

CHARLES F. MEBUS  
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HOUSE OF REPRESENTATIVES  
COMMONWEALTH OF PENNSYLVANIA  
HARRISBURG

May 8, 1980

John F. Ahearne, Chairman  
Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Ahearne:

Enclosed is a copy of House Resolution No. 211, adopted by  
the House of Representatives on May 5, 1980.

This Resolution is sent to you for your consideration as  
per the direction contained in said Resolution.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Charles F. Mebus".

Charles F. Mebus  
Chief Clerk

CFM:mvg

Enclosure

5008070 041

## THE GENERAL ASSEMBLY OF PENNSYLVANIA

**HOUSE RESOLUTION****No. 211**Session of  
1980

INTRODUCED BY MESSRS. J. L. WRIGHT, JR., MANMILLER, PICCOLA, YAHNER, STUBAN, COHEN, KLINGAMAN, MCKELVEY, RAPPAPORT, REED, DORR, A. C. FOSTER, JR., GEESEY, DININNI, BARBER, PREIND, MOEHLMANN AND HOEPPFEL, MARCH 18, 1980

AS REPORTED FROM COMMITTEE ON RULES, HOUSE OF REPRESENTATIVES,  
AS AMENDED, APRIL 29, 1980

In the House of Representatives, March 18, 1980

1       WHEREAS, The House Select Committee - TMI learned that there  
2 was a serious deficiency of trained Nuclear Regulatory  
3 Commission personnel at the TMI site at the time of the incident  
4 to handle the fast moving events which occurred and that the  
5 utility operating personnel were not trained to handle an  
6 incident of the type which occurred; and

7       WHEREAS, The committee also learned that an incident of  
8 similar nature had recently occurred at a nuclear power plant in  
9 Ohio and that it was the opinion that the dissemination of  
10 information on the incident could possibly have minimized the  
11 effects of the TMI incident; and

12       WHEREAS, The committee learned that the operating controls  
13 and visual instrumentation in the control room of TMI Unit 2  
14 were designed and placed in such a manner that the operators on  
15 duty at the time of the incident did not have immediate visual  
16 or manual access to the necessary controls and instrumentation;

1 and

2 WHEREAS, The committee feels that the operation of a nuclear  
3 power plant requires highly trained operating personnel because  
4 of the nature of and the dangers associated with nuclear energy;  
5 therefore be it

6 RESOLVED, That the House of Representatives urge the Nuclear  
7 Regulatory Commission to provide, at each operating nuclear  
8 power plant, a continuous team of personnel trained in the  
9 individual plant characteristics and emergency procedures and  
10 that these personnel have the communications facilities  
11 necessary to immediately be in contact with appropriate  
12 officials of the Nuclear Regulatory Commission in the case of  
13 accident; and be it further

14 RESOLVED, That the House of Representatives urge the Nuclear  
15 Regulatory Commission to immediately review its procedures for  
16 the dissemination of information, reports and corrective actions  
17 taken at any facility as a result of operational malfunction  
18 among all operating nuclear power plants under its jurisdiction;  
19 and be it further

20 RESOLVED, That the House of Representatives urge the Nuclear  
21 Regulatory Commission to review operation room physical  
22 configurations to assure that operating personnel will have  
23 immediate, direct access to all controls and instrumentation  
24 necessary to properly respond to operating difficulties and  
25 equipment malfunctions; and be it further

26 RESOLVED, THAT THE HOUSE OF REPRESENTATIVES REQUESTS THE  
27 CHAIRMAN OF THE NUCLEAR REGULATORY COMMISSION TO INDICATE TO THE  
28 CHAIRMAN OF THE SELECT COMMITTEE ON THREE MILE ISLAND, IN  
29 WRITING WITHIN 30 DAYS FOLLOWING RECEIPT OF A COPY OF THIS  
30 RESOLUTION, THE STATUS OF THE RECOMMENDATIONS SET FORTH HEREIN;

1 AND BE IT FURTHER

2 RESOLVED, That a copy of this resolution be transmitted to

3 the Chairman of the Nuclear Regulatory Commission.



authority may be used under circumstances such as the following:

(1) An employee or an agency presents material facts not previously considered by the regional office involved;

(2) There is room for reasonable doubt as to the appropriateness of a regional office decision, or

(3) The potential impact of a regional office decision on similar jobs under other regional offices is sufficiently significant to make central office review of the decision desirable.

(h) The Director of the Office of Personnel Management, may, in his discretion, reopen and reconsider any previous decision when the party requesting reopening submits written argument or evidence which tends to establish that:

(1) New and material evidence is available that was not readily available when the previous decision was issued;

(2) The previous decision involves an erroneous interpretation of law or regulation or a misapplication of established policy; or

(3) The previous decision is of a precedential nature involving a new or unreviewed policy consideration that may have effects beyond the actual case at hand, or is otherwise of such an exceptional nature as to merit the personal attention of the Director of the Office of Personnel Management.

(i) A final decision by the Office of Personnel Management constitutes a certificate which is mandatory and binding on all administrative, certifying, payroll, disbursing, and accounting officials of the Government.

[FR Doc. 80-14647 Filed 5-12-80; 8:45 am]

BILLING CODE 5325-01-M

## DEPARTMENT OF AGRICULTURE

### Agricultural Stabilization and Conservation Service

#### 7 CFR Part 760

#### Beekeeper Indemnity Payment Program (1978-81)

**AGENCY:** Agricultural Stabilization and Conservation Service, USDA.

**ACTION:** Lengthen comment period on proposed rule

**SUMMARY:** On April 11, 1980, a notice was published in the *Federal Register* (45 FR 24899) that the Agricultural Stabilization and Conservation Service proposed to amend its regulations relating to the Beekeeper Indemnity Payment Program by terminating the program on May 15, 1980. This action was taken because of a lack of funds for

a program which has been determined to be of low priority. The new proposed date for termination of the program is July 1, 1980. The comment period is being lengthened to allow interested parties time to familiarize themselves with the information, determine the impact and prepare their responses. This notice invites further comments on the proposed termination.

**DATE:** Comments must be received on or before June 12, 1980.

**ADDRESS:** Send comments to Director, Emergency and Indemnity Programs Divisions, ASCS, USDA, P.O. Box 2415, Room 4095 South Building, Washington, D.C. 20013.

**FOR FURTHER INFORMATION CONTACT:** Robert Cook, Emergency and Indemnity Programs Division, ASCS, USDA, P.O. Box 2415, Room 4095 South Building, Washington, D.C. 20013, (202) 447-7997.

**SUPPLEMENTARY INFORMATION:** The Food and Agriculture Act of 1977, 91 Stat. 921, 7 U.S.C. 284, extended the authority of the Secretary to conduct the Beekeeper Indemnity Payment Program through September 30, 1981. On July 14, 1978, the Department published final regulations (43 FR 3026) to govern the conduct of the program through September 30, 1981. It is not mandatory that the program be conducted.

The proposed 1980 budget for the Department of Agriculture contained no funding for the Beekeeper Indemnity Payment Program. On June 15, 1979, the Beekeeper Indemnity Payment Program Regulations were amended to provide that payment of claims filed after that date would be conditioned upon the availability of funds. Claims for 1978 losses, approved for approximately \$2.10 million, were unpaid because of the lack of funds. The Agriculture Appropriations Act for Fiscal Year 1980 authorized \$2.89 million for the beekeeper indemnity program.

The public is invited to submit written comments regarding the proposed termination, to the Director, Emergency and Indemnity Programs Division, ASCS, USDA, P.O. Box 2415, Room 4095 South Building, Washington, D.C. 20013. Persons submitting comments should include their names and address and give reasons for the comments. Copies of all written comments received will be available for review by interested persons in Room 4095 South Building, USDA, during regular business hours.

Accordingly, the comment period is lengthened and public comments must be received by June 13, 1980, in order to be assured of consideration.

## Proposed Rule

The Department proposes to amend 7 CFR Part 760, by revising the title of the Subpart—Beekeeper Indemnity Payment Program (1978-1981)—and § 760.101(b) to read as follows:

### Subpart—Beekeeper Indemnity Payment Program (1978-80)

#### § 760.101 Definitions.

(b) "Application period" means any period with respect to which application for payment is made beginning not earlier than January 1, 1978, and ending not later than July 1, 1980.

This regulation has been determined significant under the USDA criteria implementing Executive Order 12044 "Improving Government Regulations." An approved impact analysis on the proposal to terminate the program is available from the Emergency and Indemnity Programs Division.

Signed at Washington, D.C., on May 7, 1980.

Ray Fitzgerald,

Administrator, Agricultural Stabilization and Conservation Service.

[FR Doc. 80-14506 Filed 5-12-80; 8:45 am]

BILLING CODE 3410-05-M

## NUCLEAR REGULATORY COMMISSION

### 10 CFR Part 60

#### Technical Criteria for Regulating Geologic Disposal High-Level Radioactive Waste

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Advance Notice of Proposed Rulemaking.

**SUMMARY:** In the December 6, 1979 edition of the *Federal Register* (44 FR 70408), the Commission published its proposed licensing procedures for the disposal of high-level radioactive wastes (HLW) in geologic repositories. This advance notice is the next stage in the HLW rulemaking process. This notice informs the public and interested parties concerning the status of efforts related to the development of technical criteria to become part of 10 CFR Part 60. It invites public comment on issues related to such development; on the approach being considered, including partitioning of the problem into workable elements and statements of underlying principles and technical considerations. Attached to this notice are draft technical criteria. These criteria are a result of the efforts

of the staff to accommodate and include the best thinking which has been made available to the staff from technical experts in the form of technical points, suggestions and criticisms on previous drafts of technical criteria. However, these criteria do not necessarily represent staff positions with respect to rulemaking on this subject.

**DATE:** Comments must be received by July 14, 1980.

**ADDRESS:** Written comments or suggestions on the advance notice should be sent to the 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. 20555.

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

**SUPPLEMENTARY INFORMATION:**

**Background**

On December 6, 1979, the Nuclear Regulatory Commission published for comment in the *Federal Register*, proposed regulations for licensing geologic repositories for disposal of HLW (44 FR 70408). The proposed regulations contained only the procedural requirements for licensing: Subparts A, B, C, D, concerning general provisions, licenses, participation by State governments, and records, reports, tests and inspections, respectively. The technical criteria against which a license application will be reviewed were and are still under development. However, the technical and scientific understanding concerning the scope of the technical criteria were regarded as sufficiently developed to enable an appropriate licensing procedure to be established for their implementation. Thus, the Commission was able to propose a procedural rule to establish the necessary regulatory framework for licensing.

Since then the staff of the Commission has made further progress is focusing more sharply on the technical and scientific issues and problems related to licensing geologic disposal of HLW, in partitioning the problem so as to facilitate the development of practicable technical criteria: in articulating principles which might reasonably underlie the technical criteria; and in considering these principles in the identification of approaches to specifying the technical criteria. The

Commission seeks comment from all interested parties in order to provide the Commission and its staff the opportunity to obtain public assessment of the general direction being taken in the development of the technical criteria.

The formative work on the technical criteria has been conducted in as public a manner as possible. Numerous drafts of the technical criteria have been developed, and widely circulated to interested agencies, groups, and individuals to obtain input. These drafts, prepared by the licensing staff, have formed the basis for this interaction with outside groups. They started with a fairly diffuse set of principles and ideas and have evolved with an increasing concreteness through 14 staff drafts. Technical reviews of early drafts of the criteria have been conducted by the Keystone Radioactive Waste Review Group and at a workshop held at the University of Arizona. The results of these reviews have been placed in the NRC public document room. Other Federal agencies and groups which have been involved in the review of one or more of the drafts include DOE, EPA, USGS, NRDC, Atomic Industrial Forum, Bureau of Mines, and a host of individual Scientists, engineers, and public interest groups.

The technical criteria include specific numerical criteria in certain areas in order to further stimulate the thoughts and commentary of the public. The staff is preparing a document explaining the basis and rationale for these technical criteria. It is anticipated that this document will be available as a NUREG report at the time that the technical criteria are published in the form of a proposed rule. A working draft of the bases and rationale document has been placed in the NRC Public Document Room for inspection.

**Nature of the Problem**

To best comprehend regulation of geologic disposal of HLW it is useful to note that such disposal of HLW is separable into five distinct problem areas: lifetime of the repository, physical extent, waste/rock interaction, treatment of uncertainties, and the problem of human intrusion. In turn, each of these areas can be further separated into fairly distinct regimes over which certain aspects or characteristics of the problem area dominate. Each of these regimes then can be treated more-or-less individually, not as specific criteria, but as functional elements addressed by the criteria. What is described below is essentially a matrix for the technical criteria cutting across the five areas above.

**1. Lifetime of the Repository**

The operational life of a geologic repository for the disposal of HLW quite naturally divides into three periods—the period of construction and emplacement of the wastes; the period during which the shortlived fission products dominate the hazard posed by the wastes; and the long term during which the hazard is dominated by the very long-lived isotopes including the actinides. The technical criteria must reflect the different physical conditions of the repository during these periods and be responsive to the specific nature of the hazard posed by the wastes.

During site selection, the ongoing program is one of probing and testing to find an appropriate site for a repository and develop a compatible design. Construction has not yet begun, and no radiologic hazard is posed. Nonetheless, technical criteria are needed (1) to indicate site features which clearly render a site suitable or unsuitable (site suitability criteria), and (2) to allow a judgment as to whether a proposed site can accommodate an effective repository design and together provide the protection sought (site acceptability criteria). The nature of the criteria is changed to fit the particular needs of the periods as explained below.

Construction and emplacement of wastes is the next period which the criteria must address. During this period the immediate radiologic hazard is to those who are working at the repository and to a much lesser extent those who reside nearby. (There are also the hazards of construction to workers. Criteria which address these hazards would be expected to follow the regulations of the Mine Safety and Health Administration.) In addition, there is the actual design and construction of the repository to be considered for the long term. But the more proximate problem during this phase is that the construction and emplacement methods used will not compromise the ability of the repository to protect future populations. Thus, the technical criteria directed at this period deal with construction techniques, emplacement techniques, operations procedures, and designs for radiological protection of workers and persons living nearby (accidents).

The third period begins following closure of the repository, and will persist for the time that the relatively short-lived fission products dominate the hazard. During this time there will be a substantial heat output from the wastes which if not properly accommodated by site selection and engineering could compromise the



integrity of the repository. In addition, the chemical species and makeup of the emplaced wastes are rapidly changing due to radioactive decay. Criteria applicable to this period will focus on selecting sites and generating designs to accommodate these two major features.

By the time the short-lived fission products no longer dominate the hazard, the wastes are no longer generating significant amounts of heat. Moreover, the short-lived elements have for the most part decayed away and the chemical properties of the waste have greatly stabilized—generally dominated by the actinides. However, for this final period it would be imprudent to rely on engineering to contain the emplaced wastes; and final protection is achieved by the ability of the geologic setting to inhibit migration of the wastes leached from the waste form in a controlled manner. Properties which affect leaching of the waste and which affect transport of the wastes such as fractures, porosity, sorption, hydraulic gradient, and thermal gradient, and determination of the long-term stability of the geologic setting will dominate the criteria addressed to this period.

## 2. Physical Extent

A repository also can be divided physically into two broad categories—surface and subsurface. The subsurface can be further divided into the area affected by excavation and emplacement of waste and the broad geologic environment into which the repository is set.

The surface portion is comprised of the surface facilities and operations areas needed to support construction and emplacement of wastes. Generally the criteria which apply here are those which address the construction and emplacement period.

The criteria which pertain to the broad geologic environment address those geologic and hydrologic features which if too close to the excavated area can produce effects on the integrity of the repository that are not readily understood; and, therefore, lead to doubt that the waste can be safely disposed at the repository. The thrust of these criteria would be to assure that such features are far enough away so that they either present no problem, or the problem they do present can be made tractable.

The last division in the subsurface is the area affected by excavation and emplacement of wastes. It is here that the wastes are emplaced and that the engineering is expected to be used during the first period following closure. It is also here that the construction and emplacement activities must be carried

out in a manner which assures that the integrity of the repository is maintained. Hence, criteria applicable to the excavated area address siting, design, operations and the first two periods of concern.

## 3. Waste/Rock Interaction

The chemical and thermal properties of the wastes undoubtedly will have a significant interaction with the rock unit into which they are emplaced. To assure that the repository will function as planned, siting, designing, emplacement methods, engineering and waste form criteria will be needed to understand, control, and assess the effect of the waste upon its surroundings. These criteria are the complement to the excavated area criteria above. Those criteria are to protect the emplaced wastes from their surroundings; whereas these protect the repository from the effects of waste themselves.

## 4. Treatment of Uncertainties

If there is to be confidence that wastes disposed in a geologic repository will not pose a significant hazard to the health and safety of future populations, then two factors which pose fundamental difficulties must be addressed satisfactorily. First, geologic disposal is an entirely new enterprise—no experience exists with geologic disposal. Second, there will be no opportunity to observe behavior over the long term—the decisions to close the repository in effect will be a statement of its expected behavior based upon inference, deduction, and extrapolation from results of tests and experiments carried out for a comparatively short period and upon predictions of future geologic, hydrologic, and climatologic conditions based upon observations of the past. These facts impose very definite constraints as to how confidence is achieved that the expectation of behavior will match actual behavior over the long term. These constraints fairly clearly define the items of uncertainty which arise because qualitative descriptions and models necessarily approximate nature rather than exactly describe or predict nature: uncertainties which arise, because the data used as input to those descriptions and models upon which our understanding of the natural processes in question are based, are the result of tests and measurements which themselves have degrees of uncertainty. Finally, there are uncertainties which arise simply because of the large number of geologic and hydrologic elements which must be identified, measured, and combined to determine the expected behavior of a repository—

in fact, the very process of combining those elements compounds the uncertainties associated with them. Thus, criteria are needed to assure that those uncertainties are identified, understood, and compensated. Avoiding potentially adverse features is one way of compensating for uncertainties. Placing constraints on design and performance of components is another. Siting criteria which tend to lead toward relatively geologically simple sites are a third. Finally, developing criteria which address individually the separable aspects (temporal and spatial) of geologic disposal is perhaps the surest means of dealing with uncertainties.

## 5. Human Intrusions

To this point the discussion has focused upon the processes of nature—how the repository can be expected to behave over the long term. However, the problem of human intrusions, intentional or inadvertent moots much of the previous discussions since there is no way to reasonably limit the variety of conceivable human activities which might compromise a forgotten repository. The only logical recourse, since engineering against human intrusion is impossible practically,<sup>1</sup> is to avoid targets, i.e., sites which may invite such intrusion. Mineral resources, water resources, interesting geologic or hydrologic features are sure to attract the developer or the explorer. Shallow repositories would more easily be intruded upon than deep ones. Therefore, what is needed are site suitability criteria which would lead toward uninteresting sites of little resource value, and design criteria which would yield designs that present minimal "targets."

## Underlying Principles

The efforts of the Commission staff to develop the technical criteria have been guided by the following principles:

(1) Under Reorganization Plan Number 3 of 1970, the Environmental Protection Agency (EPA) was given the authority under the Atomic Energy Act of 1954 as amended to set the generally applicable standards for radiation in the environment. Such standards represent a broad social consensus concerning the amount of radioactive materials and levels of radioactivity in the general environment that are compatible with

<sup>1</sup> Actually, containing the wastes within a canister for the period that the relatively short-lived fission products dominate the hazard does tend to lessen the impact of drilling into the repository by localizing the waste (i.e., keeping the "target" small) and making a smaller quantity available for dispersion during that period should drilling penetrate a waste canister.

protection of the health and safety of the public. This EPA authority extends to the setting of the standard and not to the implementation of such standards or to the establishing of requirements concerning how they are to be met. The Commission is bound to implement these standards in its regulations, thus assuring that they will be met by activities authorized by the Commission's licensing decisions. The Commission may not substitute its judgment for that of the EPA, but the Commission may, and must, determine whether particular proposed disposal activities will conform to the EPA standard.

The EPA has published its generally applicable environmental standard for all of the fuel cycle except waste storage and disposal, 40 CFR 190, which expresses the limit in the form of a quantitative dose limit to the individual. The EPA is in the process of developing its HLW standard. The Commission expects this standard (40 CFR 191), to be similar in approach to that followed in 40 CFR 190.

(2) As noted above, although the Commission is bound to implement the EPA HLW standard, it has the authority and discretion to determine how that standard will be achieved. In particular, the Commission must decide how it will develop its regulatory requirements, viz., the technical criteria of 10 CFR Part 60, and carry out its decision process to show that in each particular licensing case, the EPA standard will be met.

(3) In order to establish the technical criteria for meeting the EPA standard and to make individual licensing decisions as to whether such criteria are met, the Commission needs to carry out conservative analyses because of the many uncertainties associated with HLW waste disposal in geologic repositories. These uncertainties arise from the inability, given the present and expected state of science and technology, to determine precisely the degree to which wastes, under credible conditions for the time periods involved, will be contained and isolated. Further, in order to carry out such analyses the Commission may require measures which may not directly enter into the analyses, but will add to confidence in those analyses, thus adding to the Commission's confidence in the degree to which the EPA standard can be or has been met. Such measures are likely to be aimed at simplifying the problem: such as requiring that precepts of simplicity and stability of the geologic settings govern the site selection process in order to reduce the overall uncertainty and thus render more

tractable the problem of demonstrating that the criteria and the EPA standard are met.

(4) Because the scientific and technical problems associated with HLW waste disposal are sufficiently understood, it is possible, even in the absence of an EPA standard, to identify relevant areas of regulation. These are the areas which contribute to: protection of the public health and safety or the environment; the reduction of uncertainty; or the confidence in any decision as to whether the EPA standard and NRC regulations are met.

(5) The natural divisions of the problem in time and space and the separation of the problem of human intrusion from natural events aid in understanding which areas should be regulated, facilitate the analyses which will serve as the decision-bases, and so will increase confidence in regulating and licensing decisions.

(6) The analyses and requirements must reflect a degree of examination and control which corresponds to the importance to safety of any given technical area. Thus, the technical criteria must address not only questions of site suitability, but—to the extent possible—address questions of site/facility acceptability.

#### Considerations

In the course of developing technical criteria a number of considerations have arisen. The Commission believes that the program to develop the technical criteria for HLW disposal in geologic repositories would benefit from comment on them:

(1) *Systems Approach.* The term "systems approach" relates to the set of natural and engineered barriers which would function to contain and isolate the waste from the biosphere for the periods of time required, to increase the degree of the Commission's confidence that indeed such containment and isolation would be achieved, or to permit appropriate and conservative analyses to be performed which would form the decision bases.

It is evident that for a geologic repository, the geologic setting must be one barrier. In considering whether there should be other barriers, a key question which needs to be answered is whether it is prudent, in view of the nature of the problems and the uncertainties involved, to rely on the geologic setting alone to accomplish the functions stated above. The state-of-the-art in the earth sciences is such that all of the uncertainties associated with these functions cannot be resolved through consideration of the geologic setting.

It is appropriate, therefore, to consider how engineering—in the broadest sense of anything used to effect a purpose—might be used to compensate for, reduce, or eliminate at least some of the uncertainties inherent in reliance on the geologic setting alone. Engineering can be used to narrow the extent of geologic processes which need to be considered in the rulemaking and licensing processes; that is, engineering can be used to bound and/or diminish the importance of certain geologic processes. Engineering also can be used to make the containment of emplaced waste as insensitive as possible to potential changes in the geologic environment. For example, the use of buffering materials to retain radionuclides is one possible way to compensate for uncertainties in the sorption capabilities of a particular medium and site.

In light of these considerations, therefore, the Commission staff believes that it is reasonable to couple a prudently and cautiously selected geologic setting (natural barrier) with a set of engineered barriers capable of performing or assisting the performance of the functions stated above. Further, the Commission staff believes that sites which are relatively easily understood and can be expected to be stable for long times, are the most desirable; and that engineered systems which are compatible with and make the least adverse impacts upon the geologic and hydrologic characteristics of the site will contribute most to the performance of the overall disposal system. Similarly, to the greatest extent possible, the performance of engineered systems should be insensitive to changes in those characteristics and should provide a high degree of protection by themselves.

Given the nature of the problems, as discussed earlier, the Commission staff has identified the following as composing the set of three primary barriers of the waste disposal system: the geologic setting; the design and configuration of the repository, including the waste emplacement scheme and engineered barriers; and the waste package.

(2) *Use of Minimum Performance Standards for Major Regulatory Elements.* Determining the expected evolution of a geologic repository in time is the key to understanding the consequences of emplacing wastes in a repository. Such expectation of the effects of perturbations and changes, both natural and man-caused to the hydrologic environment, serves to identify the kinds of events, including



institutional failures, which might cause a radioactive release to the biosphere. Assessment of such events that reasonably can be assumed to occur and their likely consequences permits the identification of the "credible" events which should be considered in the design of the repository and evaluated in rulemaking and licensing decisions: Identification of these "credible" events permits development of performance requirements for both the natural and engineered barriers to assure that such events are avoided where possible for their consequences mitigated when these performance requirements are met. Such describes the deterministic approach the Commission staff has been taking in development of the performance requirements for HLW disposal in geologic repositories, and defense-in-depth approach to provide assurance and confidence that the EPA standard can be met.

(3) *The Nature of the Major Regulatory Elements.* The regulatory elements selected should be either important to safety, that is, contain and isolate the waste from the biosphere for the periods of time required, or contribute to confidence in the functioning of the repository system or individual components. As discussed above, the repository is conceived as a system of multiple barriers, both natural and engineered. The two most important attributes of the natural barrier are that the site should be geologically simple and stable so that the site can be easily understood and so that there can be confidence that the ability of the site to contain and isolate the wastes will remain viable for long times.

The three most important attributes of the engineered barriers must be their compatibility with the geologic and hydrologic characteristics of the site so that the engineered barriers will have the least adverse impact on the site's ability to retain the emplaced wastes; their insensitivity to any changes in the site characteristics so that there can be confidence in the predictability of their performance over time; and their ability to complement the performance of the site so as to increase confidence in overall repository performance to supplement the performance of the site—where possible—to increase the overall margin of safety.

(4) *Adequacy of Favorable and Unfavorable Site Characteristics to Impose Proper Technical Restrictions.* Consideration of site characteristics is important to the development of technical requirements for HLW disposal from several aspects. The first relates to question of site suitability,

that is, to the potential of a site to serve as the location for a repository. Unfavorable site characteristics are identified to eliminate from consideration sites which would not be acceptable under any circumstances for a HLW geologic repository or which would present insuperable difficulties in terms of understanding the geology and hydrology of the site or would introduce or compound uncertainties which would affect negatively confidence in any licensing decisions. Favorable site characteristics are identified where the likelihood of a site/facility combination (repository) being acceptable is greater or which would contribute to increased understanding of the geology and hydrology, permit uncertainties to be better handled, and increase confidence in any licensing decisions. However, neither kind of site suitability characteristics say anything about the ultimate acceptability of the repository system as a means to safely contain and isolate the wastes for the time required with the degree of confidence necessary to a licensing decision. Criteria by which the acceptability of the site/facility combination can be assessed are needed for this determination.

Specifically, this second aspect relates to questions of whether or not, given the present state-of-the-art in the earth sciences, it is possible to identify on a generic basis site characteristics the presence of which at an otherwise suitable site would render the site/facility combination unacceptable for HLW disposal. The question of general site acceptability criteria is an open one in the sense that the staff has not identified to date such criteria. Should general site acceptability criteria not be developed, it will be necessary to determine the site acceptability question on a case-by-case basis.

(5) *Codification of Models in Licensing Process.* The question of whether regulations should codify models to be used in licensing disposal of HLW or whether the criteria should only allow the use of models is a controversial one. In considering these questions the staff recognizes that it is necessary to: (a) Use descriptions (models) of the behavior of geologic processes and of the repository and of the consequences associated with that behavior; (b) Acknowledge that these descriptions are approximations to nature and as such introduce uncertainties into the process; (c) Recognize that for the foreseeable future, the "old" models, in which there is the greatest confidence because of their "proven" use appear to be as qualitative as they are quantitative; (d)

Consider that the judgement of the appropriateness of these models for their intended purpose will be supported largely through expert opinion; (e) Confront and explore fully these uncertainties and their ramifications including "uncertainties" arising from differences in expert opinion; (f) Judge the acceptability of the consequences of events in the light of these uncertainties; and (g) assure that the judgment itself will be detailed in the public record.

If one views the realization of our understanding in geologic disposal from successively more nearly complete and accurate qualitative descriptions of the observed phenomenon in question through more precise and semi-quantitative and quantitative approximations where uncertainties are better understood and can be treated mathematically, to an elegant theory embodied in a mathematical description which represents a culmination of human thought, the present state of modeling for geologic repositories is closer to qualitative than quantitative. This fact does not make whatever understanding we have less valid—we know what we know. Rather this means that neither the process by which the technical criteria should be developed nor the process by which a licensing decision should be made should rely solely on quantitative calculations and assessments. It means that when analytical techniques are used, care must be taken not to apply those techniques outside their established region of validity. Finally, it means that confidence in a licensing finding is inextricably linked to uncertainty; and the validity of any licensing finding is linked to the means by which uncertainty is uncovered, explored, and treated.

There are a number of considerations that need to be taken into account before establishing whether qualitative/quantitative models will be codified in the regulations or their use merely permitted: (1) If modeling is used as the primary decision tool then demonstration of whether the geologic setting at a particular site can fulfill the stated purpose of the geologic barrier relies fundamentally on the predictive power of the particular transport model appropriate to that site; (2) The less stable the site geologically and hydrologically, the less reliable the transport model as a description of the steady-state; (3) The more complex with respect to geologic and climatology processes, the poorer the model is as an approximation to nature and the greater the uncertainty of any prediction; (4) The more complex the site or less stable



**Subpart H—Criteria for Personnel Training (Reserved)****Subpart I—Emergencies and Emergency Programs (Reserved)****Subpart E—Technical Criteria****§ 60.2 Definitions.**

For the purpose of this part—

"Accessible Environment"—means those portions of the environment directly in contact with or readily available for use by human beings. It includes the earth's atmosphere, the land surface, surface waters, and the oceans. It also includes presently used aquifers which have been designated as underground sources of drinking water under the Environmental Protection Agency's proposed rule 40 CFR Part 146.

"Aquifer"—means a distinct hydrogeologic unit that readily transmits water and yields significant quantities of water to wells or springs.

"Barrier"—means any material or structure which prevents or substantially delays movement of radionuclides from the radioactive wastes towards the accessible environment.

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

"Container"—means the first major sealed enclosure that holds the waste form.

"Containment"—means keeping radioactive waste within a designated boundary.

"Confining unit"—means a distinct hydrogeologic unit which neither transmits ground water readily nor yields significant quantities of water to wells or springs.

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

"Department"—means the U.S. Department of Energy (DOE) or its duly authorized representatives.

"Disposal"—means permanent emplacement within a storage space with no intent to retrieve for resource values.

"Expected processes and events"—means those natural processes or events that are likely to degrade the engineered elements of the geologic repository during a given period after decommissioning. As used in this part, expected processes and events do not include human intrusion.

"Floodplain"—means the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands including at a minimum that area subject to a one

percent or greater chance of flooding in any given year.

"Geologic repository"—means a system for the disposal of radioactive wastes in excavated geologic media. 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 accessible environment.

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

"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.

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

"Host rock"—means the geologic medium in which the waste is emplaced.

"Hydrogeologic unit"—means any soil or rock unit or subsurface zone that has a distinct influence on the storage or movement of ground water by virtue of its porosity or permeability.

"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.

"Intrinsic permeability"—means a measure of the relative ease with which a porous medium transmits a liquid under a potential gradient. It is a property of the medium alone and is independent of the nature of the fluid.

"Isolation"—means segregation of waste from the accessible environment within acceptable limits.

"Overpack"—means any additional, receptacle, wrapper, box or other structure which becomes an integrated part of a waste package and is used to enclose a waste container for purposes of providing additional protection or meeting the requirements of an acceptance criteria.

"Packaging"—means the container, and any overpacks, and their contents excluding radioactive materials and

their encapsulating matrix, but including absorbent material, spacing structures, thermal insulation, radiation shielding, devices for absorbing mechanical shock, external fittings or handling devices, neutron absorbers or moderators and other supplementary equipment.

"Stability"—means the rate of natural processes affecting the site during the recent geologic past are relatively low and will not significantly change during the next 10,000 years.

"Radioactive waste"—means HLW and other radioactive materials that are received for emplacement in a geologic repository.

"Transuranic wastes" or "TRU wastes"—means radioactive waste containing alpha emitting transuranic elements, with radioactive half-lives greater than one year, in excess of 10 nanocuries per gram.

"Underground facility"—means the civil engineered structure, including backfill materials, but not including seals, in which waste is emplaced.

"Waste form"—means the radioactive waste materials and any associated encapsulating or stabilizing materials.

"Waste package"—means the physical waste form, its container and any ancillary enclosures, including its shielding, packing, and overpack.

**§ 60.101 Purpose.**

(a) This subpart states the performance objectives to be achieved and the technical criteria to be met by the Department of Energy in order for the Commission to make the findings called for in Subpart B.

(b) The Commission will apply the technical criteria in this subpart in making findings that the activities authorized by a license, or any amendment thereof, will not constitute unreasonable risk to the health and safety of the public.

(c) The Commission will also apply the technical criteria in this subpart, insofar as they may be pertinent, in making determinations with respect to the issuance of a construction authorization.

(d) Omissions in the General Design Criteria do not relieve an applicant from the requirement of providing the necessary safety features in the design of a specific facility.

(e) The requirements and conditions in subsequent sections assume that disposal will be in saturated media. The Commission does not intend to exclude disposal in the vadose zone or any other method by promulgating these criteria; however, different criteria may need to be developed to license other disposal methods.

the site, the greater the difficulty in modeling long-term behavior at the interface between the geologic barrier and the set of engineered barriers; (5) The lack of empirical data on the performance of engineered barriers or the inability to obtain credible data may preclude the development or use of credible quantitative models in the showing that either the uncertainties are addressed properly in the performance standards or the performance standards are met in a particular licensing action. In light of these considerations, the staff's thought has been not to require modeling to be the primary decision tool to determine the capability of the geologic repository to contain and isolate waste from the biosphere. The staff believes, however, that quantitative models can be used to compare sites and designs.

In sum, the staff considers the following to be a reasonable position with respect to the use of models:

Technical criteria must be developed through a rulemaking process in which the logic and factual basis is clearly articulated and can withstand challenge. Hence, where appropriate, quantitative models should be used to develop technical criteria. However, because of the limitations discussed above, it is desirable to specify technical criteria associated with the regulatable elements in such a manner as not to predicate their technical justification on the results of quantitative modeling, except in those instances where quantitative modeling can contribute to their technical justification. Where quantification is not possible, without meaning, incomplete or ambiguous, the process must rely on expert opinion to provide insight and alternatives. This process is particularly appropriate to the development of criteria for which neither direct experience nor recourse to experimental verification exists to provide the basis for the criteria. Through expert opinion in public proceedings, and the exercise of judgment by the Commission, a satisfactory if imprecise margin of safety for site characteristics and engineering design can be realized. This is particularly important where quantitative modeling and experimental verification alone cannot be used to establish a sound record. When these qualitative and semiquantitative considerations are combined with quantitative models to develop a scheme for comparison, the staff believes the result will lead to a sound regulation and to sound licensing decisions.

(6) *Retrievability.* Selection of a suitable site for a geologic repository for HLW disposal and the design, construction and operation of a repository is a new human enterprise. In undertaking such a venture for the first time, it is reasonable to expect that, whatever the care exercised and however advanced the techniques, mistakes will occur, improved technologies developed, better designs created, and operational procedures improved. It is reasonable, therefore, to assume that it might be desirable to postpone any irreversible (or not easily reversible) decisions until the maximum amount of reasonably obtainable information about how well the repository is functioning and can be expected to function to contain and isolate the waste for the periods of time required is at hand. The staff believes that it may be desirable to maintain the option to retrieve the wastes for a period of time after the last waste is emplaced and is developing criteria to require it. The draft technical criteria contain a requirement that the repository be assigned to preserve the option to retrieve the wastes for a period of years following emplacement. This option, however, is not without impact, particularly in the areas of repository design and waste emplacement. However, it would allow monitoring and taking corrective actions if required, including removal of the wastes, before the repository is sealed.

(7) *Human Intrusion Problem.* For geologic repositories, the human intrusion problem is not a simple or straightforward extension of natural events and may require different standards as well as a different approach. Simply stated, human intrusion cannot be prevented: In spite of all efforts to avoid sites which may prove attractive to humans, there may be deliberate or inadvertent intrusion. In the former instance, it is reasonable to assume that the intruder has access to information which makes it attractive to intrude. For example, the intruder may know of the location and contents of the repository itself and may regard the HLW as a resource of some value. How should such an intrusion be regarded as an event to be considered in the design of the repository? That is, should attempts be made to protect future generations from the deliberate intruder? What are the consequences of intrusion to the intruder? To the general population? In the latter instance, where the event is one of inadvertent (accidental) intrusion other questions occur. Did the intrusion occur beyond the time that it is reasonable to expect

that knowledge of the existence of the repository is known? What is a reasonable period of time? What steps in repository design and enforcement can be taken to mitigate the consequences of an accidental intrusion? Is one kind of intrusion more likely than the other? Are the consequences of inadvertent intrusions different from those for deliberate intrusions? The human intrusion issue is a difficult one that is far from having been resolved.

*Questions:* In particular, we are seeking comment on the following questions.

(1) Does the list of considerations above clearly, adequately and fully identify the relevant issues involved in disposal of HLW?

(2) Would a rule structured along the lines of the referenced draft rule reasonably deal with issues in an appropriate manner?

(3) In light of the fact that EPA has the responsibility and authority to set the generally applicable environmental standard for radiation in the environment from the disposal of HLW, with what factors/issues should an NRC environmental impact statement on technical criteria deal?

(4) What are the environmental impacts of criteria constructed in accordance with the above cited principles? What alternative criteria exist and what are their impacts?

#### Draft Technical Criteria for 10 CFR Part 60

Subparts E-I are proposed to be added to Part 60 as set forth below:

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

#### Subpart E—Technical Criteria

Sec.

60.2 *Definitions* (to be inserted as appropriate into subpart A).

60.101 Purpose.

60.111 Performance objectives.

60.121 Site and environs ownership and control.

60.122 Siting requirements.

60.132 Design requirements.

60.133 Waste package and emplacement environment.

60.135 Retrieval of waste.

60.137 Monitoring programs.

#### Subpart F—Physical Protection [Reserved]

#### Subpart G—Quality Assurance

§ 60.171 Quality Assurance Program.

**§ 60.111 Performance objectives.**

(a) *Overall repository performance.*

(1) *Radiation exposure or releases during operation.* The Department of Energy shall design and operate the geologic repository operations area to provide reasonable assurance that radiation exposures and releases or radioactive materials are within the limits set forth in Part 20 of this Chapter.

(2) *Releases after decommissioning.* The Department of Energy shall provide reasonable assurance that after decommissioning the geologic repository will isolate radioactive wastes to such a degree that quantities and concentrations of radioactive waste in the accessible environment will conform to such generally applicable environmental standards as may have been established by the Environmental Protection Agency.

(3) *Retrievability.* The Department of Energy shall design the geologic repository operations area so that the radioactive waste stored there can be retrieved for a period of 50 years after termination of waste emplacement operations, if the geologic repository operations area has not been decommissioned. If during this period a decision is made to retrieve the wastes the Department shall insure that wastes could be retrieved in compliance with Part 20 of this Chapter and in about the same period of time as that during which they were emplaced.

(b) *Required barriers.* In the design and construction of a geologic repository, the Department shall utilize (1) an engineered system including waste package and an underground facility, and (2) the geologic environment.

(c) *Performance of required barriers and engineered systems.* (1) *Waste Packages.*<sup>2</sup> The Department shall design waste packages so that there is reasonable assurance that radionuclides will be contained for at least the first 1,000 years after decommissioning and for as long thereafter as is reasonably achievable given expected processes and events as well as various water flow conditions including full or partial saturation of the underground facility.

(2) *Underground facility.* The Department shall design the underground facility to provide reasonable assurance of the following:

(i) An environment for the waste packages that promotes the achievement of § 60.111(c)(1) above under conditions resulting from expected processes and events.

<sup>2</sup> Sections 60.111(c)(1) and 60.111(c)(2) apply only to HLW.

(ii) Containment of all radionuclides for the first 1,000 years after decommissioning of the geologic repository operations area and as long thereafter as is reasonably achievable, assuming expected events and processes and that some of the waste dissolves soon after decommissioning.

(3) *Overall performance of the engineered system after containment.* The Department shall design the engineered system to provide reasonable assurance that:

(i) Starting 1,000 years after decommissioning of the geologic repository operations area, the radionuclides present in HLW will be released from the underground facility at an annual rate that is as low as reasonably achievable and is in no case greater than an annual rate of one part in one hundred thousand of the total activity present in HLW within the underground facility 1,000 years after decommissioning assuming expected processes and events.

(ii) Starting at decommissioning radionuclides present in TRU waste will be released at a rate that is as low as reasonably achievable and is in no case greater than one part in one hundred thousand of the total activity present in TRU waste within the underground facility at the time of decommissioning assuming expected processes and events.

(4) *Performance of the geologic environment.* (i) The Department shall provide reasonable assurance that the degree of stability exhibited by the geologic environment at present will not significantly decrease over the long term.

(ii) The Department shall provide reasonable assurance that the site exhibits properties which promote isolation and that their capability to inhibit the migration of radionuclides will not significantly decrease over the long term.

(iii) The Department shall provide reasonable assurance that the hydrologic and geochemical properties of the host rock and surrounding confining units will provide radionuclide travel times to the accessible environment of at least 1,000 years assuming expected processes and events.

**§ 60.121 Site and environs ownership and control.**

(a) *Ownership and control of the geologic repository operations area.* The Department shall locate the geologic repository operations area in and on lands that are either acquired lands under the jurisdiction and control of the Department or lands permanently

withdrawn and reserved for its use. The Department shall hold such lands free and clear of all significant encumbrances (including rights arising under the general mining laws, easements for right-of-way, and all other rights arising under lease, rights of entry, deed, patent, mortgage, appropriations, prescription, or otherwise).

(b) *Establishment of a control zone.* The Department shall establish a "Control Zone" surrounding the geologic repository operations area. The Department shall exercise such jurisdiction and control with respect to surface and subsurface estates in the control zone as may be necessary to prevent adverse human actions that could significantly reduce the ability of the natural or engineered barriers to isolate radioactive materials from the accessible environment. The Department's rights may take the form of appropriate possessory interests, servitudes, or withdrawals from location or patent under the general mining laws.

(c) *Long-term control.* The Department shall identify the geologic repository operations area by the most permanent markers and records practicable. The markers shall be inscribed in several languages as well as English. In addition, the Department shall deposit records of the location of the geologic repository operations area and the nature and hazard of the waste in the major archives of the world. For the purpose of demonstrating compliance with § 60.111 (Performance Objectives), the Department shall assume that other institutional controls will not persist for more than one hundred years.

**§ 60.122 Siting requirements.**

(a) *General requirements.* (1) The Department shall select the site and environs so that they are not so complex as to preclude thorough investigation and evaluation of the site characteristics that are important to demonstrating that the performance objectives of § 60.111 will be met.

(2) The Department shall investigate and evaluate the natural conditions and human activities that can reasonably be expected to affect the design, construction, operation, and decommissioning of the geologic repository operations areas. The natural conditions include geologic, tectonic, hydrologic, and climatic process. The Department shall evaluate the stability of the geologic repository and the isolation of radionuclides after decommissioning.

(i) The Department shall conduct investigations on the order of 100



kilometers horizontal radius from the geologic repository operations area.

(ii) The Department shall emphasize those natural conditions active anytime since the start of the Quaternary Period in their investigations.

(iii) The Department shall emphasize the first 10,000 years following decommissioning in their prediction of changes in natural conditions and the performance of the geologic repository.

(3) The Department shall conduct investigations that adequately characterize and provide representative and bounding values for those human activities and natural events and conditions that may affect any of the following:

(i) The design, construction, operation, and decommissioning of the geologic repository operations area.

(ii) Demonstration of the stability of the geologic repository after decommissioning.

(iii) Demonstration of the isolation of radionuclides from the accessible environment after decommissioning.

(4) The Department shall evaluate reasonably likely future variations in the site characteristics which may result from natural processes, human activities, construction of the repository, or waste/rock/water interactions.

(5) The Department shall conduct the site investigations in such a manner as to obtain the required information with minimal adverse effects on the long-term performance of the geologic repository.

(6) The Department shall validate analyses and modeling of future conditions and changes in site characteristics using field tests, *in situ* tests, field-verified laboratory tests, monitoring data, or natural analog studies.

(7) The Department shall continuously verify and assess any changes in site conditions which pertain to whether the performance objectives will be met.

(8) The Department shall perform a resource assessment for the region within 100 km of the site using available information. The Department shall include estimates of both known and undiscovered deposits of all resources that (i) have been or are being exploited on (ii) have not been exploited but are exploitable under present technology and market conditions. The Department shall estimate undiscovered deposits by reasonable inference based on geologic and geophysical information. The Department shall estimate both gross and net value of resource deposits. The estimate of net value shall take into account development, extraction and marketing costs.

(9) The Department shall determine by appropriate analyses the extent of the

volume of rock within which the geologic framework, ground-water flow, ground-water chemistry, or geomechanical properties are anticipated to be significantly affected by construction of the geologic repository or by the presence of the emplaced wastes, with emphasis on the thermal loading of the latter. In order to do the analyses required in this paragraph, the Department shall at a minimum conduct investigations and tests to provide the following input data:

(i) The pattern, distribution and origin of fractures, discontinuities, and heterogeneities in the host rock and surrounding confining units;

(ii) The presence of potential pathways such as fractures, discontinuities, solution features, unsealed faults, breccia pipes, and other permeable anomalies in the host rock and surrounding confining units.

(iii) The *in situ* determination of the bulk geomechanical properties, pore pressures and ambient stress conditions of the host rock and surrounding confining units;

(iv) The *in situ* determination of the bulk hydrogeologic properties of the host rock and surrounding confining units;

(v) The *in situ* determination of the bulk geochemical conditions, particularly the redox potential, of the host rock and surrounding confining units;

(vi) The *in situ* determination of the bulk response of the host rock and surrounding confining units to the anticipated thermal loading given the pattern of fractures and other discontinuities and the heat transfer properties of the rock mass.

As a minimum, the Department shall assume that the volume will extend a horizontal distance of 2 kilometers from the limits of the repository excavation and a vertical distance from the surface to a depth of 1 kilometer below the limits of the repository excavation.

(b) *Potentially adverse conditions.* The following paragraphs describe human activities or natural conditions which can adversely affect the stability of the repository site, increase the migration of radionuclides from the repository, or provide pathways to the accessible environment. The Department shall demonstrate whether any of the potentially adverse human activities or natural conditions are present. The Department shall document all investigations. The presence of any of the potentially adverse human activities or natural conditions will give rise to a presumption that the geologic repository will not meet the performance

objectives. The conditions and activities in this section apply, unless otherwise stated, to the volume of rock determined by the Department in § 60.122(a)(8) above.

(1) *Potentially adverse human activities.* (i) There is or has been conventional or *in situ* subsurface mining for resources.

(ii) Except holes drilled for investigations of the geologic repository, there is or has been drilling for whatever purpose to depths below the lower limit of the accessible environment.

(iii) There are resources which are economically exploitable using existing technology under present market conditions.

(iv) Based on a resource assessment, there are resources that have either higher gross or net value than the average for other areas of similar size in the region in which the geologic repository is located.

(v) There is reasonable potential that failure of human-made impoundments could cause flooding of the geologic repository operations are prior to decommissioning.

(vi) There is reasonable potential based on existing geologic and hydrologic conditions and methods of construction for construction of large-scale impoundments which may affect the regional ground-water flow system.

(vii) There is indication that present or reasonably anticipatable human activities can significantly affect the hydrogeologic framework. Human activities include ground-water withdrawals, extensive irrigation, subsurface injection of fluids, underground pumped storage facilities or underground military activities.

(2) *Potentially adverse natural conditions—geologic and tectonic.* (i) There is evidence of extreme bedrock incision since the start of the Quaternary Period.

(ii) There is evidence of dissolution, such as karst features, breccia pipes, or insoluble residues.

(iii) There is evidence of processes in the candidate area which could result in structural deformation in the volume of rock such as uplift, diapirism, subsidence, folding, faulting, or fracture zones.

(iv) The geologic repository operations area lies within the near field of a fault that has been active since the start of the Quaternary Period.

(v) There is an area characterized by higher seismicity than that of the surrounding region or there is an area in which there are indications, based on correlations of earthquakes with tectonic processes and features, that seismicity may increase in the future.

(vi) There is evidence of intrusive igneous activity since the start of the Quaternary Period.

(vii) There is a high and anomalous geothermal gradient relative to the regional geothermal gradient.

(3) *Potentially adverse natural conditions—hydrologic.* (i) There is potential for significant changes in hydrologic conditions including hydraulic gradient, average pore velocity, storativity, permeability, natural recharge, piezometric level, and discharge points. Evaluation techniques include paleohydrologic analysis.

(ii) The geologic repository operations area is located where there would be long term and short term adverse impacts associated with the occupancy and modification of floodplains. (Executive Order 11988).

(iii) There is reasonable potential for natural phenomena such as landslides, subsidence, or volcanic activity to create large-scale impoundments that may affect the regional ground-water flow system.

(iv) There is a fault or fracture zone, irrespective of age of last movement, which has a horizontal length of more than a few hundreds of meters.

(4) *Potentially Adverse Natural Conditions—Geochemical.* The rock units between the repository and the accessible environment exhibit low retardation for most of the radionuclides contained in the radioactive waste.

A presumption that the geologic repository will not meet the performance objectives can be rebutted upon showing that the presence of the potentially adverse condition does not adversely affect the performance of the geologic repository. In order to make this showing, the Department shall first demonstrate that:

(1) The potentially adverse human activity or natural condition has been adequately characterized, including the extent to which the particular feature may be present and still be undetected taking into account the degree of resolution achieved by the investigations;

(2) The effect of the potentially adverse human activity or natural condition on the geologic framework, ground-water flow, ground-water chemistry and geomechanical integrity has been adequately evaluated using conservative analyses and assumptions, and the evaluation used is sensitive to the adverse human activity or natural condition;

(3) The effect of the potentially adverse human activity or natural condition is compensated by the

presence of favorable characteristics in Paragraph 60.122(c) of this Section; and

(4) The potentially adverse human activity or natural condition can be remedied during construction, operation, or decommissioning of the repository.

(c) *Favorable characteristics.* Each of the following characteristics represent conditions which enhance the ability of the geologic repository to meet the performance objectives. Candidate areas and sites which exhibit as many favorable characteristics as practicable are preferred. The Department shall demonstrate the degree to which each favorable characteristic is present. The Department shall fully document all investigations. The Department shall perform evaluations to demonstrate to what extent the favorable characteristic contributes to assuring the stability of the site and/or the isolation of the waste by restricting the access of groundwater to the waste, the rate of dissolution of the waste, or the migration of radionuclides from the geologic repository. The Department shall use conservative analyses to demonstrate the significance of the favorable characteristics. The Department shall include evaluation of the degree to which the favorable characteristic has been adequately characterized, given the degree of resolution achieved by the investigations. The specific favorable characteristics are the following:

(1) The Department shall select the site so that to the extent practicable the candidate area—

(i) Exhibits demonstrable surface and subsurface geologic, geochemical, tectonic, and hydrologic stability since the beginning of the Quaternary Period; and

(ii) Contains a host rock and surrounding confining units that provide:

(a) Long ground-water residence times and long flow paths between the repository and the accessible environment;

(b) Inactive ground-water circulation within the host rock and surrounding confining units, and little hydraulic communication with adjacent hydrogeologic units due to ground-water characteristics such as low intrinsic permeability and low fracture permeability of the rock mass; and

(c) Geochemical properties, such as reducing conditions which result in low solubility or radionuclides, and near-normal pH, or a lack of complexing agents.

(2) The Department shall select the site so that to the extent practicable the volume of rock—

(i) Possesses the favorable characteristics described above;

(ii) Possesses a geologic framework that permits effective sealing of shafts, drifts, and boreholes, and that permits excavation of a stable subsurface opening, and the emplacement of waste at a minimum depth of 300 meters from the ground surface;

(iii) Possesses ground-water flow characteristics that—

(a) Result in a host rock with very low water content;

(b) Prevent ground-water intrusion or circulation of ground water in the host rock;

(c) Prevent significant upward ground-water flow between hydrogeologic units or along shafts, drifts, and boreholes;

(d) Result in low hydraulic gradients in the host rock and surrounding confining units;

(e) Result in horizontal or downward hydraulic gradients in the host rock and surrounding confining units; and

(f) Result in ground-water residence times under ambient conditions, between the repository and the accessible environment, that exceed 1000 years.

(iv) Possesses geomechanical properties that provide stability during construction, operation, and under the influences of thermal load or other waste/rock/water interactions;

(v) Possesses a low population density;

(vi) Possesses a combination of meteorological characteristics (especially prevailing wind direction) and population distribution such as to assure that a radiological exposure of the population, which is within the limits of Part 20 of this chapter; and

(vii) Is in an area where climatic change is not expected to have an adverse impact on the geologic, tectonic, or hydrologic characteristics.

#### § 60.132 Design requirements.

(a) *General design requirements.* The requirements in this section apply to surface and subsurface facilities.

(1) *Compliance with mining regulations.* The Department shall design, construct and operate the surface and subsurface facilities to comply with all applicable Federal and state mining regulations including Subchapters D, E, and M of 30 CFR Part 57 as applicable.

(2) *Identification of structures, systems, and components important to safety.* The Department shall identify by appropriate analyses those systems, structures and components that are important to safety.

(3) *Protection against natural phenomena and environmental conditions.* (i) The Department shall



design and locate structures, systems, and components important to safety to accommodate the effects of and to be compatible with site characteristics and environmental conditions associated with normal operation, maintenance and testing at any time prior to decommissioning.

(ii) The Department shall design and locate structures, systems and components important to safety to withstand the most severe of natural phenomena that are likely to occur at the site including seismic, meteorologic and hydrologic events without loss of capability to perform their safety function.

(4) *Protection against dynamic effects of equipment failure and similar events.* The Department shall design and locate structures, systems and components important to safety to resist dynamic effects that could result from equipment failure, missile impacts, the dropping of crane loads in transit, and similar events and conditions.

(5) *Protection against fires and explosions.* (i) The Department shall design and locate structures, systems, and components important to safety to minimize the potential for impairment of their ability to perform their safety functions during fires or explosions.

(ii) The the extent practicable, the Department shall design the geologic repository to incorporate noncombustible and heat resistant materials.

(iii) The Department shall design the geologic repository to include explosion and fire detection alarm systems and appropriate suppression systems with sufficient capacity and capability to minimize the adverse effects of fires and explosions on structures, systems, and components important to safety.

(iv) The Department shall design the geologic repository to include provisions to protect personnel from either the operation of, or the failure of the fire suppression systems.

(6) *Inspection, testing, and maintenance.* The Department shall design and locate structures, systems and components important to safety to permit periodic inspection, testing, and maintenance, as appropriate, to ensure their continued functioning and readiness.

(7) *Emergency capability.* (i) The Department shall design and locate structures, systems, and components important to safety to assure safe storage of radioactive waste, prompt termination of operations and evacuation of personnel during an emergency.

(ii) The Department shall design the geologic repository to include onsite

facilities and services that assure a safe and timely response to emergency conditions and facilitate the use of available offsite services such as fire, police, medical and ambulance service that may aid in recovery from emergencies.

(8) *Utility services.* (i) The Department shall design each utility service system to provide for the meeting of safety demands under normal and abnormal conditions. The Department shall design utility services and distribution systems important to safety to include redundant systems to the extent necessary to maintain, with adequate capacity, the ability to perform safety functions assuming a single failure.

(ii) The Department shall design emergency utility services to permit testing of the functional operability and capacity, including the full operational sequence, of each system for transfer between normal and emergency supply sources, and the operation of associated safety systems.

(iii) The Department shall make provisions so that in the event of a loss of the primary electric power source or circuit, reliable and timely emergency power is provided to instruments, utility service systems, and operating systems including the security central alarm station, in amounts sufficient to allow safe conditions to be maintained with all safety devices essential to safety functioning.

(9) *Radiological protection.* (i) The Department shall design structures, systems, and components for which operation, maintenance, and required inspections could involve radiological exposure to personnel to include means to control external and internal radiation exposures within the limits specified in Part 20 of this Chapter. This includes the means to:

(a) Prevent the accumulation of radioactive material in those systems to which access by personnel is required;

(b) Minimize the time required to perform work in the vicinity of radioactive components, such as by providing sufficient space for ease of operation and designing equipment for ease of repair and replacement; and

(c) Provide shielding to assure that exposures to personnel in accessible areas are within the limits of Part 20.

(ii) The Department shall design the geologic repository to include means to—

(a) Provide appropriate radiation protection systems and programs for all areas and operations where personnel may be exposed to levels of radiation or airborne radioactive materials significantly above background levels to

insure that exposures are within the limits of Part 20;

(b) Control and monitor the spread of contamination;

(c) Control access to areas of high radiation or potential contamination, and

(d) Warn workers by a radiation alarm system of significant increases in radiation levels in normally accessible areas and of excessive radioactivity released in effluents. The Department shall design such systems with redundancy and *in situ* testing capability.

(10) *Criticality control.* The Department shall design all systems for processing, transporting, handling, storage, retrieval, emplacement, and isolation of radioactive waste to insure that a nuclear criticality accident is possible only if at least two unlikely, independent and concurrent or sequential changes have occurred in the conditions essential to nuclear criticality safety. Demonstration of criticality safety under normal and accident conditions shall be by calculation of the effective multiplication factor ( $k_{eff}$ ). This value must be sufficiently below unity to show at least a 5% margin after allowance for the bias in the method of calculation and the uncertainty in the experiments used to validate the method of calculation.

(11) *Instrumentation and control systems.* The Department shall provide instrumentation and control systems to monitor and control the behavior of engineered systems that are important to safety over anticipated ranges for normal operation, for abnormal operation and for accident conditions. The Department shall design the systems with sufficient redundancy to assure that adequate margins of safety are maintained.

(b) *Additional design requirements for surface facilities.* The requirements in this section apply only to the design of surface facilities.

(1) *Compliance with Part 72.* If the geologic repository includes surface facilities that would be required to comply with 10 CFR Part 72, were they to be geographically removed from the site, the Department shall design, construct and operate those surface facilities to conform with 10 CFR Part 72.

(2) *Facilities for retrieval of waste.* The Department shall design and construct surface facilities to facilitate safe and prompt retrieval of wastes including facilities to inspect, repair, decontaminate, and store retrieved wastes prior to their shipment off site. Surface storage capacity of all emplaced waste is not required, but must be

sufficient to handle waste backlogs prior to shipment offsite.

(3) *Ventilation.* The Department shall design surface facility ventilation system(s) supporting waste transfer, inspection, decontamination, processing and/or packaging to assure that occupational exposures and releases of gases and airborne radioactive particulate materials during normal operations do not exceed the limits identified in Part 20 of this chapter.

(4) *Radiation control and monitoring.*

(i) *Effluent control.* The Department shall design the surface facilities to minimize the release of radioactive materials in effluents of any form, during normal operations. The Department shall monitor the systems provided to guard against the release of radioactive materials. The Department shall insure that the monitoring systems are provided with alarms which are periodically tested. The Department shall design and construct facilities to assure treatment of contaminated effluents as necessary to ensure that the concentrations and total quantities of radioactive materials in effluents are maintained within the limits of Part 20 of this chapter.

(ii) *Effluent monitoring.* The Department shall design effluent monitoring systems to adequately measure the amount and concentration of radionuclides in any effluent to assure that radioactive materials are maintained within the limits of Part 20 of this Chapter.

(5) *Waste treatment.* The Department shall design radioactive waste treatment facilities to process all site generated wastes.

(6) *Consideration of decommissioning.* The Department shall design and construct surface facility structures to facilitate decommissioning.

(c) *Additional design requirements for subsurface facilities.* The requirements in this section apply only to subsurface facilities.

(1) *Underground facility.* The Department shall design the underground facility as an underground civil engineered structure that satisfies requirements for structural performance, control of groundwater movement and control of radionuclide transport. The Department shall design the facility to provide for safe operation during construction, emplacement, and retrieval of waste and to assure compliance with § 60.111 (Performance Objectives).

(2) *Waste isolation engineering.* (i) The Department shall demonstrate that the underground facility includes those engineered features that are needed to limit radioactive releases after

decommissioning to levels that are as low as reasonably achievable. The Department shall include an identification and a comparative evaluation of alternatives to the design features that are provided to enhance radionuclide retardation and containment.

(ii) The Department shall design the underground facility such that the orientation, geometry, layout, and depth of the underground excavation in addition to any engineered barriers provided as part of the underground facility are optimized for that site. The Department shall use as optimization criteria the performance objectives in § 60.111. (c)(2), (c)(3).

(iii) The Department shall design the underground facility so that the effects of disruptive events will not propagate through the facility.

(iv) To assure that shafts and boreholes do not act as preferential pathways for ground-water or radionuclide migration, the Department shall design shaft and borehole seals such that—

(a) The shafts and boreholes are sealed along their entire length as soon after they have served their operational purpose as is practicable;

(b) The sealed shafts and boreholes provide a barrier to radionuclide migration which is at least equivalent to the barrier provided by the undisturbed rock;

(c) There is effective sealing to the rock contact and the adjacent zone of disturbed rock surrounding boreholes and shafts; and

(d) The shaft and borehole seals can accommodate potential variations of stress, temperature, and moisture, and to provide for radionuclide retardation.

(v) The Department shall place emphasis on multicomponent borehole and shaft and seals and use materials that are compatible with the rock properties and other *in situ* conditions.

(iv) The Department shall design the underground facility to include engineered barriers which protect the waste package from (1) natural events and processes, (2) *in situ* stresses, (3) chemical attack, and (4) groundwater contact. The Department shall determine the location of the barriers by proper engineering analysis and *in situ* testing. The Department shall include in the design—

(a) Engineered barriers where shafts could provide access for ground water to enter or leave the underground facility;

(b) Creation of a near-field waste package environment which favorably controls chemical reactions affecting the

performance of the waste package or other engineered barriers;

(c) Creation of an emplacement environment which reduces the potential for creep deformation in the rock and deformation of waste packages; and

(d) Backfill materials as a barrier to ground-water movement into the repository. The Department shall select backfill materials to provide for (1) adequate placement and compaction in underground openings, (2) seals to reduce and control ground-water movement, (3) absorption of radionuclides, and (4) preservation of favorable properties in the presence of anticipated rise of rock temperatures.

(vii) Thermal and thermomechanical response of the rock—

(a) The Department shall design the underground facility to assure that the predicted thermal and thermomechanical response of the rock could not adversely affect the performance of the natural or engineered barriers to radionuclide migration.

(b) The Department shall conduct *in situ* monitoring of the thermomechanical response of the geologic repository until decommissioning to assure that the thermomechanical response of the natural and engineered features are within design limits. Should these limits be exceeded, the NRC shall be notified and informed of any needed changes or actions.

(3) *Design to facilities retrieval of waste.* The Department shall design the underground facility to facilitate retrieval of waste in accordance with § 60.111(a)(3). To accomplish this the Department shall design the underground facility to assure structural stability of openings and minimize ground-water contact with the waste packages and design an emplacement environment that otherwise promotes waste recovery without compromising the ability of the geologic repository to meet the performance objectives.

(4) *Design of openings.* (i) The Department shall design subsurface openings to assure stability throughout the construction, operation, and retrieval periods. If support systems and structures are required for stability, the Department shall design them to be compatible with long-term deformation characteristics of the rock and to allow for subsequent placement of backfill.

(ii) The Department shall design openings to minimize the potential for deleterious rock movement or fracturing of overlying or surrounding rock. The Department shall optimize opening design, including shape, size, orientation, spacing and support



materials with respect to natural stress conditions, deformation characteristics of the host rock under thermal loading, and the nature of weaknesses or structural discontinuities present at the location of the opening.

(5) *Lining of subsurface excavations.* The Department shall line subsurface excavations in areas that require:

(i) A positive control of water or gas inflow from aquifers or other porous zones;

(ii) Support for zones of weak or fractured rock;

(iii) Anchorage for equipment or hardware.

(6) *Shaft conveyances used in waste handling.* (i) The Department shall consider shaft conveyances as a system important to safety.

(ii) The Department shall design hoists with mechanical geared lowering devices that preclude cage free fall.

(iii) The Department shall design hoists with a reliable cage location system that provides direct signals from all levels in the shaft. The Department shall design and construct final unload points which are controlled and verified by local position detectors.

(iv) The Department shall design shaft loading and unloading systems with a reliable system of interlocks that will fail safely upon malfunction. The Department shall include in the design two independent indicators to indicate whether waste packages are in place, grappled, and ready for transfer.

(7) *In situ testing and design verification.* (i) During the early or developmental stages of construction an area the Department shall excavate and reserve an area for *in situ* testing of borehole and shaft seals, backfill, and thermal effects and waste-rock interaction. The Department shall initiate the testing as early as is practicable and continue as long as necessary to demonstrate that performance is within design limits.

(ii) The Department shall insure that the contact between lining and the rock surrounding subsurface excavations does not jeopardize repository containment by providing a preferential pathway for ground-water or radionuclide migration.

(iii) During repository construction and operation the Department shall conduct a continued program of surveillance, testing, measurement, and geologic mapping to ensure that design parameters are verified and to provide additional data to confirm the isolation and containment characteristics of the seals and the underground facility. The Department shall measure and monitor changes in subsurface conditions on a regular basis.

(iv) The Department shall, as a minimum, make measurements of rock deformations and displacement, changes in rock stress and strain, water inflow into subsurface areas, changes in ground-water locations and conditions, host rock pore water pressures, and host rock thermal and thermomechanical response as a result of development and operations of the geologic repository. The Department shall compare such measurements and observations with original design bases and assumptions and if significant differences exist the Department must determine modifications to design or construction methods and report to the Commission the recommended changes.

(8) *Compacted Backfill Test Section.* To verify performance requirements intended in the design the Department shall establish, before any backfill placement is initiated, a program for placement, sampling, and testing of the backfill section. If the result of testing and observations made at the test section are different from the original design intent then the Department must analyze the need for changes and report the recommended changes to the Commission.

(9) *Water control during operations.* (i) The Department shall provide water control systems which are of sufficient capability and capacity to minimize the potentially adverse effects of ground water or service water (including that supporting excavation) intrusion on structures systems and components important to safety, waste emplacement operations, the performance of waste packages as engineered barrier to radionuclide migration, or effect retrieval capability.

(ii) The Department shall design the water control systems to monitor and control the quality and quantity of water flowing into or from the repository.

(iii) The Department shall provide water control storage capability, modular designs, or other provisions to assure unexpected inrush or flood can be controlled are contained.

(iv) The Department shall construct water control systems to control water from waste emplacement areas and shall keep those systems separate from the systems controlling water in the excavation areas.

(v) If aquifers or water bearing structures are encountered during construction then the Department must use pregrouting in advance of excavation.

(d) *General design requirements for construction.* The requirements in this section include general design criteria which are important for construction.

(1) Site development and excavation sequence. (i) The Department shall plan the exploratory program so that construction takes advantage of exploratory boreholes, shafts, and excavations in order to minimize the total number of penetrations within the geologic repository operations area.

(ii) The Department shall coordinate the design of the geologic repository with site characterization activities to assure that boreholes necessary for site characterization are located at future positions of shafts or large unexcavated pillars.

(iii) If critical host rock and other site specific design assumptions cannot be verified from boreholes, geophysical measurements, and/or an exploratory shaft and initial excavation, then the Department must establish a pilot program to further characterize the entire volume to be occupied by the underground facility and to verify critical host rock and site specific design assumptions prior to design finalization and waste emplacement.

(iv) The Department shall design the subsurface facilities with sufficient flexibility to ensure that designs are compatible with specific site features encountered during pilot development and excavation, and to facilitate the use of tests and monitoring system outputs.

(2) *Construction management program.* The Department shall establish a construction management program which is sufficient to assure that construction activities do not adversely affect the suitability of the site or jeopardize the containment capabilities of the underground facility. The Department shall include in the program means to assure that the underground facility is excavated and constructed as designed.

(3) *Excavation techniques.* The Department shall assure that methods used for excavation will neither create a preferential pathway for ground water or radioactive waste migration, nor increase the potential for migration through existing pathways. The Department shall use to the extent practicable mechanical excavators, boring machines and other nonblasting methods. If blasting is required for excavation, the Department must use methods specifically designed for each phase of the work that minimize fracturing of the surrounding rock. In this program the Department may include the use of pilot bores and tunnels and delay systems designed to minimize the amount of explosives detonated simultaneously. If blasting is utilized the Department must utilize controlled perimeter blasting such as the

smooth blasting or preshearing techniques and cushion.

(4) *Control of explosives.* If explosives are used, the Department must meet the provisions of 30 CFR Part 57.6 as minimum safety requirements for storage, use and transportation. The Department shall use electrical detonation. If the rock contains open joints or fractures the Department must use cartridge or packaged explosives only.

(5) *Support structures.* If temporary support structures are used the Department must assure that they do not impair the placement of permanent structures or the ability of the repository to contain wastes by adversely affecting the ability to seal excavated areas.

(e) *Records and reporting requirements.* (1) *Identification and reporting of adverse features or conditions.* (a) If any feature listed under § 60.122(b) (Adverse Conditions) is encountered during excavations then the Department must report it to the Commission within 5 days. The Department must analyze the effect of such features or conditions report as required in § 60.122(b).

(2) *Construction and mapping records.* The Department shall maintain and preserve records which provide a complete, documented history of the repository construction.

The Department shall include in the records the following—

- (i) Surveys of underground excavations and shafts located with respect to readily identifiable surface features or monuments;
- (ii) Materials encountered;
- (iii) Geologic maps and profiles;
- (iv) Locations and amount of seepage;
- (v) Details of equipment, methods, progress and sequence of work;
- (vi) Construction problems;
- (vii) Anomalous conditions encountered;
- (viii) Instrument locations, reading, and analysis;
- (ix) Location and description of support systems;
- (x) Location and description of dewatering systems; and
- (xi) Details of seals used, methods of emplacement, and location.

The Department shall perform and plot surveys and geologic mapping as the work progresses.

(3) *Retention of cores and logs.* The Department shall retain on site, until decommissioning, all cores from all exploratory borings drilled during site selection, site characterization, construction, and operation. The Department shall store the cores in durable boxes housed in a weatherproof building. The Department shall arrange

the cores to be readily available for inspection. The Department shall store in the same area logs of the borings, including geophysical logs.

(f) *General design requirements for subsurface operation.* The requirements of this section apply during repository operations.

(1) If concurrent excavation and emplacement of wastes are planned, then the Department must design the repository in modules which are sufficiently separated to assure that excavation activities could not impair emplacement operations or adversely affect retrieval.

(i) If interconnections are provided, the Department shall design each module to be sealed and isolated from all other modules in the event of an accident and so that waste can be safely retrieved if necessary.

(ii) The Department shall separate ventilation systems supporting excavation and waste emplacement.

(iii) The Department shall coordinate excavation rates and emplacement rates and schedules to assure physical separation of activities and further assure that handling and emplacement operations are not adversely affected by the excavation activities.

(2) *Ventilation.* (i) The Department shall design ventilation system(s) which are capable of controlling the transport of radioactive particulates and gases within and from the subsurface facility. The Department shall design and test the ventilation system to assure that radiological exposures during operations will not exceed the limits of 10 CFR Part 20.

(ii) The Department shall design ventilation systems to permit occupancy of all areas as required either for normal operations, cessation of operations, or for maintaining the facility in a safe condition.

(iii) The Department shall design the ventilation system(s) to be capable of accommodating changes in operating conditions such as variations in temperature and humidity.

(iv) The Department shall design the ventilation system(s) to protect against the intake and accumulation of radioactive materials and hazardous substances.

(v) The Department shall design ventilation system(s) for under normal and accident conditions.

(vi) The Department shall design the ventilation system to assure by means of redundant equipment, fail safe control systems or other provisions, the continuity of ventilation.

(3) *Waste handling and emplacement.*

(i) The Department shall design the systems used to handle, transport, and

emplace radioactive wastes to have positive, fail safe designs to preclude impairment of the performance of the waste packages as a barrier to radionuclide migration and to minimize radiological hazards.

(ii) The Department shall design the handling systems for emplacement and retrieval operations to minimize the potential for operator error.

(iii) The Department shall demonstrate that the handling equipment and systems for emplacement and retrieval operations are effective under *in situ* conditions prior to the start of waste emplacement operations.

(iv) The Department shall inspect any holes that are bored to receive waste prior to waste emplacement, to assure the absence of adverse conditions that could jeopardize the integrity of the waste package.

(4) The Department shall determine by analysis the specifications of waste loading and waste spacings. The Department shall make the analysis prior to receipt of waste. The Department shall include in the analysis—

(i) Effects of the design of the geologic repository on the thermal and thermomechanical response of the host rock;

(ii) The characteristics of the site and the host rock that affect the thermal response of the host rock;

(iii) Site and host rock features that affect the thermomechanical response of the seals and underground facility, including but not limited to: behavior and deformational characteristics of the host rock, the presence of insulating layers, aquifers, faults, orientation of bedding planes and the presence of discontinuities in the host rock.

(iv) The effect of temperatures and stresses on the performance of the waste packages and other engineered barriers; and

(v) The extent to which fracturing of the host rock occurs during temperature increase and decrease cycles.

#### § 60.133 Waste package and emplacement environment.

(a) *General Requirements.* The Department shall insure that waste packages are designed and fabricated to so that the performance objectives of § 60.111 will be met. To demonstrate that the waste package meets these objectives, the Department at a minimum, shall do the following—

(1) Perform comparative evaluation of several candidate waste form and packaging combinations considering the proposed emplacement environment to

optimize the waste package performance:

(2) Provide reasonable assurance that the *in situ* chemical, physical, and/or nuclear properties of the waste package and/or its interactions with the emplacement environment will not compromise the function of the waste packages. Supporting analyses shall include, but not be limited to evaluation of the following factors: Solubility, oxidation/reduction reactions, corrosion, gas generation, thermal effects, mechanical strength, mechanical stresses, radiolysis, radiation damage, nuclide retardation, leaching, fire and explosion hazards, thermal loads, and synergistic interactions;

(3) Provide reasonable assurance that the *in situ* chemical, physical, and/or nuclear properties of the waste package and/or its interactions with the emplacement environment will not compromise the function of the site or engineered elements of the geologic repository. The supporting analyses shall include, but not be limited to, evaluation of the following factors: solubility, oxidation/reduction reactions, corrosion, gas generation, thermal effects, mechanical strength, stress, radiolysis, radiation damage, nuclide retardation, leaching, fire and explosion hazards, thermal loads, and synergistic interactions.

(4) Design and fabricate the waste packages to promote safe handling during transportation, handling, emplacement, and retrieval; and

(5) Test the waste packages, as appropriate, to ensure that the requirements of §§ 60.133(a)(1) and 60.133(a)(2) of the Performance Objectives are met.

(b) *Waste Form Requirements.* The Department shall accept waste for disposal only if it meets the following criteria—

(1) *Solidification.* All liquid radioactive wastes must have been converted to a dry solid and placed in a sealed container before transfer to the repository;

(2) *Stabilization.* Finely divided waste forms must have been stabilized (for example, by incorporation into an encapsulating matrix) to limit the production and availability of respirable fines during any accident condition to a level as low as is reasonably achievable;

(3) *Free Liquids.* The Waste package must contain no free liquids;

(4) *Combustibles.* All combustible radioactive wastes must have been reduced to a noncombustible form unless the associated packaging is such that a fire involving a single package will not—

(i) Compromise the integrity of other packages;

(ii) Result in radiation exposures or releases of radio-active materials in excess of permissible levels; and

(iii) Adversely affect any safety related structures, systems, or components.

(5) *Explosive, pyrophoric, and toxic materials.* The Department shall insure that there are not explosive or pyrophoric materials in the radioactive waste, nor are there chemically toxic wastes that could compromise either the operation or performance of the repository or adversely affect operator safety.

(c) *Container and packaging design requirements.* Containers shall meet the following criteria—

(1) *Physical dimensions and weight.* Each container has been designed and fabricated to permit safe handling at the repository during operations and if necessary, during retrieval prior to repository decommissioning;

(2) *Codes and Standards.* The container and packaging shall be designed, fabricated, and tested, to the maximum extent practical, in accordance with generally recognized codes and standards<sup>1</sup> except as authorized by the Commission upon demonstration by the Department that this would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety;

(3) *Surface contamination.* The amount of removable radioactive surface contamination on the exterior of the package is such that exposure to operational personnel will not exceed the values in Part 20 of this chapter; and

(4) *Unique identification.* A label or other means of permanent identification must be provided for each container. The identification shall not impair the integrity of the container and shall be permanently applied in such a way that the information will be legible at least to the end of the retrievable storage period. Each container identification shall match the container with its permanent written records.

#### § 60.135 Retrieval of waste.

The Department shall design and construct the geologic repository operations area to permit retrieval of all waste packages, mechanically intact, if retrieval operations begin within 50 years after all of the waste has been emplaced and if the geologic repository has not been decommissioned. The

<sup>1</sup>Regulatory guides describing generally acceptable codes and standards for containers of similar type and function will be issued.

design of the geologic repository operations area shall provide for retrievability of the waste within a period of time that is about the same as that in which it was emplaced.

#### § 60.137 Monitoring programs.

The Department shall initiate a system of monitors during site characterization. The Department shall maintain and supplement these monitors, as appropriate, throughout the period of institutional control. The Department shall design the monitoring systems to verify that the performance objectives of § 60.111 are being achieved. The Department shall design, construct and operate the monitoring system so that—

(a) They do not adversely affect the natural and engineered elements of the geologic repository;

(b) They provide baseline information on those parameters and natural processes pertaining to the safety of a candidate site that may be caused by site characterization activities; and

(c) They monitor changes from baseline condition of parameters which could affect the performance of a geologic repository operations area's natural or engineered barriers to radionuclide migration during construction, operation, and after decommissioning.

#### Subpart F—Physical Protection [Reserved]

#### Subpart G—Quality Assurance

##### § 60.171 Quality assurance program.

(a) As used in this part, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to the physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system to predetermined requirements.

(b) The Department shall implement a quality assurance program based on the criteria in Appendix B of Part 50 of this chapter. The quality assurance program shall apply to all activities affecting the safety-related functions of those structures, systems, and components that prevent or mitigate events that could cause unreasonable risk to the health and safety of the public. These activities include exploring, designing, fabricating purchasing, handling, shipping, storing, cleaning, erecting,



installing, inspecting, testing, operating, maintaining, monitoring, repairing and modifying.

**Subpart H—Criteria for Personnel Training (Reserved)**

**Subpart I—Emergencies and Emergency Programs (Reserved)**

Date: Issued at Washington, D.C. this 5th day of May, 1980

For the U.S. Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

[FR Doc. 80-14396 Filed 5-12-80; 8:45 am]

BILLING CODE 7590-01-M

**DEPARTMENT OF ENERGY**

**Economic Regulatory Administration**

**10 CFR Part 461**

(Docket No. ERA-R-79-12A)

**Financial Assistance Programs for State Utility Regulatory Commissions and Eligible Nonregulated Electric Utilities**

**AGENCY:** Economic Regulatory Administration, Department of Energy.

**ACTION:** Notice of proposed rulemaking; cancellations of public hearing.

**SUMMARY:** The Economic Regulatory Administration of the Department of Energy hereby cancels the public hearing on proposed amendments to its regulations on the Innovative Rates Program which was scheduled for Wednesday, May 14, 1980, in Washington, D.C. The public hearing is cancelled due to the lack of any written requests to speak at the hearing. As stated in the notice of proposed rulemaking, issued on April 2, 1980, (45 FR 24092, April 8, 1980) written comments on the proposed amendments must be received by 4:30 p.m. on June 9, 1980.

**FOR FURTHER INFORMATION CONTACT:** M. Larry Kaseman, Office of Utility Systems, Economic Regulatory Administration, Department of Energy, 2000 M Street NW., Room 4306, Washington, D.C. 20461 (202) 653-3920; Mary Ann Masterson, Office of the Assistant General Counsel for Conservation and Solar Applications, Department of Energy, James Forrestal Building, Room 1E-258, Washington, D.C. 20585, (202) 252-9518; William L. Webb, Office of Public Information, Economic Regulatory Administration, Department of Energy, 2000 M Street, N.W., Room B-110, Washington, D.C. 20461, (202) 653-4055.

Issued in Washington, D.C. on May 9, 1980.

Jerry L. Pfeffer,

Assistant Administrator for Utility Systems,  
Economic Regulatory Administration.

[FR Doc. 80-14682 Filed 5-12-80; 10:30 am]

BILLING CODE 6450-01-M

**FEDERAL HOME LOAN BANK BOARD**

**12 CFR Part 563**

[80-292]

**Accounting for Loan Servicing Fees**

**AGENCY:** Federal Home Loan Bank Board.

**ACTION:** Proposed rule.

**SUMMARY:** The Board is proposing to restrict savings and loan associations' accounting treatment for loan servicing fees by providing that such fees may be credited to current income only to the extent earned. The proposed regulation is intended to prohibit the reflection in net worth of unearned servicing income, which the Board regards as an unsafe and unsound practice.

**EFFECTIVE DATE:** Comments must be received by July 9, 1980.

**ADDRESS:** Send comments to the Office of the Secretary, Federal Home Loan Bank Board, 1700 G Street, NW, Washington, DC 20552. Comments will be available for public inspection at this address.

**FOR FURTHER INFORMATION CONTACT:** Nancy L. Feldman, Associate General Counsel (202-377-6440), or Joseph M. Arendes, Assistant Regional Director, Department of Supervision, Office of Examinations and Supervision (202-377-6512).

**SUPPLEMENTARY INFORMATION:** The Federal Home Loan Bank Board's regulations for institutions the accounts of which are insured by the Federal Savings and Loan Insurance Corporation currently do not set forth rules specifying the accounting treatment to be accorded loan servicing fees, or premiums received in lieu of such fees. The Board currently cannot rely on the application of generally accepted accounting principles (GAAP) to be controlling in this regard because it has been the Board's experience that there is not a uniform position among accounting professionals as to the proper treatment of such fees.

It has come to the Board's attention that some associations are following a practice of taking into current income imputed net gains on loan servicing to be performed in the future in connection with the servicing of loans and loan participations sold by these

or breakdown of irrigation equipment or facilities shall not be considered as a failure of the water supply from an unavoidable cause.

(c) Insurance shall not attach on an irrigated basis on acreage otherwise insurable on such basis unless it is so reported and designated by such practice at the time the acreage is reported.

4. *Annual Premium.* If there is no break in the continuity of participation, any premium adjustment applicable under section 5 of the policy shall be transferred to (1) the contract of the insured's state or surviving spouse in case of death of the insured, (2) the contract of the person who succeeds the insured if such person had previously participated in the farming operation, or (3) the contract of the same insured who stops farming in one county and starts farming in another county.

(b) If there is a break in the continuity of participation, any reduction in premium earned under section 5 of the policy shall not thereafter apply; however, any previous unfavorable insurance experience shall be considered in premium computation following a break in continuity.

5. *Claim for and Payment of Indemnity.* (a) Any claim for indemnity on a unit shall be submitted to the Corporation on a form prescribed by the Corporation.

(b) In determining the total production to be counted for each unit, production from units on which the production has been commingled will be allocated to such units in proportion to the liability on each unit.

(c) There shall be no abandonment to the Corporation of any insured tobacco acreage.

(b) In the event that any claim for indemnity under the provisions of the contract is denied by the Corporation, an action on such claim may be brought against the Corporation under the provisions of 7 U.S.C. 1508(c): *Provided*, That the same is brought within one year after the date notice of denial of the claim is mailed to and received by the insured.

(e) Any indemnity will be payable within 30 days after a claim for indemnity is approved by the Corporation. *However*, in no event shall the Corporation be liable for interest or damages in connection with any claim for indemnity whether such claim be approved or disapproved by the Corporation.

(f) If the insured is an individual who dies, disappears, or is judicially declared incompetent, or the insured is an entity other than an individual and such entity is dissolved after the

tobacco is planted for any crop year, any indemnity will be paid to the person(s) the Corporation determines to be beneficially entitled thereto.

(g) The Corporation reserves the right to reject any claim for indemnity if any of the requirements of this section or section 8 of the policy are not met and the Corporation determines that the amount of loss cannot be satisfactorily determined.

6. *Subrogation.* The insured (including any assignee or transferee) assigns to the Corporation all rights of recovery against any person for loss or damage to the extent that payment hereunder is made by the Corporation. The Corporation thereafter shall execute all papers required and take appropriate action as may be necessary to secure such rights.

7. *Termination of the Contract.* (a) The contract shall terminate if no premium is earned for five consecutive years.

(b) If the insured is an individual who dies or is judicially declared incompetent, or the insured entity is other than an individual and such entity is dissolved, the contract shall terminate as of the date of death, judicial declaration, or dissolution; *However*, if such event occurs after insurance attaches for any crop year, the contract shall continue in force through such crop year and terminate at the end thereof. Death of a partner in a partnership shall dissolve the partnership unless the partnership agreement provides otherwise. If two or more persons having a joint interest are insured jointly, death of one of the persons shall dissolve the joint entity.

8. *Coverage Level and Price Election.* (a) If the insured has not elected on the application a coverage level and price at which indemnities shall be computed from among those shown on the actuarial table, the coverage level and price election which shall be applicable under the contract, and which the insured shall be deemed to have elected, shall be as provided on the actuarial table for such purposes.

(b) The insured may, with the consent of the Corporation, change the coverage level and/or price election for any crop year on or before the closing date for submitting applications for that crop year.

9. *Assignment of Indemnity.* Upon approval of a form prescribed by the Corporation, the insured may assign to another party the right to an indemnity for the crop year and such assignee shall have the right to submit the loss notices and forms as required by the contract.

10. *Contract Changes.* The Corporation reserves the right to change

any terms and provisions of the contract from year to year. Any changes shall be mailed to the insured or placed on file and made available for public inspection in the office for the county at least 15 days prior to the cancellation date preceding the crop year for which the changes are to become effective, and such mailing or filing shall constitute notice to the insured. Acceptance of any changes will be conclusively presumed in the absence of any notice from the insured to cancel the contract as provided in section 13 of the policy.

This proposal has not been classified "significant" and is being published under emergency procedures, as authorized by Executive Order 12044 and Secretary's Memorandum No. 1955, without a full 60-day comment period. It has been determined by James D. Deal, Manager, Federal Crop Insurance Corporation, that an emergency situation exists which warrants less than a full 60-day comment period on this proposal because the final regulations and policies covering tobacco must be published and be available in the FCIC county offices not later than December 15, 1979, to afford the farmers an opportunity to examine them before the cancellation date of December 31, 1979. A Draft Impact Analysis has been prepared and is available from Peter F. Cole, Secretary, Federal Crop Insurance Corporation, Room 4088, South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

*Note.*—The reporting requirements contained herein have been approved by the Office of Management and Budget in accordance with the Federal Reports Act of 1942 and OMB Circular A40.

Approved by the Board of Directors on September 6, 1979.

Peter F. Cole,

Secretary, Federal Crop Insurance Corporation.

[FR Doc. 79-32965 Filed 10-24-79; 8:45 am]

BILLING CODE 3410-08-M

## NUCLEAR REGULATORY COMMISSION

### 10 CFR Parts 50 and 51

#### Storage and Disposal of Nuclear Waste

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Notice of Proposed Rulemaking.

**SUMMARY:** The United States Nuclear Regulatory Commission is conducting a generic proceeding to reassess its degree of confidence that radioactive wastes produced by nuclear facilities will be

safely disposed of, to determine when any such disposal will be available, and whether such wastes can be safely stored until they are safely disposed of. This rulemaking has been initiated in response to the decision of the United States Court of Appeals for the District of Columbia Circuit in *State of Minnesota v. NRC*, Nos. 78-1269 and 78-2032 (May 23, 1979), but it also is a continuation of previous proceedings conducted by the Commission in this area. 42 FR 34391 (July 5, 1977).

This notice describes the procedures the Commission will employ to conduct that proceeding and how members of the public can participate. If the Commission finds from this proceeding reasonable assurance that radioactive wastes from nuclear facilities will be safely stored or disposed of off-site prior to the expiration of the license for the facility, it will promulgate a rule providing that the safety and environmental implications of radioactive waste remaining on site after the anticipated expiration of the facility licenses involved need not be considered in individual facility licensing proceedings. In the event the Commission determines that on-site storage after license expiration may be necessary or appropriate, it will issue a proposed rule providing how that question will be addressed.

**DATES:** Notices of intent to participate must be filed by November 26, 1979. Other deadlines are described below.

**ADDRESS:** Send comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch. All filings will be available for public inspection in the Commission's Public Document Room at 1717 H. Street, N.W., Washington, D.C.

**FOR FURTHER INFORMATION CONTACT:** Stephen S. Ostrach, Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. (202) 634-3224.

**SUPPLEMENTARY INFORMATION:**

**Background**

On May 23, 1979 the United States Court of Appeals for the District of Columbia Circuit remanded two licensing actions to the Commission to consider whether an off-site storage solution for nuclear wastes will be available by the years 2007-09, the expiration dates of the licenses of the Vermont Yankee and Prairie Island nuclear plants to which the Commission had granted permits to increase the on-site waste storage facilities, and, if not, whether that waste can be stored at the

sites past those dates and until an off-site solution is available. In response to the D.C. Circuit's decision the Commission has decided to undertake a generic reconsideration of the radioactive waste question so that it can: (1) reassess its confidence that safe off-site disposal of radioactive waste from licensed facilities will be available; (2) determine when any such disposal or off-site storage will be available; and (3) if disposal or off-site storage will not be available until after the expiration of the licenses of certain nuclear facilities, determine whether the wastes generated by those facilities can be safely stored on-site until such disposal is available. Previously, in connection with a petition for rulemaking filed by the Natural Resources Defense Council the Commission considered the related question of the likelihood that waste disposal will be accomplished safely, and at that time it found reasonable assurance that methods of safe permanent disposal of high-level waste would be available when they were needed. 42 FR 34391, 34393 (July 5, 1977), *pet. for rev. dismissed sub nom. NRDC v. NRC*, 582 F.2d 166 (2nd Cir. 1978). However, in denying the NRDC petition, the Commission announced its intent to reassess this finding periodically. This new proceeding will offer an opportunity for the Commission to reassess its earlier finding, to obtain wider public participation in its decision and also to take account of new data and recent developments in the federal waste management plan, most notably the Report to the President by the Interagency Review Group on Waste Management, TID-29442 (March, 1979) (the "IRG Report").

**Purpose of Proceeding**

The purpose of this proceeding is solely to assess generically the degree of assurance now available that radioactive waste can be safely disposed of, to determine when such disposal or off-site storage will be available, and to determine whether radioactive wastes can be safely stored on-site past the expiration of existing facility licenses until off-site disposal or storage is available. In addition to information submitted by public participants and government agencies, this proceeding will draw upon the record compiled in the Commission's recently concluded rulemaking on the environmental impacts of the nuclear fuel cycle (44 FR 45362-74 (August 2, 1979)), and the record compiled herein will be available for use in the general fuel cycle rule update discussed in that rulemaking. However, this proceeding is not designed to reach quantitative

conclusions about waste repository impacts or performance. The Commission will consider economic issues in this proceeding in the same fashion such issues were considered in the recent fuel cycle rulemaking: namely, a waste disposal model will not be considered realistically available if it would be prohibitively expensive to build and operate such a proposed facility. Cf. 44 FR at 45367.

During this proceeding the safety implications and environmental impacts of radioactive waste storage on-site for the duration of a license will continue to be subjects for adjudication in individual facility licensing proceedings. The Commission has decided, however, that during this proceeding the issues being considered in the rulemaking should not be addressed in individual licensing proceedings. These issues are most appropriately addressed in a generic proceeding of the character here envisaged. Furthermore, the court in the *State of Minnesota* case by remanding this matter to the Commission but not vacating or revoking the facility licenses involved, has supported the Commission's conclusion that licensing practices need not be altered during this proceeding. However, licensing proceedings now underway will be subject to whatever final determinations are reached in this proceeding.

If the Commission finds reasonable assurance that safe, off-site disposal for radioactive wastes from licensed facilities will be available prior to expiration of the facilities' licenses, it will promulgate a final rule providing that the environmental and safety implications of continued on-site storage after the termination of licenses need not be considered in individual licensing proceedings. In the event the Commission determines that on-site storage after license expiration may be necessary or appropriate, it will issue a proposed rule providing how that question will be addressed.

**Procedures**

The Commission has chosen to employ hybrid rulemaking procedures for conducting this proceeding. Within thirty days after publication of this notice members of the public may file a notice of intent to participate as a "full participant" in the further stages of the proceeding discussed below. The notice of intent should set forth the person's or group's identity, technical or other qualifications to participate, tentative positions on the issues to be considered, and a discussion of any special matters or concerns sought to be raised. Furthermore, at that time those members of the public who do not wish to be full



participants but who wish to file comments on the issues addressed in this rulemaking should file their comments.

The individuals or groups who have chosen to participate as full participants shall be supervised by a "presiding officer" to be named by the Commission at a later date. That officer's principal responsibility will be to monitor the early stages of the proceeding for the Commission, and to assist the Commission in conducting the later portions. To those ends he or she will have authority to order consolidation of individuals or groups in the same fashion provided in 10 CFR 2.715a. The presiding officer may take appropriate action to avoid delay, including, if necessary, holding pre-hearing conferences or certifying matters to the Commission.

The Commission's staff will compile a full bibliography on the subjects relevant to the proceeding which will be made available to the public at an early stage of this proceeding. In addition to that bibliography the Commission will maintain a publicly available data bank which will include relevant information on waste storage and disposal. The data bank will include the IRG Report, the background material the IRG collected in preparing the report, the Generic Environmental Impact Statement on Waste Management being prepared by the Department of Energy, and a collection of other principal works that the Commission staff will compile on the subject of radioactive waste storage and disposal. Furthermore, the Commission will solicit the views of a number of federal agencies on the questions involved in this proceeding and on the conclusions of the IRG Report and make the responses of those agencies available in the data bank so that the participants can address them in their papers. The Commission expects that full participants will voluntarily make relevant documents in their possession available to other full participants to the extent practical and will reference and produce on request the documents on which they rely.

The Commission is considering whether additional procedures should be employed. One proposal is to strictly control inter-participant discovery and to provide that requests for interrogatories, depositions or other formal discovery will not be entertained unless the Commission finds compelling justification therefor. If this proposal were adopted, the Commission expects that there would be at most only a few exceptional circumstances in which such justification could be

demonstrated. An alternative proposal which is also under consideration would be to apply to this proceeding the discovery procedures set forth in 10 CFR Part 2 and to have any discovery supervised by the presiding officer. Participants or other members of the public who wish to express views on this matter should file those views with their notices of intent or comments which are due November 26, 1979. In particular participants should discuss whether imposition of the discovery provisions of Part 2 or their absence would be likely to alter their willingness to participate in this rulemaking or to affect the quality of their contribution to the record. The presiding officer will then summarize the views expressed and present his or her recommendations to the Commission. The Commission will issue a prompt decision on this matter so that the participants' preparation of their statements will not be adversely affected by uncertainty as to the extent of data that may be available to them.

Approximately 30 days after the notices of intent are filed, the officer will issue a prehearing order resolving all preliminary issues including consolidation. Following the prehearing order the participants will have approximately 60 additional days (the exact time to be set in the prehearing order) to prepare and file their statements of position. The statements will be the participants' principal contribution to the waste confidence proceeding, and participants should focus their preparation on them. The statements should set forth the participants' views on the issues discussed above, and on the underlying assumptions and scenarios, both technical and institutional, upon which those views are based. After the statements are filed, the participants will be given approximately 60 days (to be set by the order) to prepare cross-statements discussing statements filed by other participants. The cross-statements should be limited to material discussed in the statements and should not be used to introduce new material.

After the statements and cross-statements have been received, the Commission with the assistance of the presiding officer will issue a second prehearing order. This order will set out the procedures to be followed for the remainder of the hearing and may provide for further written submissions from the full participants, or for the scheduling of an oral hearing. If the Commission desires oral presentations, the participants may be further consolidated to ensure that the oral

presentations will be efficient and useful. Unless different procedures are set out in the second prehearing order, the hearing will begin with delivery of prepared statements from the representatives, both technical and legal, of the groups into which the participants have been consolidated. These statements should succinctly summarize the participants' views previously set forth in their statements and cross-statements. Participants should ensure that their representatives will be able to address the merits of the legal, technical and institutional issues that have been raised in this proceeding. After the prepared remarks the speakers will be questioned by the members of the Commission. Furthermore, other participants will be given the opportunity to submit written questions to the Commission for it, in its discretion, to ask of participants.

The Commission reserves the option of providing a final stage at which representatives of the participants may be cross-examined by other participants. The Commission will defer deciding whether to permit any cross-examination until after the hearing is over. To obtain cross-examination a participant will be required to identify the issue or issues as to which cross-examination is sought, and the representative or participant involved, and to demonstrate that cross-examination is necessary to prepare a record adequate for a sound decision.

Based on the material received in this proceeding and on any other relevant information properly available to it, the Commission will publish a proposed or final rule in the *Federal Register*. Any such final rule will be effective thirty days after publication.

Comments, notices of intent to participate and any other documents filed in this proceeding should be filed by serving a copy on the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555, Attention: Docketing and Service Branch. All filings will be available for public inspection in the Commission's Public Document Room at 1717 H Street NW., Washington, D.C.

Dated: October 18, 1979.

For the Commission, —

Samuel J. Chilk,

Secretary of the Commission.

BILLING CODE 7590-01-M

COMPARISON OF ESTIMATED SCHEDULE FOR RULEMAKING TO ASSESS COMMISSION CONFIDENCE WITH SCHEDULE FOR S-3 AND ACCESS RULE PROCEEDING

FEDERAL REGISTER NOTICE

	Public Comments and Notices of Intent	First Pre-hearing Conference Order	Statements of Position	Cross Statements	Second Prehearing Order and Preparation for Hearing	Hearing	Review Record and Write Rule	Rule effective
<b>WASTE CONFIDENCE PROCEEDING</b>	30 days	30 days	60 days	60 days	90 days	10 days	180 days	30-60 days
<b>S-3</b>	Prehearing Activities 83 days	Prepare Testimony 48 days	Written Questions 31 days	Responses Questions 76 days	Cross-ex requests Completion of record 86 days	Hearing 74 days (10 actual hearing days)	Review of record Preparation of decision 120 days	
<b>CLEARANCE ACCESS RULE</b>	Prehearing Activities 120 days	Prepare Testimony, Questions, Responses 74 days	Hearing 2 days	Cross-ex Requests Completion of Record 70 days	Review of Record Preparation of Decision 160 days			

(FR Doc. 79-32000 Filed 10-24-79; 8:45 am)  
BILLING CODE 7560-01-C



## 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 March 3, 1980.

**ADDRESS:** Written comments or suggestions on the proposed rule should be sent to the 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.

**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.

#### SUPPLEMENTARY 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 storage<sup>1</sup> 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, 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 (Pub. L. 95-601).<sup>2</sup>

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 NRC 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 tailored specifically 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

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

<sup>2</sup> Section 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 sites whenever the Commission has knowledge of such proposal.

of a 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 characterization<sup>3</sup> 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 rule also provides 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 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.

<sup>3</sup> Note.—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.

### 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 preapplication 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 characterization report assures an early opportunity for other Federal and State agencies and the public to become involved in the decision making 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 Pub. 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 Part 2 Subpart F) 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.<sup>4</sup>

### 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

<sup>4</sup>The 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.



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.<sup>5</sup>

#### 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

<sup>5</sup>Report of the Interagency Review Group on Nuclear Waste Management, March 1979.



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. Moreover, 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.\* 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

\*Note.—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.

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 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.<sup>7</sup> 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 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

<sup>7</sup>To 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.

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.\* Additional geologic and hydrologic data acquired during the emplacement period as well as the results of test and 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.

\*Unless 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.)

### 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 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 conformation amendments to 10 CFR Parts 2, 19, 20, 21, 30, 40, 51 and 70 is contemplated.<sup>9</sup> 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 March 3, 1980.

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

## PART 2—RULES OF PRACTICE

1. 10 CFR 2.101 is amended to add a new paragraph (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.

(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 the 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 revised 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 revised 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 renumbering existing subparagraphs (3) and (4) as (4) and (5), by adding a new subparagraph and revising 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:

<sup>9</sup> Amendments to 10 CFR Part 51 were published as a proposed rule on October 25, 1979 (44 FR 61372). 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.



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

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

(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 paragraph (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 [Amended]**

7. 10 CFR 19.2 is amended by adding "60," following "30, 40,".

**§ 19.3 [Amended]**

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

**PART 20—STANDARDS FOR PROTECTION AGAINST RADIATION**

**§ 20.2 [Amended]**

9. 10 CFR 20.2 is amended by adding "60," following "30, 40,".

**§ 20.3 [Amended]**

10. 10 CFR 20.3(a)(9) is amended by adding "60," following "35, 40,".

**§ 20.301 [Amended]**

11. 10 CFR 20.301(a) is amended by adding "60," following "35, 40,".

12. 10 CFR 20.408(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:

**§ 20.408 Reports of personnel monitoring on termination of employment or work.**

(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**

**§ 21.2 [Amended]**

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

**§ 21.3 [Amended]**

14. 10 CFR Part 21, § 21.3(a), 21.3(a-1)(1), 21.3(a-1)(2), and 21.3(k) are amended by adding "60," after "40, 50,".

**§ 21.21 [Amended]**

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

**PART 30—RULES OF GENERAL APPLICABILITY TO LICENSING OF BYPRODUCT MATERIAL**

16. 10 CFR 30.11 is amended by adding a new paragraph (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—DOMESTIC LICENSING OF SOURCE MATERIAL**

17. 10 CFR 40.14 is amended by adding a new paragraph (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 new paragraphs (10) and (11), and renumbering present paragraph (10) as 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 actions:

(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.

(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); substituting "(b)(4)(iv)" for "(b)(4)(iii)" in paragraph (5); inserting "60," following "40, 50," in paragraph (6); and adding a new paragraph (9). With these changes, 10 CFR 51.5(b)(4) reads in part as follows:

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

(b) \* \* \*

(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)-(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**

(a) Except as provided in paragraphs (b), (c), and (d) of this section, \* \* \*

(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 revised 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 or 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—DOMESTIC LICENSING OF SPECIAL NUCLEAR MATERIAL**

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

\*To 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.

**§ 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****Sec.**

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

**Subpart B—Licenses****Preapplication Review**

- 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 Issuance and Amendment**

- 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 License 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 Inspections**

- 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)).

**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 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 values.

(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 an 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 the 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.

(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.

#### § 60.3 License required.

(a) The Department shall not receive or possess source, special nuclear, or byproduct material at a geologic repository operations area except as

\*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."

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.

#### § 60.4. 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 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 (1) A description of the site(s) to be characterized; (2) 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; (3) the criteria used to arrive at candidate areas; (4) the method by which the site(s) was selected for site characterization; (5) 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; (6) 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 (7) 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 semiannual 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) of this section shall be placed in the Public Document Room.

(i) The activities described in paragraphs (a) through (h) of this section

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) of this section, 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 assurance of the initial construction authorization, to the extent applicable.

#### License Issuance and Amendment

##### § 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 specifications.

(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 prepare 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. The Department shall furnish the report to 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. 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 License amendment to decommissioning.

(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.

#### § 60.83 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, and Inspections

##### § 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 3rd day of December, 1979.

For the U.S. Nuclear Regulatory Commission.

John C. Hoyle,

*Assistant Secretary of the Commission.*

[FR Doc. 79-37569 Filed 12-5-79; 8:45 am]

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## NUCLEAR REGULATORY COMMISSION

### 10 CFR Part 51

#### Licensing and Regulatory Policy and Procedures for Environmental Protection; Alternative Site Reviews

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Proposed rule.

**SUMMARY:** The Nuclear Regulatory Commission is proposing to amend its regulation in 10 CFR Part 51 to provide procedures and performance criteria for the review of alternative sites for nuclear power plants under the National Environmental Policy Act of 1969 (NEPA). The proposed rule provides for (a) information requirements for applying for an alternative site review by the Commission, (b) timing of Commission review, (c) region of interest to be considered in selecting sites, (d) criteria for the selection of sites, (e) criteria for comparing a proposed site with alternative sites, and (f) requirements for reopening an alternative site decision. It is also proposed that minor amendments be made to 10 CFR Part 2 and 10 CFR Part 50 to reflect the provisions of the proposed rule. Public comment is requested on the proposed rule, on whether safety matters including emergency response capability should be admitted as issues in alternative site reviews, and on the value/impact statement supporting the proposed rule.

**DATES:** Comments are due on or before June 9, 1980.

**ADDRESSES:** Interested persons are invited to submit written comments and suggestions to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch. Single copies of the value/

impact statement may be obtained on request from the Director, Division of Technical Information and Document Control. Copies of the value/impact statement may be examined in the Commission's Public Document Room at 1717 H Street NW., Washington, D.C.

**FOR FURTHER INFORMATION CONTACT:** Dr. Jerry R. Kline, Environmental Engineering Branch, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 492-8251.

#### SUPPLEMENTARY INFORMATION:

##### I. Foreword

NEPA and NRC's environmental regulations in 10 CFR Part 51 have many provisions that shape the NRC's environmental reviews for nuclear power plants, but the basic underlying aspect is the consideration of alternatives. There are four distinct and different areas of NRC decisionmaking that involve alternatives, as described below:

1. One decision that must be made is whether additional baseload generating capacity need be provided. In other words, NRC considered the "no action" alternative, which includes consideration of conservation of energy.
2. A second decision that must be made by the NRC is whether nuclear fueled generation is an acceptable choice or whether other types of energy sources, e.g., coal, are superior.
3. A third NRC decision is whether the proposed site is acceptable. This particular decision involves the consideration of alternative sites; consideration of reasonable major mitigation measures that might be employed to make environmental impact acceptable at the candidate sites, such as the type of cooling system that should be employed at a particular site; and consideration of the costs of such major mitigation measures, as well as any major costs that might be required to make the site acceptable from a safety standpoint.
4. A fourth type of decision that is made involves whether other types of mitigation measures are warranted that normally would be of little importance to site selection, but may still be important from the standpoint of minimizing, to the extent reasonable, any residual adverse environmental impact that likely might be incurred during the construction or operation of the plant.

The proposed rulemaking focuses on the third type of NRC's environmental decisions—i.e., the question of alternative sites.

The NRC has considered the question of alternative sites in all of its NEPA reviews of applications to construct and operate nuclear power plants. As in most situations, however, the type and nature of the review has evolved over the years. Until recently, the NRC's review of the alternative site question has focused primarily on the qualities of the proposed site; i.e., a review that focuses on the "products" of an applicant's site selection process. The NRC typically did not initiate an extensive review of the applicant's site selection process and alternative site unless substantial inferior qualities were identified at the applicant's proposed site. However, the NRC has recently and dramatically expanded its review of the applicant's site selection process and procedures, as well as its review of the scope and depth of the detailed investigation of alternative sites.

The NRC believes that the experience gained in past and recent reviews of nuclear power plant sites should permit codification of the lessons learned into an intelligible, intelligent, and environmentally sensitive rule that governs the NRC review of alternative sites. While it is true that many of the issues that would be addressed by a rule on alternative site reviews could also be addressed more informally by issuance of regulatory guides and standard review plans and litigated in individual cases, some issues, particularly issues relating to notice and timing of public participation, can only be adequately addressed by rule. In addition, a comprehensive rule addressing review of alternative sites will promote public understanding of and participation in the NRC review of alternative sites. The proposed rule would:

1. Provide for more effective public participation by implementing procedural changes that: (a) require early notification of the public of an applicant's choice of a proposed site and its alternatives; (b) permit an early review of the alternative site question apart from other early site review issues; and (c) provide explicitly for consideration of candidate sites proposed by other parties that meet certain criteria and are proposed in a timely fashion.
2. Provide for greater predictability in the licensing process by (a) prescribing criteria for determining when a region of interest of sufficient size has been considered; (b) prescribing criteria for judging whether candidate sites are among the best that could reasonably be found; (c) prescribing the basic standards for comparing the proposed site to the alternative sites; and (d)



providing criteria for reopening the alternative site question after a previous NRC decision has been rendered on this subject.

The basic forces motivating the development of the proposed rulemaking are:

1. The necessity to protect the environment from unduly adverse environmental impacts, recognizing that the siting of a large, nuclear generating facility will result in some adverse impact regardless of where it is sited. Unduly adverse environmental impacts are an undesirable cost to society.

2. The realization that (a) reasonable bounds may be placed on the search for alternative sites without compromising environmental protection, and (b) the NRC's informational needs require the applicant to make a significant commitment of resources at the proposed site. As a general matter these costs are ultimately borne by the ratepayer and the taxpayer.

3. The fact that it is in the public interest to attempt to develop written, understandable NRC review and decisional criteria that provide for the necessary protection of important environmental qualities; i.e., criteria that are sensitive to the factors that would significantly and adversely impact the environment, yet still reasonably bound the consideration of alternatives to permit a rational and timely decision about the sufficiency of analysis.

Considering the above points, it should be noted that the proposed rule is environmentally based, but it does provide for other considerations (such as cost) to bound in a reasonable manner the search for candidate sites. The NRC fully realizes that an applicant does consider other factors in its site selection process. These factors are important to the applicant because they affect the economics and technical merits of the project and because many of these parameters affect reactor safety and thus must be reviewed and found acceptable by the NRC during the safety review process. The NRC sees no basic incompatibility between the environmentally-based rule proposed here and the fact that the applicant must realistically consider other, equally important, parameters in its formulation of a reasonable and effective site selection process. Also, it should be noted that the proposed rule (Section VI.2.b.(7)) includes threshold population criteria that are the same as the numerical values for population density contained in Regulatory Guide 4.7, "General Site Suitability Criteria for Nuclear Power Stations." This is reflective of past staff practice. However, these criteria may be changed

in accordance with an ongoing Commission review of siting policy which will be the subject of an advance notice of rulemaking in the immediate future.

To assist in the Commission's consideration of this question on population and related questions and as part of this proposed rulemaking on alternative sites, public comment is requested at this time on whether safety issues, including emergency response capability, should be admitted in the review and decisionmaking on alternative sites; and if so, how. At least two alternatives exist with regard to this question:

1. Establish, in a public rulemaking, exclusionary safety standards that must be met in order to have an acceptable site. Safety issues would not be considered in subsequent review of alternative sites, since such standards would be set sufficiently conservative that the residual radiological risk to the environment would be small and would be sufficiently similar to the residual risk at other reasonable sites in the region that an obviously superior alternative would likely not exist; i.e., these differences in residual radiological impacts would not weigh heavily in a NEPA-type cost-benefit balance. Such acceptance standards might include, for example, reasonable limits on population density, distances to towns and cities, distances to airports and other manmade hazards, and distances to capable faults.

2. Establish, in a public rulemaking, exclusionary safety standards that must be met, but also provide for inclusion of these safety issues in the consideration of alternative sites even when the sites meet these criteria. Such criteria may or may not be the same numerically as those addressed in 1 above. The rationale of this alternative rests on the view that even when a safety-related characteristic (e.g., population density) does not render a site unacceptable in any absolute sense, it may nevertheless involve sufficient residual risk to justify attempts to do better. The alternative sites evaluation process is suited to a determination of how well one can reasonably do in the particular area under consideration, since the process would illuminate specific alternatives. As an option, a second set of more conservative criteria might also be established which, if met, would not require that safety issue to be included in the consideration of alternative sites.

With respect to population density, alternative 1 above would seek to obtain a similar result as alternative 2, i.e., acceptance thresholds, set in light of population density and distribution.

The NRC realizes that implementation will not, and should not, remove the controversy over the question of alternative sites. The question rightfully is a controversial one that elicits high public interest. The purpose of the rule is not to eliminate this controversy, but to focus it on factors of critical importance to the protection of the environment.

## II. Background

NEPA requires the study and development of alternatives to any major Federal action that would significantly affect the quality of the human environment. The procedure for doing this must be an integral part of the planning and decisionmaking processes of Federal agencies. 10 CFR Part 51 establishes the NRC's licensing and regulatory policy and procedures under NEPA and requires that each applicant for a permit to construct a nuclear power plant discuss in an Environmental Report "Appropriate Alternatives" to the proposed facility. Among the primary alternatives to be considered, once the need for a nuclear facility has been established, are alternative sites for the facility.

The assessment of alternative sites for proposed nuclear power plants is a complex and difficult task, for the applicant, the NRC staff, and all parties in the process. Issues related to alternative siting have been a major source of controversy in a number of cases involving construction permits for nuclear power plants. The NRC has observed that there are some recurring issues at the heart of the controversy. The Commission believes that these recurring issues can and should be resolved on a generic basis.

An NRC study group seeking to identify ways to improve the effectiveness of NRC nuclear power plant licensing procedures recommended in June 1977 (see NUREG-0292, "Nuclear Power Plant Licensing: Opportunities for Improvement") that, among other measures, rulemaking should be considered for the generic resolution of certain issues presently litigated in individual licensing proceedings. An interim policy statement on generic rulemaking was published in the Federal Register on December 14, 1978, with a 90-day period for public comment ending on March 12, 1979. Additional technical detail on the ten issues identified by the staff for possible rulemaking was provided in NUREG-0499, "Preliminary Statement on General Policy for Rulemaking to Improve Nuclear Power Plant Licensing."

One of the ten issues proposed by the staff for consideration in generic rulemaking was alternative siting methodology and information requirements. Recognizing the need for further clarification of this issue, the staff issued Supplement No. 1 to NUREG-0499, a staff report entitled "General Considerations and Issues of Significance on the Evaluation of Alternative Sites for Nuclear Generating Stations Under NEPA." The major purpose of the report was to provide additional information to members of the public, industry, and other governmental agencies who intended to comment by March 12, 1979, on issues of alternative siting.

In addition, the NRC conducted a workshop to actively seek out comments on the alternative sites issue. This workshop provided invited representatives from industry, State and Federal government, public interest groups, and others the opportunity to scrutinize and comment on the NRC staff's most recent thinking on the issue of alternative sites.

Comments and feedback received from the workshop participants and observers, and those received from the public review of Supplement 1 to NUREG-0499, have been considered in the development of the proposed rule on alternative sites.

This proposed rule sets forth the resultant NRC policy regarding the evaluation of alternative sites for nuclear power plants under NEPA. The proposed rule is intended to (1) fulfill the NEPA objectives of ensuring that environmental factors have been fully considered in NRC decisionmaking; (2) reduce uncertainty and delay in the decisionmaking process; (3) reduce Federal paperwork in NEPA statements; and (4) limit alternative site review to relevant and material issues. The basic objective of this rule is to provide for a meaningful, rationale, understandable, and stable NRC review and decisionmaking process that will both reasonably protect environmental values and yield a timely decision.

The intent of this proposed rule is to establish procedural and performance criteria for the identification and evaluation of alternative sites for nuclear power plants. Controversy with regard to the issue of alternative sites will not and should not be eliminated. This proposed rule will, however, focus the controversy on whether criteria important to environmental protection have indeed been met.

The NRC has considered the values and impacts of rulemaking and of alternative actions. These considerations have been put forth by

the Commission's staff in a value/impact statement.

### III. The Role of NRC and Others in the Considerations of Alternative Sites

The NRC has the statutory responsibility to review applications for the construction and operation of nuclear power plants. It must assure the accuracy and relevance of environmental information, perform the environmental analyses, and make the decision to accept or reject a site. In carrying out its responsibilities, the NRC does not select sites or participate with the applicant in selecting a proposed site. However, the NRC is the lead Federal agency under NEPA for carrying out the NEPA mandate that alternative sites be considered in connection with nuclear power plant licensing.

The NRC may give appropriate deference to other Federal agency expertise in the assessment of certain impact, e.g., U.S. Environmental Protection Agency expertise in evaluating aquatic impacts. The Commission has also stated that "the fact that competent and responsible State authority has approved the environmental acceptability of a site or project after extensive and thorough environmentally sensitive hearings is properly entitled to 'substantial weight' in the conduct of our own NEPA analysis." Public Service Company of New Hampshire, et al. (Seabrook Station, Units 1 & 2), 5 NRC 503 at 527 (1977). Additionally, consideration is given to other information developed by State, regional, and local agencies (such as land or water use plans).

The proposed rulemaking represents no change in the above stated present practice.

### IV. The Proposed Rule

A rule must address those elements of the alternative siting process that are generic in nature and likely to recur in all or many of the cases likely to be encountered. In formulating the proposed rule, the staff identified six major issues associated with alternative site consideration. These are (1) information requirements, (2) timing, (3) region of interest, (4) selection of candidate sites, (5) comparison of the proposed site with the alternative sites, and (6) reopening of the alternative sites decision.

The following sections provide a statement of each element of the proposed rule, describe its relation to present practice, and discuss the need for the rule and rationale for each element of the rule. The elements of the rule are organized to reflect the logic and chronology of a normal NRC review

of alternative sites in response to an actual submittal for such a review.

#### A. Information Requirements

##### A-1. Notice of Intent

1. *Statement of Rule.* An applicant is to provide the NRC staff with a notice of intent to tender an application for a construction permit (CP) for a nuclear power plant either at least three months before tendering of a CP application requesting an early review of the alternative sites issue (pursuant to § 2.101 and subpart F of 10 CFR Part 2) or 3 months prior to beginning the detailed studies on the proposed site, whichever comes first. The notice of intent will identify the location, cooling water sources, and physiographic unit of the proposed and alternative sites, as well as describe the anticipated generating capacity, the number of generating units, and the types of condenser cooling systems that would be used.

2. *Relationship to Present Practice.* Present NRC rules do not require submittal of such a notice, and present practice does not yield the information on cooling systems or alternative sites at the times specified.

3. *Need for Action.* Early public notification is needed to allow the public to become aware of the project, to identify their concerns and to express those concerns in advance of significant financial commitments by the applicant and at a time when due consideration of their concerns would not result in unacceptable schedule delays.

4. *Rationale and Discussion.* After receiving a notice of intent as required by the rule, NRC would publish the information received in the *Federal Register* and in newspapers local to the sites identified. This would assure that potential public participants have sufficient time prior to the NRC review to prepare meaningful information to be considered early in the licensing process. This provision is in direct response to a recommendation from several workshop participants.

For situations where, on the effective date of this rule, a future applicant has already begun or is about to begin detailed, long-term investigations on a site likely to be proposed subsequently to the NRC as a site for a nuclear power plant, such a future applicant must provide a notice of intent within three months following the effective date of this rule.

##### A.2. Reconnaissance Level Information

1. *Statement of Rule.* Reconnaissance level information, i.e., information or analyses that can be retrieved or



generated without the performance of new, comprehensive site specific investigations, is normally adequate as a basis for identifying candidate sites and for selecting a proposed site.

Analysis of the slate of candidate sites may address other aspects of siting that are important to the applicant's decision, but must address the following subjects that are important to the NEPA reviews: hydrology, water quality and availability, aquatic and terrestrial biological resources, land use, transmission requirements, socioeconomic, population distribution and density, facility costs, institutional constraints, and public concerns where such have been provided to the applicant or NRC in writing.

#### 2. Relationship to Present Practice.

Present practice is that the analysis of alternative sites is normally based upon readily available, reconnaissance level information such as provided by scientific literature, reports of government and private research agencies, consultation with experts, and brief field investigations. The scope of depth of the data and analysis required are matched to the importance of possible impacts and the degree of certainty regarding their magnitude. In some cases, detailed investigations related to specific issues may be required.

While detailed site-specific baseline studies on the proposed site are required to support the remainder of the NRC's environmental review, these data normally add little to NRC's determinations regarding alternative sites. These detailed studies principally serve as a basis for decision-making regarding mitigative measures to reduce (on a practicable basis) any residual adverse environmental impacts. However, they also serve a secondary purpose in that they confirm judgments on likely adverse environmental impacts that are made using reconnaissance level data. On occasion these studies may not confirm such judgments, but may lead to a finding that the proposed site is unacceptable.

The proposed rule on reconnaissance level information represents no change in the above stated practice.

3. *Need for Action.* Present practice is sufficiently well established through licensing experience to permit rulemaking on information requirements for alternative site analysis.

4. *Rationale and Discussion.* The rationale for the rule on reconnaissance level information proceeds from the premise that major adverse environmental impacts can normally be identified using this type of information. Therefore, the added costs of requiring

detailed site-specific investigations and analyses on all candidate sites normally would not be justified with respect to any marginal improvement in environmental protection. There was substantial discussion during the workshop on the applicability of reconnaissance level information to alternative site analyses. Many workshop participants emphasized that the term "reconnaissance level information" should not be interpreted to mean the reliance on limited data and subsequent superficial analyses. Such an interpretation is not intended, thus the proposed rule has been drafted to ensure that this misinterpretation will not occur.

#### B. Timing

1. *Statement of Rule.* Under the proposed rule an applicant may submit the proposed and alternative sites for NRC evaluation as part of a full construction permit review either early and separate from the review of plant design (an early site review) or in conjunction with the review of plant design. An early site review (ESR) of alternative sites may be in conjunction with or separate from consideration of other ESR issues. The applicant may later submit other siting issues for an early site review during the effective period of the early alternative sites partial decision.

2. *Relationship to Present Practice.* In the past, the NRC's review of alternative sites has generally occurred concurrently with the review of all other environmental issues and at the same time as the CP safety review of facility design. However, NRC regulations do provide for a single optional early site review, which may include any issues involving environmental impact or site safety that the applicant desires to address at a proposed site. While the applicant must describe the site selection process in an early site review, the review of specific alternative sites need not be addressed unless it is believed by the NRC that the consideration of other issues could prejudice the full consideration of alternative sites at a later time.

The proposed rule on timing represents a change in the above stated practice in that early review of the full question of alternative sites would be permitted in advance of the other early site review issues, and a subsequent early review would be allowed to consider the detailed baseline studies at the proposed site.

3. *Need for Action.* The option for early review of alternative sites is needed to permit a full consideration before the applicant commits substantial

resources to the proposed site. If a favorable decision is made on the alternative site question, the applicant could then commit the funds necessary to perform early site-specific studies of environmental and safety matters with a greater degree of confidence that the proposed site will not subsequently be rejected in favor of an alternative.

4. *Rationale and Discussion.* A two-stage early site review process is permitted to provide incentive for an early review of the alternative site question. In this way an early decision could be arrived at on alternative sites, after which the applicant could expend the necessary resources for detailed site-specific studies and apply at a later date for the remainder of a full early site review. Thus, less so, the applicant's resources would be placed at risk prior to an NRC decision on alternative sites, and yet the applicant and the public would ultimately be able to achieve all of the ultimate benefits of an early site review.

All reviews and decisions would still be performed within the effective period for the early site review decision. All that would be added would be the opportunity to receive a regulatory decision on the question of alternative sites shortly after the applicant has decided upon the proposed site, but prior to the commitment of substantial funds at that proposed site.

#### C. Region of Interest

1. *Statement of Rule.* The initial geographic area for determining the region of interest for NRC regulatory review purposes may be either the State in which the proposed site is located or the service areas of the applicant. The actual region of interest must be larger in accordance with Section V.3 of the rule, or may be smaller in accordance with Section V.2 of the rule depending on the environmental diversity, institutional factors, and cost considerations set forth in those sections.

For the purpose of determining the region of interest, environmental diversity refers to the types of water bodies available within the region (upper or lower reaches of large rivers, small rivers, lakes, bays, and oceans) and the associated physiographic units.

2. *Relationship to Present Practice.* Past practice has normally been to accept the applicant's proposed region of interest which commonly is the applicant's service areas. However, the region of interest has been smaller in some situations, and in other situations an expansion of the proposed region of interest has been required. This rule preserves that practice, but it adds



specific criteria for expansion or contraction of the initial geographic area in determining the region of interest.

3. *Need for Action.* The basic forces motivating the development of this rule are:

a. The necessity to protect the environment from unduly adverse environmental impacts by providing an adequate choice of candidate sites representing reasonable environmental alternatives, and

b. The realization that reasonable bounds may be placed on the search for alternative sites without compromising environmental protection.

4. *Rationale and Discussion.* The use of service areas coupled with performance criteria for expansion or contraction is judged to be sufficient to provide a substantial range of environmental alternatives from which to choose in making the final siting decision. Unlimited expansion of the areas to be searched likely would not yield significant additional new alternatives for limiting of environmental impacts that would already be present in a reasonably bounded area. As a practical matter, utilities may initiate their searches within their service areas. In many cases this will lead to the identification of the required diversity of resources. Where service areas are small, the requirement could cause an expansion that would extend the region of interest beyond the service area boundaries. However, in very large service areas, the required diversity might be found without exploring the entire service area.

The requirements may impose a need for large regions of interest in water limited areas, particularly in the western regions of the nation. The rule is intended to ensure in all cases that all reasonable alternatives have been considered. The analysis of remote alternatives need be carried only as far as necessary to demonstrate the reasons (which include costs) for not considering them further.

The rule is intended to apply to utilities having well defined service areas as well as those that do not. In situations where the State is asking the review of the alternative sites issue or where the service areas of the applicant are not defined, the State in which the proposed site is located would be the starting point for determining the region of interest.

When considering water sources that would provide adequate water availability, the staff intends that the characteristics of the terrestrial watershed (i.e., the physiographic characteristics) also be included and

considered. Under this concept, a river having adequate water for a nuclear power plant but that flows through a dedicated terrestrial area such as a national park or national forest might not qualify as an acceptable resource. It is permissible, however, to designate portions of a watershed for possible siting while excluding other portions of the same watershed.

Different portions of a watershed or coastal zone may be considered to be different physiographic units, if the environmental impacts of siting in these areas would be clearly different from one another. For example, the "head waters" region of a river watershed would be designated as a physiographic unit separate from the estuarine region of the same watershed, since the impacts on fisheries and other aspects of the environment would be clearly different in the two areas. The rule is not intended to compel the consideration of water bodies that are in similar physiographic settings, since that would not add significantly to the range of environmental choice.

In emphasizing the terrestrial components the staff intends that the search for sites should not be confined to land areas immediately adjacent to water bodies but should be expanded to include a reasonable corridor of search around the water body. Siting up to several miles from a suitable water body may be desirable to avoid land use conflicts that are often found adjacent to water bodies.

The workshop participants unanimously supported the concepts of (1) environmental diversity as a determinant in bounding the region of interest, and (2) water being the principal regional determinant of environmental diversity.

#### D. Selection of Candidate Sites

1. *Statement of Rule.* An applicant may submit a slate of candidate sites based on either (1) a demonstration (according to criteria for site selection procedures set forth in the rule) that the site selection methodology is a reasonable, environmentally sensitive site screening process that provides a diligent search for sites that are among the best that could reasonably be found, or (2) a demonstration that the slate of candidate sites meets the prescribed environmentally sensitive threshold criteria (set forth in the rule) and are therefore among the best that could reasonably be found. The rule states that a slate of candidate sites should contain at least four sites. The rule also provides criteria for acceptance of candidate sites proposed by any party to the proceeding.

2. *Relationship to Present Practice.* Present practice is to make a determination that candidate sites identified by the applicant are "among the best that reasonably could have been found." Until recently, the NRC's review has focused primarily on the qualities of the proposed site (a product-oriented review). However, recently the NRC has expanded its review and the staff presently reviews the demonstration of this "among the best" standard by focusing on the adequacy of the applicant's site selection procedure (a process-oriented review). The rule preserves the advantages of both the process-oriented and product-oriented approaches. The rule adds criteria for implementing an adequate site selection process demonstration and evaluation, and provides the option for a product-oriented review by specifying threshold criteria for evaluating the slate of candidate sites. Most of the workshop participants believed that the applicants should be given the option to seek either a process-oriented or a product-oriented review of the slate of candidate sites.

3. *Need for Action.* The process-oriented approach codifies the elements that govern NRC reviews of the site selection process and provides guidance for the applicant's management of that site selection process. The product-oriented approach emphasizes the environmental merits of the candidate sites rather than the process that yielded these sites, and will likely be a more environmentally sensitive approach.

4. *Rationale and discussion.* The rationale for codifying the process-oriented approach is to provide guidance to all parties regarding the elements that govern NRC reviews of that process. The general rationale for the product-oriented approach is that candidate sites that pass all of the proposed threshold standards would be unlikely to have substantial, unidentified, adverse environmental impacts. Therefore, the resulting slate of candidate sites likely would be of comparable environmental quality and should be environmentally acceptable to the NRC. While there could be a situation where the proposed site could be marginal with respect to several of the thresholds and thus might be inferior on a cumulative impact basis, it would be unlikely that all the candidate sites would be similarly inferior. Thus the proposed site's inferiority would be clearly displayed in the subsequent detailed comparison with the other candidate sites.

The rule provides that the slate of candidate sites should contain at least four sites. The reason for this is to

ensure that even in regions of little diversity, there is some choice among the sites in the slate. For more diverse regions the criteria controlling how many sites would be necessary are oriented towards the diversity of environmental qualities presented, so as to give a meaningful environmental comparison of alternatives. The candidate sites would be required to be reasonably representative of all of the major diverse environmental qualities present in the region of interest, as follows:

- a. Major types of water sources.
- b. Major physiographic units.
- c. Consideration of sites of existing electric generating facilities as well as new sites.

As an example of acceptable diversity, if a new site on a lake in a woodland area was already identified as a candidate site, a woodland site on another lake within the region of interest would not be required, unless that site also hosts an existing electric generating facility.

One of the positions adopted by the public workshop on alternative sites is that public participation in the siting process would be enhanced if parties other than the applicant were permitted to propose additional candidate sites for consideration, but that the criteria proposed for acceptance of such sites should be no more stringent than those which the applicant's sites must meet. Criteria are proposed for the acceptance of such a site that are essentially the same criteria that the applicant's sites must meet in establishing the original slate of candidates.

In addition, the proposed rule imposes time limits for proposing additional candidate sites. The time limits are a key element in achieving a timely evaluation of the alternative sites issue and, except upon a substantial showing of good cause, will not be extended.

#### *E. Comparison of the Proposed Site With Alternative Sites*

1. *Statement of Rule.* A proposed site that comes from a slate of candidate sites that are among the best that could reasonably be found will not be rejected by the NRC on the basis of the alternative site review unless a comparison with the alternative sites results in a determination that an obviously superior alternative exists. There will be a two-part, sequential test for obvious superiority. The first stage of the test will be to determine whether there is an environmentally preferred site. The second stage of the test will consider economics, technology, and institutional factors to determine whether any environmentally preferred

site is obviously superior to the proposed site.

2. *Relationship to Present Practice.* Present staff practice does consider the range of factors that would be addressed by the proposed rule.

3. *Need for Action.* This proposed element of the rule will provide a more stable structure for the procedural aspects of how environmental factors should receive consideration and how these factors should be balanced with non-environmental factors to determine obvious superiority.

4. *Rationale and Discussion.* The criteria for testing the proposed site against the alternative sites comes from past practice, as reflected in individual nuclear power plant licensing reviews.

#### *F. Reopening of the Alternative Site Decision*

1. *Statement of Rule.* a. A reopening and reconsideration of the alternative site decision after a final limited work authorization or construction permit decision will be permitted only upon a reasonable showing that there exists significant new information that could substantially affect the earlier decision. Any decision to reconsider the alternative sites decision or not in these instances will consider the reasonable costs of delay and of moving to another site compared with the adverse environmental impacts that might be avoided by moving to another site.

b. For cases where the portion of the construction permit application containing facility design is filed three years or more after the effective date of this rule and where an application for an early review of alternative sites was tendered at least two and a half years prior to filing the portion of the CP application containing detailed facility design information, any reconsideration of the alternative site decision will be permitted only upon a reasonable showing that there exists significant new information that could substantially affect the earlier decision, even when allowance is made for reasonable costs of delay and of moving to another site. If such an application was not made at least two and a half years prior to filing such portion of the CP application, costs of delay and of moving to another site will not be considered in any decision to reconsider the alternative site decision or not, or in any resulting decision that there is or is not an obviously superior site.

c. If two sites are reasonably within a region of interest for a nuclear power plant site and both sites have received an affirmative NRC partial decision in an early review of alternative sites, an applicant may choose either site for an

application to construct a specific nuclear power plant without reviewing the alternative site question, except on the basis of new information, as provided above.

2. *Relationship to Present Practice.* The proposed rule is generally consistent with present criteria regarding treatment of new information under the early-site-review rule, and would result in consistent criteria for the treatment of new information regarding alternative sites at the construction permit and operating license stages.

The treatment of forward costs associated with moving to another site (including costs of delay) prescribed in this element of the proposed rule would generally codify a practice that has evolved, except that it would preclude the consideration of costs of moving to another site if the applicant did not seek an early resolution of the alternative site question.

3. *Need for Action.* This proposed element of the rule will provide for consistent treatment of new information regarding alternative sites throughout the licensing process.

4. *Rationale and Discussion.* The rationale for this element of the proposed rule is that after a decision has been reached regarding the alternative site question, during either an early site review or a CP review, the applicant (or licensee) will logically begin committing greater resources to that site. While such commitments are clearly at the applicant's risk, it is logical to allow the inclusion of such costs in any subsequent cost-benefit analyses, since such investments would have been made by the applicant in good faith.

Therefore, while it is possible that a reversal of the previous decision could be made based on new information (which is a risk the applicant or licensee must run), any reconsideration of the question of alternative sites and the cost-benefit analysis supporting any reversed decision should normally permit the full accounting of all reasonable forward costs to develop the new site (including costs of delay) compared to the reasonable forward costs of completing the project at the previously approved site.

At some point after issuance of the CP, the alternative of siting the nuclear power plant elsewhere likely will no longer be a reasonable alternative for the purposes of NEPA. That is, there is a point where comparative forward costs and the temporal proximity to the provision of needed (or desirably substitutable) power so favor the partially constructed site that, there likely is no real possibility that the nonsafety-related considerations at an



alternative site would be obviously superior to the proposed site. At that point, the reconsideration of alternative sites likely would not be required, unless the proposed site has been judged unsuitable for some safety or environmental reason.

Forward costs also could become substantial after an early site review decision, particularly as the time for a CP decision approaches. This means that a reevaluation of alternative sites after an early site review decision likely would not be justified on the basis of a full cost-benefit analysis unless there is, for example, a determination that the actual use of the site (rating and number of units) would be greater than had been evaluated earlier, or that firm and major changes in land or water use or changes in legal requirements involving the protection of species or resources have occurred since the previous evaluation. It is unlikely that changes in the prediction of environmental impacts would be so great as to warrant a re-review of the alternative sites decision on that basis alone.

The rationale for the third criterion of this portion of the proposed rule is that if two sites in the same general region of interest had been evaluated in separate reviews and neither had been found to have an obviously superior alternative, than it is likely that neither would be obviously superior to the other.

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and section 553 of title 5 of the United States Code, notice is hereby given that adoption of the following amendments to 10 CFR Part 2, 10 CFR Part 50, and 10 CFR Part 51 is contemplated. All interested persons who desire to submit written comments should send them to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Attention: Docketing and Service Branch, Washington, D.C. 20555 by June 9, 1980. Copies of comments received will be available for public inspection at the Commission's Public Document Room at 1717 H Street, NW., Washington, D.C.

#### § 2.603 [Amended]

1. It is proposed that § 2.603(a) be amended by adding at the end thereof the following:

(a) \* \* \* Where an applicant has failed to file the notice of intent required by Appendix A of 10 CFR Part 51, the application shall be docketed in accordance with the provisions of that appendix.

#### § 2.605 [Amended]

2. It is proposed that § 2.605(a) be amended by adding at the end thereof the following:

(a) \* \* \* Where an application has been filed pursuant to Appendix A of 10 CFR Part 51 for an early alternative site evaluation separate from other early site review issues, the alternative site evaluation shall not be considered a review for purposes of this one review limitation.

#### Appendix Q [Amended]

3. It is proposed that the numbered paragraph 1. of Appendix Q of 10 CFR Part 50 be amended by inserting between the first and second sentence thereof the following:

"As a part of an early site review, either in conjunction with or separate from the consideration of other early site review issues, a person may submit a request for a review of the alternative site issue and for issuance of a Staff Site Report concluding that there is no obviously superior alternative to the proposed site. If the person requests an early alternative site review separate from the consideration of other early site review issues, the person may later submit other siting issues for an early site review during the effective period of the Staff Site Report on the alternative site issue, provided that any later early site review of other issues shall remain in effect only so long as the initial Staff Site Report on alternative sites remains effective."

4. It is proposed that the numbered paragraph 3. of Appendix Q of 10 CFR Part 50 be amended by adding at the end thereof the following:

"Where a person has failed to file the notice of intent required by Appendix A of 10 CFR Part 51, the request for review shall be acted upon in accordance with the provisions of that appendix."

5. It is proposed that the numbered paragraph 5 of Appendix Q of 10 CFR Part 50 be amended by deleting the last sentence thereof and substituting the following:

"The conclusions of the Staff Site Report will be reexamined by the staff where five years or more have elapsed between the issuance of the first Staff Site Report and its incorporation by reference in a construction permit application."

6. It is proposed that the first sentence of the numbered paragraph 7. of Appendix Q of 10 CFR Part 50 be amended by adding at the end thereof the following:

"However, if a person, pursuant to Appendix A of 10 CFR Part 51, has submitted a request for an early alternative site review separate from other early site review issues, the alternative site review shall not be considered a review for purposes of this one review limitation."

7. It is proposed that a new Appendix A be added to 10 CFR Part 51 to read as follows:

#### Appendix A.—Evaluation of Alternative Sites for Nuclear Power Plants

##### I. Introduction and Scope

This appendix sets forth procedures and performance criteria for the review of alternative sites for nuclear power plants under NEPA. Specifically, this appendix provides for (a) information requirements for applying for an alternative site review by the Commission, (b) timing of Commission review, (c) region of interest to be considered in selecting sites, (d) criteria for the selection of sites, (e) criteria for comparing a proposed site with alternative sites, and (f) requirements for reopening an alternative site decision.

The basic objectives of this appendix are:

1. To provide for more effective public participation by implementing procedural changes that (a) require early notification of the public as to an applicant's choice of a proposed site and its alternatives, (b) permit an early review of the alternative site question apart from other early site review issues, and (c) provide explicitly for consideration of candidate sites proposed by other parties that meet certain criteria and are proposed in a timely fashion; and

2. To provide for greater predictability in the licensing process by codification of present practice that (a) prescribes criteria for determining when a region of interest of sufficient size has been considered, (b) prescribes criteria for judging whether candidate sites are among the best that could reasonably be found, (c) prescribes the basic standards for comparing the proposed site to the alternatives sites, and (d) provides criteria for reopening the alternative site question after a previous NRC decision has been rendered on this subject.

The nuclear power plants referred to in this appendix are those facilities which are subject to § 51.5(a) of this chapter and are of the type specified in § 50.21(b)(2) or (3) or § 50.22 or are testing facilities. The submittal for review and evaluation of alternative sites shall be made in the same manner and in the same number of copies as provided in § 50.30(a), (c)(1), and (c)(3) for license applications.

##### II. Definitions

As used in this appendix,

1. "Region of interest" means the geographic areas considered in searching for candidate sites.

2. "Candidate sites" means those sites that are within the region of interest and are considered in the comparative evaluation of sites for a nuclear power plant and are judged to be among the best that can reasonably be found for the siting of a nuclear power plant.

3. "Proposed site" means the candidate site submitted to the NRC by the applicant, or a person requesting an early review pursuant to Appendix Q of 10 CFR Part 50, as the proposed location for a nuclear power plant.

4. "Alternative sites" means those candidate sites which are specifically compared to the proposed site to determine



whether there is an obviously superior alternative site.

5. "Slate of candidate sites" means the group of candidate sites comprised of the proposed site and all alternative sites.

6. "Environmentally preferred alternative site" means an alternative site for which the environmental impacts are sufficiently less adverse than for the proposed site that environmental preference for the alternative site can be established.

7. "Site" means the geographic area needed for the construction and operation of a nuclear power plant, including the associated transmission corridors to the first intertie.

8. "Reconnaissance level information" means any information or analyses that can be retrieved or generated without the performance of new, comprehensive site-specific investigations. Reconnaissance level information includes relevant scientific literature, reports of government or private research agencies, consultation with experts, short-term field investigations, and analyses performed using such information. The amount of reconnaissance level information and the extent of analyses conducted depend on (1) the importance and magnitude of the potential impact under evaluation and (2) whether the decision is one of identifying a region of interest, identifying candidate sites, or selecting a proposed site.

9. "Partial decision on alternative sites" means a partial decision pursuant to § 2.101 and Subpart F of 10 CFR part 2 that includes a finding that there is or is not an obviously superior alternative to the proposed site.

10. "Applicant" means a person who intends to apply, or who has applied, for a permit to construct a nuclear power plant.

11. "Notice of intent" means a notice that an application will be tendered for a construction permit for a nuclear power plant.

12. "NRC" means the Nuclear Regulatory Commission, the agency established by Title II of the Energy Reorganization Act of 1974, as amended.

13. "NRC staff" means any NRC officer or employee or his/her authorized representative, except a Commissioner, a member of a Commissioner's immediate staff, an Atomic Safety and Licensing Board, an Atomic Safety and Licensing Appeal Board, a presiding officer, or an administrative law judge.

### III. Information Requirements

1. a. An applicant shall provide the NRC staff with a notice of intent to tender an application for a construction permit (CP) for a nuclear power plant either at least 3 months before tendering of a CP application requesting an early review (pursuant to § 2.101 and Subpart F of 10 CFR Part 2) of the alternative sites issue or at least 3 months before beginning detailed studies on environmental impact and site safety at the proposed site, whichever occurs earlier. The notice of intent shall identify the location, cooling water sources, and physiographic unit of the proposed and alternative sites, and shall describe the anticipated generating capacity and number and type of generating units for which a CP application will be

tendered, and types of condenser cooling systems that would be used.<sup>1</sup>

Upon receipt of the notice of intent, the NRC will publish the information received in the Federal Register and in the newspapers local to the sites identified.

If an applicant fails to provide a notice of intent within the time specified, the NRC will not docket the tendered application for 3 months where no detailed studies of the proposed site have been performed or for 12 months where such studies have been performed. As soon as practicable after tendering, the NRC will publish the above specified information in the Federal Register and in the newspapers local to the sites identified.

b. A person requesting an early review of the alternative sites issue pursuant to Appendix Q of 10 CFR Part 50 shall provide the NRC staff with a notice of intent to submit such request at least 3 months before submitting the request for review or at least 3 months before beginning detailed studies of the proposed site, whichever occurs earlier. The notice of intent shall identify the location, cooling water sources, and physiographic unit of the proposed and alternative sites, and shall describe the generating capacity, number and type of generating units, and types of condenser cooling systems anticipated or assumed to be used.

Upon receipt of the notice of intent, the NRC will publish the information received in the Federal Register and in the newspapers local to the sites identified.

If the person requesting the review pursuant to Appendix Q to 10 CFR Part 50 fails to provide a notice of intent within the time specified, the NRC will not initiate the review for 3 months where no detailed studies of the proposed site have been performed or for 12 months where such studies have been performed. As soon as practicable after receiving the request for review, the NRC will publish the above specified information in the Federal Register and in newspapers local to the sites identified.

2. Reconnaissance level information shall normally be adequate to identify candidate sites and to select a proposed site in an alternative site analysis. In the identification of candidate sites or selection of the proposed site, the amount of data required and the extent of analyses conducted shall be appropriate to support a reasoned decision.

In some cases, reconnaissance level information may not be sufficient to support the analyses necessary to reach a reasoned decision. In these situations, new comprehensive site-specific investigations must be considered. For example, if substantial questions exist regarding the likely acceptability of a site from a geologic standpoint, substantial geotechnical investigations might be required. Also, if

<sup>1</sup> For situations where, on the effective date of this rule, a future applicant has already begun or is about to begin detailed, long-term investigations on a site likely to be proposed subsequently to the NRC as a site for a nuclear power plant, such a future applicant must provide a notice of intent within three months following the effective date of this rule.

substantial questions exist regarding whether a large adverse impact will occur to an important aquatic species, long term baseline studies will be considered. The NRC staff will advise the applicant of any additional information requirements as early as practicable.

3. Where a party to a proceeding proposes for consideration (according to Section VI 4. a of this appendix) a candidate site not included in the applicant's slate of candidate sites, it is the responsibility of that party to provide adequate information to support a decision to accept the site or not. If the site is accepted as a candidate site, it is the responsibility of the applicant in the proceeding to provide the information necessary to make the final comparison of that site with the proposed site.

4. Alternative site analyses of both the identification of the slate of candidate sites and the selection of the proposed site shall, at a minimum, address the following subjects:

- a. hydrology, water quality, and water availability
- b. aquatic biological resources, including endangered species
- c. terrestrial resources and land uses, including endangered species
- d. transmission corridors (approximate length and general location) and resources affected
- e. socioeconomics, including aesthetics, and archeological and historic preservation
- f. population distribution and density<sup>2</sup>
- g. facility costs
- h. institutional constraints, as they affect site availability
- i. public concerns in the above subject areas, where such have been provided to the applicant or NRC in writing.

### IV. Timing of NRC Review

1. An applicant may submit the proposed and alternative sites for NRC evaluation as part of a full CP review either prior to and separate from the review of plant design (an early site review) or in conjunction with the review of plant design.

2. As part of an early site review, an applicant that tenders an application for an alternative site review and requests a finding that there is not obviously superior alternative to the proposed site may do so either in conjunction with or separate from the consideration of other early site review issues. If the applicant applies for an early alternative site evaluation separate from the consideration of other early site review issues, the applicant may later submit other siting issues for an early site review during the effective period of the early alternative site partial decision, provided that any later early site review of other issues shall remain in effect only so long as the initial early site review of alternative sites remains effective.

### V. Region of Interest

1. The initial geographic area for determining the region of interest for NRC regulatory review purposes shall be (a) the State in which the proposed site is located or (b) the service areas of the applicant. The

<sup>2</sup> This requirement will be modified as appropriate to conform to revisions to 10 CFR Part 100.

initial region of interest must be larger than the initial geographic area according to 3. below, or may be smaller than the initial geographic area according to 2. below.

2. The region of interest may be smaller than the initial geographic area, if (a) environmental diversity is not substantially reduced and candidate sites within the region of interest meet threshold criteria described in Section VI.2.b. of this appendix, or (b) costs of generating electricity would be exorbitant for sites located in those areas not included, or (c) siting in those areas not included would be in violation of State laws governing nonradiological health and safety aspects of utility siting, or (d) the costs would be exorbitant of developing information to demonstrate whether sites within those areas not included would likely be acceptable from the standpoint of safety.

3. The region of interest must be greater than the initial geographic area if environmental diversity would likely be substantially increased and if (a) candidate sites within the initial geographic area meet the threshold criteria in Section VI.2.b. of this appendix, and the development of sites in the added geographic areas would likely not substantially increase costs, or (b) candidate sites within the initial geographic areas do not meet threshold criteria in Section VI.2.b., and the development of sites in the added geographic areas would not require exorbitant costs.

4. For the purpose of determining the region of interest, environmental diversity refers to the types of water bodies available within the region (upper or lower reaches of large rivers, small rivers, lakes, bays, and oceans) and the associated physiographic units. A substantial increase or decrease in diversity would occur whether the region of interest includes or excludes such a water body. In areas of critical water supply, ground water and waste water are also appropriate water sources for diversity considerations.

#### VI. Selection of Candidate Sites

1. The candidate sites used in the subsequent site-specific comparison of alternatives must be one of the following:

a. Be identified through the use of a site selection methodology that (1) includes an environmentally sensitive site screening process (i.e., considers the same environmental parameters that are addressed by the criteria in VI.2.b., although not necessarily in the same way) resulting in a slate of candidate sites that are among the best that could reasonably be found and (2) meets the criteria presented in VI.3. below; or

b. Meet the criteria presented in VI.2. below, in which case there shall be no further review of the site selection process.

2. a. A sufficient number of candidate sites, which should include at least four sites, shall be selected from the region of interest to provide reasonable representation of the diversity of land and water resources within the region of interest. One or more of these sites should be associated with each type of water source and physiographic unit reasonably available within the defined region of interest, and one alternative site must have the same water source as the proposed site.

b. Except as noted in 2.c.(1), a site must meet the following criteria to be accepted as a candidate site without further review of the site selection process. (Technically appropriate and economically reasonable cooling system mitigative measures may be assumed for each candidate site.)

(1) Consumptive use of water would not cause significant adverse effects on other water users.

(2) There would not likely be any further endangerment of a State or Federally listed threatened or endangered plant or animal species.

(3) There would not likely be any significant impacts to spawning grounds or nursery areas of significance in the maintenance of populations of important aquatic species.

(4) Discharges of effluents into waterways would likely be in accordance with State or Federal regulations (e.g., avoidance of discharges to waters of the highest State quality designation) and would not likely adversely affect efforts of State or Federal agencies to implement water quality objectives (e.g., additional discharges to waters of currently unacceptable quality as determined by a State).

(5) There would be no preemption or likely adverse impacts on land uses specially designated for environmental or recreational purposes such as parks, wildlife preserves, State and National forests, wilderness areas, flood plains, Wild and Scenic rivers, or areas on the National Register of Historic Places.

(6) There would not likely be any significant impact on terrestrial and aquatic ecosystems, including wetlands, which are unique to the resource area.

(7) The population density, including weighted transient population, projected at the time of initial operation of a nuclear power plant, would not exceed 500 persons per square mile averaged over any radial distance out to 30 miles from the site (cumulative population at a distance divided by the area at that distance), and the projected population density over the lifetime of the nuclear power plant would not exceed 1,000 persons per square mile (similarly weighted and measured).\*

(8) The site is not in an area where additional safety considerations (geology; seismology; hydrology; meteorology; and industrial, military, and transportation facilities) or environmental considerations for one site compared to other reasonable sites within the region of interest would result in the reasonable likelihood of having to expend substantial additional sums of money (cumulative expenditures in excess of about 5% of total project capital costs) to make the project licensable from a safety standpoint or to mitigate unduly adverse environmental impacts.

c. (1) If a site does not meet one or more of the threshold criteria provided in VI.2.b., the site may be acceptable as a candidate if it can be reasonably shown that further examination of that particular type of water source and physiographic unit would not

\*This requirement will be modified as appropriate to conform to revisions to 10 CFR Part 100.

likely identify a site that would meet those same threshold criteria.

(2) If any candidate site does not meet one or more of the threshold criteria provided in VI.2.b. to such an extent that serious adverse environmental impacts would result from its use, that site should be rejected as a candidate site.

3. If the approach of VI.1.a. above is relied upon, demonstration must be made that the site selection process incorporated the following criteria:

a. The overall objectives of the siting study and all initial constraints and limitations (including the geographic area, i.e., region of interest, which is the subject of the study) shall be explicitly stated giving the basis and rationale for all choices.

b. The proposed ways of meeting the stated objectives shall be described, including the general approach to the site selection process.

c. The study shall explicitly state factors (e.g., aquatic biology) under consideration, parameters (e.g., spawning grounds and nursery areas) by which these factors were measured, and criteria (e.g., no significant impact) that define levels of achievement.

d. The site selection study shall be interdisciplinary and shall include natural, social, and environmental sciences. The range of the responsibilities of the study team shall be clearly defined and the methods employed in resolving differences within the group or of arriving at the consensus shall be explicitly stated.

e. The process that led to the identification of candidate sites including all specific methodologies shall be explicitly stated in detail.

(1) Where preemptive screening is used, all limiting or exclusionary criteria employed shall be explicitly stated, the bases for each criterion given, and the ways in which they are applied explained.

(2) Where comparative analysis is used, all methodologies used involving importance factors, preference functions, utility functions, weighting factors, ranking scales, scoring schemes, and rating systems shall be explicitly described; the basis for the selection of each methodology given; and the ways in which each is applied explained.

f. The study shall contain detailed description of administrative means used to support the site selection study, including any quality assurance program commensurate with the objectives of the study and a data management system for handling technical files, maps, and other information.

g. Definitions of terms used in the study shall be included.

4. Any intervening party and the NRC staff may propose one or more additional sites for consideration as candidate sites provided that the following conditions are met:

a. The additional sites are proposed for review within 30 days after the first special prehearing conference (i.e., the conference held pursuant to § 2.751a of 10 CFR Part 2).

b. The proposal contains a reasonable showing that the additional sites are comparable to the applicant's slate of candidate sites in their ability to meet the criteria specified in VI.2.b. and VI.2.c. and would add to the diversity which is exhibited



by the applicant's slate of candidate sites; or where the applicant's candidate sites do not meet all the criteria specified in VI.2.b. and VI.2.c., the proposal contains a reasonable showing that the additional sites will meet these criteria.

c. Where a party identifies more than one additional site, each additional site must meet one of the tests specified in VI.4.b. above.

d. The additional sites have no physical features that would likely create substantial increases in the cost of constructing and operating nuclear power plants at the additional sites compared with the applicant's proposed site, unless there is a reasonable showing that the additional sites meet a criterion specified in VI.2.b. that is not met by the applicant's proposed site.

e. Multiple parties to NRC proceedings should consult with one another prior to proposing additional sites for consideration as candidate sites in order to reasonably limit the total number submitted.

5. A presiding Atomic Safety and Licensing Board (ASLB) may on its own initiative proposed one or more additional sites for consideration as candidate sites up to 30 days after the issuance of the Draft Environmental Statement (DES). On or after the issuance of the DES, additional sites may be introduced by the ASLB, only after a balancing of the cost of delaying the proceeding against the likelihood that utilization of the additional site would avoid significant environmental harm.

6. The 30-day time limits in VI.4.a. and VI.5. above shall not be extended except upon a substantial showing of good cause.

#### VII. Comparison of Proposed Site With Alternative Sites

1. After it is determined by either of the above approaches that the proposed site comes from a slate of candidate sites that are among the best that could reasonably be found, the NRC will not reject the proposed site solely based on its review of the alternative sites unless a comparison with the remaining candidate sites results in a determination that an obviously superior alternative exists. The NRC will determine obvious superiority among the candidate sites by a sequential two-part analytical test. The first part gives primary consideration to hydrology, water quality, aquatic biological resources, terrestrial resources, water and land use, socioeconomic, and population<sup>4</sup> to determine whether any alternative sites are environmentally preferred to the proposed site. The second part overlays consideration of project economics, technology, and institutional factors to determine whether, if such an environmentally preferred site exists, such a site is, in fact, an obviously superior site.<sup>5</sup> The following factors are considered in this second part of the test:

a. The environmental and safety<sup>6</sup> considerations in terms of technology and costs of construction and operation of nuclear power plants at the sites.

b. The forward costs<sup>7</sup> at the proposed site compared to the alternative sites.

c. Other considerations, such as possible institutional barriers. The applicant's proposed site will be rejected solely based on NRC review of alternative sites only when the NRC determines that, considering both parts of the test, there is an environmentally preferable alternative which also is obviously superior, i.e., the NRC is confident that the applicant's proposed site should be rejected.

2.a. If an obviously superior alternative site is identified and the proposed site is rejected by the NRC, and if the applicant submits a new application naming the identified obviously superior site as the newly proposed site, the NRC will not require review of the alternative site question for the newly proposed site, provided that the previous slate of candidate sites had been determined to be acceptable by the criteria established in this rule.

b. If more than one obviously superior alternative site is identified and the proposed site is rejected by the NRC, the applicant may request that a further finding be made in that proceeding to determine whether one of those sites is obviously superior to the others. If that finding is made and one of those sites is obviously superior to the others and the applicant submits the obviously superior site as the new proposed site, the NRC will not require review of the alternative sites question for the newly proposed site, provided that the previous slate of candidate sites had been determined to be acceptable by the criteria established in this rule. If that finding is made and none of those sites is obviously superior to the others, the applicant may propose any of the obviously superior alternative sites for review as permitted according to 2.a. above.

c. If one or more obviously superior sites are identified and the proposed site is rejected by the NRC, the applicant may submit a new proposed site that is

<sup>4</sup> There are some site safety issues for which a cost-effective means for successful mitigation is not state-of-the-art engineering. For the purposes of alternative site analysis, these site safety issues are considered in terms of site acceptability, i.e., where successful mitigation is considered outside the state of the art, the site would be considered unacceptable. However, where the mitigation of the safety issues are considered to be within the state of the art, the site would be considered acceptable but still must undergo the comparative test, which includes the impact of the mitigation on overall project cost, to determine whether there is an obviously superior alternative. Even though the proposed site successfully passes the early evaluation of alternative sites, it could still be found unacceptable in the later detailed safety review of that site.

<sup>5</sup> For cases where the portion of the construction permit application containing facility design is filed 5 years or more after the effective date of this rule, and an early site review application for the review of alternative sites had not been filed at least 2½ years earlier, the costs of moving to another site, including costs of delay, will be given no weight in any consideration of alternative sites or in any decision whether to reopen a previous decision on this subject.

comparable to the obviously superior sites in its ability to meet the criteria specified in Section VI.2.b. Where a new site is proposed, appropriate public notice of intent is provided, and a showing of comparability in meeting the criteria is made, the NRC will only require that the sequential two-part analytical test for obvious superiority be performed on the new proposed site and on the sites found obviously superior in the earlier proceeding.

#### VIII. Reopening of the Alternative Site Decision

1. A reopening and reconsideration of the alternative site decision after a final limited work authorization or construction permit decision will be permitted only upon a reasonable showing that there exists significant new information that could substantially affect the earlier decision. Any decision to reconsider the alternative site decision or not in these instances will take into account preliminary estimates of the reasonable costs of delay and of moving to another site compared with the adverse environmental impacts that might be avoided by moving to another site.

2. For cases where the portion of the construction permit containing facility design is filed three years or more after the effective date of this rule and where an applicant submits the proposed and alternative sites for NRC evaluation as part of a full construction permit review at least 2½ years prior to filing the portion of the construction permit application containing detailed plant design, any reconsideration of the alternative site decision will be permitted only upon a reasonable showing that there exists significant new information that could substantially affect the earlier decision, as described in VIII.1. above. If the proposed and alternative sites were not submitted for NRC evaluation as part of a full construction permit review at least 2½ years prior to filing the portion of the construction permit application containing the plant design, costs of delay and of moving to another site will not be considered in any decision to reconsider the alternative site decision or not in any resulting decision that there is or is not an obviously superior site.

3. If two sites are reasonably within a region of interest for a nuclear power plant site and both sites have received an affirmative NRC partial decision on an early review of alternative sites, an applicant may choose either site for an application to construct a specific nuclear power plant without reviewing the alternative site question, except on the basis of new information as provided in VIII.2. above.

(Sec. 161 h., l. o., Pub. L. 83-703, 60 Stat. 948 (42 U.S.C. 2201 (h), (i), and (j)); Sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332); Sec. 201, as amended, Pub. L. 93-438, 88 Stat. 1242; Pub. L. 94-79, 89 Stat. 413 (42 U.S.C. 5641))

Dated at Washington, D.C., this 4th day of April 1980.

<sup>4</sup> This requirement will be modified as appropriate to conform to revisions to 10 CFR Part 100.

<sup>5</sup> In applying both parts of the test, the NRC will give consideration to the inherent uncertainties of cost-benefit analysis techniques and, where applicable, to the disparity in the data base between the proposed and alternative sites.



For the Nuclear Regulatory Commission.

Samuel J. Chilk,

*Secretary of the Commission.*

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WORKSHOP ON  
ALTERNATIVE SITE  
RULEMAKING

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Summary Report

Roberto Pagano

May 1979

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Contract Sponsor: Office of

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Metrek Division  
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McLean, Virginia 22102

MITRE Technical Report  
MTR-79W00112

U.S. DEPARTMENT OF COMMERCE  
National Technical Information Service  
NUREG-0625

# Report of the Siting Policy Task Force

(U.S.) Nuclear Regulatory Commission, Washington, DC

Aug 79

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