporated in the design for the protection of the health and safety of the public.

(2) The site and design comply with the criteria contained in Subparts E and F of this part.

(3) The Department's quality assurance program complies with the requirements of Subpart G of this part.

(4) The Department's personnel training program complies with the criteria contained in Subpart H of this part.

(5) The Department's emergency plan complies with the criteria contained in Subpart I of this part.

(6) The Department's proposed operating procedures to protect health and to minimize danger to life or property are adequate.

(b) Common defense and security: That there is reasonable assurance that the activities proposed in the application will not be inimical to the common defense and security.

(c) Environmental: That, after weighing the environmental, economic, technical and other benefits and considering reasonable alternatives, the action called for is issuance of the construction authorization.

§ 60.32 Conditions of construction authorization.

(a) A construction authorization shall include such conditions as the Commission finds to be necessary to protect the health and safety of the public, the common defense and security, or environmental values.

(b) The Commission may, at its discretion, incorporate provisions requiring the Department to furnish periodic or special reports regarding: (1) progress of construction, (2) any site data obtained during construction which are not within the predicted limits upon which the facility design was based, (3) any deficiencies in design and construction which, if uncorrected, could adversely affect safety at any future time, and (4) results of research and development programs being conducted to resolve safety questions.

(c) A construction authorization shall be subject to the limitation that a license to receive and possess source, special nuclear, or byproduct material at the geologic repository operations area shall not be issued by the Commission until (1) the Department has updated its application as specified in § 60.24, and (2) the Commission has made the findings stated in § 60.41.

§ 60.33 Amendment of construction authorization.

(a) An application for amendment of a construction authorization shall be filed with the Commission fully describing any changes desired and following as far as applicable the format prescribed for construction authorization applications.

(b) In determining whether an amendment of a construction authorization will be approved, the Commission will be guided by the considerations which govern the issuance of the initial construction authorization, to the extent applicable.

LICENSE

§ 60.41 Standards for issuance of a license.

A license to receive and possess source, special nuclear, or byproduct material at a geologic repository operations area may be issued by the Commission upon finding that:

(a) Construction of the geologic repository operations area has been substantially completed in conformity with the application as amended, the provisions of the Atomic Energy Act, and the rules and regulations of the Commission. Construction may be deemed to be substantially complete for the purposes of this paragraph if the construction of (1) surface and interconnecting structures, systems, and components, and (2) any underground storage space required for initial operation are substantially complete.

(b) The activities to be conducted at the geologic repository operations area will be in conformity with the application as amended, the

provisions of the Atomic Energy Act and the Energy Reorganization Act, and the rules and regulations of the Commission.

(c) The issuance of the license will not be inimical to the common defense and security and will not constitute an unreasonable risk to the health and safety of the public.

(d) All applicable requirements of Part 51 have been satisfied.

§ 60.42 Conditions of license.

(a) A license issued pursuant to this part shall include such conditions, including license specifications, as the Commission finds to be necessary to protect the health and safety of the public, the common defense and security, and environmental values.

(b) Whether stated therein or not, the following shall be deemed conditions in every license issued:

(1) The license shall be subject to revocation, suspension, modification, or amendment for cause as provided by the Atomic Energy Act and the Commission's regulations.

(2) The Department shall at any time while the license is in effect, upon written request of the Commission, submit written statements to enable the Commission to determine whether or not the license should be modified, suspended or revoked.

(3) The license shall be subject to the provisions of the Atomic Energy Act now or hereafter in effect and to all rules, regulations, and orders of the Commission. The terms and conditions of the license shall be subject to amendment, revision, or modification, by reason of amendments to or by reason of rules, regulations, and orders issued in accordance with the terms of the Atomic Energy Act.

(c) Each license shall be deemed to contain the provisions set forth in section 183 b-d, inclusive, of the Atomic Energy Act, whether or not these provisions are expressly set forth in the license.

§ 60.43 License conditions.

(a) A license issued under this part shall include license conditions derived from the analyses and evaluations included in the application, including amendments made before a license is issued, together with such additional conditions as the Commission finds appropriate.

(b) License conditions shall include items in the following categories:

(1) Restrictions as to the physical and chemical form and radioisotopic content of radioactive waste.

(2) Restrictions as to size, shape, and materials and methods of construction of radioactive waste packaging.

(3) Restrictions as to the location, size, configuration, construction and physical characteristics (e.g., physical, chemical and thermal properties) of the storage medium.

(4) Restrictions as to the amount of waste permitted per unit volume of storage space considering the physical characteristics of both the waste and the storage medium.

(5) Requirements relating to test, calibration, or inspection to assure that the foregoing restrictions are observed.

(6) Controls to be applied to restrict access and to avoid disturbance to the geologic repository operations area and adjacent areas.

(7) Administrative controls, which are the provisions relating to organization and management, procedures, recordkeeping, review and audit,

and reporting necessary to assure that activities at the facility are conducted in a safe manner and in conformity with the other license specifications.

§ 60.44 Changes, tests, and experiments.

(a)(1) Following authorization to receive and possess source, special nuclear, or byproduct material at a geologic repository operations area, the Department may (i) make changes in the geologic repository operations area as described in the application, (ii) make changes in the procedures as described in the application, and (iii) conduct tests or experiments not described in the application, without prior Commission approval, provided the change, test, or experiment involves neither a change in the license conditions incorporated in the license nor an unreviewed safety question.

(2) A proposed change, test, or experiment shall be deemed to involve an unreviewed safety question if (i) the likelihood of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the application is increased, (ii) the possibility of an accident or malfunction of a different type than any previously evaluated in the application is created, or (iii) the margin of safety as defined in the basis for any license condition is reduced.

(b) The Department shall maintain records of changes in the geologic repository operations area and of changes in procedures made pursuant to this section, to the extent that such changes constitute changes in the

geologic repository operations area or procedures as described in the application. Records of tests and experiments carried out pursuant to paragraph (a) of this section shall also be maintained. These records shall include a written safety evaluation which provides the basis for the determination that the change, test, or experiment does not involve an unreviewed safety question. The Department shall furnish the appropriate NRC Regional Office shown in Appendix D of Part 20 of this chapter with a copy to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, annually or at such shorter intervals as may be specified in the license, a report containing a brief description of such changes, tests, and experiments, including a summary of the safety evaluation of each. Any report submitted pursuant to this paragraph shall be made a part of the public record of the licensing proceedings.

§ 60.45 Amendment of license.

(a) An application for amendment of a license may be filed with the Commission fully describing the changes desired and following as far as applicable the format prescribed for license applications.

(b) In determining whether an amendment of a license will be approved, the Commission will be guided by the considerations that govern the issuance of the initial license, to the extent applicable.

§ 60.46 Particular activities requiring license amendment.

(a) Unless expressly authorized in the license, an amendment of the license shall be required with respect to any of the following activities:

(1) Any action which would make emplaced high-level radioactive waste irretrievable or which would substantially increase the difficulty of retrieving such emplaced waste.

(2) Dismantling of structures.

(3) Removal or reduction of controls applied to restrict access to or to avoid disturbance of the geologic repository operations area or adjacent areas.

(4) Destruction or disposal of records required to be maintained under the provisions of this part.

(5) Any substantial change to the design or operating procedures from that specified in the license.

(6) Decommissioning.

(b) An application for such an amendment shall be filed, and shall be reviewed, in accordance with the provisions of § 60.45.

DECOMMISSIONING

§ 60.51 Amendment to decommission.

(a) The Department shall submit an application to amend the license prior to decommissioning. The application shall consist of an update of the license application and environmental report submitted under §§60.21 and 60.22 including:

(1) A description of the program for post-decommissioning monitoring of the geologic repository.

(2) A detailed description of the measures to be employed--such as land use controls, construction of monuments, and preservation of records--to regulate or prevent activities that could impair the long-term isolation

of emplaced waste within the geologic repository and to assure that relevant information will be preserved for the use of future generations.

(3) Geologic, hydrologic, and other site data that are obtained during the operational period pertinent to the long-term isolation of emplaced radioactive wastes.

(4) The results of test, experiments, and any other analyses relating to backfill of excavated areas, shaft sealing, waste interaction with emplacement media, and any other tests, experiments, or analysis pertinent to the long-term isolation of emplaced wastes within the geologic repository.

(5) Any substantial revision of plans for decommissioning.

(6) Other information bearing upon decommissioning that was not available at the time a license was issued.

(b) The Department shall update its environmental report in a timely manner so as to permit the Commission to review, prior to issuance of an amendment, substantial changes in the decommissioning activities proposed to be carried out or significant new information regarding the environmental impacts of such decommissioning.

§ 60.52 Termination of license.

(a) Following decommissioning, the Department may apply for an amendment to terminate the license.

(b) Such application shall be filed, and will be reviewed, in accordance with the provisions of § 60.45 and this section.

(c) A license shall be terminated only when the Commission finds with respect to the geologic repository:

(1) That the final disposition of radioactive wastes has been made in conformance with the Department's plan, as amended and approved as part of the license.

(2) That the final state of the geologic repository operations area site conforms to the Department's decommissioning plans, as amended and approved as part of the license.

(3) That the termination of the license is authorized by law, including sections 57, 62, and 81 of the Atomic Energy Act, as amended.

SUBPART-C PARTICIPATION BY STATE GOVERNMENTS

§ 60.61 Site Review.

(a) Upon publication in the FEDERAL REGISTER of a notice that the Department has selected a site for site characterization, in accordance with § 60.11(b), and upon the request of a State, the Director shall make available NRC staff to consult with representatives of State and local governments to keep them informed of the Director's view on the progress of site characterization and to notify them of any subsequent meetings or further consultations with the Department.

(b) Requests for consultation shall be made in writing to the Director.

(c) The Director also shall respond to written questions or comments from the States, as appropriate, on the information submitted by the Department in accordance with § 60.11 of this part. Copies of such questions or comments and their responses shall be made available in the Public Document Room and shall be transmitted to the Department.

§ 60.62 Filing of proposals for State participation.

(a) Consultation under §60.61 may include, among other things, a review of applicable NRC regulations, licensing procedures, potential schedules, and the type and scope of State activities in the license review permitted by law. In addition, staff shall be made available to cooperate with the State in developing proposals for participation by the State.

(b) States potentially affected by siting of a geologic repository operations area at a site that has been selected for characterization may submit to the Director a proposal for State participation in the review of the site characterization report and/or license application. A State's proposal to participate may be submitted at any time prior to docketing of an application or up to 120 days thereafter.

(c) Proposals for participation in the review shall be signed by the Governor of the State submitting the proposal and shall at a minimum contain the following information:

(1) A general description of how the State wishes to participate in the review, specifically identifying those issues which it wishes to review.

(2) A description of material and information which the State plans to submit to the NRC staff for consideration in the review. A tentative schedule referencing steps in the review and calendar dates for planned submittals should be included.

(3) A description including funding estimates of any work that the State proposes to perform for the Commission, under contract, in support of the review.

(4) A description of State plans to facilitate local government and citizen participation.

(5) A preliminary estimate of the types and extent of impacts which the State expects should a geologic repository be located at the site in question.

(d) If the State desires educational or information services (seminars, public meetings) or other actions on the part of NRC, such as establishing additional public document rooms or employment or exchange of State personnel under the Intergovernmental Personnel Act, these shall be included with the proposal.

§ 60.63 Approval of proposals.

(a) The Director shall arrange for a meeting between the representatives of the State and the NRC staff to discuss any proposal submitted under §60.62(b), with a view to identifying any modifications that may contribute to the effective participation by the State.

(b) Subject to the availability of funds, the Director shall approve all or any part of a proposal, as it may be modified through the meeting described above, if he determines that:

- (1) The proposed activities are suitable in light of the type and magnitude of impacts which the State may bear, and
- (2) The proposed activities (i) will enhance communications between NRC and the State, (ii) will contribute productively to the license review, and (iii) are authorized by law.

(c) The decision of the Director shall be transmitted in writing to the Governor of the originating State. A copy of the decision shall be made available at the Public Document Room. If all or any part of a proposal is rejected, the decision shall state the reason for the rejection.

(d) A copy of all proposals received shall be made available at the Public Document Room.

SUBPART D - RECORDS, REPORTS, TESTS, INSPECTION AND ENFORCEMENT

§ 60.71 Records and reports.

(a) The Department shall maintain such records and make such reports in connection with the licensed activity as may be required by the conditions of the license or by rules, regulations, and orders of the Commission as authorized by the Atomic Energy Act and the Energy Reorganization Act.

(b) Records of the receipt, handling, and disposition of radioactive waste at a geologic repository operations area shall contain sufficient information to assure traceability from the shipper through all phases of storage and disposal.

(c) The Department shall promptly notify the Commission of each deficiency found in the site characteristics, and design and construction of the geologic repository which, were it to remain uncorrected, could (1) be a substantial safety hazard, (2) represent a significant deviation from the design criteria and design bases stated in the application, or (3) represent a significant deviation from the conditions stated in the terms of a construction authorization or the license, including license specifications. The notification shall be in the form of a written report, copies of which shall be sent to the Director and to the appropriate

Nuclear Regulatory Commission Inspection and Enforcement Regional Office listed in Appendix A to Part 73 of this chapter.

§ 60.72 Tests.

The Department shall perform, or permit the Commission to perform, such tests as the Commission deems appropriate or are necessary for the administration of the regulations in this part. These may include tests of (a) radioactive waste, (b) the geologic repository including its structures, systems, and components, (c) radiation detection and monitoring instruments, and (d) other equipment and devices used in connection with the receipt, handling, or storage of radioactive waste.

§ 60.73 Inspections.

(a) The Department shall allow the Commission to inspect the premises of the geologic repository operations area and adjacent areas to which the Department has rights of access.

(b) The Department shall make available to the Commission for inspection, upon reasonable notice, records kept by the Department pertaining to activities under this part.

(Amendments to all parts issued pursuant to citations of authority presently codified or, in the case of 10 CFR Part 60, as proposed to be codified.)

Dated at Washington, D.C. this _____ day of _____, 1979.

For the U.S. Nuclear Regulatory Commission.

Samuel J. Chilk
Secretary of the Commission

ENCLOSURE B

ENCLOSURE "B"

PROPOSED GUIDANCE ON LICENSING

STORAGE AND DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE

Preliminary Value/Impact Assessment*

I. PROPOSED ACTION

A. Description

The proposed action is to provide guidance to the Department of Energy (DOE) and interested parties on the procedures for licensing DOE to receive, store, and dispose of high-level radioactive wastes (HLW) in accordance with §§ 202(3) and (4) of the Energy Reorganization Act of 1974.** The substance of the proposed action is the procedures and general requirements applicable to licenses for geologic storage and disposal of HLW.

B. Need for Proposed Action

Facilities and activities owned by and operated for the DOE are normally excluded from NRC licensing under the Atomic Energy Act of 1954, as amended. However, sections 202(3) and 202(4) of the Energy Reorganization Act of 1974 provides NRC with licensing and related regulatory

*This assessment is prepared in parallel with, and should be considered in the light of, the Commission's Proposed General Statement of Policy, "Licensing Procedures for Geologic Repositories for High-Level Radioactive Wastes," 43 FR 53869, November 17, 1978.

**The technical criteria, against which DOE's license application will be reviewed, are not considered in this value/impact assessment, although technology does pose constraints on procedural options as discussed herein. A separate value/impact analysis will accompany the guidance on technical licensing criteria.

authority over certain DOE high-level radioactive waste storage facilities. In the view of DOE, the most promising avenue of disposal of HLW appears to be geologic disposal, i.e., emplacement of the wastes within cavities excavated in an appropriate geologic medium. Present regulations in principle are sufficient to license geologic disposal of HLW. However, as a practical matter, licensing would be difficult without some specific guidance on what is to be considered in the license review, the principles upon which licensing decisions are to be made and the procedures which NRC would employ in the licensing process. Hence, a specific goal of the NRC must be to establish regulatory procedures and general requirements to respond to planned geologic disposal of HLW by DOE.

As practicality dictates providing licensing guidance, practicality also dictates providing that guidance as soon as possible. Because the major factor in determining acceptability of geologic disposal of HLW is likely to be the suitability of the site, the licensing of geologic disposal is necessarily different from other NRC licensing activities. A greater emphasis on and time allotted for site investigation and selection will result from the fact that little in the way of engineered systems is available to compensate for site deficiencies. Hence it is important that both DOE and the public be aware of the NRC position on the extent of site investigation required and the process to be used for site evaluation as early as possible, preferably before DOE begins site selection. Added impetus to establish procedures and general licensing requirements now is provided by the anticipation

that DOE will soon begin selecting sites and subsequently apply to the NRC for a license.

C. Value/Impact of Proposed Action

1. NRC - Staff effort and expenditure of resources is moderate, in that only procedural guidance is to be provided by this action.*

2. Other Government Agencies - Assistance has been and will continue to be obtained from many Federal and State agencies, and local governments. The impact of these actions is directly related to the resources required from each organization to provide such input. No adequate means are available to quantify this impact. However, the assistance from other agencies on this action essentially will be only to review proposed NRC procedures for possible conflict with their own procedures. The DOE as the Federal agency responsible for building and operating a HLW facility is most affected. However, there is no definitive basis for evaluating the impact of this action on DOE. On the other hand, the value of the action is that it will serve as a base from which DOE can plan and schedule the development of a HLW disposal facility. Moreover, it will inform the public about the procedures and opportunities for public input. Together these should provide a licensing review for DOE HLW geologic disposal facilities that is both orderly and fully allows for public participation.

* The promulgation of the technical licensing criteria will require considerable resources, the bulk of which is monies spent for technical assistance contracts.

3. Industry - As a license will be issued only to DOE, the commercial industry will not be affected directly. The public will not be affected directly by the proposed action. An indirect effect may be costs and manpower involved with public participation in the action, however.

D. Decision on Proposed Action

General procedural guidelines and general requirements for licensing of geologic disposal of high-level radioactive waste should be provided.

II. Technical Approach

1. Scope of the Action

An issue to be resolved is whether the proposed action should be designed to provide guidance with respect to all DOE facilities that might be proposed for the long-term storage (disposal) of high-level radioactive wastes or only facilities based upon the use of cavities excavated within deep geologic media.

There are several reasons that suggest that limitation of the action to geologic repositories is appropriate. The foremost of these is that information from DOE indicates that only that technology is likely to be the subject of a license application in the foreseeable future. Moreover, some technologies are subject to such legislative restrictions as to counsel against setting up regulatory schemes for their implementation.* Other technologies, including transmutation

*Disposal of radioactive wastes in Antarctica is prohibited by The Antarctic Treaty, 12 U.S.T. 794, entered into force for the United States June 23, 1961. Seabed emplacement would appear to violate the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 26 U.S.T. 2403, entered into force for the United States August 30, 1975.

and ejection into space, involve such additional research and development as to eliminate any reasonable prospect for licensing for many years.

On the other hand, it can be argued that by developing guidance for licensing of geologic repositories, NRC might prematurely be endorsing the acceptability or preferability of this disposal mode. However, this action merely anticipates the method which appears to be the most likely at the moment. This action does not relieve the NRC of the obligation to review DOE's evaluation of alternatives, pursuant to NEPA, before it would authorize the major Federal action by issuing a license. The NRC can make no commitment to approve the licensing of a geologic repository until the alternatives are fully explored.

It is understood that DOE is preparing a generic environmental impact statement that will consider disposal alternatives in depth. The generic statement together with NRC's independent review of DOE's consideration of alternatives must be in hand before any NRC-authorized activity is undertaken.

Accordingly, it is reasonable that the scope of the action be limited to the licensing of geologic repositories.

2. Structure of licensing procedures

A second issue is whether NRC's proposed procedures should require that the licensing process commence at some point prior to the time

that DOE is ready to receive high-level radioactive wastes at a geologic repository or wait until the facility is built to begin the license review.

There are three major advantages of early NRC's involvement. First, there would be less tendency for the momentum of DOE's prelicensing activities to influence NRC's judgment. Second, there will be greater opportunity for an orderly process of identification and resolution of important safety issues, with a maximum opportunity for public participation. Third, appropriate provisions could better be made for quality assurance and documentation during construction operations. The disadvantage of early NRC involvement in the initial stages of site selection and construction is that the administrative procedure may result in some slippage of DOE's schedules.

In view of the very great importance of the issues to be decided, and the need for full public awareness of the matters considered in arriving at decisions, the procedures should provide for early review by NRC.

3. State Participation

The issue is whether State governments should participate in the actual safety and environmental review of a proposed facility in any fashion other than as a participant in the NRC licensing proceedings.

States customarily perform license reviews of one form or another for NRC licensed facilities and operations. However, these reviews involve

questions of land and resource management and environmental impacts. Under the Atomic Energy Act questions of radiologic safety of activities involving source, special nuclear, and byproduct material are entrusted exclusively to the NRC.* Moreover, even though a geologic repository is unique and not at all like other licensed facilities and operations, it is unlikely that State participation in license review would result in a safer repository than a repository that has had a license review by conventional NRC practice, i.e., with States and others participating in the hearing process as interested parties.

Nonetheless, because of the interest and concern expressed by representatives of many State governments over the role of State governments in the siting and licensing of licensed DOE HLW facilities, and the potential impact that the facilities might have upon the States concerned, it would appear to be desirable to provide some means by which State governments can become more involved in the licensing process than heretofore.

If such involvement were to begin even before a license application were filed, it might facilitate the timely consideration of problems and questions of particular interest to the States.

From the foregoing, it would seem appropriate to incorporate provision for participation by State governments in the review of DOE geologic repository license application.

*However, exercise of NRC authority may be discontinued, under the Agreement State program, with respect to certain types of materials licenses, as provided in section 274 of the Act.

III. Procedural Approach

The technical approach could in principle be implemented by reliance upon appropriate portions of the Commission's existing regulations. Alternatively, a new set of regulations could be developed to deal exclusively with geologic repositories. New regulations would permit a greater emphasis to be placed upon the characteristics of the site than is customary for materials licenses. Moreover, a detailed delination could be made of the several steps which might be appropriate for licensing of this unique activity. These might include detailed statements of required findings that would have no parallel in other materials licensing cases. Provisions could be made for expanded public and state participation. Finally, a new rule also could take into account the fact that the applicant is DOE which, unlike other NRC licensees, is charged with certain independent responsibilities under the Atomic Energy Act.

These factors in sum support a decision to develop new regulations.

V. Statutory Considerations

A. NRC Authority

Sections 202(3) and (4) of the Energy Reorganization Act of 1974 provide NRC with licensing and related regulatory authority concerning ERDA (now DOE) facilities for storage of high level radioactive waste.

B. Need for NEPA Review

The proposed action will consist primarily of adaptations of procedural requirements presently set forth in the Commission's regulations. To

the extent that an action is procedural in nature, there would be no substantive and significant environmental impact, and no environmental impact appraisal would be required. However, to the extent that regulations define the technical criteria that would be applied in determining whether a licensing action would be taken by NRC, there will be a need for NEPA review. With this in mind, the procedural mechanisms will be developed first, and the technical criteria will be developed later in the light of appropriate NEPA appraisal.

VI. Relationship to Other Existing or Proposed Regulations or Policies

The proposed action will need to be coordinated with administrative, procedural, and radioactive waste management requirements in other parts of the Commission's regulations. These include Parts 2, 19, 20, 21, 30, 40, 51, and 70 of Title 10, Code of Federal Regulation.

Technical criteria will need to be consistent with any generally applicable environmental standards which EPA may adopt in the future.

VII. Summary and Conclusions

The proposed action will provide appropriate guidance, in the form of new regulations, on which to review and evaluate a DOE license application for the storage of HLW.

ENCLOSURE C

Enclosure "C"

Site Selection and Development

Regardless of when or how NRC chooses to exercise its licensing authority, the physical steps taken to explore and develop a site for a geologic repository are to a large degree preordained by the nature of a geologic repository. For illustration, we have divided the process into three stages: preliminary survey, site characterization, and construction. We do not discuss here the process of choosing a particular site from among alternative sites and host media. Rather, we only deal with the exploration and testing which develop the information needed to review that choice.

I. Site exploration

Preliminary survey. This stage of site selection consists of a literature search of past geologic and hydrologic studies. Its purpose is to locate sites of potential interest as repositories. Data from existing mining, drilling, and mineral and water resource development records for a prospective area are compiled. Some preliminary borings and geophysical tests may be made, as well. At this stage, sites which possess unsuitable characteristics for a repository will be eliminated. Examples of such characteristics are: lack of a suitably sized host rock; extensive subsidence features indicating solutioning and/or mineral or petroleum extraction, recent volcanic activity, and active, hazardous faults nearby.

Site characterization. The second stage is separated into two steps: initial surface exploration and exploration at the planned depth of the repository. Preliminary exploration consists of surface and subsurface studies through limited borings, well logs, seismic traverses, aeromagnetic and gravity surveys, and other appropriate techniques. The object at this stage is twofold. First, the studies will be used to identify serious defects or establish the potential for unidentified defects. Second, the studies will be used to plan how further exploration will be carried out to assure that the methods used are appropriate to the particular attributes of the site and that exploration itself will not compromise the ability of the site to isolate wastes.

Upon completion of preliminary exploration, the extent of the potential host rock will be known along with stratigraphic and hydrogeologic information sufficient to identify the extent and potential influence of surrounding rocks and overlying and underlying aquifers. The hydraulic gradients, age, and chemistry of such aquifers will have been measured, and some indication of the mechanical and hydrologic properties of the potential host rock will have been obtained.

Because of both the remaining uncertainty of the particular geologic and hydrologic attributes of the site and their significance to safe isolation of wastes, further exploration at depth should be carried out at sites which appear favorable following surface exploration. The importance of exploration and testing at depth has been emphasized in Appendix A to the IRG report. Further, the recently published National Academy of Sciences report states:

"A comprehensive experimental program using exploratory excavations at the proposed depth of the repository should be conducted to supplement the earlier site investigation. The program must include construction and testing of representative lengths of shafts and tunnels for purposes of demonstrating whether or not the materials and techniques ultimately to be used in sealing the repository are adequate... The data obtained during the exploratory excavation should be used to provide an updated and more confident prediction of release of radioactive materials from the repository...."*

The necessity of exploration at depth to establish site suitability has also been expressed repeatedly by members of the U.S. Geological Survey staff.**

* National Academy of Sciences report, "Implementation of Long-term Environmental Radiation Standards: the Desire of Verification," Panel on the Implementation Requirements of Environmental Standards, Committee on Radioactive Waste Management, 1979, Sec. 3.2.3.

** On May 17, 1979, NMSS staff met with representatives of the Department of the Interior (DOI) and the United States Geological Survey (USGS) to discuss the USGS role in screening and selection of sites for a high-level waste repository and possible participation by USGS in NRC's licensing process. During the meeting, it was stated by the DOI representative that for any repository located on land managed by the DOI, the department must make a finding of site suitability in order to permit land withdrawal to allow the site to be dedicated for use as a repository. Legislation would also be required for permanent withdrawal. Such a finding of site suitability was possible only after exploration at repository depth and performing in situ testing. DOI would only issue a temporary permit to allow further exploration and in situ testing and would await an NRC finding of site suitability before requesting legislation for permanent land withdrawal. The DOI and USGS staff considered that such a request for legislation could not be supported without the results of exploration of depth and in situ testing.

The need for in situ testing at depth was again stated by Dr. David B. Stewart of the USGS in testimony given before the Subcommittee on Oversight and Investigations, House Committee on Interior and Insular Affairs, U.S. House of Representatives, on August 10, 1979, at Albuquerque, New Mexico.

This step of exploration begins with excavation of a exploratory shaft (~ 5 to 6 ft diameter) to the planned depth of the repository. This is followed by the excavation of a small room (on the order of 400 sq ft) at the base of the shaft from which lateral borings and exploratory drifts can be made. Data on stability and sealability will be gathered during excavation of the shaft and the room at its base. However, experience has shown that the values of some key properties obtained from laboratory studies - e.g., tests of rock cores - are imprecise and may be unreliable. For example, at the STRIPA mine in Sweden, the results of in situ testing of the STRIPA rock unit were significantly at variance with performance predicted from laboratory studies for several important geotechnical parameters.* Hence, the information needed to establish the ultimate suitability of the potential host formation will be obtained through logging of lateral borings and in situ hydrologic, thermal, and mechanical testing conducted at the planned depth of waste emplacement. This information includes specific properties of the rock such as homogeneity, overburden stress, moisture content, porosity, extent of fracturing and jointing, and data on fracture flow. In addition, data on thermal response to an emplaced source of heat including information regarding expansion, fluid migration, and rock decrepitation will be gathered along with mining and tunneling data. These investigations will help to confirm observations made on similar rock types and establish the limits of key geologic and hydrologic parameters as well as define the mechanical and thermal properties of the prospective repository environs. Moreover, specific

* For example, see the early results of the STRIPA project, the "Swedish-American Cooperation Program on Radioactive Waste Storage in Mined Caverns in Crystalline Rock." Technical Information Report No. 17, LBL-8571, May 19th; Technical Project Report No. 6, LBL-7086, August 1978; Technical Project Report No. 11, LBL-7072, December 1978.

data on host rock are needed to assess the ability of the repository to retard the migration of emplaced wastes alone. In addition, such data are needed to allow completion of the design of the repository, selection of the appropriate waste forms and packaging, and development of the waste emplacement and operations program for the repository.

It has been suggested that sinking of the main repository shaft could be done to acquire site suitability data in lieu of the testing and exploration at depth described above. Certainly, by excavating a large diameter shaft, a proportionately larger area of the repository media and overlying strata would be sampled than that taken with a borehole or a smaller diameter shaft. However, three or four boreholes spaced within several diameters of a main shaft will provide not only the same stratigraphic data, but allow for some hydraulic testing and the use of logging techniques which will not work in a large diameter shaft, at a cost of about 1/60 to 1/100 that of the shaft. Moreover, none of the information from logging of lateral borings and in situ testing as described above would be produced from shaft excavation alone.

II. Costs of Exploration and Testing

The costs of site exploration techniques, especially drilling operations, are highly dependent upon local factors such as strata and depth, as well as the type of rock being explored as a potential host. The costs presented here are representative only. Much of the cost data was derived from the Teknekron, Inc. report, "A Cost Optimization Study for Geologic Isolation of Radioactive Wastes," May 1979, prepared under contract to Battelle Pacific Northwest Laboratories. Information on exploration and testing techniques came from meetings

and consultations with Lawrence Livermore personnel under contract to NMSS, early reports of the Swedish American Cooperative Program on Radioactive Waste Storage in Mined Caverns in Crystalline Rock, the Teknekron report cited above, and the publication on interpretation of borehole logging, "Log Interpretation, Vols. I and II," 1979, Schlumberger Limited, New York, New York. To give some perspective on the possible range of costs, two media, granite and tuff, are chosen as representative of hard and soft rock, respectively.

Activity	Description	Cost (Millions)	
		Granite	Tuff
<u>Preliminary survey</u>			
Literature search ~ 500 manhours	mineral/petroleum development data, geologic and hydrologic studies.	.03	.03
Preliminary test boring w/core recovery	4 holes ~2000 to 4000 depth \$35/ft granite, \$25/ft tuff.	.42	.30
Core logging and laboratory testing	visual inspection of cores, tests of compressive strength, porosity, thermal expansion, creep, tensile strength, hydrology, water chemistry.	.10	.10
Total preliminary survey		.55	.43
<u>Site Characterization</u>			
Initial surface exploration (~20 sq mi)			
Seismic traverse	use of reflection and refraction of seismic pulses to delineate rock structure and provide information on rock continuity.	.07	.07
Gravity survey	provides further information on structure and continuity.	.10	.10
Test borings	4 strategically placed borings into prospective host unit.	.42	.30

Down hole logging	density, porosity, hydrology, permeability, elastic modulus, lithology, water influx, clay content in overlying strata, ~ \$2/ft.	.02	.02
Down hole testing (hydraulic testing, sonar, radar, resistivity)	fracture flow, joints, water chemistry.	.04	.04
Total initial surface exploration		.65	.53
Exploration at depth			
Exploratory shaft	3000 ft, 48 i.d., lined with 2 in steel, made with ~64 in drill.		
Set up		.60	.60
Drill cost		3.00	1.50
Steel liner		1.50	1.50
Supporting equipment		.40	.40
		<u>5.50</u>	<u>4.00</u>
Room at base	20 ft x 20 ft x 8 ft room at base of shaft	.14	.09
Lateral borings	approximately 10,000 ft of borings with core recovery. ~\$225/ft granite* ~\$125/ft tuff.*	2.25	1.25
Down hole logging	density, porosity, fluid intrusion, permeability, fractures, jointing, homogeneity.	.50	.50
Down hole testing	fracture flow, jointing.	1.00	1.00
In situ testing (heater tests stress tests)	thermal response, expansion, chemistry, rock decrepitation, mechanical properties.	2.00	2.00
Total subsurface exploration		11.29	8.84
Total site characterization		11.94	9.37
Total site selection**		12.49	9.80

* These rather large per ft costs arise primarily from the difficulty of set up and operation of horizontal drills at the bottom of a 3000-ft shaft.

** These costs should be compared with the estimated construction costs for a repository given in the Department's Draft Generic Environmental Impact Statement, "Management of Commercially Generated Radioactive Waste," DOE/EIS-0046-D, April 1979. The costs stated in that document range between \$1 and 3 billion (Table 3.1.26, p. 3.1.133). This is construction cost alone, and does not include operating cost, closure costs, or costs of fabricating the waste form.

III. Construction

In light of the considerable investigation done during exploration, it is unlikely that construction would produce any significant new or contradictory information which would call into question the suitability of the site for a repository. Of course, tests and experiments will continue to be conducted, but these will be largely confirmatory or related to specific questions and issues which require long periods (~ decades) of data gathering.

Shaft

Construction will probably begin with the main repository shaft. This may be simply enlargement of the exploratory shaft sunk for site characterization. The actual excavation might be either by conventional blast and machine digging or by large diameter drill. Care must be taken with either method to minimize fracturing and preserve sealability.

The costs of the available methods for sinking the main shaft appear to be about the same. For a shaft of about 20 ft diameter, about 3000 ft deep, the cost would be about \$15 million in soft rock (e.g., salt) and about \$50 million in granite.

Galleries and Drifts

The costs of excavating drifts and galleries vary greatly with not only the type of host rock, but also the shape of the tunnels and the method used to dig them. A detailed discussion of mining costs and techniques is beyond the scope of this enclosure. However, it will suffice to note that total construction costs have been estimated by the Department to be in the neighborhood of \$1 to \$3 billion (both soft and hard rock) for about 600,000 ft. of tunnels yielding a repository area of around 2,000 acres.

ENCLOSURE D

CONSIDERATION OF COMMENTS TO THE STATEMENT OF PROPOSED POLICY

Findings

Comments were made concerning the type of findings which should be made during the licensing reviews. In particular, the following comments were made.

It was stated that a complete and final finding should be made prior to granting construction authorization for a shaft. The NRC does not believe this to be possible. Because it is not technically possible to ascertain what lies below the surface of the ground in detail and with certainty prior to excavation, it is not feasible to make a final finding prior to excavation. Since NRC believes it best to become involved prior to completion of excavation of the repository, we have adopted a graduated finding approach in which licensing reviews are conducted before final data is available. This requires that the completeness and confidence expressed in the findings increase as development of the repository site progresses. Closure of the repository will not be authorized until all data from construction and operation is evaluated.

It was stated that the proper standard for the findings in a NEPA review of alternatives should be (1) a best alternative standard as opposed to the obviously superior standard and, conversely, (2) that the standard should be the reasonableness of DOE's approach rather than a de novo determination by NRC of the best alternative. The finding required under the proposed rule is that after weighing the environmental, economic, technical and other benefits, and in consideration of reasonable alternatives, the action called for is issuance of a construction authorization. This conforms to practice specified elsewhere in the Commission's regulations, e.g., 10 CFR 70.23.

It was stated that the language of the safety findings required by the policy statement is inconsistent with and less stringent than an interpretation

of the Atomic Energy Act which presumes a finding of "reasonable assurance of protecting public health and safety." In fact, the Atomic Energy Act is implemented by 10 CFR 70.31 for a materials license and 10 CFR 50.35 for a reactor license with language which requires a finding of no unreasonable (or undue) risk to the health and safety of the public. Thus, this finding requirement has been retained.

Environmental Impact Statement Preparation Lead Agency

Numerous commenters stated that DOE should be the lead agency in preparation of a single EIS. Others suggested that NEPA review should be solely a DOE responsibility. A suggestion of either a DOE lead or of DOE and NRC as co-lead agencies was made. Nevertheless, the proposed rule provides that NRC will prepare an environmental impact statement because the Commission believes that this degree of involvement is essential if its independent review responsibilities are to be discharged in the manner contemplated by NEPA.

NEPA Review Prior to Shaft Excavation

Comments were made that a NEPA review prior to sinking a shaft would not be beneficial because sufficient information would not be available and also that any such review should be the sole responsibility of DOE. Conversely, it was stated that both DOE and NRC have a NEPA obligation prior to shaft sinking. To obtain more information for the first licensing review, the draft rule does not permit the start of construction to occur until after site characterization. Thus, the first NEPA review by NRC likely will begin after exploratory excavation and in situ testing have been conducted.

Several commenters believed that any NEPA review prior to sinking a shaft should be limited to consideration of the impacts of only those actions to be

authorized by that stage of the licensing process. This suggestion has been mooted by scheduling the review after site characterization.

Scope of NEPA Review

Several commenters believed that DOE's programmatic policy decisions, made in accordance with NEPA requirements, should not be subject to duplicative review in a subsequent licensing proceeding. They have also commented that the policy statement appears to ignore both the programmatic NEPA obligations which will have already been undertaken by DOE and the allocation of responsibilities between the two agencies.

Although the proposed rule does not delineate in detail those issues to be considered under NEPA, the Commission has indicated that the choice of alternative technologies among other issues will be subject to NRC review. The scope of that review will reflect statutory allocations of responsibilities. (See, for example, the Commission decision in the matter of the Clinch River Breeder Reactor Plant, 4 NRC 67, 1976.)

Timing of the First Licensing Review

Recommendations on the proper time at which to conduct the first review resulting in an NRC authorization to proceed spanned a wide range. Some commenters suggested a formal review with approval before proceeding at the preliminary site review stage. Others suggested such a review was not appropriate until after a shaft was excavated or until the facility was ready to receive waste. The proposed rule has postponed the first actual licensing step until after site characterization is complete and has made the preliminary site review a mandatory and more comprehensive review.

Scope of First Safety Review

Comments varied from stating that the first safety review should include only the design, construction and environmental impact of the main shaft to stating that the review should be complete and final. AIF felt that NRC's first safety review should be concurrence only. NRDC felt that NRC's first safety review should result in final design approval except in cases where essential information can be gained only by completing additional construction. However, NRC approval and public hearings would be required before that construction would be authorized.

The scope of the review has not changed from the GSP. We still plan to look at all available data. However, the timing of the first authorization has been shifted to after site characterization rather than before shaft excavation.

WIPP Licensing

Although many comments were received concerning whether WIPP should be licensed, NRC did not address these comments in the regulation because it considers this to be a decision that will be made by the Congress (or through definition of its purposes, by the Department).

Need for Standards and Methods

Two commenters stressed the need for criteria. General Electric commented that NRC should indicate in the GSP how EPA's expected criteria for HLW repositories will be applied to judge adequacy of DOE designs. NRDC commented that NRC should develop licensing criteria prior to adoption of any policy on licensing procedures.

The need for standards and methods, i.e., criteria, was not addressed in the GSP; however, the NRC had already undertaken a parallel effort to develop regulatory standards and guides. Although the technical criteria against which a license application will be reviewed are not yet completely developed, they are sufficiently evolved to permit publication of proposed detailed licensing procedures.

State-Public Involvement

NRDC says the licensing process of the proposed general statement of policy is undesirable because it segments the process into several steps which are inconsistent with an open end public process. NRDC proposed an alternate process (to begin after NRC has established objective site selection and site approval criteria) that would have NRC conduct an early site screening review and would include public hearings. The licensing process would remain open until all NRC actions had been executed. Thus, any post operating issues requiring NRC approval (amendments, etc.) would be subject to a right of Public Hearing.

The proposed regulation preserves the step-wise licensing approach of the proposed General Statement of Policy. The NRC feels that this approach does provide an open and public process. There will be early opportunity for public comment beginning with DOE's site characterization report (which is the first stage of the review process). It is also anticipated that the NRC will hold public meetings in the immediate area of the sites to be characterized. Public hearings will be held on DOE's application for construction (the second stage of the review process). These two stages provide for public comment on site selection and facility design, which are key elements in safe disposal of HLW in geologic repositories. Further opportunity for public participation will be available prior to receipt of wastes and at closure.

State comments on the Policy statement and draft regulation were generally favorable. For example, Texas finds that the proposed regulations provide for sufficient notice to State and local entities. However, New Jersey advocates more involvement by citizens and State agencies in the second phase, i.e., the formal Commission licensing review process. In fact, New Jersey recommends that all 50 States be kept abreast of the facts in all phases of waste repository proceedings, i.e., where active participation is permitted by the regulations, notification of all State government or agencies should be required by the regulations.

South Carolina commented that the provisions for timely notification of governors of States affected is welcome.

Connecticut stated that the procedures appear to provide for an orderly and open process for licensing of geologic repositories at this time. The host State should be informed during the entire procedure regardless of whether the State requests consultation or files a proposal for participation. There should also be more provisions for host State participation during decommissioning.

Kentucky commented on two matters. First, it was not clear to them what role State and local officials may play in the review and licensing of such an HLW repository. Kentucky wants State and local officials to be involved in the decisionmaking process to the extent of consultation and concurrence at the various stages of the licensing process. Second, although NRC proposes to review repository closure after the repository is filled, Kentucky believes it would be more prudent to establish criteria for decommissioning at the early stages of licensing so that features that would enhance decommissioning could be built into the facility. The proposed regulation provides for licensing repository closure at the end of the emplacement period (rather than at the

beginning). Additional geologic and hydrologic data acquired during the emplacement period, the results of tests and experiments on backfilling and shaft sealing, and DOE's closure program all will be considered by NRC as it decides whether to license the closure. However, the character of both the required findings and the information to be included in the license application assure that the feasibility of closure is reviewed at the time construction is authorized. In fact, the proposed regulation requires that decommissioning and closure specifically be addressed in the license application.

The State involvement was not addressed in detail by the proposed General Statement of Policy. State involvement is covered in the proposed regulation as discussed below, however.

The proposed regulation stipulates that States may submit proposals for participation in the review of the site report and for any subsequent license application from DOE. The proposal from the State(s) is to stipulate what activities the State(s) proposes to perform in the review, i.e., review specific portions of license applications or perform background or technical assistance work for the Commission. States could also participate through employment or exchange of State personnel. Thus, States will be provided with the opportunity to participate in the review process. Moreover, it is anticipated that funding for State participation will be available at the time that DOE submits a site report to the NRC.

The issue of State concurrence at the various stages of licensing is before the Congress and has been discussed in a report from the Commission to the Congress, NUREG-0539.

The Southwest Research and Information Center commented that staff offer to meet with "State and local officials" should be extended to representatives

of citizen organizations. Secondly, the regulations (10 CFR Part 2) should specify that public document rooms will be established in the affected region. Presently, the staff intends to hold public meetings in areas which contain sites which DOE considers characterization. Further, the Commission's regulations do provide for establishing local public document rooms as appropriate.

The Tennessee Valley Clean Energy Alliance commented that the process of site selection should be a public procedure rather than one done "informally" by DOE and NRC. Their argument was that informal site selection "gives inadequate time for citizen consideration of either the site or design" (of the repository).

The proposed regulation provides for public comment on both site selection and facility design. This was discussed in more detail earlier in this section.

Preliminary Site Review

Westinghouse suggests that the licensing process would be quicker and cheaper if DOE would submit a license application after the sinking of the first shaft. DOE would thus determine site acceptability prior to the license application. NRC would not be involved in site review.

NRDC (Roisman) suggests a licensing procedure which would have DOE submit a formal license application which would contain a minimum of five sites, each thoroughly explored, along with an FSAR for the design of the facility. NRC would conduct an early site screening review, including public hearings. DOE would be entitled to make a showing.

Shaw, Pittman, Potts and Trowbridge (representing Utility Waste Management Group) imply that NRC should perform an informal site review.

The Environmental Policy Institute comments that site suitability should be the principal concern of NRC in licensing a geologic repository. Thus, NRC should take an active role if it is to adequately assess the entire repository-geology system and compare it to alternative systems.

The Southwest Research and Information Center commented that a variety of sites should be presented to the Licensing Agency to permit detailed comparison of alternatives.

The proposed regulation provides for NRC and public review of sites proposed for site characterization by DOE. It requires DOE to submit a site characterization report. This report will describe how the site or sites were selected, DOE's plan for further development of alternatives, a description of the sites to be characterized and the site characterization program. The report will be reviewed by the NRC staff, and there will be opportunity for comment on the staff analysis of the report. It is anticipated that NRC will hold public meetings in the immediate area of the sites to be characterized. These meetings will be held both to disseminate information and to obtain public input.

ENCLOSURE E

Environmental Impact Appraisal
of
Proposed 10 CFR Part 60
Disposal of High Level Radioactive Wastes
in
Geologic Repositories
(Procedural aspects)

INTRODUCTION

For the most part, the proposed 10 CFR Part 60 sets forth straightforward administrative requirements which in themselves have no impact beyond the resources needed to prepare, submit, and review the licensing documents (application, reports, letters, etc.). However, one requirement could conceivably have a significant impact and therefore warrants the following examination of the proposed rulemaking.

MULTIPLE SITE CHARACTERIZATION

A requirement associated with the proposed 10 CFR Part 60 (specifically 10 CFR 51.40) is that prior to selection of a site as a proposed repository and subsequent submittal of an application for construction authorization, the Department of Energy must characterize a number of sites in different geologic media. That is, the Department must conduct a program to establish the value and range of key geologic and hydrologic characteristics at several potential repository sites. The NRC staff expects that this will be done at five or six sites. Further, the NRC staff expects that the program of characterizing sites will include exploration and in situ testing at depth for each site characterized. While not explicitly required, the NRC staff has concluded that it would be

unlikely that the Department could develop the quantity and quality of site-specific information needed to support an application for construction authorization without such exploration and testing at depth. The basis for this conclusion is explained in the Supplemental Information to the proposed rulemaking and in Enclosure "C", "Site Selection and Development," to the staff paper forwarding the proposed rulemaking to the Commission.

APPRAISAL OF IMPACTS

Preliminary survey. The environmental impacts from preliminary survey work would be those arising from field work performed. For example, topographical surveys would involve 2 or 3 surveyors traversing the area of a site. Some vegetation might be destroyed in laying out survey lines, establishing bench marks, and setting up environmental monitoring equipment, as well as through the possible use of one or two off-road vehicles to transport the survey team and their equipment. Test boring and down hole logging would require a drill rig, water truck, and one or two support trailers. A road would need to be made to the drilling sites if none existed.

Initial surface exploration. The impacts from surface exploration largely will arise from the borings and down hole loggings done in this step. These impacts will be about the same as any drilling and logging done during the preliminary survey work. Additional impacts may accrue from seismic traverses if heavy vehicles or small explosive charges are used to produce the necessary ground vibrations. Gravity surveys and aeromagnetic surveys have little impacts. The former consists of taking readings from hand-carried instruments every several yards along previously established survey lines. An aeromagnetic survey involves a fly-over of the area in an instrumented light plane.

Exploration at depth. The major impact arising from site exploration will be the approximately 5500 cubic yards of spoils from excavation of an exploratory shaft and a small room at its base.* This is about 10% of the spoils from a main (20 ft diameter) shaft and less than 0.1% of the total spoils which can be expected from complete excavation of a repository. If the spoils were to be trucked offsite the impacts could be lessened considerably. At about 10 cubic yards per truck load, approximately 6 truckloads per day would be taken offsite for the estimated 6 months needed to drill the exploratory shaft.

Support equipment for exploration and testing at depth would consist of 2 or 3 equipment trailers, 1 instrument trailer, the drill rig, a hoist, 2 or 3 large earth-moving trucks while the exploratory shaft is being drilled and 1 small truck thereafter, a water truck, and 1 or 2 miscellaneous equipment trucks or vans. A parking lot of about 25 to 30 car capacity and a fence surrounding the area would also be needed. Total personnel would be in the neighborhood of 50 or fewer individuals.

Summary of impacts

Fugitive dust and erosion runoff from roads, cleared areas and spoils tips present the dominant environmental impact at typical sites. However, these largely can be mitigated by proper grading and spreading gravel on roads and cleared areas, and use of stabilization techniques for spoils tips. Alternatively, the spoils can be trucked offsite. The small size of the area impacted

* The excavated volume of a 3000-ft shaft approximately 6 ft in diameter is roughly 90,000 cu ft or 3200 cu yds. The volume of spoils will be approximately 1.6 times the excavated volume. The 20 ft x 20 ft x 8 ft room at the base of the shaft will contribute about 5000 cu ft for a total of about 150,000 cu ft, or 5500 cu yds. These spoils could be disposed of in a pile about 200 ft long, 100 ft wide, and 8 ft high.

(on the order of an acre) combined with the relatively large area of formations of interest, allow impacts to be further lessened by exercising judgment in the choice of locating sites from which to conduct exploration and testing.*

The relatively small physical size of the project tends to lessen the potential for long term subsurface effects, as it does for short term impacts upon nearby habitats, aquatic environments, and local flora and fauna. Experience with petroleum exploration and subsurface mining indicates that the relatively few (~6) boreholes to be drilled and the small shaft to be excavated do not provide significant avenues for mixing or contamination of aquifers which may be penetrated. Neither is there significant potential for subsidence, both because of the small size of the exploratory shaft and because of the expected competency of the rock unit to be explored.

CONCLUSION

Other than the money, manpower, and fuel consumed in site characterization, no impacts should be irreversible. The boreholes can be sealed, the excavated shafts filled in, the remaining spoils trucked offsite, and roads and cleared areas replanted as appropriate. Damage to habitats and stress on endangered or rare species can be avoided by careful selection of the site from which the underground formations are explored. Environmental stress during the exploration at a site can be minimized by adequate attention to planning and operations. Socio-economic stress on nearby communities should be insignificant because of the relatively small number of workers involved at any site.

* The extent of formations of interest can range from a few miles across, for example salt domes or granitic plutons, to several hundreds of miles common to bedded salt or basalt flows.

It is recognized that the construction of roads and deposition of spoils in remote areas may detract from aesthetic and recreational values. These impacts may be sufficiently significant in particular instances to warrant their site-specific examination prior to the Department's proceeding with site characterization. However, given the short duration of site characterization, the substantial reversibility of the impacts, the small areas disturbed and quantities of spoils generated, and the opportunity to exercise judgment in selecting a site in a suitable formation or in selecting candidate areas for investigation, the harm associated with the general requirement that multiple sites be characterized is too small and speculative to be considered significant.

In sum, there appears to be no reason to expect any significant or lasting impact upon the environment from site characterization at any site. Moreover, when considered in the larger context of the continental United States, neither would the characterization of several sites produce any significant or lasting environmental impact. Accordingly, no environmental impact statement need be prepared for this requirement.

ENCLOSURE F

NRC ISSUES PROPOSED REGULATIONS ON PROCEDURES
FOR REVIEWING WASTE REPOSITORY APPLICATIONS

The Nuclear Regulatory Commission is considering new regulations on procedures for reviewing a possible application from the Department of Energy (DOE) for a license to receive and dispose of high-level nuclear wastes at a geologic repository.

The proposed repository licensing procedures are divided into four steps:

1) As soon as possible after commencement of planning for a particular disposal site or sites, DOE would submit to NRC a site characterization report. ("Site characterization" refers to the program of exploration and research--including borings, limited excavations and testing--undertaken to determine the suitability of a site for a geologic repository.) The report would describe the program plan by which DOE will investigate and characterize the sites, the process by which media and sites for the repository were chosen for characterization and DOE's program for further development of alternatives.

This site characterization report would be reviewed by the NRC staff, with opportunity for public comment on both the report and a staff analysis of the report. NRC also plans to hold local public meetings in the immediate area of the sites to be characterized. The NRC anticipates that DOE will need to explore at depth more than one site at different locations and in different media.

2) When DOE submits an application for construction authorization for a particular site from among those characterized, the NRC staff would review the application and prepare an Environmental Impact Statement. It is anticipated that NRC would then appoint a licensing board to hold public hearings and conduct a formal review. If found appropriate, construction of the repository would be authorized.

3) NRC would conduct a further review of the application before it could issue a license to DOE to receive waste for storage in the facility. It is expected that additional hearings would be held at this stage to consider appropriate issues.

4) When the repository has been filled, DOE could submit an application to decommission it. If found appropriate after decommissioning, the NRC could terminate the license or, alternatively, DOE could continue as an NRC licensee, with responsibility for monitoring the site and exercising such control as might be necessary.

The proposed rule also provides for state participation in the repository licensing process. States would be able to submit proposals for taking part in the review of the site characterization report and any subsequent license application from DOE. In addition, the NRC staff would be available to discuss with representatives of state and local governments the information submitted by DOE.

The proposed new regulations, which would consist of amendments to Parts 2, 4, 19, 20, 21, 30, 40, 51 and 70 of the Commission's regulations and a new Part 60, reflect comments received on a proposed statement of policy on this subject--published in the Federal Register on November 17, 1978. The proposed policy statement is superseded by the proposed rule and is therefore being withdrawn.

Interested persons are invited to submit written comments on the proposed regulations to the Secretary, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Docketing and Service Branch, by _____ (90 days after publication in the Federal Register on _____).

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COMMISSIONER KENNEDY
OFFICE OF

DEC 01 1978 5 12

SECRET

Enclosure "F"

PROPOSED NEW 10 CFR PART 60:

DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES

PROCEDURAL ASPECTS

NOVEMBER 19, 1979

BRIEFING PROGRAM

- . REVIEW OF PROPOSED GENERAL STATEMENT OF POLICY (GSP)**
- . STATE/PUBLIC COMMENTS ON GSP**
- . COMPARISON OF PROPOSED PROCEDURAL RULE WITH GSP**
- . PROVISIONS OF PROPOSED PROCEDURAL RULE**
- . COSTS OF EXPLORATION AND MULTI-SITE CHARACTERIZATION**

GENERAL STATEMENT OF POLICY

- . MULTI-STAGE LICENSING APPROACH
- . EARLY AND CONTINUING STATE AND PUBLIC INVOLVEMENT
- . CONSTRUCTION AUTHORIZATION FINDING OF "REASONABLE ASSURANCE" THAT TYPES AND AMOUNTS OF WASTE DESCRIBED IN THE APPLICATION CAN BE STORED IN A REPOSITORY OF THE DESIGN PROPOSED WITHOUT UNREASONABLE RISK TO THE HEALTH AND SAFETY OF THE PUBLIC..."
- . RECEIPT OF WASTE FINDING OF "...RECEIPT, POSSESSION, AND USE... AT THE REPOSITORY WILL NOT CONSTITUTE UNREASONABLE RISK."
- . PREFERRED SITE CAN BE IDENTIFIED THROUGH EXPLORATION FROM SURFACE.

Absolute Assurance not required.

Interest balancing

COMPARISON OF PROPOSED PROCEDURAL RULE TO GSP

- . MULTI-STAGE LICENSING APPROACH: RETAINED IN PROPOSED RULE.
- . STATE AND PUBLIC INVOLVEMENT: GREATER DEFINITION UNDER PROPOSED RULE.
- . CA FINDING: SAME FOR BOTH.
- . SITE EXPLORATION: MORE CONTEMPLATED UNDER PROPOSED RULE,
INCLUDING EXPLORATION AND IN SITU
TESTING AT DEPTH OF POTENTIAL REPOSITORY.

*more opportunity
for state's public
participation*

COSTS OF EXPLORATION: SOURCES

. SCOPE OF EXPLORATORY PROGRAM

- ✓ - NAS REPORT, "IMPLEMENTATION OF LONG-TERM ENVIRONMENTAL RADIATION STANDARDS: THE DESIRE OF VERIFICATION"
- OPINIONS OF USGS STAFF IN INFORMAL MEETINGS AND IN TESTIMONY
- RESULTS OF STRIPA, SWEDEN MINE PROGRAM
- SCHLUMBERGER, LTD., PUBLICATION, "LOG INTERPRETATION OF BOREHOLE LOGGING"

. COSTS OF EXPLORATION AND TESTING

- DOE REPORT PREPARED BY TEKNEKRON, INC., "A COST OPTIMIZATION STUDY FOR GEOLOGIC ISOLATION OF RADIOACTIVE WASTES"
- LLL WORK FOR NMSS
- ✓ - \$9.80 - \$12.5 M: ESTIMATE USING ABOVE SOURCES (*\$20 million*)
- COMPATIBLE WITH ESTIMATE FOR BUREAU OF MINES EXPLORATORY TEST FACILITY

PROPOSED PROCEDURAL RULE: LICENSING APPROACH

- . Site Characterization**
- . Construction Authorization**
- . Waste Emplacement**
- . Decommissioning**
- . Closure**

COSTS OF EXPLORATION AT PLANNED DEPTH OF REPOSITORY

(ENCLOSURE C OF SECY-79-580)

INCLUDES:

- . INCREMENTAL COST TO EXPLORE AT DEPTH
- . LIMITED PROGRAM OF IN SITU TESTING TO OBTAIN MEDIUM SPECIFIC DATA

DOES NOT INCLUDE:

- . R&D COSTS
- . EARLY CONSTRUCTION COSTS

MULTI-SITE CHARACTERIZATION

- . Preferred Site Prelude to Major Commitment
- . Staff Views Underground Exploration as Probably Necessary to Support C.A. Application for Preferred Site
- . Selection of Preferred Site from Among Alternatives Should be Based on Comparable Information
- . Costs of Obtaining Comparable Information Through Underground Exploration are Not Exorbitant
- . Conclusion: Program of Multi-Site Characterization Requirement Which May Include Underground Exploration Reasonable



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

March 13, 1985

The Honorable Nunzio J. Palladino
Chairman
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS COMMENTS ON PROPOSED AMENDMENTS TO 10 CFR 60, "DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE IN GEOLOGIC REPOSITORIES"

During its 299th meeting, March 7-9, 1985, the Advisory Committee on Reactor Safeguards discussed the proposed amendments to the licensing procedures for 10 CFR Part 60, "Disposal of High-Level Radioactive Waste in Geologic Repositories." This subject was also discussed during the ACRS Waste Management Subcommittee meeting on February 15-16, 1985.

As a result of these discussions, we offer the following comments:

1. As presently written, the proposed amendments could be mistakenly interpreted to mean that the NRC does not plan to issue a Site Characterization Analysis (SCA). Since it is only the draft SCA that will not be issued, we recommend that the rule be rewritten to reduce the possibilities for such a misinterpretation.
2. The proposed rule, Paragraph 60.17, part (a)(3) (Page 2589, Reference 1), leaves open the question as to what restoration is required for a site which, although suitable, was not selected for use as a repository. This matter should be clarified. In addition, we believe that the phrase, "site restoration," would be a more accurate description to use than the phrase, "decontamination and decommissioning." Also, it would be helpful to note in this same paragraph that the site characterization guidance, as stated in the "Standard Format and Content of Site Characterization Plans" (Reference 2), still pertains.
3. In response to Commissioner Asselstine's "Additional Views" as contained in the Federal Register announcement (Page 2588, Reference 1), we offer these comments:
 - a. The NRC Commissioners have approved the guidelines prepared by the Department of Energy for the screening and selection of repository sites. Consequently, we believe that the NRC need monitor the application of the guidelines only. There is no need for the NRC to conduct an independent evaluation of the relative merits of the several sites.

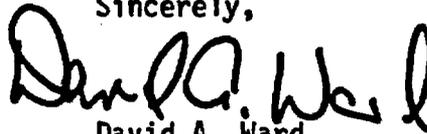
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March 13, 1985

- b. In view of the many existing opportunities for public input into the review process, we believe that issuance of an SCA in draft form is not necessary.

We trust these comments will be helpful to you and members of the NRC Staff.

Sincerely,



David A. Ward
Chairman

References:

1. U. S. Nuclear Regulatory Commission, 10 CFR Part 60, "Disposal of High-Level Radioactive Waste in Geologic Repositories: Amendments to Licensing Procedures," Federal Register, Vol. 50, No. 12, January 17, 1985, 2579-2590
2. U. S. Nuclear Regulatory Commission, Proposed Revision 1 to Regulatory Guide 4.17, "Standard Format and Content of Site Characterization Plans for High-Level Waste Geologic Repositories," dated February 1985