DOUGLAS PAUL LETTER

MAR 23 1992

89001548

Mr. Douglas E. Paul
212 Homevale Road
Reisterstown, MD 21136

Dear Mr. Paul:

This is in response to your letter of March 5, 1992 regarding the disposal and/or holding of nuclear waste. Enclosed you will find a copy of the U.S. Nuclear Regulatory Commission's (NRC's) Rules and Regulations, Title 10, Chapter 1, Code of Federal Regulations-Energy, Part 60 entitled, "Disposal of High-Level Radioactive Wastes In Geologic Repositories" and a copy of "Disposal of High-Level Radioactive Waste in Geologic Repositories; Licensing Procedures - Statements of Consideration." Because the NRC's mission is that of a regulator responsible for the licensing of a repository, this is the only information available from NRC. It contains those safety requirements that apply to the disposal of high-level waste, and provides a discussion of the considerations given when the regulations were promulgated.

On the other hand, the U.S. Department of Energy (DOE) is directly responsible for the development of a nuclear waste repository. Therefore, I have forwarded your name and address to DOE which has a vast amount of public information on this subject and have asked that it forward to you a package of information on the high-level waste disposal program. In addition, DOE will also be forwarding information on Monitored Retrievable Storage Facilities.

If you have not received the package from DOE by April 20, 1992, please contact Anne Garcia of my staff at (301) 504-2438, or by writing her at the following address:

Anne Garcia, Licensing Assistant
U.S. Nuclear Regulatory Commission
Mail stop 4-H-3
Washington, D. C. 20555

I hope the information provided herein and that which you receive from DOE helps you in your project. If we can be of further assistance, please contact Ms. Garcia.

Sincerely,

/S/

Joseph J. Holonich, Director
Repository Licensing and Quality
Assurance Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure:
As stated

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PART 60

DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES

[56 FR 40664]

Authority: Secs. 51, 53, 62, 63, 65, 81, 161, 182, 183, 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, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846); secs. 10 and 14, Pub. L. 95–601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851); sec. 102, Pub. L. 91–190, 83 Stat. 853 (42 U.S.C. 4332); secs. 114, 121, Pub. L. 97–425, 96 Stat. 2213(g), 2228 as amended (42 U.S.C. 10134, 10141).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); § 60.11 is issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); § 60.11 is issued under sec. 161i, 68 Stat. 949, as amended (42 U.S.C. 2201(i)); and §§ 60.10, 60.71 to 60.75 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

PART 60 • DISPOSAL OF RADIOACTIVE WASTES . . .

Subpart A—General Provisions

56 FR 40664

§ 60.1 Purpose and scope.

This part prescribes rules governing the licensing of the U.S. Department of Energy to receive and possess source, special nuclear, and byproduct material at a geologic repository operations area sited, constructed, or operated in accordance with the Nuclear Waste Policy Act of 1982. This part does not apply to any activity licensed under another part of this chapter. This part also gives notice to all persons who knowingly provide to any licensee, contractor, or subcontractor, components, equipment, materials, or other goods or services, that relate to a licensee's activities subject to this part, that they may be individually subject to NRC enforcement action for violation of § 60.11.

48 FR 28194

§ 60.2 Definitions.

As used in this part—

"Accessible environment" means: (1) The atmosphere, (2) the land surface, (3) surface water, (4) oceans, and (5) the portion of the lithosphere that is outside the controlled area.

51 FR 27158

"Affected Indian Tribe" means any Indian Tribe (1) within whose reservation boundaries a repository for high-level radioactive waste or spent fuel is proposed to be located; or (2) whose Federally defined possessory or usage rights to other lands outside of the reservation's boundaries arising out of Congressionally ratified treaties or other Federal law may be substantially and adversely affected by the locating of such a facility; *Provided*, That the Secretary of the Interior finds, upon the petition of the appropriate governmental officials of the Tribe, that such effects are both substantial and adverse to the Tribe.

48 FR 28194

"Anticipated processes and events" means those natural processes and events that are reasonably likely to occur during the period the intended performance objective must be achieved. To the extent reasonable in the light of the geologic record, it shall be assumed that those processes operating in the geologic setting during the Quaternary Period continue to operate but with the perturbations caused by the presence of emplaced radioactive waste superimposed thereon.

"Barrier" means any material or structure that prevents or substantially delays movement of water or radionuclides.

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

"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.

"Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

"Containment" means the confinement of radioactive waste within a designated boundary.

"Controlled area" means a surface location, to be marked by suitable monuments, extending horizontally no more than 10 kilometers in any direction from the outer boundary of the underground facility, and the underlying subsurface, which area has been committed to use as a geologic repository and from which incompatible activities would be restricted following permanent closure.

"Director" means the Director of the Nuclear Regulatory Commission's Office of Nuclear Material Safety and Safeguards.

"Disposal" means the isolation of radioactive wastes from the accessible environment.

"Disturbed zone" means that portion of the controlled area the physical or chemical properties of which have changed as a result of underground facility construction or as a result of heat generated by the emplaced radioactive wastes such that the resultant change of properties may have a significant effect on the performance of the geologic repository.

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

"Engineered barrier system" means the waste packages and the underground facility.

"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 media. A geologic repository includes: (1) The geologic repository operations area, and (2) the portion of the geologic setting that provides isolation of the radioactive waste.

48 FR 28194

"Geologic repository operations area" means a high-level radioactive waste facility that is part of a geologic repository, including both surface and subsurface areas, where waste handling activities are conducted.

"Geologic setting" means the geologic, hydrologic, and geochemical systems of the region in which a geologic repository operations area is or may be located.

50 FR 29641

"Groundwater" means all water which occurs below the land surface.

48 FR 28194

"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).[1]

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

"Important to safety," with reference to structures, systems, and components means those engineered structures, systems, and components essential to the prevention or mitigation of an accident that could result in a radiation dose to the whole body, or any organ, of 0.5 rem or greater at or beyond the nearest boundary of the unrestricted area at any time until the completion of permanent closure.

"Isolation" means inhibiting the transport of radioactive material so that

[1] These are DOE "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."

amounts and concentrations of this material entering the accessible environment will be kept within prescribed limits.

"Permanent closure" means final backfilling of the underground facility and the sealing of shafts and boreholes. [48 FR 28194]

"Performance confirmation" means the program of tests, experiments, and analyses which is conducted to evaluate the accuracy and adequacy of the information used to determine with reasonable assurance that the performance objectives for the period after permanent closure will be met.

"Public Document Room" means the place at 2120 L Street N.W., Washington, D.C., at which records of the Commission will ordinarily be made available for public inspection and any other place, the location of which has been published in the Federal Register, at which public records of the Commission pertaining to a particular geologic repository are made available for public inspection. [53 FR 43419]

"Radioactive waste" or "waste" means HLW and other radioactive materials other than HLW that are received for emplacement in a geologic repository. [48 FR 28194]

"Restricted area" means any area access to which is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

"Retrieval" means the act of intentionally removing radioactive waste from the underground location at which the waste had been previously emplaced for disposal.

"Saturated zone" means that part of the earth's crust beneath the regional water table in which all voids, large and small, are ideally filled with water under pressure greater than atmospheric. [50 FR 29641]

"Site" means the location of the controlled area.

"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 at depth 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. [48 FR 28194]

"Unanticipated processes and events" means those processes and events affecting the geologic setting that are judged not to be reasonably likely to occur during the period the intended performance objective must be achieved, but which are nevertheless sufficiently credible to warrant consideration. Unanticipated processes and events may be either natural processes or events or processes and events initiated by human activities other than those activities licensed under this part. Processes and events initiated by human activities may only be found to be sufficiently credible to warrant consideration if it is assumed that: (1) The monuments provided for by this part are sufficiently permanent to serve their intended purpose; (2) the value to future generations of potential resources within the site can be assessed adequately under the applicable provisions of this part; (3) an understanding of the nature of radioactivity, and an appreciation of its hazards, have been retained in some functioning institutions; (4) institutions are able to assess risk and to take remedial action at a level of social organization and technological competence equivalent to, or superior to, that which was applied in initiating the processes or events concerned; and (5) relevant records are preserved, and remain accessible, for several hundred years after permanent closure. [48 FR 28194]

"Underground facility" means the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals.

"Unrestricted area" means any area, access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

"Unsaturated zone" means the zone between the land surface and the regional water table. Generally, fluid pressure in this zone is less than atmospheric pressure, and some of the voids may contain air or other gases at atmospheric pressure. Beneath flooded areas or in perched water bodies the fluid pressure locally may be greater than atmospheric. [50 FR 29641]

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

"Waste package" means the waste form and any containers, shielding, packing and other absorbent materials immediately surrounding an individual waste container. [48 FR 28194]

"Water table" means that surface in a groundwater body at which the water pressure is atmospheric.

§ 60.3 License required. [46 FR 13971]

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

(b) DOE 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. [46 FR 13971]

§ 60.4 Communications and records. [53 FR 43419]

(a) Except where otherwise specified, all communications and reports concerning the regulations in this part and applications filed under them should be addressed to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 2120 L Street NW., Washington DC, or 11555 Rockville Pike, Rockville, Maryland.

(b) Each record required by this part must be legible throughout the retention period specified by each Commission regulation. The record may be the original or a reproduced copy or a microform provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records such as letters, drawings, specifications, must include all pertinent information such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records. [53 FR 19240]

§ 60.5 Interpretations. [46 FR 13971]

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 DOE, 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.

§ 60.7 License not required for certain preliminary activities.

The requirement for a license set forth in § 60.3(a) of this part is not applicable to the extent that DOE receives and possesses source, special nuclear, and

byproduct material at a geologic repository:

(a) For purposes of site characterization: or

(b) For use, during site characterization or construction, as components of radiographic, radiation monitoring, or similar equipment or instrumentation.

[46 FR 13971]

§ 60.8 Reporting, recordkeeping, and application requirements: OMB approval not required.

The information collection requirements contained in this part affect fewer than ten persons. Therefore, under section 3506(c)(5) of the Paperwork Reduction Act of 1980 (Pub. L. 96-511), OMB clearance is not required for these information collection requirements.

[47 FR 13774]

§ 60.9 Employee protection.

(a) Discrimination by a Commission licensee, an applicant for a Commission license, or a contractor or subcontractor of a Commission licensee or applicant against an employee for engaging in certain protected activities is prohibited. Discrimination includes discharge and other actions that relate to compensation, terms, conditions, and privileges of employment. The protected activities are established in section 210 of the Energy Reorganization Act of 1974, as amended, and in general are related to the administration or enforcement of a requirement imposed under the Atomic Energy Act or the Energy Reorganization Act.

(1) The protected activities include but are not limited to—

(i) Providing the Commission information about possible violations of requirements imposed under either of the above statutes;

(ii) Requesting the Commission to institute action against his or her employer for the administration or enforcement of these requirements; or

(iii) Testifying in any Commission proceeding.

(2) These activities are protected even if no formal proceeding is actually initiated as a result of the employee assistance or participation.

(3) This section has no applicaton to any employee alleging discrimination prohibited by this section who, acting without direction from his or her employer (or the employer's agent), deliberately causes a violation of any requirement of the Energy Reorganization Act of 1974, as amended, or the Atomic Energy Act of 1954, as amended.

(b) Any employee who believes that he or she has been discharged or otherwise discriminated against by any person for engaging in the protected activities specified in paragraph (a)(1) of this section may seek a remedy for the discharge or discrimination through an administrative proceeding in the Department of Labor. The administrative proceeding must be initiated within 30 days after an alleged violation occurs by filing a complaint alleging the violation with the Department of Labor, Employment Standards Administration, Wage and Hour Division. The Department of Labor may order reinstatement, back pay, and compensatory damages.

[47 FR 30425]

(c) A violation of paragraph (a) or paragraph (f) of this section by a Commission licensee, an applicant for a Commission license, or a contractor or subcontractor of a Commission licensee or applicant may be grounds for—

[53 FR 10397]

(1) Denial, revocation, or suspension of the license.

(2) Imposition of a civil penalty on the licensee or applicant.

(3) Other enforcement action.

(d) Actions taken by an employer, or others, which adversely affect an employee may be predicated upon nondiscriminatory grounds. The prohibition applies when the adverse action occurs because the employee has engaged in protected activities. An employee's engagement in protected activities does not automatically render him or her immune from discharge or discipline for legitimate reasons or from adverse action dictated by nonprohibited considerations.

[47 FR 30425]

(e) Each licensee and each applicant shall post Form NRC-3, "Notice to Employees," on its premises. Posting must be at locations sufficient to permit employees protected by this section to observe a copy on the way to or from their place of work. Premises must be posted not later than 30 days after an application is docketed and remain posted while the application is pending before the Commission, during the term of the license, and for 30 days following license termination.

(f) No agreement affecting the compensation, terms, conditions and privileges of employment, including an agreement to settle a complaint filed by an employee with the Department of Labor pursuant to section 210 of the Energy Reorganization Act of 1974, may contain any provision which would prohibit, restrict, or otherwise discourage, an employee from participating in protected activity as defined in paragraph (a)(1) of this section, including, but not limited to, providing information to the NRC on potential violations or other matters within NRC's regulatory responsibilities.

[53 FR 10397]

Note.—Copies of Form NRC-3 may be obtained by writing to the Regional Administrator of the appropriate U.S. Nuclear Regulatory Commission Regional Office listed in Appendix D, Part 20 of this chapter.

[47 FR 30425]

§ 60.10 Completeness and accuracy of information.

(a) Information provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects.

(b) Each applicant or licensee shall notify the Commission of information identified by the applicant or licensee as having for the regulated activity a significant implication for public health and safety or common defense and security. An applicant or licensee violates this paragraph only if the applicant or licensee fails to notify the Commission of information that the applicant or licensee has identified as having a significant implication for public health and safety or common defense and security. Notification shall be provided to the Administrator of the appropriate Regional Office within two working days of identifying the information. This requirement is not applicable to information which is already required to be provided to the Commission by other reporting or updating requirements.

[52 FR 49362]

§ 60.11 Deliberate misconduct.

(a) Any licensee or any employee of a licensee; and any contractor (including a supplier or consultant), subcontractor, or any employee of a contractor or subcontractor, of any licensee, who knowingly provides to any licensee, contractor, or subcontractor, components, equipment, materials, or other goods or services, that relate to a licensee's activities subject to this part; may not:

(1) Engage in deliberate misconduct that causes or, but for detection, would have caused, a licensee to be in violation of any rule, regulation, or order, or any term, condition, or limitation of any license, issued by the Commission, or

(2) Deliberately submit to the NRC, a licensee, or a licensee's contractor or subcontractor, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the NRC.

(b) A person who violates paragraph (a)(1) or (a)(2) of this section may be subject to enforcement action in accordance with the procedures in 10 CFR part 2, subpart B.

[58 FR 40664]

(c) For purposes of paragraph (a)(1) of this section, deliberate misconduct by a person means an intentional act or omission that the person knows:

(1) Would cause a licensee to be in violation of any rule, regulation, or order, or any term, condition, or limitation, of any license issued by the Commission, or

(2) Constitutes a violation of a requirement, procedure, instruction, contract, purchase order or policy of a licensee, contractor, or subcontractor.

[58 FR 40684]

Subpart B—Licenses

Preapplication Review

§ 60.15 Site characterization.

(a) Prior to submittal of an application for a license to be issued under this part DOE shall conduct a program of site characterization with respect to the site to be described in such application.

(b) Unless the Commission determines with respect to the site described in the application that it is not necessary, site characterization shall include a program of in situ exploration and testing at the depths that wastes would be emplaced.

[51 FR 27158]

(c) The program of site characterization shall be conducted in accordance with the following:

(1) Investigations to obtain the required information shall be conducted in such a manner as to limit adverse effects on the long-term performance of the geologic repository to the extent practical.

(2) The number of exploratory boreholes and shafts shall be limited to the extent practical consistent with obtaining the information needed for site characterization.

(3) To the extent practical, exploratory boreholes and shafts in the geologic repository operations area shall be located where shafts are planned for underground facility construction and operation or where large unexcavated pillars are planned.

(4) Subsurface exploratory drilling, excavation, and in situ testing before and during construction shall be planned and coordinated with geologic repository operations area design and construction.

[54 FR 27864]

§ 60.16 Site characterization plan required.

Before proceeding to sink shafts at any area which has been approved by the President for site characterization, DOE shall submit to the Director, for review and comment, a site characterization plan for such area. DOE shall defer the sinking of such shafts until such time as there has been an opportunity for Commission comments thereon to have been solicited and considered by DOE.

§ 60.17 Contents of site characterization plan.

The site characterization plan shall contain—

(a) A general plan for site characterization activities to be conducted at the area to be characterized, which general plan shall include:

(1) A description of such area, including information on quality assurance programs that have been applied to the collection, recording, and retention of information used in preparing such description.

(2) A description of such site characterization activities, including the following—

(i) The extent of planned excavations;

(ii) Plans for any onsite testing with radioactive material, including radioactive tracers, or nonradioactive material;

(iii) Plans for any investigation activities that may affect the capability of such area to isolate high-level radioactive waste;

(iv) Plans to control any adverse impacts from such site characterization activities that are important to safety or that are important to waste isolation; and

(v) Plans to apply quality assurance to data collection, recording, and retention.

(3) Plans for the decontamination and decommissioning of such area, and for the mitigation of any significant adverse environmental impacts caused by site characterization activities, if such area is determined unsuitable for application for a construction authorization for a geologic repository operations area;

(4) Criteria, developed pursuant to section 112(a) of the Nuclear Waste Policy Act of 1982, to be used to determine the suitability of such area for the location of a geologic repository; and

(5) Any other information which the Commission, by rule or order, requires.

(b) A description of the possible waste form or waste package for the high-level radioactive waste to be emplaced in such geologic repository, a description (to the extent practicable) of the relationship between such waste form or waste package and the host rock at such area, and a description of the activities being conducted by DOE with respect to such possible waste form or waste package or their relationship; and

(c) A conceptual design for the geologic repository operations area that takes into account likely site-specific requirements.

[51 FR 27158]

§ 60.18 Review of site characterization activities.[8]

(a) The Director shall cause to be published in the Federal Register a notice that a site characterization plan has been received from DOE and that a staff review of such plan has begun. The notice shall identify the area to be characterized and the NRC staff members to be consulted for further information.

(b) The Director shall make a copy of the site characterization plan available at the Public Document Room. The Director shall also transmit copies of the published notice of receipt to the Governor and legislature of the State in which the area to be characterized is located and to the governing body of any affected Indian Tribe. The Director shall provide an opportunity, with respect to any area to be characterized, for the State in which such area is located and for affected Indian Tribes to present their views on the site characterization plan and their suggestions with respect to comments thereon which may be made by NRC. In addition, the Director shall make NRC staff available to consult with States and affected Indian Tribes as provided in Subpart C of this part.

(c) The Director shall review the site characterization plan and prepare a site characterization analysis with respect to such plan. In the preparation of such site characterization analysis, the Director may invite and consider the views of interested persons on DOE's site characterization plan and may review and consider comments made in connection with public hearings held by DOE.

(d) The Director shall provide to DOE the site characterization analysis, together with such additional comments as may be warranted. These comments shall include either a statement that the Director has no objection to the DOE's site characterization program, if such a statement is appropriate, or specific objections with respect to DOE's program for characterization of the area concerned. In addition, the Director may make specific recommendations

[51 FR 27158]

[8] In addition to the review of site characterization activities specified in this section, the Commission contemplates an ongoing review of other information on site investigation and site characterization, in order to allow early identification of potential licensing issues for timely resolution. This activity will include, for example, a review of the environmental assessments prepared by DOE at the time of site nomination, and review of issues related to long lead time exploratory shaft planning and procurement actions by DOE prior to issuance of site characterization plans.

pertinent to DOE's site characterization program.

(e) If DOE's planned site characterization activities include onsite testing with radioactive material, including radioactive tracers, the Director's comments shall include a determination regarding whether or not the Commission concurs that the proposed use of such radioactive material is necessary to provide data for the preparation of the environmental reports required by law and for an application to be submitted under § 60.22 of this part.

(f) The Director shall publish in the Federal Register a notice of availability of the site characterization anaylsis and a request for public comment. A reasonable period, not less than 90 days, shall be allowed for comment. Copies of the site characterization analysis and of the comments received shall be made available at the Public Document Room.

(g) During the conduct of site characterization activities, DOE shall report not less than once every six months to the Commission on the nature and extent of such activities and the information that has been developed, and on the progress of waste form and waste package research and development. The semiannual reports shall include the results of site characterization studies, the identification of new issues, plans for additional studies to resolve new issues, elimination of planned studies no longer necessary, identification of decision points reached and modifications to schedules where appropriate. DOE shall also report its progress in developing the design of a geologic repository operations area appropriate for the area being characterized, noting when key design parameters or features which depend upon the results of site characterization will be established. Other topics related to site characterization shall also be covered if requested by the Director

(h) During the conduct of site characterization activities, NRC staff shall be permitted to visit and inspect the locations at which such activities are carried out and to observe excavations, borings, and in situ tests as they are done.

(i) The Director may comment at any time in writing to DOE, expressing current views on any aspect of site characterization. In particular, such comments shall be made whenever the Director, upon review of comments invited on the site characterization analysis or upon review of DOE's semiannual reports, determines that there are substantial new grounds for making recommendations or stating objections to DOE's site characterization program. The Director shall invite public comment on any comments which the Director makes to DOE upon review of the DOE semiannual reports or on any other comments which the Director makes to DOE on site characterization.

(j) The Director shall transmit copies of the site characterization analysis and all comments to DOE made by the Director under this section to the Governor and legislature of the State in which the area to be characterized is located and to the governing body of any affected Indian Tribe. When transmitting the site characterization analysis under this paragraph, the Director shall invite the addressees to review and comment thereon.

(k) All correspondence between DOE and the NRC under this section, including the reports described in paragraph (g), shall be placed in the Public Document Room.

(l) The activities described in paragraphs (a) through (k) 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. Accordingly, neither the issuance of a site characterization analysis nor any other comments of the Director made under this section constitutes 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 such proceeding.

51FR27156

51FR27156

License Applications

§ 60.21 Content of application.

54 FR 27684 ➤ (a) An application shall consist of general information and a Safety Analysis Report. An environmental impact statement shall be prepared in accordance with the Nuclear Waste Policy Act of 1982, as amended, and shall accompany the application. Any Restricted Data or National Security Information shall be separated from unclassified information.

46 FR 13971 (b) The general information shall include:

(1) A general description of the proposed geologic repository identifying the location 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 DOE will provide at the geologic repository operations area such safeguards as it requires at comparable surface facilities (of DOE) to promote the common defense and security.

(4) A description of the physical security plan for protection against radiological sabotage. Since the radiation hazards associated with high-level wastes make them inherently unattractive as a target for theft or diversion, no detailed information need be submitted on protection against theft or diversion.

46 FR 13971 (5) A description of site characterization work actually conducted by DOE at all sites considered in the application and, as appropriate, explanations of why such work differed from the description of the site characterization program described in the Site Characterization Report for each site.

48 FR 28194 (c) The Safety Analysis Report shall include:

(1) A description and assessment of the site at which the proposed geologic repository operations area is to be located with appropriate attention to those features of the site that might affect geologic repository operations area design and performance. The description of the site shall identify the location of the geologic repository operations area with respect to the boundary of the accessible environment.

(i) The description of the site shall also include the following information regarding subsurface conditions. This description shall, in all cases, include such information with respect to the controlled area. In addition, where subsurface conditions outside the controlled area may affect isolation within the controlled area, the description shall include such information with respect to subsurface conditions outside the controlled area to the extent such information is relevant and material. The detailed information referred to in this paragraph shall include—

(A) The orientation, distribution, aperture in-filling and origin of fractures, discontinuities, and heterogeneities;

(B) The presence and characteristics of other potential pathways such as solution features, breccia pipes, or other potentially permeable features;

(C) The geomechanical properties and conditions, including pore pressure and ambient stress conditions;

(D) The hydrogeologic properties and conditions;

(E) The geochemical properties; and

(F) The anticipated response of the geomechanical, hydrogeologic, and geochemical systems to the maximum design thermal loading, given the pattern of fractures and other discontinuities and the heat transfer properties of the rock mass and groundwater.

(ii) The assessment shall contain—

(A) An analysis of the geology, geophysics, hydrogeology, geochemistry, climatology, and meteorology of the site.

(B) Analyses to determine the degree to which each of the favorable and potentially adverse conditions, if present, has been characterized, and the extent to which it contributes to or detracts from isolation. For the purpose of determining the presence of the potentially adverse conditions, investigations shall extend from the surface to a depth sufficient to determine critical pathways for radionuclide migration from the underground facility to the accessible environment. Potentially adverse conditions shall be investigated outside of the controlled area if they affect isolation within the controlled area.

(C) An evaluation of the performance of the proposed geologic repository for the period after permanent closure, assuming anticipated processes and events, giving the rates and quantities of releases of radionuclides to the accessible environment as a function of time; and a similar evaluation which assumes the occurrence of unanticipated processes and events.

48 FR 28194 (D) 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. The analysis shall also include a comparative evaluation of alternatives to the major design features that are important to waste isolation, with particular attention to the alternatives that would provide longer radionuclide containment and isolation.

(E) An analysis of the performance of the major design structures, systems, and components, both surface and subsurface, to identify those that are important to safety. For the purposes of this analysis, it shall 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.

(F) An explanation of measures used to support the models used to perform the assessments required in paragraphs (A) through (D). Analyses and models

that will be used to predict future conditions and changes in the geologic setting shall be supported by using an appropriate combination of such methods as field tests, in situ tests, laboratory tests which are representative of field conditions, monitoring data, and natural analog studies. 48 FR 28194

(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 performance objectives 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 DOE proposes to apply to the design and construction of the geologic repository operations area. 46 FR 13971

(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. This analysis 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; and (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. 48 FR 28194

(4) A description of the quality assurance program to be applied to the structures, systems, and components important to safety and to the engineered and natural barriers important to waste isolation.

(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. 46 FR 13971

(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 site and adjacent areas, including a conceptual design of monuments which would be used to identify the controlled area after permanent closure. 48 FR 28194

(9) Plans for coping with radiological emergencies at any time prior to permanent closure and decontamination or dismantlement of surface facilities. 46 FR 13971 46 FR 28194

(10) A description of the nuclear material control and accounting program. 46 FR 13971 46 FR 28194

(11) A description of design considerations that are intended to facilitate permanent closure and decontamination or dismantlement of surface facilities. 46 FR 13971 46 FR 28194

(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. 46 FR 13971 46 FR 28194

(13) An identification and evaluation of the natural resources of the geologic setting, including estimates as to undiscovered deposits, the exploitation of which could affect the ability of the geologic repository to isolate radioactive wastes. Undiscovered deposits of resources characteristic of the area shall be estimated by reasonable inference based on geological and geophysical evidence. This evaluation of resources, including undiscoverd deposits, shall be conducted for the site and for areas of similar size that are representative of and are within the geologic setting. For natural resources with current markets the resources shall be assessed, with estimates provided of both gross and net value. The estimate of net value shall take into account current development, extraction and marketing costs. For natural resources without current markets, but which would be marketable given credible projected changes in economic or technological factors, the resources shall be described by physical factors such as tonnage or other amount, grade, and quality. 48 FR 28194

(14) 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 structures, systems, and components important to safety and for the engineered and natural barriers important to waste isolation, DOE shall provide a detailed description of the programs designed to resolve safety questions, including a schedule indicating when these questions would be resolved.

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

(i) The organizational structure of DOE as it pertains to construction and operation of the geologic repository operations area 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) Identification of key positions which are assigned responsibility for safety at and operation of the geologic repository operations area.

(iii) Personnel qualifications and training requirements.

(iv) Plans for startup activities and startup testing.

(v) Plans for conduct of normal activities, including maintenance, surveillance, and periodic testing of structures, systems, and components of the geologic repository operation area. 48 FR 28194

(iv) Plans for permanent closure and plans for the decontamination or dismantlement of surface facilities.

(vii) 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 and the engineered and natural barriers important to waste isolation.

§ 60.22 Filing and distribution of application.

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

(b) Each portion of such application and any amendments, and each environmental impact statement and any supplements, shall be accompanied by 30 additional copies. Another 120 copies shall be retained by DOE for distribution in accordance with written instructions from the Director or the Director's designee. 54 FR 27864

(c) DOE shall, upon notification of the appointment of an Atomic Safety and Licensing Board, update the application, eliminating all superseded information, and supplement the environmental impact statement if necessary, and serve the updated application and environmental impact statement (as it may have been supplemented) as directed by the Board. At that time DOE shall also serve one such copy of the application and environmental impact statement on the Atomic Safety and Licensing Appeal Panel. Any subsequent amendments to the application or supplements to the environmental impact statement shall be served in the same manner.

(d) At the time of filing of an application and any amendments thereto, one copy shall be made

available in an appropriate location near the proposed geologic repository operations area (which shall be a public document room, if one has been established) for inspection by the public and updated as amendments to the application are made. The environmental impact statement and any supplements thereto shall be made available in the same manner. An updated copy of the application, and the environmental impact statement and supplements, shall be produced at any public hearing held by the Commission on the application, for use by any party to the proceeding. 54 FR 27864

(e) The DOE shall certify that the updated copies of the application, and the environmental impact statement as it may have been supplemented, 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. 48 FR 28194

In its application, environmental report, or Site Characterization Report, the DOE 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 the public document room located near the site of the proposed geologic repository.

§ 60.24 Updating of application and environmental report.

(a) The application shall be as complete as possible in the light of information that is reasonably available at the time of docketing. 54FR27864

(b) The DOE shall update its application in a timely manner so as to permit the Commission to review, prior to issuance of a license: 48 FR 28194

(1) Additional geologic, geophysical, geochemical, 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 DOE shall supplement its environmental impact statement in a timely manner so as to take into account the environmental impacts of any substantial changes in its proposed actions or any significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. 54 FR 27864

Construction Authorization

§ 60.31 Construction authorization. 54 FR 27864

Upon review and consideration of an application and environmental impact statement 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 radioactive materials described in the application can be received, possessed, and disposed of in a geologic repository operations area 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: 46 FR 13971

(1) DOE has described the proposed geologic repository including but not limited to: (i) The geologic, geophysical, 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 operations area; (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. 48 FR 28194

(2) The site and design comply with the performance objectives and criteria contained in Subpart E of this part.

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

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

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

(6) The DOE's proposed operating procedures to protect health and to minimize danger to life or property are adequate. 46 FR 13971

(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. A DOE certification that it will provide at the geologic repository operations area such safeguards as it requires at comparable DOE surface facilities to promote the common defense and security will constitute a rebuttable presumption of noninimicality to the common defense and security.

(c) *Environmental.* That, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, the action called for is issuance of the construction authorization, with any appropriate conditions to protect environmental values.

§ 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 will incorporate in the construction authorization provisions requiring DOE to furnish periodic or special reports regarding: (1) Progress of construction, (2) any data about the site 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) The construction authorization will include restrictions on subsequent changes to the features of the geologic repository and the procedures authorized. The restrictions that may be imposed under this paragraph can include measures to prevent adverse effects on the geologic setting as well as measures related to the design and construction of the geologic repository operations area. These restrictions will fall into three categories of descending importance to public health and safety as follows: (1) Those features and procedures which may not be changed without: (i) 60 days prior notice to the Commission (ii) 30 days notice of opportunity for a prior hearing, and (iii) prior Commission approval; (2) those features and procedures which may not be changed without (i) 60 days prior notice to the Commission, and (ii) prior Commission approval; and (3) those features and procedures which may not be changed without 60 days notice to the Commission. Features and procedures falling in paragraph (c)(3) of this section may not be changed without prior Commission approval if the Commission, after having received the required notice, so orders. 46 FR 13971

(d) 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 DOE 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 in § 60.21.

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

License 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. A DOE certification that it will provide at the geologic repository operations area such safeguards as it requires at comparable DOE facilities to promote the common defense and security, will constitute a rebuttable presumption of non-inimicality to the common defense and security.

(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

48 FR 13971

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 DOE 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.

[48 FR 13971]

§ 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.

[48 FR 28194]

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

[48 FR 13971]

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

[48 FR 28194]

(5) Controls to be applied to restricted access and to avoid disturbance to the controlled area and to areas outside the controlled area where conditions may affect isolation within the controlled area.

[46 FR 13971]

(6) 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 DOE 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.

[52 FR 31601]

(b) The DOE 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 DOE 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 DOE 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, Office of Nuclear Material Safety and Safeguards 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.

[52 FR 31601]

§ 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.

[46 FR 13971]

(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—

[46 FR 13971]

(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.

[48 FR 28194]

(3) Removal or reduction of controls applied to restrict access to or avoid disturbance of the controlled area and to areas outside the controlled area where conditions may affect isolation within the controlled area.

[46 FR 13971]

(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.

[48 FR 28194]

(6) Permanent closure.

(7) Any other activity involving an unreviewed safety question.

[46 FR 13971]

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

Permanent Closure

[54 FR 27864]

§ 60.51 License amendment for permanent closure.

(a) DOE shall submit an application to amend the license prior to permanent closure. The submission shall consist of an update of the license application submitted under §§ 60.21 and 60.22, including:

(1) A description of the program for post-permanent closure 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. As a minimum, such measures shall include—

(i) Identification of the controlled area and geologic repository operations area by monuments that have been designed, fabricated, and emplaced to be as permanent as is practicable; and

(ii) Placement of records in the archives and land record systems of local State, and Federal government agencies, and archives elsewhere in the world, that would be likely to be consulted by potential human intruders—such records to identify the location of the geologic repository operations area, including the underground facility, boreholes and shafts, and the boundaries of the controlled area, and the nature and hazard of the waste.

(3) Geologic, geophysical, geochemical, 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 tests, experiments, and any other analyses relating to backfill of excavated areas, shaft sealing, waste interaction with the host rock, and any other tests, experiments, or analyses pertinent to the long-term isolation of emplaced wastes within the geologic repository.

(5) Any substantial revision of plans for permanent closure.

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

(b) If necessary, so as to take into account the environmental impact of any substantial changes in the permanent closure activities proposed to be carried out or any significant new information regarding the environmental impacts of such closure, DOE shall also supplement its environmental impact statement and submit such statement, as supplemented, with the application for license amendment.

§ 60.52 Termination of license.

(a) Following permanent closure and the decontamination or dismantlement of surface facilities, DOE 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 DOE's plan, as amended and approved as part of the license.

(2) That the final state of the geologic repository operations area conforms to DOE's plans for permanent closure and DOE's plans for the decontamination or dismantlement of surface facilities, 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 and Affected Indian Tribes

§ 60.61 Provision of information.

(a) The Director shall provide to the Governor and legislature of any State in which a geologic repository operations area is or may be located, and to the governing body of any affected Indian Tribe, timely and complete information regarding determinations or plans made by the Commission with respect to the site characterization, siting, development, design, licensing, construction, operation, regulation, permanent closure, or decontamination and dismantlement of surface facilities, of such geologic repository operations area.

(b) For purposes of this section, a geologic repository operations area shall be considered to be one which "may be located" in a State if the location thereof in such State has been described in a site characterization plan submitted to the Commission under this part.

(c) Notwithstanding paragraph (a) of this section, the Director is not required to distribute any document to any entity if, with respect to such document, that entity or its counsel is included on a service list prepared pursuant to Part 2 of this chapter.

(d) Copies of all communications by the Director under this section shall be placed in the Public Document Room, and copies thereof shall be furnished to DOE.

§ 60.62 Site review.

(a) Whenever an area has been approved by the President for site characterization, and upon request of a State or an affected Indian Tribe, the Director shall make NRC staff available to consult with representatives of such States and Tribes.

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

(c) Consultation under this section may include:

(1) Keeping the parties informed of the Director's views on the progress of site characterization.

(2) Review of applicable NRC regulations, licensing procedures, schedules, and opportunities for State and Tribe participation in the Commission's regulatory activities.

(3) Cooperation in development of proposals for State and Tribe participation in license reviews.

§ 60.63 Participation in license reviews.

(a) State and local governments and affected Indian Tribes may participate in license reviews as provided in Subpart G of Part 2 of this chapter. A State in which a repository for high-level radioactive waste is proposed to be located and any affected Indian Tribe shall have an unquestionable legal right to participate as a party in such proceedings.

(b) In addition, whenever an area has been approved by the President for site characterization, a State or an affected Indian Tribe may submit to the Director a proposal to facilitate its participation in the review of a site characterization plan and/or license application. The proposal may be submitted at any time and shall contain a description and schedule of how the State or affected Indian Tribe wishes to participate in the review, or what services or activities the State or affected Indian Tribe wishes NRC to carry out, and how the services or activities proposed to be carried out by NRC would contribute to such participation. The proposal may include 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.

(c) The Director shall arrange for a meeting between the representatives of the State or affected Indian Tribe and the NRC staff to discuss any proposal submitted under paragraph (b) of this section, with a view to identifying any modifications that may contribute to the effective participation by such State or Tribe.

(d) 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 it is determined that:

(1) The proposed activities are suitable in light of the type and magnitude of impacts which the State or affected Indian Tribe may bear;

(2) The proposed activities:

(i) Will enhance communications between NRC and the State or affected Indian Tribe;

(ii) Will make a productive and timely contribution to the review; and

(iii) Are authorized by law.

(e) The Director will advise the State

or affected Indian Tribe whether its proposal has been accepted or denied, and if all or any part of proposal is denied, the Director shall state the reason for the denial.

(f) Proposals submitted under this section, and responses thereto, shall be made available at the Public Document Room.

§ 60.64 Notice to States.

If the Governor and legislature of a State have jointly designated on their behalf a single person or entity to receive notice and information from the Commission under this part, the Commission will provide such notice and information to the jointly designated person or entity instead of the Governor and legislature separately.

§ 60.65 Representation.

Any person who acts under this subpart as a representative for a State (or for the Governor or legislature thereof) or for an affected Indian Tribe shall include in the request or other submission, or at the request of the Commission, a statement of the basis of his or her authority to act in such representative capacity.

Subpart D—Records, Reports, Tests, and Inspections

§ 60.71 Records and reports.

(a) DOE 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 provide a complete history of the movement of the waste from the shipper through all phases of storage and disposal. DOE shall retain these records in a manner that ensures their useability for future generations in accordance with § 60.51(a)(2).

§ 60.72 Construction records.

(a) DOE shall maintain records of construction of the geologic repository operations area in a manner that ensures their useability for future generations in accordance with § 60.51(a)(2).

(b) The records required under paragraph (a) shall include at least the following—

(1) Surveys of the underground facility excavations, shafts, and boreholes referenced to readily identifiable surface features or monuments;

(2) A description of the materials encountered;

(3) Geologic maps and geologic cross sections;

(4) Locations and amount of seepage;

(5) Details of equipment, methods, progress, and sequence of work;

(6) Construction problems;

(7) Anomalous conditions encountered;

(8) Instrument locations, readings, and analysis;

(9) Location and description of structural support systems;

(10) Location and description of dewatering systems; and

(11) Details, methods of emplacement, and location of seals used.

§ 60.73 Reports of deficiencies.

DOE shall promptly notify the Commission of each deficiency found in the characteristics of the site, and design and construction of the geologic repository operations area which, were it to remain uncorrected, could: (a) Be a substantial safety hazard, (b) represent a significant deviation from the design criteria and design bases stated in the application, or (c) represent a 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 Regional Office listed in Appendix D of Part 20 of this chapter.

§ 60.74 Tests.

(a) DOE shall perform, or permit the Commission to perform, such tests as the Commission deems appropriate or necessary for the administration of the regulations in this part. These may include tests of: (1) Radioactive waste, (2) the geologic repository including its structures, systems, and components, (3) radiation detection and monitoring instruments, and (4) other equipment and devices used in connection with the receipt, handling, or storage of radioactive waste.

(b) The tests required under this section shall include a performance confirmation program carried out in accordance with Subpart F of this part.

§ 60.75 Inspections.

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

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

(c)(1) DOE shall upon requests by the Director, Office of Nuclear Material Safety and Safeguards , provide rent-free office space for the exclusive use of the Commission inspection personnel. Heat, air-conditioning, light, electrical outlets and janitorial services shall be furnished by DOE. The office shall be convenient to and have full access to the facility and shall provide the inspector both visual and acqoustic privacy.

(2) The space provided shall be adequate to accommodate a full-time inspector, a part-time secretary and transient NRC personnel and will be generally commensurate with other office facilities at the geologic repository operations area. A space of 250 square feet either within the geologic repository operations area's office complex or in an office trailer or other onsite space at the geologic repository operations area is suggested as a guide. For locations at which activities are carried out under licenses issued under other parts of this chapter, additional space may be requested to accomodate additional full-time inspectors. The Office space that is provided shall be subject to the approval of the Director, Office of Nuclear Material Safety and Safeguards. All furniture, supplies and communication equipment will be furnished by the Commission.

(3) DOE shall afford any NRC resident inspector assigned to that location, or other NRC inspectors identified by the Regional Administrator as likely to inspect the facility, immediate unfettered access, equivalent to access provided regular employees, following proper identification and compliance with applicable access control measures for security, radiological protection and personal safety.

Subpart E—Technical Criteria

§ 60.101 Purpose and nature of findings.

(a)(1) Subpart B of this part prescribes the standards for issuance of a license to receive and possess source, special nuclear, or byproduct material at a geologic repository operations area. In particular, § 60.41(c) requires a finding that the issuance of a license will not constitute an unreasonable risk to the health and safety of the public. The purpose of this subpart is to set out performance objectives and site and design criteria which, if satisfied, will support such a finding of no unreasonable risk.

(2) While these performance objectives and criteria are generally stated in unqualified terms, it is not expected that complete assurance that they will be met can be presented. A

reasonable assurance, on the basis of the record before the Commission, that the objectives and criteria will be met is the general standard that is required. For § 60.112, and other portions of this subpart that impose objectives and criteria for repository performance over long times into the future, there will inevitably be greater uncertainties. Proof of the future performance of engineered barrier systems and the geologic setting over time periods of many hundreds or many thousands of years is not to be had in the ordinary sense of the word. For such long-term objectives and criteria, what is required is reasonable assurance, making allowance for the time period, hazards, and uncertainties involved, that the outcome will be in conformance with those objectives and criteria. Demonstration of compliance with such objectives and criteria will involve the use of data from accelerated tests and predictive models that are supported by such measures as field and laboratory tests, monitoring data and natural analog studies.

(b) Subpart B of this part also lists findings that must be made in support of an authorization to construct a geologic repository operations area. In particular, § 60.31(a) requires a finding that there is reasonable assurance that the types and amounts of radioactive materials described in the application can be received, possessed, and disposed of in a geologic repository operations area of the design proposed without unreasonable risk to the health and safety of the public. As stated in that paragraph, in arriving at this determination, the Commission will consider whether the site and design comply with the criteria contained in this subpart. Once again, while the criteria may be written in unqualified terms, the demonstration of compliance may take uncertainties and gaps in knowledge into account, provided that the Commission can make the specified finding of reasonable assurance as specified in paragraph (a) of this section.

§ 60.102 Concepts.

This section provides a functional overview of Subpart E. In the event of any inconsistency with definitions found in § 60.2, those definitions shall prevail.

(a) *The HLW facility.* NRC exercises licensing and related regulatory authority over those facilities described in section 202 (3) and (4) of the Energy Reorganization Act of 1974. Any of these facilities is designated a *HLW facility.*

(b) *The geologic repository operations area.* (1) This part deals with the exercise of authority with respect to a particular class of HLW facility—namely a *geologic repository operations area.*

(2) *A geologic repository operations area* consists of those surface and subsurface areas that are part of a geologic repository where radioactive waste handling activities are conducted. The underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals, is designated the *underground facility.*

(3) The exercise of Commission authority requires that the geologic repository operations area be used for *storage* (which includes *disposal*) of *high-level radioactive wastes (HLW).*

(4) HLW includes irradiated reactor fuel as well as reprocessing wastes. However, if DOE proposes to use the geologic repository operations area for storage of *radioactive waste* other than HLW, the storage of this radioactive waste is subject to the requirements of this part.

(c) *Areas related to isolation.* Although the activities subject to regulation under this part are those to be carried out at the geologic repository operations area, the licensing process also considers characteristics of adjacent areas that are defined in other ways. There is to be an area surrounding the underground facility referred to above, which is designated the *controlled area,* within which DOE is to exercise specified controls to prevent adverse human actions following permanent closure. The location of the controlled area is the *site.* The *accessible environment* is the atmosphere, land surface, surface water, oceans, and the portion of the lithosphere that is outside the controlled area. There is an area, designated the *geologic setting,* which includes the geologic, hydrologic, and geochemical systems of the region in which a geologic repository operations area is or may be located. The geologic repository operations area plus the portion of the geologic setting that provides isolation of the radioactive waste make up the *geologic repository.*

(d) *Stages in the licensing process.* There are several stages in the licensing process. The *site characterization* stage, though begun before submission of a license application, may result in consequences requiring evaluation in the license review. The *construction stage* would follow, after issuance of a construction authorization. A *period of operations* follows the issuance of a license by the Commission. The period of operations includes the time during which *emplacement* of wastes occurs; any subsequent period before permanent closure during which the emplaced wastes are *retrievable;* and *permanent closure,* which includes sealing of shafts. Permanent closure represents the end of active human intervention with respect to the engineered barrier system.

(e) *Isolation of waste.* (1) During the first several hundred years following permanent closure of a geologic repository, when radiation and thermal levels are high and the uncertainties in assessing repository performance are large, special emphasis is placed upon the ability to contain the wastes by waste packages within an *engineered barrier system.* This is known as the *containment period.* The *engineered barrier system* includes the waste packages and the underground facility. A *waste package* is composed of the waste form and any containers, shielding, packing, and absorbent materials immediately surrounding an individual waste container. The *underground facility* means the underground structure, including openings and backfill materials, but excluding, shafts, boreholes, and their seals.

(2) Following the containment period special emphasis is placed upon the ability to achieve isolation of the wastes by virtue of the characteristics of the geologic repository. The engineered barrier system works to control the release of radioactive material to the geologic setting and the geologic setting works to control the release of radioactive material to the accessible environment. *Isolation* means inhibiting the transport of radioactive material so that amounts and concentrations of the materials entering the accessible environment will be kept within prescribed limits.

Performance Objectives

§ 60.111 Performance of the geologic repository operations area through permanent closure.

(a) *Protection against radiation exposures and releases of radioactive material.* The geologic repository operations area shall be designed so that until permanent closure has been completed, radiation exposures and radiation levels, and releases of radioactive materials to unrestricted areas, will at all times be maintained within the limits specified in Part 20 of this chapter and such generally applicable environmental standards for radioactivity as may have been established by the Environmental Protection Agency.

(b) *Retrievability of waste.* (1) The geologic repository operations area shall be designed to preserve the option of waste retrieval throughout the period during which wastes are being emplaced and, thereafter, until the completion of a preformance confirmation program and Commission review of the information obtained from such a program. To

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satisfy this objective, the geologic repository operations area shall be designed so that any or all of the emplaced waste could be retrieved on a reasonable schedule starting at any time up to 50 years after waste emplacement operations are initiated, unless a different time period is approved or specified by the Commission. This different time period may be established on a case-by-case basis consistent with the emplacement schedule and the planned performance confirmation program.

(2) This requirement shall not preclude decisions by the Commission to allow backfilling part or all of, or permanent closure of, the geologic repository operations area prior to the end of the period of design for retrievability.

(3) For purposes of this paragraph, a reasonable schedule for retrieval is one that would permit retrieval in about the same time as that devoted to construction of the geologic repository operations area and the emplacement of wastes.

§ 60.112 Overall system performance objective for the geologic repository after permanent closure.

The geologic setting shall be selected and the engineered barrier system and the shafts, boreholes and their seals shall be designed to assure that releases of radioactive materials to the accessible environment following permanent closure conform to such generally applicable environmental standards for radioactivity as may have been established by the Environmental Protection Agency with respect to both anticipated processes and events and unanticipated processes and events.

§ 60.113 Performance of particular barriers after permanent closure.

(a) *General provisions.* (1) *Engineered barrier system.* (i) The engineered barrier system shall be designed so that assuming anticipated processes and events: (A) Containment of HLW will be substantially complete during the period when radiation and thermal conditions in the engineered barrier system are dominated by fission product decay; and (B) any release of radionuclides from the engineered barrier system shall be a gradual process which results in small fractional releases to the geologic setting over long times. For disposal in the saturated zone, both the partial and complete filling with groundwater of available void spaces in the underground facility shall be appropriately considered and analysed among the anticipated processes and events in designing the engineered barrier system.

(ii) In satisfying the preceding requirement, the engineered barrier system shall be designed, assuming anticipated processes and events, so that:

(A) Containment of HLW within the waste packages will be substantially complete for a period to be determined by the Commission taking into account the factors specified in § 60.113(b) provided, that such period shall be not less than 300 years nor more than 1,000 years after permanent closure of the geologic repository; and

(B) The release rate of any radionuclide from the engineered barrier system following the containment period shall not exceed one part in 100,000 per year of the inventory of that radionuclide calculated to be present at 1,000 years following permanent closure, or such other fraction of the inventory as may be approved or specified by the Commission; provided, that this requirement does not apply to any radionuclide which is released at a rate less than 0.1% of the calculated total release rate limit. The calculated total release rate limit shall be taken to be one part in 100,000 per year of the inventory of radioactive waste, originally emplaced in the underground facility, that remains after 1,000 years of radioactive decay.

(2) *Geologic setting.* The geologic repository shall be located so that pre-waste-emplacement groundwater travel time along the fastest path of likely radionuclide travel from the disturbed zone to the accessible environment shall be at least 1,000 years or such other travel time as may be approved or specified by the Commission.

(b) On a case-by-case basis, the Commission may approve or specify some other radionuclide release rate, designed containment period or pre-waste-emplacement groundwater travel time, provided that the overall system performance objective, as it relates to anticipated processes and events, is satisfied. Among the factors that the Commission may take into account are—

(1) Any generally applicable environmental standard for radioactivity established by the Environmental Protection Agency;

(2) The age and nature of the waste, and the design of the underground facility, particularly as these factors bear upon the time during which the thermal pulse is dominated by the decay heat from the fission products;

(3) The geochemical characteristics of the host rock, surrounding strata and groundwater; and

(4) Particular sources of uncertainty in predicting the performance of the geologic repository.

(c) Additional requirements may be found to be necessary to satisfy the overall system performance objective as it relates to unanticipated processes and events.

Land Ownership and Control

§ 60.121 Requirements for ownership and control of interests in land.

(a) *Ownership of land.* (1) Both the geologic repository operations area and the controlled area shall be located in and on lands that are either acquired lands under the jurisdiction and control of DOE, or lands permanently withdrawn and reserved for its use.

(2) These lands shall be held free and clear of all encumbrances, if significant, such as: (i) Rights arising under the general mining laws; (ii) easements for right-of-way; and (iii) all other rights arising under lease, rights of entry, deed, patent, mortgage, appropriation, prescription, or otherwise.

(b) *Additional controls.* Appropriate controls shall be established outside of the controlled area. DOE shall exercise any jurisdiction and control over surface and subsurface estates necessary to prevent adverse human actions that could significantly reduce the geologic repository's ability to achieve isolation. The rights of DOE may take the form of appropriate possessory interests, servitudes, or withdrawals from location or patent under the general mining laws.

(c) *Water rights.* (1) DOE shall also have obtained such water rights as may be needed to accomplish the purpose of the geologic repository operations area.

(2) Water rights are included in the additional controls to be established under paragraph (b) of this section.

Siting Criteria

§ 60.122 Siting criteria.

(a)(1) A geologic setting shall exhibit an appropriate combination of the conditions specified in paragraph (b) of this section so that, together with the engineered barriers system, the favorable conditions present are sufficient to provide reasonable assurance that the performance objectives relating to isolation of the waste will be met.

(2) If any of the potentially adverse conditions specified in paragraph (c) of this section is present, it may compromise the ability of the geologic repository to meet the performance objectives relating to isolation of the waste. In order to show that a potentially adverse condition does not so compromise the performance of the geologic repository the following must be demonstrated:

(i) The potentially adverse human activity or natural condition has been adequately investigated, including the

extent to which the condition may be present and still be undetected taking into account the degree of resolution achieved by the investigations; and

(ii) The effect of the potentially adverse human activity or natural condition on the site has been adequately evaluated using analyses which are sensitive to the potentially adverse human activity or natural condition and assumptions which are not likely to underestimate its effect; and

(iii)(A) The potentially adverse human activity or natural condition is shown by analysis pursuant to paragraph (a)(2)(ii) of this section not to affect significantly the ability of the geologic repository to meet the performance objectives relating to isolation of the waste, or

(B) The effect of the potentially adverse human activity or natural condition is compensated by the presence of a combination of the favorable characteristics so that the performance objectives relating to isolation of the waste are met, or

(C) The potentially adverse human activity or natural condition can be remedied.

(b) *Favorable conditions.* (1) The nature and rates of tectonic, hydrogeologic, geochemical, and geomorphic processes (or any of such processes) operating within the geologic setting during the Quaternary Period, when projected, would not affect or would favorably affect the ability of the geologic repository to isolate the waste.

(2) For disposal in the saturated zone, hydrogeologic conditions that provide—

(i) A host rock with low horizontal and vertical permeability;

(ii) Downward or dominantly horizontal hydraulic gradient in the host rock and immediately surrounding hydrogeologic units; and

(iii) Low vertical permeability and low hydraulic gradient between the host rock and the surrounding hydrogeologic units.

(3) Geochemical conditions that—(i) Promote precipitation or sorption of radionuclides; (ii) Inhibit the formation of particulates, colloids, and inorganic and organic complexes that increase the mobility of radionuclides; or (iii) Inhibit the transport of radionuclides by particulates, colloids, and complexes.

(4) Mineral assemblages that, when subjected to anticipated thermal loading, will remain unaltered or alter to mineral assemblages having equal or increased capacity to inhibit radionuclide migration.

(5) Conditions that permit the emplacement of waste at a minimum depth of 300 meters from the ground surface. (The ground surface shall be deemed to be the elevation of the lowest point on the surface above the disturbed zone.)

(6) A low population density within the geologic setting and a controlled area that is remote from population centers.

(7) Pre-waste-emplacement groundwater travel time along the fastest path of likely radionuclide travel from the disturbed zone to the accessible environment that substantially exceeds 1,000 years.

(8) For disposal in the unsaturated zone, hydrogeologic conditions that provide—

(i) Low moisture flux in the host rock and in the overlying and underlying hydrogeologic units;

(ii) A water table sufficiently below the underground facility such that fully saturated voids contiguous with the water table do not encounter the underground facility;

(iii) A laterally extensive low-permeability hydrogeologic unit above the host rock that would inhibit the downward movement of water or divert downward moving water to a location beyond the limits of the underground facility;

(iv) A host rock that provides for free drainage; or

(v) A climatic regime in which the average annual historic precipitation is a small percentage of the average annual potential evapotranspiration.

(c) *Potentially adverse conditions.* The following conditions are potentially adverse conditions if they are characteristic of the controlled area or may affect isolation within the controlled area.

(1) Potential for flooding of the underground facility, whether resulting from the occupancy and modification of floodplains or from the failure of existing or planned man-made surface water impoundments.

(2) Potential for foreseeable human activity to adversely affect the groundwater flow system, such as groundwater withdrawal, extensive irrigation, subsurface injection of fluids, underground pumped storage, military activity or construction of large scale surface water impoundments.

(3) Potential for natural phenomena such as landslides, subsidence, or volcanic activity of such a magnitude that large-scale surface water impoundments could be created that could change the regional groundwater flow system and thereby adversely affect the performance of the geologic repository.

(4) Structural deformation, such as uplift, subsidence, folding, or faulting that may adversely affect the regional groundwater flow system.

(5) Potential for changes in hydrologic conditions that would affect the migration of radionuclides to the accessible environment, such as changes in hydraulic gradient, average interstitial velocity, storage coefficient, hydraulic conductivity, natural recharge, potentiometric levels, and discharge points.

(6) Potential for changes in hydrologic conditions resulting from reasonably foreseeable climatic changes.

(7) Groundwater conditions in the host rock, including chemical composition, high ionic strength or ranges of Eh-pH, that could increase the solubility or chemical reactivity of the engineered barrier system.

(8) Geochemical processes that would reduce sorption of radionuclides, result in degradation of the rock strength, or adversely affect the performance of the engineered barrier system.

(9) Groundwater conditions in the host rock that are not reducing.

(10) Evidence of dissolutioning such as breccia pipes, dissolution cavities, or brine pockets.

(11) Structural deformation such as uplift, subsidence, folding, and faulting during the Quaternary Period.

(12) Earthquakes which have occurred historically that if they were to be repeated could affect the site significantly.

(13) Indications, based on correlations of earthquakes with tectonic processes and features, that either the frequency of occurrence or magnitude of earthquakes may increase.

(14) More frequent occurrence of earthquakes or earthquakes of higher magnitude than is typical of the area in which the geologic setting is located.

(15) Evidence of igneous activity since the start of the Quaternary Period.

(16) Evidence of extreme erosion during the Quaternary Period.

(17) The presence of naturally occurring materials, whether identified or undiscovered, within the site, in such form that:

(i) Economic extraction is currently feasible or potentially feasible during the foreseeable future; or

(ii) Such materials have greater gross value or net value than the average for other areas of similar size that are representative of and located within the geologic setting.

(18) Evidence of subsurface mining for resources within the site.

(19) Evidence of drilling for any purpose within the site.

(20) Rock or groundwater conditions that would require complex engineering measures in the design and construction of the underground facility or in the sealing of boreholes and shafts.

(21) Geomechanical properties that do not permit design of underground opening that will remain stable through permanent closure.

(22) Potential for the water table to rise sufficiently so as to cause saturation of an underground facility located in the unsaturated zone.

(23) Potential for existing or future perched water bodies that may saturate portions of the underground facility or provide a faster flow path from an underground facility located in the unsaturated zone to the accessible environment.

(24) Potential for the movement of radionuclides in a gaseous state through air-filled pore spaces of an unsaturated geologic medium to the accessible environment.

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Design Criteria for the Geologic Repository Operations Area

§ 60.130 Scope of design criteria for the geologic repository operations area.

Sections 60.131 through 60.134 specify minimum criteria for the design of the geologic repository operations area. These design criteria are not intended to be exhaustive, however. Omissions in §§ 60.131 through 60.134 do not relieve DOE from any obligation to provide such safety features in a specific facility needed to achieve the performance objectives. All design bases must be consistent with the results of site characterization activities.

§ 60.131 General design criteria for the geologic repository operations area.

(a) *Radiological protection.* The geologic repository operations area shall be designed to maintain radiation doses, levels, and concentrations of radioactive material in air in restricted areas within the limits specified in Part 20 of this chapter. Design shall include—

(1) Means to limit concentrations of radioactive material in air;

(2) Means to limit the time required to perform work in the vicinity of radioactive materials, including, as appropriate, designing equipment for ease of repair and replacement and providing adequate space for ease of operation;

(3) Suitable shielding;

(4) Means to monitor and control the dispersal of radioactive contamination;

(5) Means to control access to high radiation areas or airborne radioactivity areas; and

(6) A radiation alarm system to warn of significant increases in radiation levels, concentrations of radioactive material in air, and of increased radioactivity released in effluents. The alarm system shall be designed with provisions for calibration and for testing its operability.

(b) *Structures, systems, and components important to safety. (1) Protection against natural phenomena and environmental conditions.* The structures, systems, and components important to safety shall be designed so that natural phenomena and environmental conditions anticipated at the geologic repository operations area will not interfere with necessary safety functions.

(2) *Protection against dynamic effects of equipment failure and similar events.* The structures, systems, and components important to safety shall be designed to withstand dynamic effects such as missile impacts, that could result from equipment failure, and similar events and conditions that could lead to loss of their safety functions.

(3) *Protection against fires and explosions.* (i) The structures, systems, and components important to safety shall be designed to perform their safety fuctions during and after credible fires or explosions in the geologic repository operations area.

(ii) To the extent practicable, the geologic repository operations area shall be designed to incorporate the use of noncombustible and heat resistant materials.

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

(iv) The geologic repository operations area shall be designed to include means to protect systems, structures, and components important to safety against the adverse effects of either the operation or failure of the fire suppression systems.

(4) *Emergency capability.* (i) The structures, systems, and components important to safety shall be designed to maintain control of radioactive waste and radioactive effluents, and permit prompt termination of operations and evacuation of personnel during an emergency.

(ii) The geologic repository operations area shall be designed to include onsite facilities and services that ensure a safe and timely response to emergency conditions and that facilitate the use of available offsite services (such as fire, police, medical and ambulance service) that may aid in recovery from emergencies.

(5) *Utility services.* (i) Each utility service system that is important to safety shall be designed so that essential safety functions can be performed under both normal and accident conditions.

(ii) The utility services important to safety shall include redundant systems to the extent necessary to maintain, with adequate capacity, the ability to perform their safety functions.

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(iii) Provisions shall be made so that, if there is a loss of the primary electric power source or circuit, reliable and timely emergency power can be provided to instruments, utility service systems, and operating systems, including alarm systems, important to safety.

(6) *Inspection, testing, and maintenance.* The structures, systems, and components important to safety shall be designed to permit periodic inspection, testing, and maintenance, as necessary, to ensure their continued functioning and readiness.

(7) *Criticality control.* All systems for processing, transporting, handling, storage, retrieval, emplacement, and isolation of radioactive waste shall be designed to ensure that a nuclear criticality accident is not possible unless at least two unlikely, independent, and concurrent or sequential changes have occurred in the conditions essential to nuclear criticality safety. Each system shall be designed for criticality safety under normal and accident conditions. The calculated effective multiplication factor (k_{eff}) 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.

(8) *Instrumentation and control systems.* The design shall include provisions for instrumentation and control systems to monitor and control the behavior of systems important to safety over anticipated ranges for normal operation and for accident conditions.

(9) *Compliance with mining regulations.* To the extent that DOE is not subject to the Federal Mine Safety and Health Act of 1977, as to the construction and operation of the geologic repository operations area, the design of the geologic repository operations area shall nevertheless include such provisions for worker protection as may be necessary to provide reasonable assurance that all structures, systems, and components important to safety can perform their intended functions. Any deviation from relevant design requirements in 30 CFR, Chapter I, Subchapters D, E, and N will give rise to a rebuttable presumption that this requirement has not been met.

(10) *Shaft conveyances used in radioactive waste handling.* (i) Hoists important to safety shall be designed to preclude cage free fall.

(ii) Hoists important to safety shall be designed with a reliable cage location system.

(iii) Loading and unloading systems for hoists important to safety shall be designed with a reliable system of interlocks that will fail safely upon malfunction.

(iv) Hoists important to safety shall be

designed to include two independent indicators to indicate when waste packages are in place and ready for transfer.

§ 60.132 Additional design criteria for surface facilities in the geologic repository operations area.

(a) *Facilities for receipt and retrieval of waste.* Surface facilities in the geologic repository operations area shall be designed to allow safe handling and storage of wastes at the geologic repository operations area, whether these wastes are on the surface before emplacement or as a result of retrieval from the underground facility.

(b) *Surface facility ventilation.* Surface facility ventilation systems supporting waste transfer, inspection, decontamination, processing, or packaging shall be designed to provide protection against radiation exposures and offsite releases as provided in § 60.111(a).

(c) *Radiation control and monitoring.* *(1) Effluent control.* The surface facilities shall be designed to control the release of radioactive materials in effluents during normal operations so as to meet the performance objectives of § 60.111(a).

(2) *Effluent monitoring.* The effluent monitoring systems shall be designed to measure the amount and concentration of radionuclides in any effluent with sufficient precision to determine whether releases conform to the design requirement for effluent control. The monitoring systems shall be designed to include alarms that can be periodically tested.

(d) *Waste treatment.* Radioactive waste treatment facilities shall be designed to process any radioactive wastes generated at the geologic repository operations area into a form suitable to permit safe disposal at the geologic repository operations area or to permit safe transportation and conversion to a form suitable for disposal at an alternative site in accordance with any regulations that are applicable.

(e) *Consideration of decommissioning.* The surface facility shall be designed to facilitate decontamination or dismantlement to the same extent as would be required, under other parts of this chapter, with respect to equivalent activities licensed thereunder.

§ 60.133 Additional design criteria for the underground facility.

(a) *General criteria for the underground facility.* (1) The orientation, geometry, layout, and depth of the underground facility, and the design of any engineered barriers that are part of the underground facility shall contribute to the containment and isolation of radionuclides.

(2) The underground facility shall be designed so that the effects of credible disruptive events during the period of operations, such as flooding, fires and explosions, will not spread through the facility.

(b) *Flexibility of design.* The underground facility shall be designed with sufficient flexibility to allow adjustments where necessary to accommodate specific site conditions identified through in situ monitoring, testing, or excavation.

(c) *Retrieval of waste.* The underground facility shall be designed to permit retrieval of waste in accordance with the performance objectives of § 60.111.

(d) *Control of water and gas.* The design of the underground facility shall provide for control of water or gas intrusion.

(e) *Underground openings.* (1) Openings in the underground facility shall be designed so that operations can be carried out safely and the retrievability option maintained.

(2) Openings in the underground facility shall be designed to reduce the potential for deleterious rock movement or fracturing of overlying or surrounding rock.

(f) Rock excavation. The design of the underground facility shall incorporate excavation methods that will limit the potential for creating a preferential pathway for groundwater to contact the waste packages or radionuclide migration to the accessible environment.

(g) *Underground facility ventilation.* The ventilation system shall be designed to—(1) Control the transport of radioactive particulates and gases within and releases from the underground facility in accordance with the performance objectives of § 60.111(a).

(2) Assure continued function during normal operations and under accident conditions; and

(3) Separate the ventilation of excavation and waste emplacement areas.

(h) *Engineered barriers.* Engineered barriers shall be designed to assist the geologic setting in meeting the performance objectives for the period following permanent closure.

(i) *Thermal loads.* The underground facility shall be designed so that the performance objectives will be met taking into account the predicted thermal and thermomechanical response of the host rock, and surrounding strata, groundwater system.

§ 60.134 Design of seals for shafts and boreholes.

(a) *General design criterion.* Seals for shafts and boreholes shall be designed so that following permanent closure they do not become pathways that compromise the geologic repository's ability to meet the performance objectives or the period following permanent closure.

(b) *Selection of materials and placement methods.* Materials and placement methods for seals shall be selected to reduce, to the extent practicable:

(1) The potential for creating a preferential pathway for groundwater to contact the waste packages or (2) for radionuclide migration through existing pathways.

Design Criteria for the Waste Package

§ 60.135 Criteria for the waste package and its components.

(a) *High-level-waste package design in general.* (1) Packages for HLW shall be designed so that the in situ chemical, physical, and nuclear properties of the waste package and its interactions with the emplacement environment do not compromise the function of the waste packages or the performance of the underground facility or the geologic setting.

(2) The design shall include but not be limited to consideration of the following factors: solubility, oxidation/reduction reactions, corrosion, hydriding, gas generation, thermal effects, mechanical strength, mechanical stress, radiolysis, radiation damage, radionuclide retardation, leaching, fire and explosion hazards, thermal loads, and synergistic interactions.

(b) *Specific criteria for HLW package design.* *(1) Explosive, pyrophoric, and chemically reactive materials.* The waste package shall not contain explosive or pyrophoric materials or chemically reactive materials in an amount that could compromise the ability of the underground facility to contribute to waste isolation or the ability of the geologic repository to satisfy the performance objectives.

(2) *Free liquids.* The waste package shall not contain free liquids in an amount that could compromise the ability of the waste packages to achieve the performance objectives relating to containment of HLW (because of chemical interactions or formation of pressurized vapor) or result in spillage and spread of contamination in the event of waste package perforation during the period through permanent closure.

(3) *Handling.* Waste packages shall be designed to maintain waste containment during transportation, emplacement, and retrieval.

(4) *Unique identification.* A label or other means of identification shall be provided for each waste package. The identification shall not impair the integrity of the waste package and shall be applied in such a way that the information shall be legible at least to the end of the period of retrievability.

Each waste package identification shall be consistent with the waste package's permanent written records.

(c) *Waste form criteria for HLW.* High-level radioactive waste that is emplaced in the underground facility shall be designed to meet the following criteria:

(1) *Solidification.* All such radioactive wastes shall be in solid form and placed in sealed containers.

(2) *Consolidation.* Particulate waste forms shall be consolidated (for example, by incorporation into an encapsulating matrix) to limit the availability and generation of particulates.

(3) *Combustibles.* All combustible radioactive wastes shall be reduced to a noncombustible form unless it can be demonstrated that a fire involving the waste packages containing combustibles will not compromise the integrity of other waste packages, adversely affect any structures, systems, or components important to safety, or compromise the ability of the underground facility to contribute to waste isolation.

(d) *Design criteria for other radioactive wastes.* Design criteria for waste types other than HLW will be addressed on an individual basis if and when they are proposed for disposal in a geologic repository.

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Performance Confirmation Requirements

§ 60.137 General requirements for performance confirmation.

The geologic repository operations area shall be designed so as to permit implementation of a performance confirmation program that meets the requirements of Subpart F of this part.

Subpart F—Performance Confirmation Program

§ 60.140 General requirements.

(a) The performance confirmation program shall provide data which indicates, where practicable, whether—

(1) Actual subsurface conditions encountered and changes in those conditions during construction and waste emplacement operations are within the limits assumed in the licensing review; and

(2) Natural and engineered systems and components required for repository operation, or which are designed or assumed to operate as barriers after permanent closure, are functioning as intended and anticipated.

(b) The program shall have been started during site characterization and it will continue until permanent closure.

(c) The program shall include in situ monitoring, laboratory and field testing, and in situ experiments, as may be appropriate to accomplish the objective as stated above.

(d) The program shall be implemented so that:

(1) It does not adversely effect the ability of the natural and engineered elements of the geologic repository to meet the performance objectives.

(2) It provides baseline information and analysis of that information on those parameters and natural processes pertaining to the geologic setting that may be changed by site characterization, construction, and operational activities.

(3) It monitors and analyzes changes from the baseline condition of parameters that could affect the performance of a geologic repository.

(4) It provides an established plan for feedback and analysis of data, and implementation of appropriate action.

48 FR 28194

§ 60.141 Confirmation of geotechnical and design parameters.

(a) During repository construction and operation, a continuing program of surveillance, measurement, testing, and geologic mapping shall be conducted to ensure that geotechnical and design parameters are confirmed and to ensure that appropriate action is taken to inform the Commission of changes needed in design to accommodate actual field conditions encountered.

(b) Subsurface conditions shall be monitored and evaluated against design assumptions.

(c) As a minimum, measurements shall be made of rock deformations and displacement, changes in rock stress and strain, rate and location of water inflow into subsurface areas, changes in groundwater conditions, rock pore water pressures including those along fractures and joints, and the thermal and thermomechanical response of the rock mass as a result of development and operations of the geologic repository.

(d) These measurements and observations shall be compared with the original design bases and assumptions. If significant differences exist between the measurements and observations and the original design bases and assumptions, the need for modifications to the design or in construction methods shall be determined and these differences and the recommended changes reported to the Commission.

(e) In situ monitoring of the thermomechanical response of the underground facility shall be conducted until permanent closure to ensure that the performance of the natural and engineering features are within design limits.

§ 60.142 Design testing.

(a) During the early or developmental stages of construction, a program for in situ testing of such features as borehole and shaft seals, backfill, and the thermal interaction effects of the waste packages, backfill, rock, and groundwater shall be conducted.

(b) The testing shall be initiated as early as is practicable.

(c) A backfill test section shall be constructed to test the effectiveness of backfill placement and compaction procedures against design requirements before permanent backfill placement is begun.

(d) Test sections shall be established to test the effectiveness of borehole and shaft seals before full-scale operation proceeds to seal boreholes and shafts.

48 FR 28194

§ 60.143 Monitoring and testing waste packages.

(a) A program shall be established at the geologic repository operations area for monitoring the condition of the waste packages. Waste packages chosen for the program shall be representative of those to be emplaced in the underground facility.

(b) Consistent with safe operation at the geologic repository operations area, the environment of the waste packages selected for the waste package monitoring program shall be representative of the environment in which the wastes are to be emplaced.

(c) The waste package monitoring program shall include laboratory experiments which focus on the internal condition of the waste packages. To the extent practical, the environment experienced by the emplaced waste packages within the underground facility during the waste package monitoring program shall be duplicated in the laboratory experiments.

(d) The waste package monitoring program shall continue as long as practical up to the time of permanent closure.

Subpart G—Quality Assurance

§ 60.150 Scope.

As used in this part, "quality assurance" comprises all those planned and systematic actions necessary to provide adequate confidence that the geologic repository and its subsystems or components 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.

§ 60.151 Applicability.

The quality assurance program applies to all systems, structures and components important to safety, to design and characterization of barriers important to waste isolation and to activities related thereto. These activities include: site characterization,

facility and equipment construction, facility operation, performance confirmation, permanent closure, and decontamination and dismantling of surface facilities.

§ 60.152 Implementation.

DOE shall implement a quality assurance program based on the criteria of Appendix B of 10 CFR Part 50 as applicable, and appropriately supplemented by additional criteria as required by § 60.151.

Subpart H—Training and Certification of Personnel

§ 60.160 General requirements.

Operations of systems and components that have been identified as important to safety in the Safety Analysis Report and in the license shall be performed only by trained and certified personnel or by personnel under the direct visual supervision of an individual with training and certification in such operation. Supervisory personnel who direct operations that are important to safety must also be certified in such operations.

48 FR 28194

§ 60.161 Training and certification program.

DOE shall establish a program for training, proficiency testing, certification and requalification of operating and supervisory personnel.

§ 60.162 Physical requirements.

The physical condition and the general health of personnel certified for operations that are important to safety shall not be such as might cause operational errors that could endanger the public health and safety. Any condition which might cause impaired judgment or motor coordination must be considered in the selection of personnel for activities that are important to safety. These conditions need not categorically disqualify a person, so long as appropriate provisions are made to accommodate such conditions.

Subpart I—Emergency Planning Criteria [Reserved]

PART 60

DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES; LICENSING PROCEDURES

PROPOSED RULE MAKING

51 FR 22288
Published 6/19/86
Comment period expires 8/18/86.

10 CFR Part 60

Disposal of High-Level Radioactive Wastes in Geologic Repositories; Conforming Amendments

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations for disposal of high-level radioactive wastes in geologic repositories. The amendments are necessary to conform existing NRC regulations to the environmental standards for management and disposal of high-level radioactive wastes promulgated by the Environmetal Protection Agency (EPA) on September 19, 1985. The proposed rule would incorporate all the substantive requirements of the environmental standards and make several changes in the wording used by EPA in order to maintain consistency with the current wording of the NRC regulations.

DATE: Comment period expires August 18, 1986. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments received on or before this date.

ADDRESSES: Written comments may be submitted to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Services Branch. Comments may also be delivered to Room 1121, 1717 H Street NW., Washington, DC, from 8:15 a.m. to 5:00 p.m. weekdays. Copies of the documents referred to in this notice and comments received may be examined at the NRC Public Document Room, 1717 H Street NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Daniel J. Fehringer, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 427-4796.

SUPPLEMENTARY INFORMATION:

Background

Section 121 of the Nuclear Waste Policy Act of 1982 (NWPA), 42 U.S.C. 10141, directs the Environmental Protection Agency (EPA) to "promulgate generally applicable standards for protection of the general environment from offsite releases from radioactive material in repositories." EPA published its final high-level radioactive waste (HLW) standards in the Federal Register on September 19, 1985 (50 FR 38066). Section 121 of the NWPA further specifies that the regulations of the NRC "shall not be inconsistent with any comparable standards promulgated by [EPA]."

The Nuclear Regulatory Commission has previously published rules (10 CFR Part 60, 46 FR 13980, February 25, 1981, 48 FR 28204, June 21, 1983) which established procedures and technical criteria for disposal of HLW in a geologic repository by the U.S. Department of Energy (DOE). This notice describes the interpretations and analyses which the Commission considers to be appropriate for implementation of the EPA standards, and identifies modifications to the Commission's regulations which are considered appropriate to maintain consistency with the standards promulgated by EPA.

It should be noted that "working draft" versions of the EPA standards were available to the Commission when Part 60 was being developed, and the Commission structured its regulations to be compatible with those draft standards. (See, for example, 48 FR 28195–28205, June 21, 1983, where the Commission discussed its final technical criteria, and NUREG–0804, the staff's analysis of public comments on the proposed technical criteria. NUREG–0804 is available in the NRC Public Document Room.) Since many of the general features of the "working drafts" remain present in the final standards, Part 60 is largely consistent with those standards. EPA has, however, sometimes used different terminology to describe concepts already present in Part 60. To maintain the overall structure of Part 60, and to avoid introduction of duplicative terminology which could prove confusing in a licensing review, the Commission prefers to retain its own established terms. Most of the amendments to Part 60 proposed in this notice involve direct incorporation within Part 60 of the substantive requirements of the EPA standards, reworded as necessary to conform to the terminology of Part 60. (Additional proposed amendments derive from EPA's "assurance requirements," as discussed in Section III of this notice. One further amendment, unrelated to the EPA standards, is proposed for clarification of existing wording in Part 60.) With the issuance of this rule, no substantive changes are intended in the requirements of the EPA standards or in the environmental protection they afford.

The EPA standards specify certain limits on radiation exposures and releases of radioactive material during two principal stages: First, the period of management and storage operations at a repository and, second, the long-term period after waste disposal has been completed. These standards, and the proposed rules to implement them during operations and after closure, are discussed in section I below, while section II provides some further observations regarding the manner in which the Commission intends to apply the EPA standards in its licensing proceedintgs. Section III describes additional proposed rules related to certain "assurance requirements" which are present in EPA's standards but which are not applicable to NRC-licensed facilities. In order to avoid potential jurisdictional problems which might arise if this section of the EPA

standards were applied to NRC-licensed facilities, the NRC is proposing to add substantially equivalent provisions to its regulations. Finally, this notice presents a section-by-section analysis of the proposed rule (section IV), followed by the specific text of the proposed amendments to Part 60. (The organization of section IV follows that of Part 60 while the text of section I is organized to present a section-by-section discussion of the EPA standards. Parts of section IV are therefore repetitions of information presented in section I.)

I. Limits on Exposures and Releases

The limits established by EPA for the period of repository operations appear at 40 CFR 191.03. The limits applicable to the period after disposal include "containment requirements" (limits on cumulative releases of radionuclides to the environment for 10,000 years) in § 191.13, "individual protection requirements" in § 191.15, and "ground water protection requirements" in § 191.16. Implementation of each of these sections is discussed in the following paragraphs.

Standards for repository operations (§ 191.03). The standards for repository operations are virtually identical to the standards previously promulgated by EPA for the uranium fuel cycle (42 FR 2860, January 13, 1977), and will be implemented in the same manner.[1] DOE will be expected to demonstrate, through analyses of anticipated facility performance, that the dose limits of these standards, as well as the standards for protection against radiation set out in 10 CFR Part 20, will not be exceeded. Releases of radionuclides and resulting doses during operations are amenable to monitoring, and DOE will be required to conduct a monitoring program to confirm that the limits are complied with. Section 60.111(a) would be amended to includes the EPA dose limits. Section 60.101(a)(2) already includes a provision requiring "reasonable assurance" that the release limits be achieved, and it is not necessary to repeat this language in the release limits of § 60.111. It is also not necessary to employ the terms "management" and "storage," as EPA has done, since all preclosure repository operations are already subject to the provisions of § 60.111.

Postclosure standards. The EPA postclosure standards are all expressed in terms of a "reasonable expectation" of meeting specified levels of performance. EPA explained that it selected this term because " 'reasonable assurance' has come to be associated with a level of confidence that may not be appropriate for the very long-term analytical projections that are called for by 191.13." The Commission is sensitive to the need to account for the uncertainties involved in predicting performance over 10,000 years, and the difficulties as well as the importance of doing so. The Commission has attempted to address this concern in the existing language of § 60.101(a)(2). That section requires a finding of reasonable assurance, "making allowance for the time period, hazards, and uncertainties involved, that the outcome will be in conformance" with the relevant criteria. Rather than adopt an additional concept such as "reasonable expectation," the Commission proposes to add additional explanatory text, derived from EPA's wording, to its existing discussion of resonable assurance. This text will make clear the Commission's belief that its concept of reasonable assurance, although somewhat different from previous usage in reactor licensing, is appropriate for evaluations of repository performance where long-term issues and substantial uncertainties are inherent in projections of repository performance. The Commission considers that the level of confidence associated with its concept of reasonable assurance is the same as that sought by EPA in the use of the term "reasonable expectation."

In the case of the *individual protection requirements* (40 CFR 191.15), the standards limit the annual dose equivalent to any member of the public in the accessible environment. A new provision in § 60.112(b) is proposed that would include the dose limits established by EPA as well as the additional specifications, which the Commission finds to be reasonable, with regard to consideration of all pathways including consumption of drinking water from a "significant source of ground water," as defined by EPA.

The EPA standards require that the individual protection requirements be achieved only for "undisturbed performance" of a geologic repository ("disposal system" in EPA's terminology). The proposed amendment to Part 60 makes no reference to "undisturbed performance." Instead, it provides that the standard is to be met "in the absence of unanticipated processes and events." The Commission considers the concepts of undisturbed performance and the absence of unanticipated processes and events to be identical. As used by EPA (40 CFR 191.12(p)), "undisturbed performance" refers to the predicted behavior of a disposal system if it is "not disrupted by human intrusion or the occurrence of unlikely natural events. "Since human intrusion and unlikely natural processes and events are precisely the types of "unanticipated processes and events" defined in § 60.2, the two concepts are the same. Thus, the Commission considers that the phrase "in the absence of unanticipated processes and events" has the same meaning as "undisturbed performance" in the EPA standards. To maintain the overall structure of Part 60, and to avoid introduction of duplicative language, the Commision prefers to retain its own established terms.

The engineered barriers of a repository will, in many cases, be instrumental in achieving compliance with both the individual protection requirements and the groundwater protection requirements discussed below. The Commission notes that the existing provisions of Part 60 require the engineered barriers of a repository to achieve their containment and release rate performance objectives "assuming anticipated processes and events." Thus, equating "undisturbed performance" with "anticipated processes and events" causes no change in the types of conditions for which the engineered barriers must be designed.

The *ground water protection requirements* (40 CFR 191.16) focus on the quality of any "special source of ground water," which is defined, generally, as a source of drinking water in an area that includes and surrounds the geologic repository. This area extends for five kilometers beyond the controlled area. The standard applies to water "withdrawn" from such a special source. The Commission is proposing to include the EPA standard as a new performance objective (§ 60.112(c)). Once again the rule applies in the absence of unanticipated processes and events instead of "undisturbed performance."

The *containment requirements* (40 CFR 191.13) restrict the total amount of radioactive material released to the environment for 10,000 years following permanent closure of a repository. EPA provides a table listing release limits for

[1] It should be noted that a potential ambiguity exists in this section of EPA's HLW standards and in EPA's uranium fuel cycle standards. Both standards limits the annual dose equivalent to any member of the public to "25 millirems to the whole body, 75 millirems to the thyroid, *and* 25 millirems to any other critical organ" (emphasis added). The Commission has always interpreted these limits as if the word "and" were replaced by "or." Thus, the Commission would *not* consider it acceptable to allow an annual dose equivalent of 25 millirems to the whole body and an additional 25 millirems to any other organ. The Commission will continue to implement these limits as it has in the past, but will encourage EPA to clarify the wording quoted above.

the significant radionuclides present in HLW or spent fuel. The values in this table were derived, based on environmental transport and dosimetry considerations, so that the amount of each radionuclide listed in the table will, if released to the environment, produce approximately the same number of population health effects. The standard further specifies different release limits for releases with differing likelihoods of occurrence. The Commission is proposing to incorporate these requirements as a new performance objective (§ 60.112(a)), along with a new § 60.115 containing EPA's table of release limits.

The regulation goes on to state that the disposal systems shall be designed to provide a reasonable expectation—"based on performance assessments"—that the release limits are satisfied. While the proposed amendments incorporate most of the EPA standard in its precise terms, they omit the reference to performance assessments. Part 60 already requires analyses virtually identical to those contemplated by EPA, but the Commission proposes to add additional wording to § 60.21(c)(1)(ii)(C) to emphasize consistency with the EPA standards.

The Commission notes, in this connection, that EPA's reference to estimating the cumulative releases caused by all significant processes and events, to be incorporated in an overall probability distribution of cumulative release to the extent practicable, does not modify the principles underlying Part 60. As was observed when NRC's final technical criteria were published in 1983 (48 FR 28204), the Commission expects that the information considered in a licensing proceeding will include probability distribution functions for the consequences from anticipated and unanticipated processes and events. Further information concerning the Commission's plans for assessing repository performance is contained in Section II of this notice.

II. Additional Comments on Implementation of the EPA Standards

Four sections of the EPA standards contain numerial requirements for which compliance must be demonstrated—standards for repository operations, post-closure individual and groundwater protection requirements and containment requirements restricting the total amount of radionuclides projected to be released to the environment after repository closure. The discussion of section I of this notice articulates the Commission's interpretation of the standards that have been issued by EPA. Additional comments related to implementation of each of these sections are presented in the following paragraphs.

Standards for repository operations. As discussed previously, the standards for repository operations are virtually identical to the standards previously promulgated by EPA for the uranium fuel cycle, and will be implemented in the same manner. A license applicant will be expected to demonstrate, through analyses of anticipated facility performance, that the dose limits of these standards will not be exceeded. Doses during operations are amenable to monitoring, and the applicant will be required to conduct a monitoring program to confirm that the dose limits are complied with.

Individual and groundwater protection requirements. The individual and groundwater protection requirements are applicable for the first 1,000 years after permanent closure of a repository. Monitoring is not practical for this period of time and the applicant will therefore be required to demonstrate compliance with these requirements through analyses of projected repository performance. Two general approaches might be pursued by DOE. First, DOE might choose to calculate the expected concentrations of radionuclides in certain groundwaters potentially useable by humans in the future. Such calculations would include projections of waste package and engineered barrier performance (to provide a source term) as well as evaluations of the direction, velocity and volumetric flow rates of groundwaters near the repository. The EPA standards specify the types of groundwaters to be considered in such analyses (through the definitions of the terms "significant" and "special" sources of groundwater), and these concepts will be incorporated directly into Part 60. Alternatively, DOE might choose to show compliance with these requirements by demonstrating that other barriers, such as the waste packages or the emplacement medium (e.g., salt), will provide substantially complete containment for the first 1,000 years after permanent closure thereby preventing contamination of the groundwaters of concern.

If DOE chooses to calculate the expected concentrations of radionuclides in groundwaters, rather than to rely on containment by engineered barriers, it will also be necessary to calculate potential doses to individuals in the future. The individual protection requirements limit the annual dose equivalent to any member of the public in the accessible environment. If a "significant source of groundwater" (as defined) is present, the Commission will assume that a hypothetical individual resides at the boundary of the controlled area and obtains his domestic water supply from a well at that location. If no such source of groundwater is present, the location of the maximally exposed individual and the pathways by which he might be exposed to radionuclides released from a repository must be examined on a site-specific basis.

The individual protection requirements also necessitate assumptions about the dietary patterns and other potential modes of ingestion of radionuclides during the next 1,000 years. The Commission will assume that current patterns remain unchanged, unless it can be convincingly demonstrated that a change is likely to occur (e.g., reduced groundwater consumption due to depletion of an aquifer).

Both the individual and groundwater protection requirements are applicable only for "undisturbed performance" of a repository system. As discussed in Section I, this term is considered to be equivalent to "anticipated processes and events," as currently defined in Part 60. The Commission will therefore require a demonstration of compliance with these requirements assuming the occurrence of anticipated processes and events, but will not require a demonstration of compliance in the event of unanticipated processes and events.

Containment requirements. The containment requirements are applicable for 10,000 years after repository closure. Therefore, compliance with these requirements must also be evaluated by analyses of projected repository performance rather than by monitoring. The containment requirements call for significantly different analyses than those discussed above. This section of the EPA standards restricts the total amount of radioactive material released to the environment for 10,000 years following permanent closure of a repository. This section further specifies different release limits for releases with differing likelihoods of occurrence. Notwithstanding the quantitative probabilistic form of the EPA containment requirements (40 CFR 191.13), the Commission finds that there is adequate flexibility therein to allow them to be implemented using the licensing procedures of 10 CFR Parts 2 and 60. A further discussion of these matters is appropriate in order to avoid ambiguity in the application of the probabilistic conditions.

As the Commission emphasized when the technical criteria for geologic repositories were promulgated in final form (48 FR 28204), there are two distinct elements underlying a finding that a proposed facility satisfies the desired performance objective for long-term isolation of radioactive waste. There is, first, a standard of performance—some statement regarding the quantity of radioactive material that may be released to the accessible environment. This standard can be expressed in quantitative terms, and may include numerical requirements for the probabilities of exceeding certain levels of release.

The second element of a finding relates to the confidence that is needed by the factfinder in order to be able to conclude that the standard of performance has been met. The Commission has insisted, and the EPA has agreed, that this level of confidence must be expressed qualitatively. The licensing decisions that must be made in connection with a repository involve substantial uncertainties, many of which are not quantifiable (e.g., those pertaining to the correctness of the models used to describe physical systems). Such uncertainties can be accommodated within the licensing process only if a qualitative test is applied for the level of confidence that the numerical performance objective will be achieved.

The essential point to be kept in mind is that findings regarding long-term repository performance must be made with "reasonable assurance." The Commission attempted to explain this concept in the existing wording of § 60.101(a) where it noted that allowance must be made for the time period, hazards, and uncertainties involved. Additional language is being proposed at this time, in the same section of Part 60, to further emphasize that qualitative judgments will need to be made including, for example, consideration of the degree of diversity or redundancy among the multiple barriers of a special repository.

Application of a qualitative test in no way diminishes the level of safety required by a numerical standard. The applicant will be required to submit a systematic and thorough analysis of potential releases and the Commission will issue a license only if it finds a substantial, though unquantified, level of confidence that compliance with the release limits will be achieved. As we have stated previously (48 FR 28201), in order to make a finding with "reasonable assurance," the performance assessment which has been performed in the course of the licensing review must indicate that the likelihood of exceeding the EPA standard is low and, further, the Commission must be satisfied that the performance assessment is sufficiently conservative, and its limitations are sufficiently well understood, that the actual performance of the geologic repository will be within predicted limits.

The Commission will evaluate compliance with the containment requirements based on a performance assessment. Such an assessment will: (1) Identify all significant processes and events which could affect the repository (2) evaluate the likelihood of each process or event and the effect of each on release of radionuclides to the environment, and (3) to the extent practicable, combine these estimates into an overall probability distribution displaying the likelihood that the amount of radioactive material released to the environment will exceed specified values. The Commission anticipates that the overall probability distribution will be displayed in the format shown below.

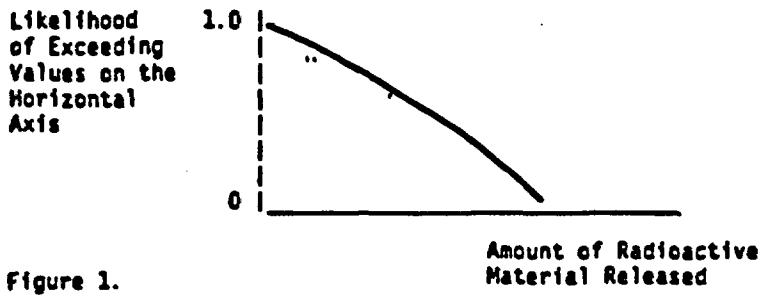

Figure 1.

Illustrative "Complementary Cumulative Distribution Function."

When the results of analyses are displayed in this format, the limits of EPA's containment requirements take the form of "step functions," as shown in Figure 2.

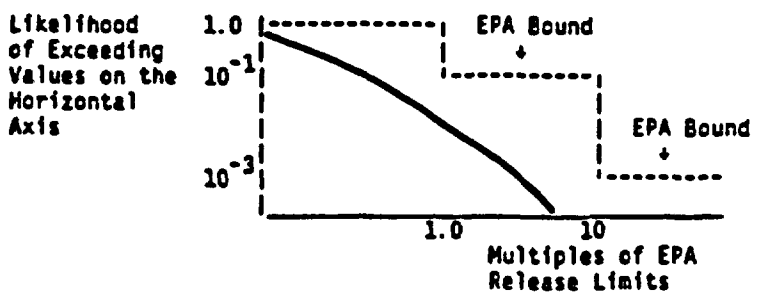

Figure 2. Graphic Representation of EPA Containment Requirements.

In Figure 2, releases which exceed the value specified in the EPA containment requirements (Table 1) must have a likelihood less than one chance in ten (over 10,000 years), and releases which exceed ten times that value must have a likelihood less than one chance in one thousand (over 10,000 years). Thus, in order to demonstrate compliance with EPA's containment requirements, the entire probability distribution must lie below the "stair-step" constraints illustrated in Figure 2.

In constructing a probability distribution of the type illustrated above, it is necessary to consider, in EPA's terms, all "significant processes and events that may affect the disposal system." This is equivalent, as we interpret the EPA standard, to all "anticipated" and unanticipated" processes and events in the terminology of Part 60. (By the definition of "unanticipated processes and events" in Part 60, processes and events less likely than "unanticipated" are not sufficiently credible to warrant consideration.) For

purposes of the proposed § 60.112(a) only, which incorporates EPA's containment requirements, no distinction is to be made between "anticipated" and "unanticipated" processes and events; all such processes and events must be factored into the evaluation, including determination of such probabilities of occurrence as may be found to be appropriate. (For purposes of the proposed § 60.112 (b) and (c), which incorporate EPA's individual and groundwater protection requirements, only "anticipated" processes and events need be considered as discussed previously.)

The Commission will require an extensive and thorough identification of relevant processes and events, but will require analyses of the probability and/or consequence of each only to the extent necessary to determine its contribution to the overall probability distribution. If it can be shown, for example, that a particular event is so unlikely to occur that its effects on the probability distribution would not be meaningful, further analysis of the consequences of that event would not be required. Generally, categories of processes and events which can be shown to have a likelihood less than one chance in 10,000 over 10,000 years, along with categories of processes and events which otherwise can be shown not to change the remaining probability distribution of cumulative release significantly, need not receive further analysis. (The term "categories" is used to refer to general classes of processes and events, such as faulting, volcanism, or drilling, subsets of these general categories, such as drilling which intersects a canister or fault displacement of a specific magnitude, may need to be retained in an analysis if the general category has been finely divided into a large number of specific process or event description, each with reduced probabilities of occurrence.)

Treatment of uncertainties. As discussed previously, substantial uncertainties will be involved in analyses of long-term repository performance. These uncertainties may include (1) identification of basic phenomena and their potential effects on repository performance, (2) development and validation of models to describe these phenomena, (3) accuracy of available data, and (4) calculational uncertainties. Various methods may be used to accommodate such uncertainties including, for example, numerical estimates of uncertainties (expressed as probability distributions) or conservative, "bounding" models or data. Treatment of uncertainties will rely heavily on expert judgment, both for selection of an appropriate method and for application of that technique. EPA recognzied the importance of uncertainties when its standards wee promulgated. In Appendix B of 40 CFR Part 191 (50 FR 38088, September 19, 1985), EPA stated "substantial uncertainties are likely to be encountered in making (numerical) predictions (of repository performance). In fact, sole reliance on these numerical predictions to determine compliance may not be appropriate; the implementing agencies may choose to supplement such predictions with qualitative judgments as well." It is possible—in fact likely—that the various parties to a licensing proceeding will have significantly different views, all with technical merit, regarding the best methods to use, and these differing views may result in presentation of widely different estimates of repository performance.

Any such differences could be resolved in a number of ways. One permissible method for dealing with the uncertainties reflected in the record of the proceeding would be to rely heavily upon conservative, "bounding" analyses. Perhaps it could be shown that even if this approach were employed, the predicted performance would still satisfy the containment requirements established by EPA. On the other hand, an apparent violation of the standard (based on conservative analyses) would not necessarily preclude the Commission from finding, with reasonable assurance, that repository performance would conform to the EPA standard. After carefully evaluating the relevant uncertainties, DOE could present the same data in the form of a cumulative probability distribtion that was less conservative—for example, one that more accurately represents the best current technical understanding. Thus, alternative methods are available to DOE for treatment of uncertainties when making its demonstration of reasonable assurance of compliance with the provisions of Part 60.

It should be noted, however, that analyses based on "best estiamtes" of repository performance might be found to be inadequate if substantial uncertainties are present. In that case, notwithstanding the apparent conformity with the EPA standard, the Commission might ultimately conclude that it lacked the necessary reasonable assurance, considering the uncertainties involved, that the performance would meet the containment requirements.

Because uncertainties are so important in analyses of repository performance and will play such a major role in a licensing proceeding, the Commission emphasizes the importance of efforts being undertaken to foster a common technical understanding and to resolve issues, where it is practicable to do so, prior to receipt of a license application. Many of the provisions of the Nuclear Waste Policy Act are directed toward this goal. One especially important opportunity, in this regard, is DOE's preparation of site characterization plans and the review and comment process to be carried out by the Commission and other interested parties. Additionally, NRC and DOE are engaged, under an interagency procedural agreement, in ongoing technical discussions on matters that pertain to licensing requirements; these discussions are in the form of open meetings, affording other persons an opportunity to identify pertinent considerations that might also need to be addressed. The staff is also issuing staff technical positions on specific methods of analysis that would be acceptable for evaluating compliance with Part 60 technical criteria and performance objectives. As issues mature, the Commission will, where appropriate, use the rulemaking process to seek resolution of issues where a licensing proceeding might otherwise encounter difficulties due to ambiguity regarding acceptable assessment methods. Nevertheless, the data available at the time of licensing will inevitably be imperfect. It is therefore essential that every effort be made by DOE—and by any other party that develops data which it may propound at a hearing—to use careful methods to enhance, and document, the trustworthiness of the evidence which it may submit.

III. EPA Assurance Requirements

EPA's regulations (40 CFR 191.14) include certain "assurance requirements" designed, according to the rule, to provide the confidence needed for long-term compliance with the containment requirements. As noted by EPA in its preamble, the Commission took exception to the inclusion of these provisions in the regulations. The Commission viewed the assurance requirements as matters of implementation that were not properly part of the EPA's authorities assigned by Reorganization Plan No. 3 of 1970. In response to this concern, the two agencies have agreed to resolve this issue by NRC's making appropriate modifications to Part 60, reflecting the matters addressed by the assurance requirements, and by EPA's declaration

that those requirements would not apply to facilities regulated by the Commission. The following discussion sets forth the Commission's views with respect to each of the EPA assurance requirements and identifies the proposed rule changes that are deemed to be appropriate under the circumstances.

EPA Assurance Requirement 40 CFR 191.14(a). Active institutional controls over disposal sites should be maintained for as long a period of time as is practicable after disposal; however, performance assessments that assess isolation of the wastes from the accessible environment shall not consider any contributions from active institutional controls for more than 100 years after disposal.

Analysis and Proposed Changes. The Commission's existing provisions (§ 60.52) related to license termination will determine the length of time for which institutional controls should be maintained, and there is therefore no need to alter Part 60 to reflect this part of the assurance requirement.

The second part of this assurance requirement would require that "active" institutional controls be excluded from consideration (after 100 years) when the isolation characteristics of a respository are assessed. It has always been the intent of Part 60 not to rely on remedial actions (or other active institutional controls) to compensate for a poor site or inadequate engineered barriers. However, in the definition of "unanticipated processes and events," Part 60 expressly contemplates that, in assessing human intrusion scenarios, the Commission would assume that "institutions are able to assess risk *and to take remedial action* at a level of social organization and technological competence equivalent to, or superior to, that which was applied in initiating the processes or events concerned" (emphasis added). Therefore, it might appear at first examination that Part 60 is at odds with the EPA assurance requirements.

Although both the EPA regulation and Part 60 refer to "remedial action," the action being considered is not the same. The EPA assurance requirement deals with a planned capability to maintain a site and, if necessary, to take remedial action at a site in order to assure that isolation is achieved. The Commission agrees that such capability should not be relied upon. The extent to which corrective action may be taken after an unanticipated intrusion occurs is an entirely different matter. The Commission may wish to consider, for example, the extent to which the application of the limited societal response capability assumed by the rule (e.g., sealing boreholes consistent with current petroleum industry practice) could reduce the likelihood of releases exceeding the values specified in the containment requirements or could eliminate certain hypothetical scenarios such as systematic and persistent intrusions into a site.

Subject to the comments above, the Commission concurs with the EPA's definitions of "active" and "passive" institutional controls, as well as the principle that ongoing, planned, active protective measures should not be relied upon for more than 100 years after permanent closure. We are therefore proposing to include EPA's definitions, together with a new section (§ 60.114) which would expressly provide that active (or passive) institutional controls shall not be deemed to assure compliance with the containment requirements over the long term. Some activities which arguably fall within EPA's definition of "active institutional controls" (e.g., remedial actions and monitoring parameters related to geologic respository performance) are relevant to assessing the likelihood and consequences of processes and events affecting the geologic setting. We are proposing, also in § 60.114, to allow such activites to be considered for this purpose. We regard this as being fully consistent with the thrust of the EPA position.

EPA Assurance Requirement 40 CFR 191.14(b). Disposal systems shall be monitored after disposal to detect substantial and detrimental deviations from expected performance. This monitoring shall be done with techniques that do not jeopardize the isolation of the wastes and shall be conducted until there are no significant concerns to be addressed by further monitoring.

Analysis and Proposed Changes. Part 60 currently requires DOE to carry out a performance confirmation program which is to continue until repository closure. Part 60 does not now require monitoring after repository closure because of the likelihood that post-closure monitoring of the underground facility would degrade repository performance. The Commission recognizes, however, that monitoring such parameters as regional ground water flow characteristics may, in some cases, provide desirable information beyond that which would be obtained in the performance confirmation program, and the Commission is proposing to require such monitoring when it can be accomplished without adversely affecting repository performance.

The proposed requirement for post-permanent closure monitoring requires that such monitoring be continued until termination of a license. The Commission intends that a repository license not be terminated until such time as the Commission is convinced that there is no significant additional information to be obtained from such monitoring which would be material to a finding of reasonable assurance that long-term repository performance would be in accordance with the established performance objectives.

A number of changes in Part 60 are proposed to reflect these views with respect to post-closure monitoring. First, a new section (§ 60.144) would provide for the performance confirmation program, already required by Subpart F of Part 60, to include a program of post-closure monitoring. Second, the licensing findings required at the time of license termination (§ 60.52(c)) would specifically be related to the results available from the post-closure monitoring program. Third, DOE would be required to provide more detailed information concerning its plans for post-closure monitoring in its original application (§ 60.21(c)) and when it applies to amend its license prior to permanent closure (§ 60.51(a)).

EPA Assurance Requirement 40 CFR 191.14(c). Disposal sites shall be designated by the most permanent markers, records, and other passive institutional controls practicable to indicate the dangers of the wastes and their location.

Analysis and Proposed Changes. The existing provisions of 10 CFR Part 60 already required that DOE take the measures set out in this assurance requirement. For further information, refer to § 60.21(c)(8) (requirement that license application describe controls to regulate land use), § 60.51(a)(2) (information to be submitted, prior to permanent closure, with respect to land use controls, construction of monuments, preservation of records, etc.), and § 60.121 (requirements for ownership and control of interests in land).

EPA Assurance Requirement 40 CFR 191.14(d). Disposal systems shall use different types of barriers to isolate the wastes from the accessible environment. Both engineered and natural barriers shall be included.

Analysis and Proposed Changes. This is another provision that is already inherent in Part 60. Nevertheless, in order to avoid any possible doubt in this regard, a new paragraph (§ 60.113(d)) would be added to state explicitly that the geologic repository shall incorporate a system of multiple barriers, both engineered and natural.

Questions might arise regarding the types of engineered or natural materials

or structures which would be considered to constitute "barriers," as required by this new language. In this connection, the Commission notes that § 60.2 now contains this definition: " 'Barrier' means any material or structure that *prevents or substantially delays* movement of water or radionuclides" (emphasis added). Thus, consistent with the approach endorsed by EPA, the Commission considers that the new paragraph to be added to § 60.113 will confirm its commitment to a multiple barrier approach as contemplated by section 121(b)(1)(B) of the Nuclear Waste Policy Act.

EPA Assurance Requirement 40 CFR 191.14(e). Places where there has been mining for resources, or where there is reasonable expectation of exploration for scarce or easily accessible resources, or where there is a significant concentration of any material that is not widely available from other sources, should be avoided in selecting disposal sites. Resources to be considered shall include minerals, petroleum or natural gas, valuable geologic formations, and ground waters that are either irreplaceable because there is not reasonable alternative source of drinking water available for substantial populations or that are vital to the preservation of unique and sensitive ecosystems. Such places shall not be used for disposal of the wastes covered by this Part [40 CFR Part 191] unless the favorable charcteristics of such places compensate for their greater likelihood of being distrubed in the future.

Analysis and Proposed Changes. Part 60 contains provisions that, in large part, are equivalent to this assurance requirement. See § 60.122(c)(17), (18), and (19). The existing regulation does not, however, address "a significant concentration of any material that is not widely available from other sources."

The Commission believes that there is merit in having the presence of such concentrated materials evaluated in the context of the licensing proceeding. It is, after all, quite possible that the economic value of materials could change in the future in a way which might attract future exploration or development detrimental to repository performance. By adding an additional "potentially adverse condition" to those already set out in the regulation, DOE would be required to identify the presence of the materials in question and evaluate the effect thereof on repository performance, as specified in § 60.122(a)(2)(ii). It should be noted that the presence of potentially adverse conditions does not preclude the selection and use of a site for a geologic repository, provided that the conditions have been evaluated and demonstrated not to compromise performance.

EPA Assurance Requirement 40 CFR 191.14(f). Disposal systems shall be selected so that removal of most of the wastes is not precluded for a reasonable period of time after disposal.

Analysis and Proposed Changes. The Commission understands that the purpose of this assurance requirement is to discourage or preclude the use of disposal concepts such as deep well injection for which it would be virtually impossible to remove or recover wastes regardless of the time and resources employed. (This provision is thus significantly different from the Commission's retrievability requirement.) For a mined geologic repository—which is the only type of facility subject to licensing under 10 CFR Part 60—wastes could be located and recovered (i.e. "removed," in the sense that EPA is using the term), albeit at high cost, even after repository closure. A repository would therefore meet this assurance requirement, and no further statements on the subject in Part 60 are indicated.

Petition for Rulemaking. The Commission calls to the attention of all interested parties a pending petition for rulemaking submitted by the States of Nevada and Minnesota which deals, in large part, with the matters addressed by section III of this notice. All relevant comments received by the Commission in response to the notice of receipt of the petition for rulemaking (published in the Federal Register on December 19, 1985, 50 FR 51701) will be considered along with comments received in response to this notice. It should be noted that the Commission's present proposal conforms to the approach which was discussed with EPA during the course of its rulemaking. The petition for rulemaking follows the same language very closely, but does suggest certain modifications. The Commission would be particularly interested in comments addressed to the respective merits of the language proposed herein and that proposed by the States of Nevada and Minnesota.

The Commission further notes that EPA has provided it with copies of comments regarding the assurance requirements that were received during the 40 CFR Part 191 rulemaking. These comments are available for inspection in the Commission's public document room.

IV. Section by Section Analysis of Proposed Conforming Amendments

The Commission considers that the simplest and most useful way to amend Part 60 for consistency with the EPA standards would be to incorporate directly within Part 60 all the substantive requirements of the environmental standards promulgated by EPA, modified as necessary to conform to the terminology currently used in Part 60. The following paragraphs present a section-by-section analysis of the NRC's proposed conforming amendments to Part 60.

Section 60.1 Purpose and scope.

This paragraph is analogous to EPA's 40 CFR 191.01 and 191.11 which state the applicability of the EPA standards. Part 60 is, however, a more specific regulation than the EPA standards in that it addresses only deep geologic repositories used for disposal of high-level radioactive wastes, while the EPA standards apply to other disposal methods and certain other types of radioactive wastes. No changes are proposed for § 60.1, but the Commission notes that any regulations developed in the future for alternative disposal methods or for other types of wastes will incorporate any applicable provisions of the EPA standards.

Section 60.2 Definitions.

New definitions of several terms are proposed for incorporation within § 60.2. These are taken directly from the EPA standards (or from 40 CFR Part 190) and are needed for purposes of implementation. These added terms are:

(1) Active institutional control
(2) Community water system
(3) Passive institutional control
(4) Significant source of groundwater
(5) Special source of groundwater
(6) Transmissivity
(7) Uranium fuel cycle

In addition, the definition of "controlled area" and the related definition of "accessible environment" in the EPA standards are different from those currently in Part 60. The Commission proposed to revise its current definitions to conform to EPA's wording. In the case of "accessible environment," the change is merely editorial. The amendments to the definition of "controlled area" are also largely editorial, except for the specification of extent—i.e., that the controlled area is to encompass "no more than 100 square kilometers" and to extend "horizontally no more than five kilometers in any direction from the outer boundary of the original location of the radioactive wastes."

The Commission has reviewed this aspect of the EPA definition in the light of the policies which it articulated when the final technical criteria of 10 CFR Part 60 were adopted. One of these policies was that the controlled area "must be small enough to justify confidence that

the monuments will effectively discourage subsurface disturbances." The prior rule would have authorized the establishment of a controlled area well over 300 square kilometers (about 75,000 acres) in size. While we would not deny the abstract possibility that effective controls could be instituted even over an area of that magnitude, we have much greater confidence that DOE would be able to demonstrate an ability to discourage subsurface disturbances over an area of more limited extent. It is our judgment that the 100 square kilometers that EPA has adopted, after consultation with the NRC staff, represents an appropriate limitation.

The other policy related to the definition of the "controlled area" is that it must allow the isolation capability of the rock surrounding the underground facility to be given appropriate weight in licensing reviews. This isolation capability is measured in two ways. First, it is to be taken into account in determining whether releases of radionuclides to the accessible environment are within the limits specified in the "containment requirements" (40 CFR 191.13). Second, under § 60.113(a)(2), the isolation capability of the geologic setting must be such that the pre-waste-emplacement groundwater travel time along the fastest path of likely readionuclide travel from the disturbed zone to the accessible environment shall be a specified period (generally, 1000 years).

The Commission anticipates that adoption of the EPA terminology will have little effect on achievement of the containment requirements inasmuch as the controlled area is allowed a horizontal extent as large as five kilometers (presumably in the direction of radionuclide travel). Nor does the Commission anticipate that the limitation will make it impracticable to achieve a demonstration of compliance with the groundwater travel time performance objective. When the Commission adopted Part 60, it observed that the "accessible environment" might be larger (and, of course, the "controlled area" might therefore be smaller) than would be the case under the EPA standards then being considered (48 FR 28202). EPA has not moved in the direction of eliminating this difference, and the Commission's amendment, for this reason, represents no important change.

The proposed reduction in the maximum allowable extent of the controlled area (i.e., distance to the accessible environment) requires additional discussion to clarify the Commission's concepts of "disturbed zone" and "groundwater travel time." Groundwater travel time from the edge of the disturbed zone to the accessible environment is one of the criteria which the Commission identified, at the time of proposed rulemaking, as providing confidence that the wastes will be isolated for at least as long as they are most hazardous (46 FR 35280, 35281, July 8, 1981). As noted above, this objective concerns travel time from the edge of the disturbed zone rather than from the edge of the underground facility. The Commission selected the disturbed zone for the purpose of determining the groundwater travel time since the physical and chemical processes which isolate the wastes are "especially difficult to understand in the area close to the emplaced wastes because that area is physically and chemically disturbed by the heat generated by those wastes." *Ibid.*

One potential type of effect which could alter local groundwater flow conditions is thermal buoyancy of groundwater. Because buoyancy effects could extend over significant distances (see, e.g., M. Gordon and M. Weber, "Non-isothermal Flow Modeling of the Hanford Site," available in the NRC Public document room) and because the Commission is proposing to reduce the maximum allowable distance to the accessible environment, it is particularly important to emphasize that the Commission did not intend such effects to serve as the basis for defining the extent of the disturbed zone. The Commission recognizes that such effects can be modeled with well developed assessment methods, and therefore were not the type of effects for which the disturbed zone concept was developed. Any contrary implication in our statement of considerations at the time the technical criteria were issued in final form (see 48 FR 28210) should be disregarded. (The staff is currently developing Generic Technical Positions discussing the disturbed zone and groundwater travel time. These technical positions will be publicly available prior to promulgation of these proposed amendments in final form, and will illustrate how the staff intends to approach these two concepts.)

Four other terms defined by EPA deserve additional discussion here.

The EPA standards contain a definition of the term "transuranic radioactive waste." The Commission does not use this term in Part 60 and thus has no need to define it there. All radioactive waste stored or disposed of at a geologic repository licensed under Part 60—including transuranic radioactive waste—would be subject to the requirements of the EPA standards as applied by the rules proposed herein.

EPA defines the terms "storage" and "disposal" to mean retrievable storage and permanent isolation, respectively. Under Part 60, on the other hand, the term "storage" is used in the sense of section 202 of the Energy Reorganization Act of 1974 (42 U.S.C. 5842) to refer to both long-term storage and disposal of wastes. The difference in EPA and NRC usage has no effect upon application of the EPA standards at NRC-licensed geologic repositories.

The Commission has recently defined "groundwater," for purposes of Part 60, to include all water which occurs below the land surface (50 FR 29641, July 22, 1985), while the EPA standards use the term to mean water below the land surface *in a zone of saturation* (emphasis added). The EPA standards use the term only in connection with the more specifically defined terms "significant source of groundwater" and "special source of groundwater." Thus, it is possible to identify "significant" or "special" sources of groundwater unambiguously with either definition of the term "groundwater," and the Commission therefore proposes to retain its current definition of the term.

Section 60.21 Content of application.

Paragraph (c)(1)(ii)(C) now requires a license application to include certain evaluations of the performance of a proposed geologic repository for the period after permanent closure. The Commission proposes to add an additional sentence to this paragraph requiring that the results of these analyses be incorporated into an overall probability distribution of cumulative releases to the extent practicable. This reflects the language of EPA's definition of "performance assessment."

The Commission also proposes to add a new paragraph to § 60.21 requiring submittal of a general description of the program for post-permanent closure monitoring of the geologic repository. (See the discussion (section III) regarding the EPA assurance requirements—specifically 40 CFR 191.14(b).)

Section 60. 51 License amendment for permanent closure.

Paragraph (a)(1) currently requires that an application to amend a license for permanent closure must include a description of the program for post-permanent closure monitoring of the geologic repository. The Commission proposes to revise this paragraph to specify in more detail the information to be submitted, including descriptions of

the parameters to be monitored and the length of time for which the monitoring is to be continued. (See also the preceding discussion regarding 40 CFR 191.14(b).)

Section 60.52 Termination of license.

The Commission proposes to add a new condition for license termination which would explicitly require that the results available from post-permanent closure monitoring confirm the expectation that the repository will comply with the performance objectives of Part 60. (See also the preceding discussion regarding 40 CFR 191.14(b).)

Section 60.101 Purpose and nature of findings.

The EPA standards use the phrase "reasonable expectation" to describe the required level of confidence that compliance will be achieved with the provisions of the standards. The Supplementary Information accompanying the EPA standards contrasts the concept of "reasonable expectation" with the reasonable assurance standard that is used by the Commission in dealing with other licensing actions. The Commission has considered adopting EPA's "reasonable expectation" concept, but has decided that doing so would result in a needless, and potentially confusing, proliferation of terms. Instead, the Commission proposes to expand the current discussion of "reasonable assurance" in § 60.101 to make clear its belief that the level of confidence associated with the term, when used in connection with the long-term issues involved in repository licensing, is the same as that sought by EPA in its use of the term "reasonable expectation."

Section 60.111 Performance of the geologic repository operations area through permanent closure.

Paragrah (a) currently requires compliance with "such generally applicable environmental standards for radioactivity as may have been established by the Environmental Protection Agency." The Commission proposes to replace this wording with the specific does limits promulgated by EPA in 40 CFR 191.03(a) of its standards. The proposed wording would apply the dose limits to any member of the public outside the geologic repository operations area, consistent with EPA's phrase "any member of the public in the general environment."

The EPA provision includes wording that requires reasonable assurance of compliance with the dose limits. In Part 60, Subpart B now specifies the findings that must be made by the Commission for issuance of a license, including a finding of reasonable assurance of compliance with the performance objective of § 60.111. Because Part 60 already requires that findings be made with reasonable assurance, it is unnecessary to repeat such a requirement within this proposed performance objective.

One additional amendment, unrelated to the EPA standards, is being proposed for § 60.111. The current wording of this section now requires that the geologic repository operations area be designed so that radiation exposures, radiation levels, and releases of radioactive materials "will *at all times* be maintained within the limits specified in Part 20 . . ." (emphasis added). The words "at all times" were intended to emphasize the need to design the geologic repository operations area so that any waste retrieval found to be necessary in the future cound be carried out in conformance with the radiation protection requirements of 10 CFR Part 20. In order to clarify the meaning of the phrase "at all times," the Commission is proposing to revise this wording to read "will at all times, including the retrievability period of § 60.111(b), be maintained within the limits specified in Part 20 . . . ."

Section 60.112 Overall system performance objective for the geologic repository after permanent closure.

The current wording of this section now refers to "such generally applicable environmental standards for radioactivity as may have been established by the Environmental Protection Agency." The Commission proposes to replace this wording with the specific provisions promulgated by EPA in 40 CFR 191.13, 191.15 and 191.16 of its standards, reworded as appropriate for incorporation into Part 60.

As discussed previously, the Commission proposes to revise the language of § 60.101 to make clear that its concept of the phrase "reasonable assurance" in Part 60 closely parallels the meaning intended by "reasonable expectation" in the EPA standards. Inasmuch as the findings to be made by the Commission must be made with "reasonable assurance," there is no need to use the term "reasonable expectation" in the specific standards.

EPA requires that cumulative releases of radioactivity to the environment be evaluated on the basis of "performance assessments." This concept already is built into the structure of Part 60. As discussed previously, however, the Commission is proposing an addition to § 60.21 which would specifically require a license application to incorporate the results of analyses, as stated by EPA, in an overall probability distribution of cumulative releases to the extent practicable.

The individual and groundwater protection requirements of the ERA standards refer to "undisturbed performance" of a disposal system, where "undisturbed performance" is defined to mean "the predicted behavior of a disposal system, including consideration of the uncertainties in prodicted behavior, if the disposal system is not disrupted by human intrusion or the occurrence of unlikely natural events." The Commission considers undisturbed performance, as defined by EPA, to be equivalent to performance in the absence of "unanticipated processes and events," as currently defined in Part 60. The Commission is proposing to use the current Part 60 terminology rather than introduce a new term from the EPA standards.

Section 60.113 Performance of particular barriers after permanent closure.

Section 60.113 specifies performance objectives for individual barriers of a geologic repository, and permits the Commission to approve or specify specific numerical requirements on a case-by-case basis. The Commission considers that § 60.113 clearly requires use of both engineered and natural barriers. Nevertheless, in order to avoid any possible confusion regarding the provisions of § 60.113(b), the Commission proposes to add additional clarifying language to this section making it clear that a repository must incorporate a system of multiple barriers, both engineered and natural. (See the preceding discussion in section III regarding the EPA assurance requirements—specifically 40 CFR 191.14(d).)

Paragraph (b)(1) of § 60.113 now refers to "any generally applicable environmental standard for radioactivity established by the Environmental Protection Agency." The Commission proposes to replace this wording with a direct reference to the overall system performance objectives of § 60.112.

Section 60.114 Institutional control.

The Commission proposes to add a new § 60.114 to Part 60 to clarify its views regarding reliance on institutional controls. (See the preceding discussion in Section III regarding 40 CFR 191.14(a).)

Section 60.115 Release limits for overall system performance objectives.

The Commission proposes that the table of release limits (and accompanying notes) in Appendix A of the EPA standards be added to Part 60 in a new § 60.115.

Section 60.122 Siting criteria.

Part 60 contains provisions related to the presence of economically valuable mineral resources at a repository site. Part 60 does not, however, address deposits of materials which, though of limited economic value, are not reasonably available from other sources. Because the economic value of materials could change in the future, the Commissin proposes to add an additional potentially adverse condition to Part 60 related to significant concentrations of material that is not reasonably available from other sources.

EPA used the term "widely available." The Commission believes that an additional consideration—the practicality of obtaining materials from alternative sources—is also germane, and the Commission is therefore proposing the phrase "reasonably available" for this potentially adverse condition. (See also the preceding discussion in section III regarding 40 CFR 191.14(e).)

Section 60.144 Monitoring after permanent closure.

Part 60 currently requires DOE to carry out a performance confirmation program which is to continue until repository closure. Part 60 does not now require monitoring after repository closure because of the likelihood that post-closure monitoring of the underground facility would degrade repository performance. The Commission proposes to add a new § 60.144 to Part 60 which would require post-closure monitoring of repository characteristics provided that such monitoring can be expected to provide material confirmatory information regarding long-term repository performance and provided that the means for conducting such monitoring will not degrade repository performance. (See the preceding discussion in section III regarding 40 CFR 191.14(b).)

Environmental Impact

Pursuant to section 121(c) of the Nuclear Waste Policy Act of 1982, this proposed rule does not require the preparation of an environmental impact statement under section 102(2)(C) of the National Environmental Policy Act of 1969 or any environmental review under subparagraph (E) or (F) of section 102(2) of this Act.

Paperwork Reduction Act Statement

The information collection requirements contained in this proposed rule are of limited applicability and affect fewer than ten respondents. Therefore, Office of Management and Budget clearance is not required pursuant to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.).

Regulatory Flexibility Act Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule, if adopted, will not have a significant economic impact on a substantial number of small entities. The only entity subject to regulation under this rule is the U.S. Department of Energy, which does not fall within the scope of the definition of "small entities" set forth in the Regulatory Flexibility Act.

List of Subjects in 10 CFR Part 60

High-level waste, Nuclear power plants and reactors, Nuclear materials, Penalty, Reporting and recordkeeping requirements, Waste treatment and disposal.

Backfitting Requirements

The provisions of 10 CFR 50.109 on backfitting do not apply to this rulemaking because the rule is not applicable to production and utilization facilities licensed under 10 CFR Part 50.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended; the Nuclear Waste Policy Act of 1982, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR Part 60.

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

1. The authority citation for Part 60 continues to read as follows:

Authority: Secs. 51, 53, 62, 63, 65, 81, 161, 182, 183, 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, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846); secs. 10 and 14, Pub. L. 95-601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332); sec. 121, Pub. L. 97-425, 96 Stat. 2228 (42 U.S.C. 10141).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 60.71 to 60.75 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

2. Section 60.2 is amended by revising the definitions of "accessible environment" and "controlled area" and by adding seven new definitions in alphabetical order as follows:

§ 60.2 Definitions.

* * * * *

"Accessible environment" means: (1) The atmosphere, (2) land surfaces, (3) surface waters, (4) oceans, and (5) all of the lithosphere that is beyond the controlled area.

* * * * *

"Active institutional control" means: (1) Controlling access to a disposal site by any means other than passive institutional control, (2) performing maintenance operations or remedial actions at a site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to disposal system performance.

* * * * *

"Community water system" means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections used by year—round residents or regularly serves at least 25 year-round residents.

* * * * *

"Controlled area" means: (1) A surface location, to be identified by passive institutional controls, that encompasses no more than 100 square kilometers and extends horizontally no more than five kilometers in any direction form the outer boundary of the underground facility, and (2) the subsurface underlying such a surface location.

* * * * *

"Passive institutional control" means: (1) Permanent markers placed at a disposal site, (2) public records and archives, (3) government ownership and regulations regarding land or resource use, and (4) other methods of preserving knowledge about the location, design, and contents of a disposal system.

* * * * *

"Significant source of groundwater" means: (1) An aquifer that: (i) is saturated with water having less than 10,000 milligrams per liter of total dissolved solids; (ii) is within 2,500 feet of the land surface; (iii) has a transmissivity greater than 200 gallons per day per foot, provided that any formation or part of formation included within the source of groundwater has a hydraulic conductivity greater than 2 gallons per day per square foot; and (iv) is capable of continuously yielding at least 10,000 gallons per day to a pumped or flowing well for a period of at least a year; or (2) and aquifer that provides the primary source of water for a

community water system as of November 18, 1985.

• • • • •

"Special source of groundwater" means those Class I groundwaters identified in accordance with the Environmental Protection Agency's Ground-Water Protection Strategy published in August 1984 that: (1) Are within the controlled area encompassing a disposal system or are less than five kilometers beyond the controlled area; (2) are supplying drinking water for thousands of persons as of the date that the Department chooses a location within the area for detailed characterization as a potential site for a disposal system (e.g., in accordance with section 112(b)(1)(B)(of the NWPA); and (3) are irreplaceable in that no reasonable alternative source of drinking water is available to that population.

• • • • •

"Transmissivity" means the hydraulic conductivity intergrated over the saturated thickness or an underground formation. The transmissivity of a series of formations is the sum of the individual transmissivities of each formation comprising the series.

• • • • •

"Uranium fuel cycle" means the operations of milling of uranium ore, chemical conversion of uranium, isotopic enrichment of uranium, fabrication of uranium fuel, generation of electricity by a light-water-cooled nuclear power plant using uranium fuel, and reprocessing of spent uranium fuel, to the extent that these directly support the production of electrical power for public use utilizing nuclear energy, but excludes mining operations, operations at waste disposal sites, transportation of any radioactive material in support of these operations, and the reuse of recovered non-uranium speical nuclear and by-product materials from the cycle.

• • • • •

3. Section 60.21 is amended by revising paragraph (c)(1)(ii)(C), redesignating the existing paragraphs (c)(9) through (c)(15) as paragraphs (c)(10) through (c)(16) and adding a new paragraph (c)(9).

§ 60.21 Content of application

• • • • •

(c) • • •

(1) • • •

(ii) • • •

(C) An evaluation of the performance of the proposed geologic repository for the period after permanent closure, assuming anticipated processes and events, giving the rates and quantities of releases of radionuclides to the accessible environment as a function of time; and a similar evaluation which assumes the occurrence of unanticipated processes and events. In making such evaluations, estimated values shall be incorporated into an overall probability distribution of cumulative release to the extent practicable.

• • • • •

(9) A general description of the program for post-permanent closure monitoring of the geologic repository.

• • • • •

4. Section 60.51 is amended by revising paragraph (a)(1) to read as follows:

§ 60.51 License amendment for permanent closure.

(a) • • •

(1) A detailed description of the program for post-permanent closure monitoring of the geologic repository in accordance with § 60.144. As a minimum, this description shall:

(i) Identify those parameters that will be monitored;

(ii) Indicate how each parameter will be used to evaluate the expected performance of the repository; and

(iii) Discuss the length of time over which each parameter should be monitored to adequately confirm the expected performance of the repository.

• • • • •

5. Section 60.52 is amended by designating current paragraph (c)(3) as paragraph (c)(4) and by adding a new paragraph (c)(3) as follows:

§ 60.52 Termination of license.

• • • • •

(c) • • •

(3) That the results available from the post-permanent closure monitoring program confirm the expectation that the repository will comply with the performance objectives set out at § 60.112 and § 60.113; and

• • • • •

6. Section 60.101 is amended by revising paragraph (a)(2) to read as follows:

§ 60.101 Purpose and nature of findings.

(a) • • •

(2) While these performance objectives and criteria are generally stated in unqualified terms, it is not expected that complete assurance that they will be met can be presented. A reasonable assurance, on the basis of the record before the Commission, that the objectives and criteria will be met is the general standard that is required. For § 60.112, and other portions of this subpart that impose objectives and criteria for repository performance over long times into the future, there will inevitably be greater uncertainties. Proof of the future performance of engineered barrier systems and the geologic setting over time periods of may hundreds of many thousands of years is not to be had in the ordinary sense of the word. For such long-term objectives and criteria, what is required is reasonable assurance, making allowances for the time period, hazards, and uncertainties involved, that the outcome will be in conformance with those objectives and criteria. Demonstration of compliance with such objectives and criteria will involve the use of data from accelerated tests and predictive models that are supported by such measures as field and laboratory tests, monitoring data and natural analog studies. Demonstration of compliance with the performance objectives of § 60.112 will also involve predicting the likelihood and consequences of events and processes that may disturb the repository. Such predictions may involve complex computational models, analytical theories and prevalent expert judgment. Substantial uncertainties are likely to be encountered and sole reliance on numerical predictions to determine compliance may not be appropriate. In reaching a determination of reasonable assurance, the Commission may supplement numerical analyses with qualitative judgments including, for example, consideration of the degree of diversity or redundancy among the multiple barriers of a specific repository.

• • • • •

7. In § 60.111, paragraph (a) is revised to read as follows:

§ 60.111 Performance of the geologic repository operations area through permanent closure.

(a) *Protection against radiation exposures and releases of radioactive material.* The geologic respository operations area shall be designated so that until permanent closure has been completed:

(1) The annual dose equivalent to any member of the public outside the geologic repository operations area, resulting from the combination of (i) discharges of radioactive material and direct radiation from activities at the geologic repository operations area and (ii) uranium fuel cycle operations, shall not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other critical organ.

(2) Radiation exposures and radiation levels, and releases of radioactive materials to unrestricted areas, will at all times, including the retrievability period of § 60.111(b), be maintained

within the limits specified in Part 20 of this chapter.

• • • • •

8. Section 60.112 is revised to read as follows:

§ 60.112. Overall system performance objective for the geologic repository after permanent closure.

The geologic setting shall be selected and the engineered barrier system and the shafts, boreholes and their seals shall be designed:

(a) So that, for 10,000 years following permanent closure, cumulative releases of radionuclides to the accessible environment, from all anticipated and unanticipated processes and events, shall:

(1) Have a likelihood of less than one chance in 10 of exceeding the quantities calculated in accordance with § 60.115.

(2) Have a likelihood of less than one chance in 1,000 of exceeding ten times the quantities calculated in accordance with §60.115.

(b) So that for 1,000 years after permanent closure, and in the absence of unanticipated processes and events, the annual dose equivalent to any member of the public in the accessible environment does not exceed 25 millirems to the whole body or 75 millirems to any critical organ. For the purpose of applying this paragraph, all potential pathways from the geologic repository to people shall be considered, including the assumption that individuals consume 2 liters per day of drinking water from any significant source of groundwater outside of the controlled area.

(c) So that for 1,000 year after permanent closure, and in the absence of unanticipated processes and events:

(1) Except as provided in paragraph (c)(2) of this section, the radionuclide concentrations averaged over any year in water withdrawn from any portion of a special source of groundwater do not exceed:

(i) 5 picocuries per liter of radium-226 and radium-228;

(ii) 15 picouries per liter of alpha-emitting radionuclides (including radium-226, and radium-228 but excluding radon); or

(iii) The combined concentrations of radionuclides that emit either beta or gamma radiation that would produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems per year if an individual consumed 2 liters per day of drinking water from such a source of groundwater.

(2) If any of the average annual radionuclide concentrations existing in a special source of groundwater before construction of the geologic repository operations area already exceed the limits in paragraph (c)(1) of this section, the increase, caused by the geologic repository, in the existing average annual radionuclide concentrations in water withdrawn from that special source of groundwater does not exceed the limits specified in paragraph (c)(1) of this section.

9. In § 60.113, paragraph (b)(1) is revised and a new paragraph (d) is added to read as follows:

§ 60.113 Performance of particular barriers after permanent closure.

• • • • •

(b) • • •

(1) The overall system performance objectives of § 60.112.

• • • • •

(d) Notwithstanding the provisions of paragraph (b) of this section, the geologic repository shall incorporate a system of multiple barriers, both engineered and natural.

10. A new § 60.114 is added to read as follows:

§ 60.114 Institutional control.

Neither active nor passive institutional control shall be deemed to assure compliance with the overall system performance objectives set out at § 60.112 for more than 100 years after permanent closure. However, the effects of institutional control may be considered in assessing, for purposes of that section, the likelihood and consequences of processes and events affecting th geologic setting.

11. A new § 60.115 is added to read as follows:

§ 60.115 Release limits for overall system performance objective.

The following table shall be used to make the calculations referred to in paragraph (a) of § 60.112.

TABLE 1.—RELEASE LIMITS FOR OVERALL SYSTEM PERFORMANCE OBJECTIVE

[Cumulative Releases to the Accessible Environment for 10,000 Years After Disposal]

Radionuclide	Release limit per 1,000 MTHM or other unit of waste (see notes) (curies)
Americium-241 or 243	100
Carbon-14	100
Cesium-135 or 137	1,000
Iodine-129	100
Neptunium-237	100
Plutonium-238, 239, 240 or 242	100
Radium-226	100
Strontium-90	1,000
Technetium-99	10,000
Thorium-230 or 232	10
Tin-126	1,000
Uranium-233, 234, 235, 236 or 238	100
Any other alpha-emitting radionuclide with a half-life greater than 20 years	100
Any other radionuclide with a half-life greater than 20 years that does not emit alpha particles	1,000

Application of Table 1

Note.—*Units of Waste.* The Release Limits in Table 1 apply to the amount of wastes in any one of the following:

(a) an amount of spent nuclear fuel containing 1,000 metric tons of heavy metal (MTHM) exposed to a burnup between 25,000 megawatt-days per metric ton of heavy metal (MWd/MTHM) and 40,000 MWd/MTHM;

(b) the high-level radioactive wastes generated from reprocessing each 1,000 MTHM exposed to a burnup between 25,000 MWd/MTHM; and 40,000 MWd/MTHM;

(c) each 100,000,000 curies of gama or beta-emitting radionuclides with half-lives greater than 20 years but less than 100 years (for use as discussed in Note 5 or with materials that are identified by the Commission as high-level radioactive waste in accordance with part (B) of the definition of high-level waste in the Nuclear Waste Policy Act (NWPA));

(d) each 1,000,000 curies of other radionuclides (i.e., gamma or beta-emitters with half-lives greater than 100 years or any alpha-emitters with half-lives greater than 20 years) (for use as discussed in Note 5 or with materials that are identified by the Commission as high-level waste in accordance with part (B) of the definition of high-level waste in the NWPA); or

(e) an amount of transuranic (TRU) wastes containing one million curies of alpha-emitting transuranic radionuclides with half-lives greater than 20 years.

Note 2.—*Release Limits for Specific Disposal Systems.* To develop Release Limits for a particular disposal system, the quantities in Table 1 shall be adjusted for the amount of waste included in the disposal system compared to the various units of waste defined in Note 1. For example:

(a) If a particular disposal system contained the high-level wastes from 50,000 MTHM, the Release Limits for that system would be the quantities in Table 1 multiplied by 50 (50,000 MTHM divided by 1,000 MTHM).

(b) If a particular disposal system contained three million curies of alpha-emitting transuranic wastes, the Release Limits for that system would be the quantities in Table 1 multiplied by three (three million curies divided by one million curies).

(c) If a particular disposal system contained both the high-level wastes from 50,000 MTHM *and* 5 million curies of alpha-emitting transuranic wastes, the Release Limits for that system would be the quantities in Table 1 multiplied by 55:

$$\frac{50{,}000\ \text{MTHM}}{1{,}000\ \text{MTHM}} + \frac{5{,}000{,}000\ \text{curies TRU}}{1{,}000{,}000\ \text{curies TRU}} = 55$$

Note 3.—*Adjustments for Reactor Fuels with Different Burnup.* For disposal systems containing reactor fuels (or the high-level wastes from reactor fuels) exposed to an average burnup of less than 25,000 MWd/MTHM or greater than 40,000 MWd/MTHM, the units of waste defined in (a) and (b) of Note 1 shall be adjusted. The unit shall be multiplied by the ratio of 30,000 MWd/MTHM divided by the fuel's actual average burnup, except that a value of 5,000 MWd/MTHM may be used when the average fuel burnup is below 5,000 MWd/MTHM and a value of 100,000 MWd/MTHM shall be used when the average fuel burnup is above 100,000 MWd/MTHM. This adjusted unit of waste shall then be used in determining the Release Limits for the disposal system.

For example, if a particular disposal system contained only high-level wastes with an average burnup of 3,000 MWd/MTHM, the unit of waste for that disposal system would be:

$$1{,}000\ \text{MTHM} \times \frac{(30{,}000\ \text{MWd/MTHM})}{(5{,}000\ \text{MWd/MTHM})} = 6{,}000\ \text{MTHM}$$

If that disposal system contained the high-level wastes from 60,000 MTHM (with an average burnup of 3,000 MWd/MTHM), then the Release Limits for that system would be the quantities in Table 1 multiplied by ten:

$$\frac{60{,}000\ \text{MTHM}}{6{,}000\ \text{MTHM}} = 10$$

which is the same as:

$$\frac{60{,}000\ \text{MTHM}}{1{,}000\ \text{MTHM}} \times \frac{(5{,}000\ \text{MWd/MTHM})}{(30{,}000\ \text{MWd/MTHM})} = 10$$

Note 4.—Treatment of Fractionated High-Level Wastes. In some cases, a high-level waste stream from reprocessing spent nuclear fuel may have been (or will be) separated into to or more high-level waste components destined for different disposal systems. In such cases, the implementing agency may allocate the Release Limit multiplier (based upon the original MTHM and the average fuel burnup of the high-level waste stream) among the various disposal systems as it chooses, provided that the total Release Limit multiplier used for that waste stream at all of its disposal systems may not exceed the Release Limit multiplier that would be used if the entire waste stream were disposed of in one disposal system.

Note 5. Treatment of Wastes with Poorly Known Burnups or Original MTHM. In some cases, the records associated with particular high-level waste streams may not be adequate to accurately determine the original metric tons of heavy metal in the reactor fuel that created the waste, or to determine the average burnup that the fuel was exposed to. If the uncertainties are such that the original amount of heavy metal or the average fuel burnup for particular high-level waste streams cannot be quantified, the units of waste derived from (a) and (b) of Note 1 shall no longer be used. Instead, the units of waste defined in (c) and (d) of Note 1 shall be used for such high-level waste streams. If the uncertainties in such information allow a range of values to be associated with the original amount of heavy metal or the average fuel burnup, then the calculations described in previous Notes will be conducted using the values that result in the smallest Release Limits, except that the Release Limits need not be smaller than those that would be calculated using the units of waste defined in (c) and (d) of Note 1.

Note 6.—*Use of Release Limits to Determine Compliance with § 60.112(c).* Once release limits—for a particular system have been determined in accordance with Notes 1 through 5, these release limits shall be used to determine compliance with the requirements of § 60.122(a) as follows. In cases where a mixture of radionuclides is projected to be released to the accessible environment, the limiting values shall be determined as follows: For each radionuclide in the mixture, determine the ratio between the cumulative release quantity projected over 10,000 years and the limit for that radionuclide as determined from Table 1 and Notes 1 through 5. The sum of such ratios for all radionuclides in the mixture may not exceed one with regard to § 60.112(a)(1) and may not exceed ten with regard to § 60.112(a)(2).

For example, if radionuclides A, B and C are projected to be released in amounts Q_a, Q_b, Q_c, and if the applicable Release Limits are RL_a, RL_b, and RL_c, then the cumulative release over 10,000 years shall be limited so that the following relationship exists:

$$\frac{Q_a}{RL_a} + \frac{Q_b}{RL_b} + \frac{Q_c}{RL_c} < 1$$

12. In § 60.122, paragraph (c) is amended by redesignating the current pargraphs (c)(18) through (c)(24) as paragraphs (c)(19) through (c)(25) and by adding a new paragraph (c)(18) to read as follows:

§ 60.122 Siting criteria

• • • • •

(c) • • •

(18) The presence of significant concentrations of any naturally-occurring material that is not reasonably available from other sources.

• • • • •

13. A new § 60.144 is added to read as follows:

§ 60.144 Monitoring After permanent closure.

A program of monitoring shall be conducted after payment closure to monitor all repository characteristics which can reasonably be expected to provide material confirmatory information regarding long-term repository performance, provided that the means of conducting such monitoring will not degrade repository performance. This program shall be continued until termination of license.

Dated at Washington, DC this 13th day of June 1986.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

52 FR 5992
Published 2/27/87
Comment period extended to 6/29/87.

10 CFR Part 60

Definition of "High-Level Radioactive Waste"

AGENCY: Nuclear Regulatory Commission.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: The Commission has previously adopted regulations for disposal of high-level radioactive wastes (HLW) in geologic repositories (10 CFR Part 60). The Commission intends to modify the definition of HLW in those regulations so as to follow more closely the statutory definition in the Nuclear Waste Policy Act of 1982 (NWPA). In this advance notice of proposed rulemaking (notice), the Commission identifies legal and technical considerations that are pertinent to the definition of HLW and solicits public comment on alternative approaches for developing a revised definition.

DATES: Comment period expires April 29, 1987. Comments received after this date will be considered if it is practical to do so, but assurance of consideration can be given only for comments received on or before this date.

ADDRESSES: Send comments or suggestions to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch. Copies of comments received and of documents referenced in this notice may be examined at the NRC Public Document Room, 1717 H Street NW., Washington, DC. Copies of NUREG documents may be purchased through the U.S. Government Printing Office by calling (202) 275–2060 or by writing to the U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013–7082. Copies of NUREG and DOE documents may also be purchased from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

FOR FURTHER INFORMATION CONTACT: W. Clark Prichard, Division of Engineering Safety, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 443–7668.

SUPPLEMENTARY INFORMATION:

I. Introduction and Background

Radioactive wastes contain a wide variety of radionuclides, each with its own half-life and other radiological characteristics. These radionuclides are present in concentrations varying from extremely high to barely detectable. One type of waste, generated by reprocessing spent nuclear fuel, contains both long-lived radionuclides which pose a long-term hazard to human health and other, shorter-lived nuclides which produce intense levels of radiation. This combination of highly-concentrated, short-lived nuclides together with other very long-lived nuclides has historically been described by the term "high-level radioactive wastes" (HLW). There has long been a recognition that such waste materials require long-term isolation from man's biological environment and that, in view of public health and safety considerations, disposal of such wastes should be accomplished by the Federal government on Federally owned land. This policy was codified by the Atomic Energy Commission (AEC) in 1970 in Appendix F to 10 CFR Part 50.

A. *Previous use of the term "HLW."* In Appendix F, HLW was defined in terms of the source of the material rather than its hazardous characteristics. Specifically, HLW was defined as "those aqueous 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 fuels." As used in Appendix F, "high-level waste" thus refers to the highly concentrated (and hazardous) waste containing virtually all the fission product and transuranic elements (except plutonium) present in irradiated reactor fuel. The term does not include incidental wastes resulting from reprocessing plant operations such as ion exchange beds, sludges, and contaminated laboratory items, clothing, tools, and equipment. Neither are radioactive hulls and other irradiated and contaminated fuel structural hardware within the Appendix F definition.[1]

The first statutory use of the term "high-level radioactive waste" occurs in the Marine Protection, Research, and Sanctuaries Act of 1972 (Marine Sanctuaries Act). Congress adopted the Appendix F definition, but broadened it to include unreprocessed spent fuel as well.[2] Two years later, the AEC was abolished and its functions were divided between the Energy Research and Development Administration (ERDA, now the Department of Energy, DOE) and the Nuclear Regulatory Commission (NRC or Commission) by the Energy Reorganization Act of 1974, Pub. L. 93–438, 42 U.S.C. 5811. Under this legislation, certain activities of ERDA were to be subject to the Commission's licensing and regulatory authority. Specifically, NRC was to exercise licensing authority as to certain nuclear reactors and the following waste facilities:

(1) Facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from activities licensed under the [Atomic Energy] Act.

(2) Retrievable Surface Storage Facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by the Administration [now DOE], which are not used for, or are part of, research and development activities.[3]

Although neither the statute nor the legislative history defines the term "high-level radioactive waste," earlier usage of the term in Appendix F and the Marine Sanctuaries Act is indicative of the meaning. The Commission so construed the statute when it declared spent nuclear fuel to be a form of HLW and, by the same token, when it found transuranic-contaminated wastes not to be HLW.[4]

A different statutory formula appears in the West Valley Demonstration Project Act (West Valley Act), enacted in 1980. This legislation authorizes the Department of Energy (DOE) to carry out a high-level radioactive waste management demonstration project for the purpose of demonstrating solidification techniques which can be used for preparing HLW for disposal. It includes the following definition:

> The term "high level radioactive waste" means the high level radioactive waste which was produced by the reprocessing at the Center of spent nuclear fuel. Such term includes both liquid wastes which are produced directly in reprocessing, dry solid material derived from such liquid waste and such other material as the Commission designates as high level radioactive waste for purposes of protecting the public health and safety.[5]

The Commission has not yet designated any "other material" as HLW under the West Valley Act. Rather, it has construed the term in a

[1] See 34 FR 8712, June 3, 1969 (notice of proposed rulemaking), 35 FR 17530 at 17532, November 14, 1970 (final rule). Incidental wastes generated in further treatment of HLW (e.g., decontaminated salt with residual activities on the order of 1,500 nCi/g Cs–137, 30 nCi/g Sr–90, 3 nCi/g Pu, as described in the Department of Energy's FEIS on long-term management of defense HLW at the Savannah River Plant, DOE/EIS–0023, 1979) would also, under the same reasoning, be outside the Appendix F definition.

[2] Sec. 3, Pub. L. 92–532, as amended by Pub. L. 93–254 (1974), 33 U.S.C. 1402.

[3] Sec. 202, Pub. L. 93–438, 42 U.S.C. 5842. Nuclear waste management responsibilities were subsequently transferred to the Department of Energy. Secs. 203(a)(5), 301(a), Pub. L. 95–91, 42 U.S.C. 7133(a)(5), 7151(a).

[4] Proposed General Statement of Policy, "Licensing Procedures for Geologic Repositories for High-Level Radioactive Wastes," 43 FR 53869, 53870, November 17, 1978; Report to Congress, "Regulation of Federal Radioactive Waste Activities," NUREG–0527 (1979), 2–1, 2–2, Appendix C.

[5] Sec. 6(4), Pub. L. 96–368, 42 U.S.C. 2021a note.

manner equivalent to the 10 CFR 50, Appendix F definition. That is, it is the liquid wastes in storage at West Valley and the dry solid material derived from solidification activities that are regarded as HLW, and it is DOE's plans with respect to such wastes that are subject to the Commission's review.

B. *Current NRC regulations.* The Commission has adopted regulations that govern the licensing of DOE activities at geologic repositories for the disposal of HLW. The regulations define HLW in the jurisdictional sense. That is, if the facility is for the "storage" of "HLW" as contemplated by the Energy Reorganization Act, the prescribed procedures and criteria would apply.[6] The appropriate definition for this purpose draws upon the understanding in 1974, as reflected in Appendix F and the Marine Sanctuaries Act, rather than the words of the West Valley Act of more limited purpose and scope.

It should be emphasized that NRC's existing regulations in Part 60 do not require that any radioactive materials, whether HLW or not, be stored or disposed of in a geologic repository.[7] Nor do they provide that radioactive materials must be HLW in order to be eligible for disposal in a geologic repository. Part 60 expressly provides for NRC review and licensing with respect to any radioactive materials that may be emplaced in a geologic repository authorized for disposal of HLW. The term "high-level radioactive waste" in Part 60 identifies the class of facilities subject to NRC jurisdiction.

The Commission has also adopted regulations related to land disposal of low-level radioactive wastes (10 CFR Part 61). Based on analyses of potential human health hazards, these regulations identify three classes of low-level radioactive wastes which are routinely acceptable for near-surface disposal, with "Class C" denoting the highest radionuclide concentrations of the three. Class C does not, however, denote a maximum concentration limit for low-level wastes. The low-level waste category includes all wastes not otherwise classified, while HLW is currently defined by source (rather than concentration or hazard) and is limited to reprocessing wastes and spent fuel. Thus, there is no regulatory limit on the concentrations of LLW, and some LLW (exceeding Class C concentrations) may have concentrations approaching those of HLW. These are the wastes which the Commission wishes to evaluate for possible classification as HLW. The Appendix to this notice presents information on the volumes and characteristics of wastes with radionuclide concentrations exceeding the Class C concentration limits. (This Appendix was prepared in 1985. DOE is currently carrying out a study of "above Class C" wastes which will update the information presented here.)

C. *Nuclear Waste Policy Act of 1982.* The Nuclear Waste Policy Act of 1982 (NWPA), Pub. L. 97-425, provides for the development of repositories for the disposal of high-level radioactive waste and establishes a program of research, development, and demonstration regarding the disposal of high-level radioactive waste.[8] The NWPA follows, with some modification, the text of the West Valley Act. For purposes of the NWPA, the term "high-level radioactive waste" means:

(A) The highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and

(B) Other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.[9]

It should be noted that the NWPA does not require that materials regarded as HLW pursuant to this definition be disposed of in a geologic repository. Indeed, the NWPA directs the Secretary (of DOE) to continue and accelerate a program of research, development and investigation of alternative means and technologies for the permanent disposal of HLW.[10] Part 60 and the changes discussed in this notice would allow for consideration of such alternatives by the Commission. Nevertheless, the NWPA does not specifically authorize DOE to construct or operate facilities for disposal by alternative means, and new legislative authorization might be needed in order to dispose of HLW by means other than emplacement in a deep geologic repository.

II. Considerations for Defining "High-Level Radioactive Waste"

Wastes which have historically been referred to as HLW (i.e., reprocessing wastes) are initially both intensely radioactive and long-lived. These wastes contain a wide variety of radionuclides. Some (principally Sr-90 and Cs-137) are relatively short-lived and represent a large fraction of the radioactivity for the first few centuries after the wastes are produced. These nuclides produce significant amounts of heat and radiation, both of which are of concern when disposing of such wastes. Other nuclides, including C-14, Tc-99, I-129 and transuranic nuclides, have very long half-lives and thus constitute the longer-term hazard of the wastes. Some of these nuclides pose a hazard for sufficiently long periods of time that the term "permanent isolation" is used to describe the type of disposal required to isolate them from man's environment. The Commission considers that these two characteristics, intense radioactivity for a few centuries followed by a long-term hazard requiring permanent isolation, are key features which can be used to distinguish high-level wastes from other waste categories.

The NWPA identifies two sources of HLW, each of which is discussed separately in the following sections.

A. Clause (A)

Clause (A) of the NWPA definition of HLW refers to wastes produced by reprocessing spent nuclear fuel and thus is essentially identical to the Commission's current HLW definition in 10 CFR Part 60. Clause (A) is, however, different in one respect. The NWPA wording would classify solidified reprocessing waste as HLW only if such waste "contains fission products in sufficient concentrations"—a phrase that may reflect the possibility that liquid reprocessing wastes may be partitioned or otherwise treated so that some of the solidified products will contain substantially reduced concentrations of radionuclides.

The question, then, is whether Commission should (1) numerically specify the concentrations of fission products which it would consider "sufficient" to distinguish HLW from non-HLW under Clause (A); or (2) define HLW so as to equate the Clause (A) wastes with those which have traditionally been regarded as HLW.

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[6] NRC regulations are codified in 10 CFR Part 60 (Part 60). DOE is required to have a license to receive source, special nuclear or byproduct material at a geologic repository operations area. § 60.3. A geologic repository operations area is defined to refer to a "HLW facility" which in turn is defined as a facility subject to NRC licensing authority under the Energy Reorganization Act of 1974, note 3, *supra*. § 60.2 The Part 60 definition of HLW, *ibid.*, is as follows:

"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.

[7] In the event that commercial reprocessing of irradiated reactor fuel is pursued, Appendix F of 10 CFR Part 50 would require that the resulting reprocessing wastes be transferred to a Federal repository.

[8] For purposes of the NWPA, "spent nuclear fuel" is distinguished from "high-level radioactive waste," but the provisions of the statute dealing with such spent nuclear fuel are not of present concern.

[9] Sec. 2(12), Pub. L. 97-425, 42 U.S.C. 10101(12). Sec. 2(16) also authorizes the Commission to classify certain radioactive material as low-level radioactive waste.

[10] Sec. 222, Pub. L. 97-425, 42 U.S.C. 10202.

1. Numerically Specifying Concentrations of Fission Products

The first option considered is to numerically define "sufficient concentrations" of fission products. Liquid reprocessing wastes may contain significant amounts of non-radioactive salts, and removal of these salts prior to waste solidification may be desirable for both economic and public health and safety reasons. Removal of salts in this way would result in a smaller volume of highly radioactive wastes, which might reduce the cost and radiological impacts associated with transportation and occupational handling of those wastes. Nevertheless, any salts removed from liquid HLW would retain residual amounts of radioactive contaminants. By establishing numerical limits on the concentrations of fission products, the Commission would be identifying those wastes from reprocessing that require disposal in a deep geologic repository or its equivalent. The proper classification of the salts discussed above would then be made on the basis of the numerical limits on radionuclide concentrations and the salts would be disposed of accordingly. In other cases, certain radionuclides may be removed from the bulk liquid reprocessing waste (as has been done in removing cesium and strontium from wastes at Hanford), raising similar questions about the classification of the remaining waste and acceptable methods of disposal. For these reasons, there would be merit in numerically specifying the concentrations of radionuclides in solidified reprocessing wastes which would distinguish HLW from non-HLW.

(Clause (A) refers to solidified waste "that contains fission products in sufficient concentrations." No mention is made of the long-lived transuranic radionuclides which are also present in liquid reprocessing wastes but, since the transuranics constitute the predominant long-term hazard of reprocessing wastes, such nuclides must be considered as well in defining reprocessing wastes that should be regarded as HLW. With this view, a numerical classification of solidified wastes under Clause (A) could be derived in the same manner, and contain the same concentration limits, as the numerical definitions developed under Clause (B). Derivation of concentration limits under Clause (B) is discussed in the following section of this notice.)

2. Traditional Definition

The alternate approach is to define HLW so as to equate the category of Clause (A) wastes with those wastes which have traditionally been regarded as HLW under Appendix F to 10 CFR Part 50 and the Energy Reorganization Act. The advantage of this option is that the term HLW retains its utility in defining the facilities that are subject to NRC licensing. That is, all materials that have traditionally been considered HLW for purposes of the Energy Reorganization Act would also be regarded as HLW under the Nuclear Waste Policy Act. The disadvantage is that some materials might continue to fall within the HLW classification even though they do not require the degree of isolation afforded by a repository. They would be called "HLW" even though the technical community might not so regard them.

3. Other Considerations Regarding Clause (A) Options

The Commission would add two observations regarding the options discussed above.

a. Development of a definition under Clause (A), as suggested by the first option, would not alter the Commission's existing authority to license DOE waste facilities, including defense wastes facilities, under the Energy Reorganization Act of 1974 (ERA). Any classification of wastes as non-HLW on the basis that they do not contain "sufficient concentrations" of fission products would be irrelevant in determining whether such wastes must be disposed of in licensed disposal facilities. For example, if DOE were to pursue its proposal for in-place stabilization of the Hanford "tank" wastes (see DOE/EIS-0113, March, 1986), most or all of the disposal "facilities" for those wastes would need to be licensed by the NRC.

b. Retaining the traditional definition for purposes of Clause (A) does not limit the Commission's ability to establish at some later date criteria to define wastes that require the isolation afforded by a deep geologic repository or its equivalent. That is, wastes requiring such isolation could be identified by terms other than "high-level".

B. Clause (B)

Clause (B) of the NWPA authorizes the Commission to classify "other highly radioactive material" (other than reprocessing wastes) as HLW if that material "requires permanent isolation." The Commission considers that both characteristics (highly radioactive and requiring permanent isolation) must be present simultaneously in order to classify a material as HLW.[11] Each of these characteristics is discussed in turn in the following sections.

1. Highly Radioactive

The Commission proposes [12] to consider a material "highly radioactive" if it contains concentrations of short-lived radionuclides in excess of the Class C limits of Table 2 of 10 CFR Part 61. Such concentrations are sufficient to produce significant radiation levels and to generate substantial amounts of heat. Moreover, the Class C concentration limits for short-lived nuclides approximate the actual concentrations of those nuclides present in some existing reprocessing wastes (see NUREG-0946, Table 4).

2. Permanent Isolation

The phrase "permanent isolation" in NWPA is much less subjective than is "highly radioactive." Within the context of NWPA, "permanent isolation" clearly implies the degree of isolation afforded by a deep geologic repository.[13] Thus, a waste "requires permanent isolation" if it cannot be safely disposed of in a facility less secure than a repository. The Commission will determine which wastes require permanent isolation by evaluating the disposal capabilities of alternative, less secure, disposal facilities.[14] Any wastes which cannot be safely disposed of in such facilities will be deemed to require permanent isolation and, if also highly radioactive, would be classified as high-level wastes.

The approach which the Commission proposes to pursue to determine which wastes requires permanent isolation will be an extension of the 10 CFR Part 61 waste classification analyses and will consist of the following steps.

a. *Establish acceptance criteria.* 10 CFR Part 61 currently contains performance objectives for disposal of radioactive wastes in a land disposal facility. These performance objectives will serve as acceptance criteria for

[11] The Commission would not find tenable the argument that a material requires permanent isolation *because* it is highly radioactive. The need for permanent isolation correlates with the length of time a material will remain hazardous. Long half-lives, in turn, correlate with low rather than high levels of radioactivity.

[12] All references to "proposals" by the Commission refer only to its tentative views. No formal proposals will be developed until comments are received in response to this notice.

[13] The NWPA includes the following definitions:

The term "disposal" means the emplacement in a repository of high-level radioactive waste, spent nuclear fuel, or other highly radioactive material with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste.

The term "repository" means any system licensed by the Commission that is intended to be used for, or may be used for, the permanent deep geologic disposal of high-level radioactive waste and spent nuclear fuel, whether or not such system is designed to permit the recovery, for a limited period during initial operation, of any materials placed in such system. Such term includes both surface and subsurface areas at which high-level radioactive waste and spent nuclear fuel handling activities are conducted.

[14] These facilities might make use of intermediate depth burial or various engineering measures, such as intruder barriers, to accommodate wastes with radionuclide concentrations unsuitable for disposal by shallow land burial.

waste classification analyses, but might need to be supplemented for specific types of facilities or wastes. The Part 61 performance objectives may also need to be supplemented to accommodate any environmental standards for non-HLW which may be promulgated by the U.S. Environmental Protection Agency pursuant to its authority under the Atomic Energy Act of 1954, as amended.

b. *Define disposal facility.* The hazard which a radioactive waste poses to public health depends, in part, on the nature of the facility used for its disposal. Thus, a reference disposal facility, less secure than a repository, needs to be defined in terms of the characteristics which contribute to isolation of wastes from the environment. For land disposal facilities, such characteristics might include depth of disposal, use of engineered barriers, and the geologic, hydrologic and geochemical features of a disposal site.

c. *Characterize wastes.* Wastes will be characterized in terms of the factors which determine their hazard and behavior after disposal, including physical and chemical forms of the waste, the radionuclide concentrations and associated radiological characteristics, the waste volumes, and the heat generation rates. The wide range of types and characteristics of wastes arising from industrial, biomedical and nuclear fuel cycle sources makes this a particularly critical step in the waste classification process—especially for wastes to be generated in the future (e.g., decommissioning wastes).

d. *Develop assessment methodology.* Analytical methods (including mathematical models and computer codes) for projecting disposal system performance will be acquired or developed. For land disposal facilities, such methods include models of groundwater flow and contaminant transport. An assessment methodology also includes descriptions of the natural and human-initiated disruptive events or processes which could significantly affect disposal system performance as well as the analytical means for evaluating the impacts of such events or processes.

e. *Evaluate disposal system performance.* The performance of the alternative disposal facility will be evaluated to estimate the public health hazards from disposal of various types and concentrations of wastes. Hazards below the acceptance criteria of item (a) above indicate an acceptable match of waste type and disposal option. Wastes which cannot be safely disposed of in the alternative facility will be classified as requiring permanent isolation.

A practical difficulty with classifying wastes as described here is that alternative disposal facilities are currently unavailable. Thus, classification of wastes in this manner requires many assumptions about the performance of nonexistent disposal facilities. Such analyses will inevitably involve substantial uncertainties.

It is also possible that no alternative disposal facility will ever be needed for commercially-generated "above Class C" wastes. (Disposal of such wastes is a Federal, rather than State, responsibility.) Because of the overhead costs of developing and licensing new facilities, the relatively small volumes of such wastes, and the low heat generation rates of some of these wastes, it might prove most economical to dispose of all such wastes in a repository. Nevertheless, the Commission recognizes a "chicken-and-egg" problem here. Until wastes are classified as HLW or non-HLW, it may be difficult for the DOE to make decisions regarding appropriate types of disposal facilities. Therefore, despite the uncertainties involved, the Commission proposes to select a hypothetical alternative disposal facility which will serve as the basis for carrying out waste classification analyses.

Previous analyses by the NRC (NUREG–0782, draft EIS for 10 CFR Part 61) suggest that disposal facilities with characteristics intermediate between shallow land burial and geologic repository disposal may be most effective in protecting against short-term radiological impacts associated with inadvertent intrusion into a disposal facility. These "intermediate" facilities may be much less effective in providing enhanced long-term isolation of very long-lived radionuclides. If this preliminary view is supported by subsequent analyses, wastes with concentrations above the Commission's current Class C limits for long-lived nuclides (Table 1 of 10 CFR Part 61) would require permanent isolation. In the following sections, the Commission will assume, for the sake of illustration, that Table 1 is an appropriate interpretation of the term "requires permanent isolation."

3. Conceptual Definition of "High-Level Waste"

The Commission proposes to classify wastes as HLW under Clause (B) of the NWPA definition only if they are both highly radioactive and in need of permanent isolation. As discussed above, the Commission considers that wastes should be considered to be highly radioactive if they contain concentrations of short-lived radionuclides which exceed the Class C limits of Table 2 of 10 CFR Part 61. The Commission also assumes, for illustrative purposes, that the radionuclide concentrations of Table 1 of Part 61 are appropriate for identifying the concentrations of long-lived radionuclides requiring permanent isolation. Solidified reprocessing wastes would similarly be classified as HLW only if they contain both short- and long-lived radionuclides in concentrations exceeding Tables 2 and 1, respectively.

It is assumed that a revised definition of HLW would appear in the definitions section of Part 60, and that the materials encompassed by the definition would be subject to the containment requirements of that regulation. It would also serve incidentally to define the materials covered by DOE's waste disposal contracts. This definition would apply only to wastes disposed of in a facility licensed under Part 60. As discussed elsewhere in this notice, there would be no alteration of the Commission's authority to license disposal of HLW under provisions of the Energy Reorganization Act. Some technical amendments would be needed to preserve the jurisdictional provisions of existing Part 60—i.e., to indicate that Part 60 applies to the DOE facilities described in sections 202(3) and (4) of the Energy Reorganization Act, and for that purpose the proposed definition of HLW would not be controlling.

A conceptual, revised definition of HLW could be stated as follows:

"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, (3) solids into which such liquid wastes have been converted, and solid radioactive wastes from other sources, provided such solid materials contain both long-lived radionuclides in concentrations exceeding the values of Table 1 and short-lived radionuclides with concentrations exceeding the values of Table 2.

TABLE 1

Radionuclide	Concentration[1] (Ci/m³)
C-14	8
C-14 in act. metal	80
Ni-59 in act. metal	220
Nb-94 in act. metal	0.2
Tc-99	3
I-129	0.08
Alpha emitting TRU, $t_{1/2}$ > 5 yr	[2]100
Pu-241	[2]3,500
Cm-242	[2]20,000

[1] If a mixture of radionuclides is present, a sum of the fractions rule is to be applied for each table. The concentration of each nuclide is to be divided by its limit, and the resulting fractions are to be summed. If the sum exceeds one for both tables, the waste is classified as HLW.

[2] Units are nanocuries per gram.

TABLE 2

Radionuclide	Concentration [1] (Ci/m³)
Ni-63	700
Ni-63 in act. metal	7,000
Sr-90	7,000
Cs-137	4,600

[1] If a mixture of radionuclides is present, a sum of the fractions rule is to be applied for each table. The concentration of each nuclide is to be divided by its limit, and the resulting fractions are to be summed. If the sum exceeds one for both tables, the waste is classified as HLW

4. Status of wastes not classified as HLW

The NWPA, the Low-Level Radioactive Waste Policy Act, and the Commission's regulations in 10 CFR Part 61 currently classify wastes as "low-level" if they are not otherwise classified as high-level wastes or certain other types of materials (e.g., uranium mill tailings). Classification of certain wastes as HLW, under Clause (B) of the NWPA definition, would reduce the amount of waste classified (by default) as LLW and, more importantly, would establish a distinct, concentration-based boundary between the two classes of waste.

If this conceptual definition of Clause (B) were adopted, certain wastes with radionuclide concentrations above the Class C limits of 10 CFR Part 61 would not be classified as HLW because they do not contain the requisite combination of short- and long-lived nuclides. These wastes would continue to be classified as special types of low-level wastes analogous to DOE's "transuranic" waste category. Any such wastes generated by defense programs would continue to fall under DOE's responsibility for disposal, and no NRC licensing of facilities intended solely for their disposal, such as the Waste Isolation Pilot Plant (WIPP), would be authorized.

As provided by the amendments to the Low-Level Radioactive Waste Policy Act,[15] the Federal government is responsible for disposal of all commercially-generated "above Class C" wastes; it is contemplated, under the amendments, that the NRC would be responsible for licensing the facilities for their disposal. The Commission would continue to permit disposal of wastes containing naturally-occurring or accelerator-produced materials in licensed facilities provided there was no unreasonable risk to public health and safety.

[15] Low-Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. 99-240, Sec. 3, 42 U.S.C. 2021c.

III. Legal Considerations Related to the Nuclear Waste Policy Act

The exercise of NWPA Clause (B) authority may give rise to a number of legal questions which are discussed below.

A. *Disposal of waste generated by materials licensees.* The NWPA established a Nuclear Waste Fund composed of payments made by the generators and owners of "high-level radioactive waste" (including spent fuel) that will ensure that the costs of disposal will be borne by the persons responsible for generating such waste. The Nuclear Waste Fund is to be funded with moneys obtained pursuant to contracts entered into between the Secretary of Energy and persons who generate or hold title to high-level radioactive waste.

The statute addresses the particulars of contracts with respect to spent nuclear fuel and solidified high-level radioactive waste derived from spent nuclear fuel used to generate electricity in a civilian nuclear power reactor. It further limits the authority of the Commission to issue or renew licenses for utilization and production facilities—i.e., for present purposes, nuclear reactors and reprocessing plants—unless the persons using such facilities have entered into contracts with the Secretary of Energy.

The absence of any reference to materials licensees (e.g., fuel fabricators, some research laboratories) suggests that the Nuclear Waste Fund was not intended to apply to their activities. As as result, there could be a question if the Commission were to define materials licensees' waste as high-level waste, because the waste might thereby become ineligible for disposal in a repository. The reason is that the law prohibits disposal of HLW in a repository unless such waste was covered by a contract entered into by June 30, 1983 (or the date the generator or owner commences generation of or takes title to the waste, if later). Few contracts have been entered into with materials licensees except those who are also facility licensees. Thus, it can be argued that the Commission should refrain from designating as HLW, under Clause (B),[16] materials generated by materials licensees.

The Commission is not persuaded by such an argument. The statutory language dealing with the Commission's classification of materials as HLW refers solely to considerations relating to the nature of the wastes, and the character of the licensee generating or owning the waste is simply not relevant. If there are good reasons to treat that waste from materials licensees as HLW, the Commission regards it as likely that any statutory impediment to the acceptance of such waste at a geologic repository could be modified.

B. *Confidence regarding disposal capacity for power reactors.* The availability of waste disposal facilities for wastes generated at commercial power reactors has been the subject of controversy and litigation. The NWPA addresses these concerns by establishing a Federal responsibility to provide for the construction and operation of a geologic repository, leaving undefined (i.e., to the discretion of the Commission) the classes of materials that require permanent isolation in such a facility. Whatever materials they may be, however, they must be transferred to DOE for disposal; and the persons responsible for generating the waste must enter into contracts with DOE which provide for payment of fees sufficient to offset DOE's costs of disposal. Existing facility licensees were required to enter into such contracts by June 30, 1983.

The Commission believes that the purpose of the NWPA can best be accomplished if all the highly radioactive wastes generated by facility licensees (reactors and reprocessing plants) which require permanent isolation are covered by waste disposal contracts with DOE. This would assure that DOE can and will accept possession of such wastes when necessary. Further, in the absence of such assurance, the basis for Commission confidence that these wastes will be safely stored and disposed of would be subject to question even if concerns about the disposal of the licensees' spent nuclear fuel had been laid to rest. Accordingly, if there are any highly radioactive materials (other than those previously regarded as HLW) that are generated by facility licensees and that require permanent isolation, the Commission believes that, for purposes of the NWPA, they should be regarded as "high-level waste." The Commission has reviewed the terms of DOE's standard waste disposal contract and believes that classifying such additional materials as HLW would require no changes to the contract terms.

C. *Implications with respect to disposal methods.* Under the Atomic Energy Act of 1954, the Commission is authorized to establish such standards to govern the possession of licensed nuclear materials as it may deem necessary or desirable to protect health.[17] Under this authority, the Commission may classify materials according to their hazards and may

[16] The Nuclear Waste Fund is governed by Sec. 302, Pub. L. 97-425, 42 U.S.C. 10222. The prohibition of disposal of HLW not covered by timely contracts is set out in sec. 302(b)(2).

[17] Sec. 161b., Pub. L. 83-703, 42 U.S.C. 2201(b).

prescribe requirements for the long-term management or disposal thereof. It is not necessary to label materials as HLW under the NWPA in order to require their disposal in a geologic repository or other suitably permanent facility.

The Commission exercised this authority with respect to concentrated reprocessing wastes by specifying, in Appendix F to 10 CFR Part 50, that any such wastes generated at licensed facilities are to be transferred to a Federal repository for disposal. More recently, the Commission classified certain low-level wastes as being generally acceptable for near-surface disposal (10 CFR Part 61). On the basis of further consideration, the Commission could specify appropriate disposal means for wastes exhibiting radionuclide concentrations greater that those defined in Part 61. Thus, the Commission need not exercise NWPA Clause (B) authority in order to assure that radioactive wastes from licensed activities are disposed of properly. Moreover, the identification of material as HLW under Clause (B) would not by itself mandate that such material must be disposed of in a geologic repository. Since the NWPA authorizes only a single method of permanently isolating HLW—geologic repositories—classification of materials as HLW may effectively preclude disposal of such wastes by other means. Nevertheless, the Commission's regulations will continue to leave open the prospect of disposal by other means if Congress should so authorize.

D. *Relationship to State role.* Section 3 of the Low-level Radioactive Waste Policy Act (LLRWPA), Pub. L. 96-573, 42 U.S.C. 2021b., enacted in 1980, defines a State responsibility to provide, pursuant to regional compacts, for the disposal of "low-level radioactive waste" (LLW).[18] Such waste is defined to mean "radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in section 11.e.(2) of the Atomic Energy Act of 1954."

The Low-Level Radioactive Waste Policy Amendments Act of 1985, Pub. L. 99-240, 42 U.S.C. 2021c., limited the range of LLW for which the States must provide disposal capacity. Specifically, the States are not responsible for wastes with radionuclide concentrations in excess of the Class C limits of 10 CFR Part 61. Instead, the Federal government now assumes responsibility for providing disposal capacity for such wastes. Thus, classification of "above Class C" wastes as HLW or non-HLW will have no impact on State government responsibilities.

E. *Impact on existing technical criteria.* NRC's regulations in Part 60 include technical criteria to be applied in licensing DOE's receipt and possession of source, special nuclear, and byproduct material at a geological repository. The regulations would accommodate the disposal of any radioactive materials, including spent fuel, reprocessing wastes, or any other materials which could be disposed of in accordance with the specified performance objectives.

Materials categorized as high-level waste are subject to a containment requirement (§ 60.113(a)(1)(i)(A)) and to specified waste package design criteria and waste form criteria (§ 60.135 (a-c)). These criteria apply to wastes characterized by the presence of fission products generating substantial amounts of heat at the time of emplacement, but with much reduced heat generation after decades or a few centuries.[19] The rule also explicitly provides that design criteria for waste types other than HLW will be addressed on an individual basis if and when they are proposed for disposal in a geologic repository (§ 60.135(d)).

If additional materials were to be designated as high-level waste, the Commission would need to consider whether the existing repository design criteria are appropriate with respect to such materials.

F. *Applicability of HLW definition to naturally-occurring and accelerator-produced radioactive materials.* Clause (B) of the NWPA provides that the Commission may extend the definition of the term "high-level radioactive waste" to include material requiring permanent isolation only where this is "consistent with existing law." The applicable existing law is the Atomic Energy Act of 1954, under which the Commission has authority to regulate the possession and use of "source material," "special nuclear material," and "byproduct material." There are other radioactive materials, however: naturally-occurring radionuclides, such as radium, and accelerator-produced radionuclides. These are not covered by the Atomic Energy Act and hence there would be no statutory basis, consistent with existing law, for the Commission to require that they be disposed of at facilities licensed by the Commission or otherwise to regulate their possession or use. Accordingly, no legal basis exists for the Commission to classify such materials as HLW or non-HLW.

Nevertheless, as already noted, 10 CFR Part 60 contemplates that "other radioactive materials other than HLW" may be received for emplacement in a geologic repository. This provision of Part 60 would not be altered by expanding the definition of HLW. Part 60 provides that waste package requirements for such wastes will be determined on a case-by-case basis when these wastes are proposed for disposal. Thus, it might be determined, on the basis of technical considerations, that certain naturally-occurring or accelerator-produced radioactive waste materials present hazards similar to licensed materials that are defined as high-level waste and that such material should be disposed of in a geologic repository developed under NWPA. If so, plans for such disposal can be reviewed under Part 60 and the Commission could impose such packaging or other requirements as appropriate to protect public health and safety.

IV. Issues on Which Public Comments are Particularly Sought.

The Commission invites comments on all the issues identified in this notice and any other issues that might be identified. However, comments (with supportive rationale) in response to the following would be particularly helpful.

1. Two options are presented for defining reprocessing wastes under Clause (A) of NWPA. The first option proposes to define the "sufficiency" of fission product concentrations in solidified reprocessing wastes in a manner analogous to its treatment of "highly radioactive" and "requires permanent isolation" under Clause (B) (i.e., by examining the hazards posed by wastes if disposed of in facilities other than a repository). The second option interprets Clause (A) as encompassing all those wastes which have heretofore been considered high-level waste under Appendix F to 10 CFR Part 50 and the Energy Reorganization Act. Which of these two approaches is preferable?

2. The Commission proposes that the current Class C concentration limits of 10 CFR Part 61 serve to identify radionuclide concentrations which are "highly radioactive" for purposes of Clause (B) of the NWPA definition. Would an alternative set of concentration limits be preferable? If so, how should such limits be derived?

3. The Commission proposes to equate the "requires permanent isolation" wording of the NWPA definition with a level of long-term radiological hazard requiring disposal in a geologic repository. Are the Commission's

[18] States are not responsible for disposal of LLW from atomic energy defense activities or Federal research and development activities.

[19] The Commission's expectation that HLW would generate significant amounts of heat is reflected in the discussion of transuranic waste in the notice of proposed rulemaking on the Part 60 technical criteria. 46 FR 35284, July 8, 1981. Reduction of the heat load, for example by removal of cesium-137 and strontium-90, could result in different containment requirements. 48 FR 28196, June 21, 1983 (final rule).

proposed analyses appropriate for identification of concentrations requiring permanent isolation?

4. Although, under section 121 of NWPA, no environmental review is required with respect to the definition of HLW, the Commission would welcome identification of any environmental consequences associated with the matters discussed in this notice.

5. Some waste materials, such as certain laboratory wastes or some sealed sources, may be highly concentrated, yet contain only relatively small total quantities of radioactive materials. Is there a need for a special provision (e.g., a minimum total quantity of activity) before a waste should be classified as HLW?

6. What difficulties (legal, administrative, financial, or other) would an expanded definition of HLW cause in implementing the provisions of the NWPA?

7. The Commission's regulations do not generally require that any particular type of waste be disposed of in any specified type of facility. Would such a requirement be appropriate?

8. As discussed in this notice, the Commission has no legal authority to classify naturally-occurring or accelerator-produced radioactive materials (NARM) as HLW or non-HLW. Nevertheless, such materials may be presented for disposal at facilities licensed by the Commission. When the Commission carries out its proposed analyses to identify "other highly radioactive material that . . . requires permanent isolation," should NARM be included in the analyses?

9. Are there issues other than those identified in this notice which the Commission should consider in developing approaches to implement its authority?

Separate Views of Commissioner Asselstine

Commissioner Asselstine is concerned about the potential for creating a confusing situation if the Commission were to adopt the first option under Clause (A). The first option is to numerically specify concentrations of fission products in defining high-level wastes. Under this approach, it is conceivable that material considered high-level waste for the purposes of licensing under the Energy Reorganization Act of 1974 will also be considered low-level waste for the purposes of the Nuclear Waste Policy Act (NWPA) of 1982. Wastes presently being stored at the Hanford waste tanks, which have traditionally been classified as high-level wastes, would likely be reclassified as above Class C low-level waste under the first option. Commissioner Asselstine requests public comment on how this reclassification would affect the NRC's licensing authority over the long-term storage or *in situ* disposal of the Hanford waste tanks. Commissioner Asselstine also requests comments on whether there are alternative approaches to achieving the stated purpose of this advanced notice of proposed rulemaking of identifying wastes subject to the provisions of the NWPA without altering the traditional definition of high-level waste and thus creating this potential for confusion.

List of Subjects in 10 CFR Part 60

High-level waste, Nuclear power plants and reactors, Nuclear materials, Penalty, Reporting requirements, Waste treatment and disposal.

Authority: The authority citation for this document is Sec. 161, Pub. L. 83-703, 68 Stat. 948, as amended (42 U.S.C. 2201).

Dated at Washington, DC, this 20th day of February 1987.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

Appendix—Volumes and Characteristics of Wastes Exceeding Class C Concentration Limits

For a number of years NRC has had an ongoing program to develop regulations and criteria for disposal of low-level radioactive waste. At the time this program was initiated, there was a well-documented need for comprehensive national standards and technical criteria for the disposal of low-level waste. The absence of sufficient technical standards and criteria was seen to be a major deterrent to the siting of new disposal facilities by states and compacts.

A significant milestone in this program was the promulgation of the regulation 10 CFR Part 61 ("Licensing Requirements for Land Disposal of Radioactive Waste") on December 27, 1982 (47 FR 57446). This regulation establishes procedural requirements, institutional and financial requirements, and overall performance objectives for land disposal of radioactive waste, where land disposal may include a number of possible disposal methods such as mined cavities, engineered bunkers, or shallow land burial. This regulation also contains technical criteria (on site suitability, design, operation, closure, and waste form) which are applicable to near-surface disposal, which is a subset of the broader range of land disposal methods. Near-surface disposal is defined as disposal in or within the upper 30 meters of the earth's surface, and may include a range of possible techniques such as concrete bunkers or shallow land burial. The Part 61 regulation is intended to be performance-oriented rather than prescriptive, with the result that the Part 61 technical criteria are written in relatively general terms, allowing applicants to demonstrate how their proposals meet these criteria for various specific near-surface disposal methods.

A waste classification system was also instituted in the regulation which establishes three classes of waste suitable for near-surface disposal: Class A, Class B, and Class C. Limiting concentrations for particular radionuclides were established for each waste class, with the highest limits being for Class C. The concentration limits were established based on NRC's understanding (at the time of the rulemaking) of the characteristics and volumes of low-level waste that would be reasonably expected to the year 2000, as well as potential disposal methods.

The Class C concentration limits are applicable to all potential near-surface disposal systems; however, the calculations performed to establish the limits are based on postulated use of one near-surface disposal method: shallow land burial. The Class C limits are therefore conservative since there may be other near-surface disposal methods that have greater confinement capability (and higher costs) than shallow land burial.

The regulation states that waste exceeding Class C concentration limits is considered to be "not generally acceptable for near-surface disposal," where this is defined in § 61.55(a) as "waste for which waste form and disposal methods must be different, and in general more stringent, than those specified for Class C waste." Thus, waste exceeding Part 61 concentrations generally has been excluded from near-surface disposal and is being held in storage by licensees. (This amounts to less than 1% of the approximately 3,000,000 ft^3 of commercial low-level waste annually being generated.) Given the current absence of prescriptive requirements for disposal of waste exceeding Class C concentration limits, the regulation allows for evaluation of specific proposals for disposal of such waste on a case-by-case basis. The general criteria to be used in evaluating specific proposals are the Part 61 performance objectives contained in Subpart C of the regulation.

Current NRC activities include analyses of low-level waste that exceeds Class C concentration limits to determine the extent to which alternative near-surface disposal systems (e.g. concrete bunkers, augered holes, deeper disposal) may be suitable for safe disposal of such waste. These analyses include a more detailed characterization of physical, chemical, and radiological characteristics of wastes that may be close to or exceed Class C concentration limits as well as development of improved methods for modeling the radiological and economic impact of disposal of these wastes. A related activity is development of more specific guidance for design and operation of alternative near-surface and other land disposal systems. These activities represent a continuation of the Part 61 rulemaking process as discussed in the December 27, 1982 notice of the final Part 61 regulation (47 FR 57446).

Wastes exceeding Class C concentrations are projected to be generated by nuclear power reactors and other supporting nuclear fuel cycle facilities, and also generated by

radioisotope product manufacturers and other facilities and licensees outside of the nuclear fuel cycle. Such wastes can be grouped as follows:

—Plutonium-contaminated nuclear fuel cycle wastes
—Activated metals
—Sealed sources
—Radioisotope product manufacturing wastes
—Other waste

Plutonium-contaminated nuclear fuel cycle wastes. These wastes are being generated from two principal sources. One source of waste arises from operations supporting the nuclear fuel cycle—i.e., post-irradiation radiochemical and other performance analyses of spent fuel rods from nuclear reactors (e.g., "burnup" studies). These operations generate about 200 ft^3 of plutonium-contaminated waste per year, much of which is believed to exceed Class C concentration limits. This waste consists of solidified liquids and other solid material such as scrap, trash, and contaminated equipment. Eventual decommissioning of the three facilities currently performing these analyses is expected to generate additional waste volumes, a portion of which is expected to exceed Class C concentration limits.

The second source of waste arises from fuel cycle licensees who have previously been authorized to use plutonium in research and development of advanced reactor fuels. None of these licensees is using plutonium now, and there is no prospect in the foreseeable future for such activities. In fact, each of the licensees in this category has either decommissioned, or is in the process of decommissioning, its facility. Some of the licensees have made contractual arrangements to transfer their decommissioning waste to DOE for retrievable storage. Approximately 5,000 to 10,000 ft^3 of waste, however, is projected to be generated on a one-time basis that will not be covered by contract.

Activated metals. Activated metals are typically generated as a result of long-term neutron bombardment of metals forming the structure or internal components of a nuclear reactor used for power production, radioisotope production, or other purpose (e.g., education, testing, research). Activated metal wastes are unlike most other wastes being generated in that the radionuclides form part of the actual metal matrix rather than being mixed with large volumes of other, nonradioactive material such as paper, cloth or resins. Radionuclide release is principally governed by the material corrosion rate, and for most reactor metals of concern (e.g., stainless steel), the corrosion rate is quite low.

To date, only a small fraction (about 200 ft^3/yr) of the activated metal waste currently being generated by nuclear power reactors has been identified as exceeding Class C concentration limits. Such waste appears to primarily consist of in-core instrumentation which is no longer serviceable. An example of this waste is a reactor flux wire which is physically small but may be high in activity. (A flux wire is a wire that is inserted into a tube running the length of the reactor core and used to make neutron flux measurements.)

Large quantities of activated metal wastes are projected to be generated in the future as a part of reactor decommissioning. Studies by NRC (NUREG/CR-0130, addendum 3 and NUREG/CR-0672, addendum 2) indicate that over 99% of the waste volume that is projected to result from nuclear power reactor decommissioning will not exceed class C concentration limits and the 1% that is projected to exceed these limits will be almost all activated metals from core structure. Conservative estimates presented in these studies indicate that packaged quantities of decommissioning wastes exceeding Class C concentration limits will total about 4700 ft^3 for a large (1175 MWe) pressurized water reactor (PWR) and about 1660 ft^3 for a large (1155 MWe) boiling water reactor (BWR). Much smaller quantities of wastes exceeding Class C concentration limits may also be generated from future decommissioning of test, research, and education reactors.

Another source of activated metal waste is expected to arise as part of consolidation of spent fuel assemblies for storage and/or disposal. Spent fuel assemblies now being periodically discharged from nuclear power reactors are stored in on-site fuel storage pools. Each assembly is composed of a large number of fuel rods arranged in a rectangular array, and held in place by spacer grids, tie rods, metal end fittings, and other miscellaneous hardware. One option under consideration, for long-term waste storage and eventual disposal is to remove this hardware form the fuel rods. This allows the fuel rods, which contain the fission products which are of primary interest in terms of geologic repository disposal, to be consolidated into a smaller volume. This enables more economical storage and easier handling for transport and disposal. The hardware, which is composed of various types of corrosion-resistant metal such as Inconel or zircalloy, becomes a second waste stream which could potentially be safely disposed by a less expensive method than a geologic repository.

Based on information from DOE (DOE/RW-0006, September, 1984) about 12 kg of waste hardware would be generated per BWR fuel assembly, and about 25 kg per PWR fuel assembly. Assuming 200 fuel assemblies are replaced per year per large 1000 NWe) BWR, roughly 2400 kg of activated metal hardware would be generated per year per large BWR, and about 1700 kg per PWR. An approximate compacted volume is on the order of 50 ft^3/yr per large reactor, or about 4,000 ft^3/yr over the entire industry. Depending upon parameters such as the fuel irradiation history and the hardware elemental composition, particular pieces of separated hardware may or may not exceed Class C concentration limits.

Other than perhaps a few isolated cases, all of the spent fuel assemblies are being stored by licensees with the hardware still attached. Under the provisions of the NWPA, operators of nuclear power plants have entered into contracts with DOE for acceptance by DOE of the spent fuel for storage and eventual disposal. (See 48 FR 16590, April 18, 1983 for the terms of the contract.) Acceptance of the spent fuel by DOE implies acceptance of the activated hardware along with the fuel rods, with the result that disposal of the hardware would intrinsically be a Federal rather than a State responsibility. Disposal responsibility becomes less clear if licensees, seeking more efficient onsite storage, consolidated fuel themselves.

Sealed sources. A number of discrete sealed sources have been fabricated for a variety of medical and industrial applications, including irradiation devices, moisture and density gauges, and well-logging gauges. Each source contains only one or a limited number of radioisotopes. Sealed sources can range in activity from a few millionths of a curie for sources used in home smoke detectors to several thousand curies for sources used in radiotherapy irradiators. Sealed sources are produced in several physical forms, including metal foils, metal spheres, and metal cylinders clamped onto cables. The larger activity sealed sources typically consist of granules of radioactive materials encapsulated in a metal such as stainless steel.

Sealed sources are generally quite small physically. Even sources containing several curies of activity have physical dimensions which are normally less than an inch or two in diameter and 6 inches in length. These dimensions are such that, like activated metals, sealed sources may be considered to be a unique form of low-level waste. Characterizing sealed sources in terms of radionuclide concentration certainly appears to be of less utility than characterizing sealed sources in terms of source activity.

Depending upon the application, sealed sources may be manufactured using a variety of different radioisotopes. A review of the NRC sealed source registry was conducted to identify those source designs which may contain radioisotopes in quantities that might exceed Class C concentration limits. The principal possibilities appear to be those containing cesium-137, plutonium-238, plutonium-239, and americium-241. Large cesium-137 sources are generally used in irradiators, and while some large sources can range up to a few thousand curies, most which are sold appear to contain in the neighborhood of 500 curies. Cesium-137 is a beta/gamma emitter having a half-life of 30 years, which suggests that special packaging and disposal techniques can be readily developed for safe near-surface disposal of sources containing this isotope.

The remaining three isotopes are alpha emitters and are longer lived. Sources manufactured using these isotopes can range up to a few tens of curies, although most that have been sold appear to be much less than one curie in strength. Plutonium-239 sources are not commonly manufactured. Plutonium-238 sources have been manufactured for use as nuclear batteries for applications such as heart pacemakers. Plutonium-238 has also been used in neutron sources, although neutron sources currently being manufactured generally contain americium-241. Americium-241 is also used in a wide

variety of other industrial applications such as fill level gauges.

Neutron sources produce neutrons for applications such as reactor startup, well logging, mineral exploration, and clinical calcium measurements. These sources contain alpha-emitting radionuclides such as americium-241 plus a target material (generally beryllium) which generates neutrons when bombarded by alpha particles. Neutron sources can contain up to approximately 20 curies of activity.

It is difficult to project potential waste sealed source quantities and activities, since sealed sources as wastes are not routinely generated as part of licensed operations. In addition, sealed sources only become waste when a decision is made by a licensee to treat them as such. In many instances sources held by licensees may be recycled back to the manufacturer when they are no longer usable, and the radioactive material recovered and fabricated into new sources. Finally, source manufacturers are licensed by the NRC and NRC Agreement States to manufacture a particular source design up to a specified radioisotope curie limit. Most actual sources, however, contain activities considerably less than the design limit.

NRC staff estimates that licensees currently possess approximately 10,000 encapsulated sources having activities above a few thousandths of a curie and containing americium-241 or plutonium-238. Given the hypothetical case that all these sources were candidates for disposal, the total consolidated source volume would be only about 35 ft ^{3}. After packaging for shipment, however, the total disposed waste volume would be significantly increased. The total activity contained in the sources is estimated to be approximately 70,000 curies.

Radioisotope product manufacturing wastes. Wastes exceeding Class C concentration limits are occasionally generated as part of manufacture of sealed sources, radiopharmaceutical products, and other materials used for industrial, educational, and medical applications. Volumes and characteristics of such wastes are difficult to project. However, it is believed that the largest volume of this waste consists of sealed sources which cannot be recycled, plutonium-238 and americium-241 source manufacturing scrap, and waste contaminated with carbon-14.

Sealed sources as a waste form are discussed above. Manufacture of large plutonium-238 and americium-241 sources is concentrated in only a few facilities, from which the generation of waste exceeding Class C concentration limits is believed to total only a few hundred ft ^{3} per year. Approximately 10 ft ^{3} per year of carbon-14 waste is generated as a result of radiopharmaceutical manufacturing.

Other wastes. Although the above discussed wastes are believed to be the principal wastes that are expected to exceed Class C concentration limits, other wastes may occasionally also be generated. For example, relatively small quantities of such wastes are currently being generated as part of decontamination of the Three Mile Island, Unit 2, nuclear power plant. However, these wastes are being generated as a result of an accident, are therefore considered abnormal, and are being transferred to DOE under a memorandum of understanding with NRC. Wastes exceeding Class C concentration limits and generated as part of the West Valley Demonstration Project are also being transferred to DOE for storage pending disposal.

Sealed sources and other waste containing discrete quantities of radium-226 may also exceed Class C concentration limits. Products containing radium-226 have been manufactured in the past for a variety of industrial and medical applications. Such wastes are not regulated by NRC but occasionally have been disposed at licensed low-level waste disposal facilities. NRC is currently investigating the impacts of disposal of such waste in order to provide guidance to States and other interested parties on safe disposal methods and any concentration limitations.

62 FR 16403
Published 5/5/87
Comment period expires 6/29/87.

10 CFR Part 60

Definition of "High-Level Radioactive Waste"; Extension of Comment Period

AGENCY: Nuclear Regulatory Commission.

ACTION: Advance notice of proposed rulemaking: Extension of comment period.

SUMMARY: On February 27, 1987, the Nuclear Regulatory Commission (NRC) published for comment an advance notice of proposed rulemaking (ANPRM) indicating its intention to amend the definition of "hight-level radioactive waste" (HLW) in its regulations governing disposal of HLW (52 FR 5992). The notice proposed to revise this definition to conform more closely to the statutory definition of HLW in the Nuclear Waste Policy Act of 1982. The comment period for the notice expired April 29, 1987. The NRC has received a request for a 60-day extension of the comment period. This request indicates that the public needs additional time to examine and prepare comments on the numerous legal and technical considerations in a proposed rulemaking of this scope. The NCR agrees that additional time may be needed to prepare comments on an issue of this scope, and, therefore, extends for 60 days the original comment period to June 29, 1987.

DATES: Submit comments by June 29, 1987, a 60-day extension of the original comment period. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments received before this date.

ADDRESSES: Submit written comments or suggestions to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.

Examine copies of comments received at the NRC Public Document Room, 1717 H Street, NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: W. Clark Prichard, Division of Engineering, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-433-7668.

Dated at Washington, DC, this 29th day of April 1987.

For the Nuclear Regulatory Commisiaon.

Samuel J. Chilk,

Secretary of the Commisison.

53 FR 16131
Published 5/5/88
Comment period expires 8/3/88.

10 CFR Parts 2, 51 and 60

NEPA Review Procedures for Geologic Repositories for High-Level Waste

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission is proposing to revise its procedures for implementation of the National Environmental Policy Act (NEPA). The proposed rule would address the Commission's role under NEPA in connection with a license application submitted by the Department of Energy with respect to a geologic repository for high-level radioactive waste (HWL). The changes are needed in order to reflect the provisions of the Nuclear Waste Policy Act of 1982 (NWPA), as amended. Under that Act, the Commission is required to adopt the Department's environmental impact statement (EIS) to the extent practicable. The proposed rule, among other things, sets out the standards and procedures that would be used in determining whether such adoption is practicable.

In summary, under the proposed rule:

(1) The Commission will conduct a thorough review of DOE's draft EIS and will provide comments to DOE regarding the adequacy of the statement.

(2) If requested by Congress pursuant to the NWPA, the Commission will provide comments on DOE's EIS to the Congress with respect to a State or Tribal notice of disapproval of a designated site.

(3) The NRC will find it practicable to adopt DOE's EIS (and any DOE supplemental EIS) unless:

(a) The action proposed to be taken by the NRC differs in an environmentally significant way from the action described in DOE's license application, or

(b) Significant and substantial new information or new considerations render the DOE EIS inadequate.

(4) The DOE EIS will accompany the application through the Commission's review process, but will be subject to litigation in NRC's licensing proceeding only where factors 3(a) or 3(b) are present.

In accordance with NWPA, the primary responsibility for evaluating environmental impacts lies with DOE, and DOE would therefore be required to supplement the EIS, whenever necessary, to consider changes in its proposed activities or any significant new information.

DATES: Comment period expires August 3, 1988. Comments received after August 3, 1988 will be considered if it is practical to do so, but assurance of consideration is given only for comments filed on or before that date.

ADDRESSES: Submit written comments and suggestions to: Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC. 20555. Attention: Docketing and Service Branch. Copies of comments received may be examined at the NRC Public Document Room, 1717 H Street, NW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: James R. Wolf, Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone (301) 492–1641.

SUPPLEMENTARY INFORMATION:

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Introduction

All agencies of the Federal Government are charged with the duty to interpret and administer the laws of the United States, to the fullest extent possible, in accordance with the policies set forth in the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq.* Under NEPA, the Nuclear Regulatory Commission is required to prepare an environmental impact statement (EIS) with respect to any major Federal action in which it is engaged that might significantly affect the quality of the human environment. The EIS contains a detailed statement of the environmental impacts of a proposed action, including adverse unavoidable effects resulting from its implementation, as well as an identification and environmental evaluation of alternatives to the proposed action.

The Commission is responsible for the licensing and regulation of activities involving the possession of nuclear materials. Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.* The Department of Energy (DOE) must obtain a license from NRC before disposing of high-level radioactive waste (HLW) in geologic repositories. Section 202, Energy Reorganization Act of 1974, 42 U.S.C. 5842. The licensing of DOE to receive and possess HLW at a geologic repository involves one or more major Federal actions which might significantly affect the quality of the human environment. Accordingly, NEPA requires the Commission to have an EIS (or multiple EIS's if more than one major Federal action by NRC is involved) to accompany its decision process when it considers a license application from DOE involving HLW disposal. Further direction regarding NRC's NEPA responsibilities is provided by the Nuclear Waste Policy Act of 1982 (NWPA), as amended, 42 U.S.C. 10101 *et seq.*

The Commission in 1984 promulgated revised regulations (10 CFR Part 51) to implement section 102(2) of NEPA, the section which, among other things, calls for the preparation of an EIS. 49 FR 9352, March 12, 1984, and 49 FR 24512, June 14, 1984. In issuing these regulations, the Commission noted that it had initiated a review of the licensing procedures applicable to geologic repositories in the light of the Nuclear Waste Policy Act and that the Commission would determine, as part of that review, whether further changes to 10 CFR Part 51 are needed. On July 30, 1986, the Commission promulgated certain amendments to 10 CFR Part 60, 51 FR 27158. Those amendments deal with (1) the role of NRC during site screening and site characterization activities and (2) State, tribal, and public participation in NRC activities with respect to geologic repositories. In proposing those rules, the commission had noted that issues pertaining to NRC responsibilities under NEPA will require modifications to 10 CFR Part 51 and that such amendments would be the subject of a subsequent rulemaking. 50 FR 2579, Jan. 17, 1985. The statement of considerations accompanying the final amendments advised that Part 51 "will need to be changed—specifically to (1) define the alternatives that must be discussed in an environmental impact statement, (2) exempt the promulgation of the NRC licensing requirements and criteria from environmental review under NEPA, and (3) set out procedures that will be followed by the Commission in determining whether or not to adopt the DOE EIS."

As contemplated by its prior statements, the Commission now proposes amendments dealing with NRC implementation of NEPA in connection with Department of Energy geologic repositories. A full appreciation of these amendments requires an understanding of NEPA itself and the Commission's original plans for meeting its NEPA responsibilities; an analysis of the text and legislative history of NWPA, and of the recent amendments thereto, with particular regard to the policies and procedures established by that law for the resolution of environmental issues; and, finally, the specific regulations the Commission would promulgate in order to implement the NWPA policies and procedures. These matters are examined in the following discussion.

The Pre-NWPA Licensing Framework

The Commission believes it will be helpful to outline the repository licensing procedure that it had approved before enactment of NWPA. As appears below, that procedure included a customary NEPA review of DOE's license application. With that intention in mind, the Commission required DOE to characterize at least three sites and to provide certain timely information to the Commission regarding its site selection process. The Commission's requirements had been promulgated before the passage of NWPA, and they were familiar to Congress. In some respects the new law tracked the Commission rules closely; in other cases, however, there were marked differences, and from these differences a modification of policy can be inferred. A review of the pre-NWPA framework is therefore essential.

To begin this review with fundamental considerations, it is first noted that the Atomic Energy Act of 1954 charges the Commission with several types of licensing responsibility. One class of Commission action is *materials licensing*. Under its statutory authority, the Commission prescribes such rules as it finds to be needed to assure that persons possess and use the regulated materials in a manner that protects public health and safety and is not inimical to the common defense and security. DOE's disposal of HLW at a geologic repository is subject to this materials licensing authority of the Commission. The Commission several years ago determined that it would be necessary, to protect health and safety, to review DOE's plans with respect to a geologic repository before commencement of construction. 46 FR 13971, Feb. 25, 1981 (final licensing procedures). Accordingly, DOE may not commence construction of a geologic repository unless it has first filed a license application and obtained the Commission's construction authorization. 10 CFR 60.3(b). A construction authorization is not itself a license, since it does not authorize possession or use of nuclear materials, but DOE's failure to comply with the requirement to apply for and to obtain construction authorization constitutes grounds for denial of the license that DOE would later need in order to receive high-level waste at the repository. Moreover, the Commission may, if necessary, issue orders to secure compliance with construction authorization conditions and to protect the integrity of the repository. 46 FR 13971.

In the pre-NWPA licensing framework, the Commission specified that an environmental report prepared in accordance with 10 CFR Part 51 was to accompany the license application. 10 CFR 60.21(a). The environmental report was to discuss relevant NEPA considerations. In particular, as provided by this regulation, 10 CFR 51.40(d)(1983):

> 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. Such characterization data shall include results of appropriate in situ testing at repository depth unless the Commission finds with respect to a particular site that such testing is not required. The Commission considers the characterization of three sites representing two geologic media at least one of which is not salt to be the minimum necessary to satisfy the requirements of NEPA. [However, in light of the significance of the decision selecting a site for a repository, the Commission fully expects the DOE to submit a wider range of alternatives than the minimum required here.]

Failure to provide the specified site characterization data would constitute grounds for denial of a license application. 10 CFR 2.101(f)(4). If DOE had prepared its own EIS, that document could be submitted so long as it contained the information called for by the regulation; the Commission noted, however, that it could not be bound to accept judgments arrived at by DOE in its EIS. 46 FR 13973.

NRC was to publish notices of the availability of the environmental report and of its intent to prepare an environmental impact statement. 10 CFR 51.50(a), (b)(1983). An environmental impact statement would be required before issuance of a construction authorization, 10 CFR 51.5(a)(11)(1983); and an EIS might also be determined to be necessary for issuance of the license to possess high-level waste at a repository, *id.* at § 51.5(b)(11), or to terminate such license, *id.* at § 51.5(b)(10). The EIS prepared before construction would be supplemented prior to issuance of a license to take account of any substantial changes in the activities proposed to be carried out or significant new information regarding the environmental impacts of the proposed activities, *id.* at § 51.41.

Whenever an EIS was required, it was first to be distributed as a draft and, after receipt of comments, NRC would then prepare a final EIS which would respond to any responsible opposing view not adequately discussed in the draft. The draft and final statements, and comments received, were to accompany the application through the Commission's review processes. *Ibid.* (reference to §§ 51.22–51.26). In an adjudicatory hearing, as is required before issuance of construction authorization for a repository, the NRC staff was to offer the final EIS in evidence. Any part to the proceeding could have taken a position and offered evidence on NEPA issues. As a result of the hearing, the Commission could have arrived at findings and conclusions different from those in the final EIS prepared by the staff, and the final EIS would have been deemed modified to that extent. *Id.* at § 51.52(b).

Upon review and consideration of an application and environmental report, a construction authorization could have been issued if the following environmental standard was met:

> That, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, the action called for is issuance of the construction authorization, with any appropriate conditions to protect environmental values. 10 CFR 60.31(c).

While the Commission's formal NEPA determination would thus have been made in the course of licensing proceedings, the regulation Buenos Aires, Argentinas provided further for NRC involvement at an even earlier stage—namely, at the time of site characterization. Site characterization is a program of exploration and testing that includes specified activities "to determine the suitability of the site for a geologic repository." 10 CFR 60.2(p)(1983). It is needed not only to determine whether 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. Site characterization data are needed so as to provide a satisfactory basis for arriving, with confidence, at the technical judgments underlying the Commission's initial licensing decision. 44 FR 70410, Dec. 6, 1979 (proposed licensing procedures). The Commission noted its belief that it would be necessary for DOE to carry out site characterization at three or more sites in two (or more) geologic media, at least one of which is not salt. Such a program of multiple site characterization would provide the only effective means by which NRC could make a comparative evaluation of alternatives as a basis for arriving at a reasoned decision under NEPA. It was estimated that $30,000,000 represented the upper limit for the "at depth" portion of site characterization in soft rock, with a limit of up to about $40,000,000 in hard rock. 46 FR 13972–73.

The Commission regulations called upon DOE to submit, in advance of site characterization, a Site Characterization Report, which would have been reviewed informally by NRC. In addition to describing the site to be characterized and the proposed site characterization program, the report would have included several items of information pertaining to site selection, specifically:

- The criteria used to arrive at the candidate area.
- The method by which the site was selected for site characterization.
- Identification and location of alternative media and sites at which site characterization is contemplated.
- A description of the decision process by which the site was selected for characterization, including the means used to obtain public, Indian tribal and State views during selection.

10 CFR 60.11 (1983). The Commission found the inclusion of plans for considering alternative sites to be necessary so that NRC could call to the attention of DOE, in a timely manner, additional information that might be needed by the Commission in reviewing a license application in accordance with NEPA. 46 FR 13972. (Also, in the preamble to the proposed licensing procedures, the Commission had discussed the requirement that DOE describe the site selection process, and State involvement therein. The Commission noted its belief, in this connection, that many issues, "including the NEPA questions related to alternatives and alternative sites," would be more easily resolved if State concerns were identified and addressed at the earliest possible time. 44 FR 70412.)

The Nuclear Waste Policy Act of 1982

[Note: Under this heading, the Commission reviews its NEPA responsibilities under the Nuclear Waste Policy Act, as originally enacted; that is, this discussion does not reflect the 1987 amendments. The 1987 changes, which will be analyzed below (under the heading "Nuclear Waste Policy Amendments Act of 1987"), were not intended to alter the duties of the Commission with respect to NEPA; and it is therefore in order to review the pre-1987 situation in order to understand the Commission's role. All citations in this part of this notice are to NWPA as codified as of January 1, 1987.]

Congress established Federal policy for civilian radioactive waste disposal in the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10131 et seq.). The Commission's responsibilities for radiological safety, under prior law, were recognized and confirmed—most clearly in the express provision in section 114(f) that "Nothing

in this Act shall be construed to amend or otherwise detract from the licensing requirements of the Nuclear [sic] Regulatory Commission as established in title II of the Energy Reorganization Act of 1974 (Pub. L. 93-438)." 42 U.S.C. 10134(f)

The statute provides for a licensing process that conforms closely to the preexisting framework of 10 CFR Part 60. NWPA thus requires DOE to carry out a program of site characterization, after first submitting to NRC a general plan for site characterization activities (along with certain information regarding waste form or packaging as well as a conceptual repository design). Section 113(b)(1), 42 U.S.C. 10133(b)(1). This corresponds closely to the Site Characterization Report provision of Part 60, 10 CFR 60.11(a) (1982); notably, however, the NEPA-related requirement of the regulation that DOE include site screening and selection information in its submission was omitted. (As discussed below, the site screening and selection information must be identified in a separate document—the environmental assessment—which does not require NRC review.)

As provided earlier in Part 60, an application is to be submitted in advance of construction. This is to be followed by Commission review in accordance with the laws applicable to such applications and a decision approving or disapproving the issuance of a construction authorization. Section 114 (b), (d), 42 U.S.C. 10134 (b), (d). In addition to its action on applications for construction authorization, the Commission would review, and approve or disapprove, applications for licenses to receive and possess the waste (and spent fuel) in a respository and applications for closure and decommissioning. *See* section 121(b), 42 U.S.C. 10141(b). For the corresponding provisions of NRC regulations, *see* 10 CFR 60.31 (construction authorization), 60.41 (license to receive and possess), and 60.51 (license amendment for permanent closure).[1]

The Nuclear Waste Policy Act also confirmed the Commission's most important stated position with respect to compliance with NEPA. In its regulations, cited above, the Commission had construed NEPA's direction to consider reasonable alternatives as constituting a mandate to characterize at least three sites, in at least two geologic media. Although establishing new procedures, NWPA followed precisely the same substantive approach.

Site Selection Under the Nuclear Waste Policy Act

The Nuclear Waste Policy Act directed the development of two geologic repositories. This section will describe the process leading to the selection of a site for the first repository. The process for a second repository was generally the same, except that the statutory dates for particular actions were several years later.

The site selection process, as carried out by DOE, began with the identification of States with "potentially acceptable sites"—sites at which DOE, after geologic studies and field mapping, was to undertake preliminary drilling and geophysical testing for the definition of site location. DOE was required to notify States involved, and affected Indian tribes, of the identification of such sites. Section 116(a), 42 U.S.C. 10136(a). DOE identified nine potentially acceptable sites for the first repository and provided notice to the six States in which such sites were located.

Before the selection process could move any further, DOE had to issue "general guidelines for the recommendation of sites for repositories." NWPA provided that, under the guidelines, DOE would need to consider the various geologic media in which sites may be located and, to the extent practicable, to recommend sites in different geologic media. The guidelines were to specify factors that qualify or disqualify a site from development as a repository; among the factors specified by the law were certain nonradiological environmental concerns as well as considerations related to the isolation of the radionuclides in the waste. NWPA required DOE, prior to issuance of the guidelines, to consult with the Council on Environmental Quality, the Environmental Protection Agency, the Geologic Survey, and interested Governors. DOE was also required to obtain the concurrence of the Commission in the guidelines. Section 112(a), 42 U.S.C. 10132(a) Guidelines have been issued by DOE. 49 FR 47714, Dec. 6, 1984. The concurrence of the Commission in the guidelines was published in the Federal Register on July 10, 1984. 49 FR 28130.

DOE was directed, following issuance of the guidelines and consultation with the governors of affected States, to nominate at least 5 sites determined to be suitable for site characterization. Section 112(b)(1)(A), 42 U.S.C. 10132(b)(1)(A). Nomination had to be preceded by public hearings near the site, on which occasions residents of the area would be solicited with respect to issues that should be addressed by DOE in its environmental assessment and site characterization plan. Section 112(b)(2), 42 U.S.C. 10132(b)(2). Also, before nomination DOE was required to notify the States or affected Indian tribes of its intent to nominate a site and of the basis for such nomination. Section 112(b)(1)(H), 42 U.S.C. 10132(b)(1)(H). The nomination itself needed to be accompanied by an environmental assessment, which set out the basis for nomination and which discussed the probable impacts of site characterization activities. The environmental assessment, to be made public, would contain an evaluation of the suitability of the site for site characterization under the general guidelines, an evaluation of the suitability of the site for development as a repository under each guideline that does not require site characterization as a prerequisite for application, an evaluation of the effects of site characterization on the public health and safety and the environment, a comparative evaluation with other sites that have been considered, a description of the decision process by which the site was recommended, and an assessment of the regional and local impacts of locating the repository at the site. The sufficiency of an environmental assessment with respect to these matters was subject to the judicial review provisions of the statute, which generally require petitions for review to be filed within 180 days after the action involved. Section 112(b)(1) (E through G), 119; 42 U.S.C. 10132(b)(1) (E through G), 10139. On May 28, 1986, DOE released final environmental assessments on five potential repository sites (at Yucca Mountain, Nevada; Deaf Smith County, Texas; the Hanford Reservation, Washington; Richton Dome, Mississippi; and Davis Canyon,

[1] One difference between the language of NWPA and Part 60 is worthy of note: that the statute differentiates between an application for construction authorization and an application for a license, whereas the regulation had referred, and continues to refer, solely to an application for a license to receive and possess waste (to be filed prior to construction). The Commission considers this differentiation to lack any substantive significance. In the view to the Commission, the information it needs in order to be able to consider the issuance of a construction authorization is generally the same as will be needed prior to issuance of the license to receive and possess HLW. For this reason, the Commission regulations call for the application to be as complete as possible in the light of information that is reasonably available at the time of docketing—i.e. prior to commencement of construction. 10 CFR 60.24(a). Accordingly, the Commission intends to retain its requirement of a unitary application: it is not required to, and it does not propose to, modify its rules to provide separately for applications for construction authorization on the one hand and a license to receive waste on the other.

Utah). (The NRC staff had previously reviewed and commented on the draft environmental assessments for these sites.)

Subsequent to site nomination, DOE was required to recommend to the President three of the nominated sites for characterization as candidate sites. Section 112(b)(1)(B), 42 U.S.C. 10132(b)(1)(B). Upon arrival of the candidate sites, the States and affected Indian tribes were to be notified. Section 112(c), 42 U.S.C. 10132(c). On May 28, 1986, the Secretary of Energy formally recommended the sites in Nevada, Texas, and Washington, and these recommendations were approved by the President.

Before sinking shafts at an approved site, DOE is to submit to the States and affected Indian tribes—and, in this instance to the Commission as well—for their review and comment, a general plan for site characterization activities, a description of the possible form or packaging of the waste, and a conceptual repository design. The general plan is to describe the site, the proposed site characterization activities, plans for decommissioning a site that is determined to be unsuitable (and plans for investigation of significant adverse environmental impacts of site characterization), the criteria to be used to determine site suitability (i.e., the siting guidelines), and other information related to site characterization activities required by the Commission. Section 113(b), 42 U.S.C. 10133(b). Congress has declared that site characterization activities shall not require the preparation of an environmental impact statement, or other environmental review under NEPA. Section 113(d), 42 U.S.C. 10133(d). However, DOE is to hold public hearings near a site, and to receive comments of residents of the area with respect to the site characterization plan. Section 113(b)(2), 42 U.S.C. 10133(b)(2). And those comments, as well as those received on the environmental assessments, are to be considered by DOE. DOE, in consultation with the States and affected Indian tribes (but not specifically the Commission), is to conduct site characterization activities in a manner that minimizes significant adverse environmental impacts identified in the comments. Section 113(a), 42 U.S.C. 10133(a). DOE is to report periodically to the Commission and to States and affected Indian tribes on the progress of site characterization and the information developed to date. Section 113(b)(3), 42 U.S.C. 10133(b)(3).

Under NWPA, the selection process was to continue with the identification of one site for development of a repository. DOE was required to hold hearings near that site, and it was also required to complete site characterization not only for that site but for at least two other sites as well. DOE might recommend to the President that he approve the site where hearings were held. The recommendation, notice of which would be given to States and affected Indian tribes, was to be accompanied by a description of the proposed repository and waste form or packaging; a discussion of data obtained in site characterization activities, relating to the safety of the site; a final environmental impact statement, together with comments made concerning such statement by the Commission and others; preliminary Commission comments regarding the sufficiency of data for inclusion in a license application; comments of States and affected Indian tribes, with DOE's response; and an impact report prepared by States or affected Indian tribes requesting financial or technical assistance, to mitigate impacts. Section 114(a)(1), 42 U.S.C. 10134(a)(1). Subject to a good cause exception, the EIS might only be reviewed by the courts if a petition is filed within 180 days after the date of the decision concerned (i.e., presumably, the recommendation to the President). Section 119(a)(1)(D), 42 U.S.C. 10139(a)(1)(D). The alternative sites to be considered in the EIS would consist of three sites at which characterization has been completed and DOE has made a preliminary determination of their suitability for development as repositories under the guidelines issued earlier. Section 114(f), 42 U.S.C. 10134(f).

The President might submit to Congress a recommendation of a site that had previously been recommended to him by DOE. By law, the President's recommendation would not require the preparation of an EIS or other NEPA environmental review. Section 114(a), 42 U.S.C. 10134(a). A State might disapprove a site recommended by the President, by giving notice of such action to Congress. Any such notice of disapproval is to be accompanied by a statement of the State's reasons. Section 116(b), 42 U.S.C. 10136(b). In the case of a site on a reservation, the affected Indian tribe might submit such a notice of disapproval. Section 118(a), 42 U.S.C. 10138. The President's recommendation would then become effective only if Congress passes a resolution approving the site, and such resolution thereafter becomes law. Section 115(c), 42 U.S.C. 10135(c). In considering a notice of disapproval, Congress might obtain comments of the Commission, but the provision of comments would not bind the Commission with respect to any licensing action. Section 115(g), 42 U.S.C. 10135(g).

If the site designation becomes effective—by virtue of a State or Tribe's failure to disapprove within the specified times or by virtue of the Congressional override of the State's or Tribe's notice of disapproval—DOE was directed then to submit its application to the Commission. Section 114(b), 42 U.S.C. 10134(b). The Commission was to consider an application in accordance with the laws applicable thereto. Section 114(d), 42 U.S.C. 10134(d).

If DOE's application is acceptable, the site selection process would then end, subject to judicial review, with the Commission's issuance of a construction authorization.

NRC NEPA Responsibilities in Light of NWPA

The Nuclear Waste Policy Act of 1982 generally preserves the Commission's obligation to comply with NEPA. Nevertheless, the scope of the inquiry and the standards and procedures to be applied in arriving at findings in accordance with NEPA are clearly influenced by the express and implied mandates of the later statute. The import of NWPA is especially forceful in relation to site selection, but the Commission regards the statute as having a pervasive effect upon all of its NEPA responsibilities.

First, there are several express provisions of NWPA that narrow the range of alternatives that must be considered in the environmental impact statement, especially for the first repository. Thus, DOE's compliance with the procedures and requirements of the Nuclear Waste Policy Act "shall be deemed adequate consideration of the need for a repository, the time of the initial availability of a repository, and all alternatives to the isolation of high-level radioactive waste and spent nuclear fuel in a repository." Even more forcefully, the 1982 Act declares that any EIS prepared with respect to the first repository shall not consider the need for a repository or nongeologic alternatives to the site; and the alternative sites to be considered are those candidate sites (three in the case of the first repository, and at least three in the case of subsequent repositories) with respect to which site characterization has been completed and the Secretary of Energy has made a preliminary determination that such sites are suitable for development of

repositories. Section 114(f), 42 U.S.C. 10134(f).

In addition, section 114(f) directs the Commission to adopt DOE's EIS "to the extent practicable." As a minimum, this requires the Commission to give substantial weight to the findings of other bodies, where relevant to the determinations to be made by the Commission itself. This is consistent with prior practice. For example, in *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 527 (1977), the Commission observed that a competent and responsible state authority's approval of the environmental acceptability of a site or a project after extensive and thorough and environmentally sensitive hearings is properly entitled to such substantial weight in the conduct of its own NEPA analysis. Similarly, to the extent that Congress has enacted legislation approving a specific project, an agency's obligation to discuss alternatives in its EIS is relatively narrow; although the "rule of reason" applies, such action does have a bearing on what is considered a reasonable alternative and a reasonable discussion. *Izaak Walton League* v. *Marsh*, 655 F.2d 346, 372 (D.C. Cir. 1981), citing *Sierra Club* v. *Adams*, 578 F.2d 389, 396 (D.C. Cir. 1978). The concept of adoption, as it appears in NWPA, is examined more fully below.

The Nuclear Waste Policy Act provides that adoption of the EIS shall be deemed to satisfy the Commission's NEPA responsibilities "and no further consideration shall be required." While the purpose of this provision is not entirely clear, it appears to counsel, against the wide-ranging independent examination of environmental concerns that is customary in NRC licensing proceedings.

The final limitation on the Commission's consideration of NEPA issues stems from the judicial review provisions of the Nuclear Waste Policy Act. Section 119, 42 U.S.C. 10139 provides for the United States courts of appeals to have original and exclusive jurisdiction over any civil action for review of any environmental impact statement prepared with respect to a geologic repository and imposes a deadline of 180 days (with certain exceptions) for commencing such an action. Thus, a review of the adequacy of DOE's environmental impact statement must be sought, if at all, within 180 days after the Secretary has made a site recommendation to the President. As a minimum, any judicial findings with respect to the adequacy of the EIS prepared by DOE would be entitled to substantial weight in the Commission's deliberations. But this statement is incomplete. As explained below, if the EIS prepared by DOE has been adjudged to be adequate for purposes of the site recommendation made by the Department, further litigation of the issues in NRC adjudications would be precluded under the doctrine of collateral estoppel. *Toledo Edison Co.* (Davis-Besse Nuclear Power Station, Units 1, 2, and 3) ALAB-378, 5 NRC 557, 561 (1977). And, if an issue bearing upon the adequacy of that EIS could have been raised, but was not raised in a timely manner, the deadline for commencing action set out in section 119 operates to bar a challenge at a later date in NRC licensing proceedings.

In the light of the policies and procedures established by the Nuclear Waste Policy Act, the Commission regards the scope of its NEPA review to be narrowly constrained, with those issues that were ripe for consideration after issuance of DOE's EIS being excluded from independent examination, for purposes of NEPA, in the course of NRC licensing proceedings. It will be useful to review the legislative history of the Act and certain regulations of the Council on Environmental Quality, and to discuss applicable principles of repose, in order to explain the basis for the Commission's views.

Legislative History

The Nuclear Waste Policy Act of 1982 reflects a judgment that the Commission is to concern itself primarily with issues of health and safety rather than the other kinds of issues that are ordinarily considered in the context of reviews under NEPA. This judgment is especially clear in connection with the screening and selection of repository sites. The *only* provisions for NRC involvement in the site screening and selection process concern the issuance of the general guidelines for the recommendation of sites for repositories (in which the Commission is required to concur), the Department's plans for site characterization (which must be submitted to the Commission for review and comment), and the preparation of preliminary comments by the Commission to accompany the Secretary's recommendation of a site concerning the extent to which DOE's site characterization analysis and waste form proposal seem to be sufficient for inclusion in a license application. With the possible exception of the guidelines, the Commission's role is defined so as to address the safety issues (which are the subject of DOE's site characterization program and waste form proposal) that must be resolved in licensing proceedings. Where Congress sets up a detailed mechanism for consideration of particular issues by an agency, and both judicial and legislative review of that agency's decisions, as it has here done with respect to the NEPA actions of DOE, it may be inferred that it did not intend to rely upon this Commission to challenge DOE's possible "disregard of the law" after all these procedures have run their course. *Cf. Block v. Community Nutrition Institute*, 467 U.S. 340, 351, 81 L.Ed.2d 270, 279 (1984).

A consideration of the legislative history lends further support to this analysis. Although there were several bills dealing with nuclear waste issues before the 97th Congress, the provisions dealing with site selection issues can be traced directly to H.R. 3809, as reported out by the Committee on Interior and Insular Affairs. H.R. Rep. 97-491, Part 1, 97th Cong., 2d Sess. (1982). The bill included sections—similar to those ultimately enacted—on guidelines, site characterization, site approval and construction authorization, review of repository site selection by Congress, participation of States and Indian tribes, etc. The provision relating to the site characterization plan to be prepared by DOE was drawn directly from the corresponding NRC regulation. (*Compare* H.R. 3809, section 113(b)(1)(B) *with* 10 CFR 60.11(a) (1982). All the matters related to the ability of the site to host a repository and isolate radioactive waste were carried over from the regulation to the bill. But, matters pertaining to the screening and selection of sites, though set out in the regulation, were omitted in the bill. These include the requirements that DOE discuss the decision process used by DOE in selecting sites for characterization and identify alternative media and sites at which DOE intended to conduct size characterization. Under the proposed legislation, this information would no longer come to the Commission for review. H.R. 3809 also included the provsion, ultimately enacted, that the Commission would be required to adopt the EIS prepared by the Secretary "to the extent practicable." The limited nature of the Commission's role was emphasized by the explanatory language of the report to the effect that the Commission would be required so to adopt the EIS "to the *maximum* extent practicable" (emphasis added). Moreover, the EIS "is intended to suffice regarding the issues addressed and not be duplicated by the Commission unless the Commission determines, in its discretion, that significant and substantial new

information or new considerations render the Secretary's statement inadequate as a basis for the Commission's determinations." H.R. Rep. 97-491, Part 1, 53-54.

There was no specific provision in H.R. 3809 requiring DOE to carry out and document a comparative evaluation of sites considered for site characterization. Later in the year, however, such a provision was incorporated into the bill (now H.R. 6598), as reported by the Committee on Energy and Commerce. H.R. Rep. 97-785, Part 1, 97th Cong., 2d Sess. (1982). Among other things, the bill (in section 113(b)(1)(A)(v)) would have required DOE to prepare, prior to site characterization, an environmental assessment which would include a description of any other sites considered for site characterization. This information would have been submitted to the Commission for its review and comment. The purpose of providing reports at this stage was "to assure that adequate information is available to the Commission regarding the Secretary's proposed activities." *Id.* at 64. H.R. 6598 retained the provision for NRC adoption of DOE's environmental impact statement. The report explained, *id.* at 69:

> This provision is intended to avoid the duplication caused as a result of the applicability of NEPA to the actions of both the Secretary and the Commission regarding the preparation of an environmental impact statement. While the Commission is encouraged to adopt the Secretary's statement or parts of such statement, the independent responsibilities of the Commission are specifically recognized. To the extent the Commission determines it is not practicable to adopt all or part of the Secretary's environmental impact statement, the Commission's responsibilities under NEPA remain in force, thus requiring the preparation of a supplemental environmental impact statement.

Floor consideration in the House was addressed to H.R. 7187, as a substitute for both H.R. 3809 and H.R. 6598. The EIS-adoption language appears once again. However, the provisions for an environmental assessment were modified in two important ways. First, DOE would not explicitly be required to make "a reasonable comparative evaluation" of the sites that had been considered for site characterization. Section 112(b)(1)(A). Second, under H.R. 7187 the environmental assessment would precede, rather than follow, the President's approval of sites to be characterized, and it would no longer be submitted to the Commission for review and comment. *Ibid.*

There was no committee report on H.R. 7187, but a summary of its provisions noted.

> In issuing the construction permit and license the NRC will rely on the Environmental Impact Statement prepared by the Secretary of Energy in recommending the repository site. The Commission will have to supplement any environmental impact statement with considerations of the public health and safety required under the Atomic Energy Act of 1954.

128 Cong.Rec. H8163 (daily ed. Sept. 30, 1982) (statement of Rep. Udall). Rep Moorhead also characterized the Commission's role in terms of its health and safety responsibilities:

> • • • an extensive environmental assessment must be developed by the Secretary of Energy in consultation with the States. There will be a full and complete review of the planned site under the National Environmental Policy Act, culminating in a comprehensive environmental impact statement. This as well as all other final agency actions—will be open to full judicial review. The Nuclear Regulatory Commission will have ovesight authority over the development of this repository under its independent public health and safety standards.

Id. at H8170. Congressman Ottinger, too, differentiated in passing between "full environmental review" on the one hand and "full NRC licensing procedures to assure that the storage is safe" on the other. 128 Cong.Rec. H8527 (daily ed. Nov. 29, 1982).

The legislative history in the Senate is less illuminating, inasmuch as its bill, S. 1662, differs substantially from the final legislation. (S. 1662, as reported from the Committee on Energy and Natural Resources, appears at 128 Cong.Rec. S4139 ff., daily ed. Apr. 28, 1982.) Under S. 1662, the Commission would have a more substantive role with respect to implementation of NEPA. There would be no direction to the Commission to adopt the DOE environmental impact statement. Rather, under Section 405, the Commission would be required to consider the application in accordance with the laws applicable thereto; as an exception, however, the bill provided that the Commission need only consider as alternate sites for the proposed repository those sites which have been approved by the President for characterization. Senator Simpson, sponsor of the legislation, explained that the NRC licensing process would provide opportunities for "a detailed evaluation of the health and safety *and environmental* aspects of the proposed project" (emphasis added). 128 Cong.Rec. S4302 (daily ed. Apr. 29, 1982).

In December 1982, the Senate turned to consider legislation following the pertinent language of the bill which had by that time been passed by the House of Representatives. Senator Mitchell declared that the national nuclear waste policy should "preserve the integrity and full scope of the NRC licensing review and environmental analysis under the National Environmental Policy Act." 128 Cong.Rec. S15689 (daily ed. Dec. 20, 1982), but the broad scope of his remarks leaves it of doubtful import in the context of geologic repositories alone. Of more significance, perhaps, is the colloquy with respect to an amendment proposed by Senator Levin, and passed, to include in section 114(f) the language that nothing in the Act should be construed to amend or otherwise detract from the Commission's licensing requirements. Sen. Levin stated his understanding that the Act was not intended to restrict, or amend, or modify NRC requirments for the repository in any way "including, but not limited to, findings of need." Senator McClure, the floor manager of the bill, replied that Sen. Levin was correct and added that "that is my understanding also." Since findings of need have generally been regarded as NEPA issues, this could be taken to mean that the Commission should discharge its NEPA requirements in the same way as it would in the absence of the review procedures prescribed by the Nuclear Waste Policy Act. This cannot be the case, however, in light of the other provisions of the Act, including those in section 114(f) itself. It seems clear that the law was not intended to modify any of the Commission's licensing requirements under the Atomic Energy Act. The Commission construes the clause in question to be limited to those requirements; it does not pertain to the provisions of NEPA. The remarks of a single legislator, even the sponsor, are not controlling in analyzing legislative history, *Chrysler Corp.* v. *Brown*, 441 U.S. 281, 311, 60 L.Ed.2d 208, 231 (1979), especially where as here their significance is not apparent without further study. Whatever the understanding of Sen. Levin may have been, the Nuclear Waste Policy Act manifestly does affect the manner in which the NEPA responsibilities of the Commission must be carried out, and the rules proposed below indicate the approach which we intend to take.

Although the views of Congress are not entirely unambiguous, the overall tenor is that the Commission's role should focus upon radiological safety, with an independent review of NEPA factors only where warranted in the light of "significant and substantial new information or new consideration."

"Adoption" and the Nuclear Waste Policy Act

The Council on Environmental Quality has established procedures to guide agencies that are engaged in actions that have related environmental impacts. These procedures allow for several approaches to NEPA compliance, including one approach in which the environmental impact statement prepared by one agency is "adopted" by another agency. 40 CFR 1506.3. In appropriate circumstances, an EIS prepared by another agency may be adopted, in accordance with CEQ regulations, in whole or part by NRC. 10 CFR Part 51, Appendix A to subpart ¶ 1(b). An examination of those regulations will illuminate the direction to the Commission, in section 114(f) of the Waste Policy Act, to "adopt" the DOE EIS to the extent practicable. In the absence of irreconcilable conflict with other provisions of NWPA, those regulations should be followed.

The CEQ regulations provide that where more than one agency is involved in the same action, either one agency will be designated a lead agency to prepare an EIS, or two (or more) agencies will be designated as joint lead agencies. Any agency which has jurisdiction by law with respect to the action shall be a cooperating agency, if so requested by the lead agency. An agency—even if it has jurisdiction—need not serve as a cooperating agency, however, unless the lead agency has requested it to do so. Whether or not it is a cooperating agency, a Federal agency with jurisdiction by law or special expertise with respect to any environmental impact involved has a duty to comment on a lead agency's statement within the commenting agency's jurisdiction, expertise, or authority. 40 CFR 1501.5, 1501.6, 1503.2.

In the context of NWPA, it is apparent that the Department of Energy would be the lead agency and that the Commission would not be a lead agency. The Commission could either be a cooperating agency, with the particular responsibilities set out in § 1501.6 of the CEQ regulations, or a commenting agency. The NWPA points to the Commission's assuming the latter role. A cooperating agency is required to participate in the NEPA process at the earliest possible time, to participate in the scoping process leading to preparation of the environmental impact statement, and to assume on request of the lead agency responsibility for developing information and preparing environmental analyses including portions of the EIS concerning which the cooperating agency has special expertise. The framework of NWPA, as rehearsed above, contemplates no such involvement by the Commission. It would be far more faithful to the statutory scheme for this agency merely to provide its comments, from time to time, with respect to environmental impacts falling within its jurisdiction or areas of special expertise. This is entirely consistent with the statutory provision that the Secretary of Energy's recommendation to the President of a site for repository development shall be accompanied by a final EIS, together with comments made by the Commission concerning such EIS Section 114(a)(1)(D), 42 U.S.C. 10134(a)(1)(D).

As a commenting agency, the Commission would be authorized to adopt the EIS prepared by DOE provided that the statement meets the standards for an adequate statement under the CEQ regulations. The pendency or outcome of litigation with respect to the DOE EIS is one factor to be considered. This is apparent from CEQ's direction to the adopting agency to specify, where applicable, that "the statement's adequacy is the subject of a judicial action which is not final." Since the actions covered by the DOE EIS and the Commission's action are substantially the same—namely, development of a geologic repository of the proposed design at the proposed site—the Commission would not be required to recirculate the DOE EIS except as a final statement. 40 CFR 1506.3.

The Commission can follow the CEQ procedures for a commenting agency, including the procedures for adoption of DOE's EIS. But the IES can only be adopted if it meets the standards for an "adequate statement." The approach being taken by the Commission, in these proposed rules, is that NWPA and the principles of res judicata obviate the need for an entirely independent adjudication of the adequacy of the EIS by this agency. As this might be seen as a departure from established practices, the differences merit some further discussion.

It is well established that the Commission has a responsiblity to consider enviromental issues just as it considers other matters within its mandate. Moreover, the duty to consider environmental issues extends through all stages of the Commission's review processes, including proceedings before hearing boards. And the Commission may not simply defer totally to the standards set by other regulatory authorities with respect to enviromental matters within their jurisdiction; to do so would be an abdication of the Commission's NEPA authority. *Citizens' Coordinating Committee v. U.S. Atomic Energy Commission*, 449 F.2d 1109 (D.C. Cir. 1971). There would be an abdication because NEPA mandates a case-by-case balancing judgment—a judgment that is entirely different from the piecemeal certification by another agency that its own environmental standards are met. The only agency in a position to make the kind of balancing judgment contemplated by NEPA is the agency with overall responsibility for the proposed federal action. *Id.* at 1123. In *Calvert Cliffs*, only the Atomic Energy Commission could make the required decision. In the case of a geologic repository, the Department of Energy is required to make precisely the kind of analysis that the court there deemed to be essential. For the Commission to adopt the DOE EIS without independent analysis, after there had been opportunity for judicial review, therefore, would be entirely consistent with the reasoning of the earlier case. Similarly, the overlap between DOE and Commission actions distinguishes the present situation from the other NEPA decisions which required an independent balancing judgment by each of the agencies involved in a project. *See Silentman v. Federal Power Commission*, 566 F.2d 237, 240 (D.C. Cir. 1977); *Henry v. Federal Power Commission*, 513 F.2d 395, 407 (D.C. Cir. 1975) (Bureau of Reclamation control of relevant water rights for coal gasification plant; FPC regulation of gas transportation).

The similarity of DOE and Commission actions, from the standpoint of their respective environmental impacts, has not in the past been considered, by itself, to be sufficient to persuade the Commission to defer to DOE's balancing judgments. The fact that the applicant for a license to build a nuclear power plant is another Federal agency has not excused NRC from carrying out its usual NEPA obligations, even though both agencies were considering the same impacts associated with construction and operation of the facility. *Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 and 2), ALAB-506, 8 NRC 533, 545 (1978). But in prior practice there was no prior judicial determination that the other agency's EIS was adequate and there was no special statutory scheme for consideration of environmental impacts by interested parties and Congress. It is the judgment of the Commission that these unique considerations warrant, and indeed require, adoption of an EIS

that is adequate to meet the obligations of DOE.

To repeat: the Commission must consider the environmental impacts resulting from the construction and development of geologic repository for high-level radioactive waste. All that is in question is the basis for the Commission's consideration. The factors discussed above make it entirely reasonable for the Commission not to reopen issues that have been, or could previously have been, brought before the courts for resolution. The Commission does not derogate the importance of NEPA issues. Under the Nuclear Waste Policy Act, they are extremely important—and in fact they are central to many of the elaborate procedural provisions incorporated in that legislation. It is to those provisions that parties concerned must turn. But once an application is submitted to the Commission, the primary question to be addressed is no longer one of environmental balancing, but rather the critical issue of radiological safety. That is an issue that is entrusted solely to the Commission, and the Commission can discharge its duties most effectively if it makes that the primary basis for decision.

The Preclusive Effect of Section 119

The approach being proposed by the Commission reflects the policies of respose associated with the rules of res judicata. Before examining those rules in detail, it might be helpful to go over, once again, salient features of the NWPA site selection and approval procedures.

The NWPA procedures really reflect two different kinds of review. The first requires judgments regarding the radiological safety of HLW disposal—matters to adjudicated solely by the Commission, taking into account the standards issued by the Environmental Protection Agency. The Act clearly recognizes that while the Commission's preliminary views are to be solicited and considered on several occasions, a final judgment of radiological safety can only be made at the conclusion of the adjudicatory licensing process. The Commission is expected and required to deny an application—long after other procedures had run their course—if it is unable to find, with reasonable assurance, that the relevant safety criteria have been met. The responsibility of consideration of the radiological consequences of a proposed action is advisedly vested in the Commission, which can bring its experience and expertise to the task, in accordance with the Atomic Energy Act.

The second kind of review involves the weighing of the range of environmental concerns that are addressed by NEPA. This review focuses heavily on the comparison of alternatives, including alternative sites rather than with the narrower task of evaluating a specific site. Moreover, the relevant concerns under NEPA are multitudinous, as opposed to the single issue of radiological safety that is the primary concern of the Atomic Energy Act. While the Commission does have experience and expertise in carrying out a review under NEPA, Congress in 1982 elected not to rely upon the Commission in this regard. It structured the process in such a way that the evaluation of alternatives—in particular, alternative sites—would have been attended to before the Commission was required to act. This was accomplished largely through the State and Tribal participation provisions, including the requirement of Congressional action to proceed in the face of a notice of disapproval. And, additionally, it was accomplished through requiring early judicial review.

The consequence of this approach is that the Commission would carry out a licensing review to assure that a repository could be operated safely—but that it would, in general, treat as settled those other issues arising under NEPA.

The Commission's understanding, based in particular upon its reading of section 119, merits a fuller statement of the legal doctrines that are collectively referred to as the rules of *res judicata*. One of these doctrines is the rule of "claim preclusion"—that a party who once has had a chance to litigate a claim before an appropriate tribunal usually ought not to have another chance to do so. The related rule of "issue preclusion" (or collateral estoppel) reflects the principle that one who has actually litigated an issue should not be allowed to relitigate it. The effect, and value, of these rules is that they compel repose, so that the indefinite continuation of a dispute can be avoided. Judgments must in general be accorded finality despite flaws in the processes leading to decision and the unavoidable possibility that the results in some instances were wrong. Only when there is a substantial possibility of injustice might relitigation be warranted. *Restatement (Second) of Judgments* 2-12.

The clearest application of these principles would occur where there has actually been a timely challenge to the adequacy of DOE's environmental statement. A final judgment in such litigation would be conclusive, in any subsequent action between the parties, as to any issue of law or fact that had actually been litigated. *id.*, section 27. Moreover, the party who had challenged the EIS would thereafter be precluded from litigating such issues with another person as well. *id.*, section 29.

The judgment in an action, under section 119(a)(1)(D), for review of DOE's environmental impact statement will therefore preclude the petitioner from later litigating the same issues with NRC (even assuming that NRC is a different person, for these purposes, from its sister agency, DOE). The dimensions of the issue that were determined by the judgment may be a matter of debate. But if the litigant has had an adequate day in court, a desire to prevent repetitious litigation of what is essentially the same dispute justifies preclusion of the issue's being raised anew. While the action being taken by DOE is the recommendation to the President of a site for repository development and the action being taken by the Commission is the issuance of a construction authorization for a repository, the relevant considerations in the two situations are identical. Both agencies will be addressing the development of a repository at a specific location and both will require an environmental impact statement that describes the pertinent environmental impacts and considers appropriate alternatives. If the DOE EIS is found to be adequate to meet the requirements of NEPA, then it would ordinarily be proper to preclude a challenge to the "adequacy" of the identical EIS, if relied upon by the Commission. See *id.*, section 27.

The preclusive effect of a prior judgment sustaining DOE's environmental impact statement would not necessarily be limited to the petitioner of record in that proceeding. It can be argued that those who were represented by that petitioner would also be barred from litigating the issue in a subsequent action.[8]

Section 119 specifically requires that a civil action for review of an environmental impact statement with respect to any action under Subtitle A (pertaining to geologic repositories) be

[8] For example, if the EIS had been challenged by the public officials of the State in which a respository was proposed to be located, members of the public who had been represented by those officials might be precluded, to the same extent, from raising the issues anew. *Restatement (Second) of Judgments* § 41, comment d. The basis for this argument would be that, under the doctrine of *parens patriae*, a State is deemed to represent all of its citizens when the State is a party in a suit involving a matter of sovereign interest. *See, e.g., Environmental Defense Fund, Inc. v. Higginson*, 631 F.2d 738 (D.C. Cir. 1979); *U.S. v. Olin Corp.*, 606 F. Supp. 1301 (N.D. Ala. 1985).

brought within a period of 180 days after the date of the action (or after obtaining actual or constructive knowledge thereof). Thus, a failure to meet the deadline for challenging the DOE environmental impact statement would foreclose any subsequent litigation with respect to the action to which that EIS pertains. The objective appears to have been to identify issues promptly and to seek to resolve them in a timely manner. Where there is litigation in accordance with this provision, the principles described above would preclude further judicial examination of the same issues as they relate to the Commission's action. But what would happen if for some reason the adequacy of the DOE environmental impact statement had not been challenged judicially before it was time for the Commission to act—or if it had been challenged, the action had been brought by other parties? If the Commission were to adopt the DOE environmental impact statement, would the merits of the decision to adopt be subject to further review? The Commission suggests that the courts should deny a petition under these circumstances as being untimely. There would be, in this case, only one environment impact statement; and, in accordance with section 119, there would be but one opportunity for review. To conclude otherwise would be to frustrate the objective of seeking an early resolution of the environmental issues that might be involved. *See Eagle-Picher Industries v. U.S. Environmental Protection Agency*, 759 F.2d 905, 911–919 (D.C. Cir. 1985). *See also National Wildlife Federation v. Gorsuch*, 744 F.2d 963 (3rd Cir. 1984), in which the National Wildlife Federation, having been aware of prior litigation and having elected not to intevene, was barred from later raising the issues of concern to it.

The Nuclear Waste Policy Amendments Act of 1987

The Nuclear Waste Policy Amendments Act of 1987 (Amendments Act), Title V, Subtitle A, Omnibus Budget Reconciliation Act of 1987, Pub. L. 100–203, redirected the nuclear waste program. Under section 5011 of that law site characterization for the first repository is to be carried out exclusively at the Yucca Mountain site in the State of Nevada, with site specific activities at other candidate sites to be phased out promptly. NWPA as amended, section 160(a), 42 U.S.C. 10172. The provision of NWPA that contemplated a second repository are removed, and DOE is expressly prohibited from conducting site specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities. NWPA as amended, section 161(a), 42 U.S.C. 10172a.

Conforming to this redirection of the waste program, the law revises the provisions of Section 114 of NWPA that deal with the application of NEPA to the licensing process. The langauge of section 114(a)(1)(D) describing DOE's final environmental impact statement, which is to be submitted to the President with DOE's recommendatition of approval for development of a respository, is revised so that DOE "shall not be required * * * to consider the need for a repository, the alternatives to geological disposal, *or alternative sites to the Yucca Mountain site*", NWPA as amended, section 160(h), 42 U.S.C. 10134 (emphasis supplied). Section 114(f), 42 U.S.C. 10134(f), is revised in the same way, so that DOE "need not consider alternative sites to the Yucca Mountain site;" and, moreover, the Commission in its NEPA review is similarly advised that it need not consider such alternative sites. NWPA as amended, section 160(i), 42 U.S.C. 10134. (In the case of a site negotiated under Title IV of NWPA, added by Section 5041 of Pub L. 100–203, at a site other than Yucca Mountain, consideration would be given to Yucca Mountain as an alternate site. NWPA as amended, section 407, 42 U.S.C. 10247).

The merits of multiple site characterization were addressed in the course of the Congressional debate that immediately preceded passage of the Amendments Act. Senator Burdick, in particular, noted that full characterization of three sites (according to the original NWPA) was based, in part, on the important NEPA principle of fully considering reasonable alternatives when making important decisions that will significantly affect the human environment. In discussing the different approach (in the conference report on the pending budget reconcilation, legislation) that was soon to be adopted, he stated:

> Other than the elimination of the consideration of three alternate sites for the repository, which was just outlined, is a major and dangerous departure from current law, the [conference] substitute does not affect the application of NEPA to the repository program. Congressional Record, S 18674 (daily ed., Dec. 21, 1987).

The conference report expresses the same point. It declares:

> The provisions of the Nuclear Waste Policy Act pertaining to the application of the National Environmental Policy Act (NEPA) are preserved except that the existing requirement that the environmental impact statement accompanying DOE's repository siting recommendation consider alternative sites is eliminated. NEPA applies to the redirected program under this Act in the same way as NEPA applied to the Nuclear Waste Policy Act of 1982. The conferees do not intend that enactment of the conference substitute result in any change in NEPA application except as expressly provided. Omnibus Budget Reconciliation Act of 1987, Conference Report to Accompany H.R. 3545, 100th Cong., 1st Sess. H.R. Rept. 100–495, 770.

The Commission has explained above that, under NWPA as originally enacted, it should make an independent review of NEPA factor only when warranted in the light of "significant and substantial new information or new considerations." Further, it was the duty of the Commission, under that law, to adopt an EIS that is adequate to meet the obligations of DOE. Since the Amendments Act was not intended to affect the implementation of NEPA with respect to the repository program—except as to the consideration of alternative sites—the Commission will follow the same procedures, discussed below, that it would have had the Amendments Act not been passed.

The Proposed Rules

This rulemaking proceeding is primarily concerned with amendments to 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." The proceeding also encompasses conforming amendments to other parts of the Commission's regulations.

Subpart A of 10 CFR Part 51 sets out NRC regulations for implementing section 102(2) of NEPA. The principal matters addressed by Subpart A are the following: (1) Identification of licensing and regulatory actions requiring the preparation of enviornmental impact statements or environmental assessments; (2) requirements for the submission of environmental reports and information by license applicants and petitioners for rulemaking; (3) contents and distribution of draft and final environmental impact statements; (4) NEPA procedure and administrative action; and (5) public notice of and access to enviornmental documents. Since each of these topics is treated, expressly or implicitly, by the Nuclear Waste Policy Act, as amended, the Commission proposes to develop as part of Subpart A certain new rules, discussed below, that will apply to geologic repositories and that will take into account the provisions of the Act.[8]

[8] The Nuclear Waste Policy Act applies only with respect to geologic repositories that are used, at

Continued

Actions Requiring Preparation of Environmental Document

Under Section 121 of the Nuclear Waste Policy Act, 42 U.S.C. 10141, the Commission's promulgation of technical requirements and criteria in 10 CFR Part 60 does not require the preparation of an environmental impact statement or other environmental review under section 102(2) of NEPA. The proposed rules incorporate this provision.[4] Under existing 10 CFR Part 51, certain procedural actions pertaining to the licensing of geologic repositories have been determined to be categorically excluded from environmental assessment. See references to 10 CFR Part 60 in 10 CFR 51.22(c). No change in those provisions is needed.

Under 10 CFR 51.20(a), an environmental impact statement is required if the proposed action is a major Federal action significantly affecting the quality of the human environment or if the Commission, in the exercise of its discretion, determines that the proposed action should be covered by such an EIS. Section 114(f) of the Nuclear Waste Policy Act, 42 U.S.C. 10134(f), reflects a Congressional understanding, with which the Commission is in full accord, that the issuance of a construction authorization and license for a geologic repository will require an environmental impact statement. This has been incorporated into the proposed rules. Other licensing actions, unless covered by existing categorical exclusions (see paragraphs (10), (11), and (12) of 10 CFR 51.22(c)), would require an environmental assessment under 10 CFR 51.21.

Ordinarily, a determination that an environmental impact statement (or supplement) will be prepared triggers public notice and the initiation of a scoping process. Where another agency prepares the EIS, however, it has the responsibility to carry out these functions. We are proposing to clarify this point by limiting the application of these procedures to situations in which the appropriate NRC staff director determines that an environmental impact statement will be prepared "by NRC." See the amendment to § 51.20(a).

Submission of Environmental Information

The Commission's regulations encourage prospective applicants or petitioners for rulemaking to confer with NRC staff before submitting environmental information. 10 CFR 51.40. The regulations also provide that the Commission may require such persons to submit information which may be useful in aiding the Commission in complying with section 102(2) of NEPA. 10 CFR 51.41. These general provisions are compatible with the requirements of the Nuclear Waste Policy Act.

The more specific regulations dealing with the submission of environmental reports are inappropriate in the context of the geologic repository program. Instead of providing for the submission of an environmental report, the Nuclear Waste Policy Act requires that NRC consider, and if practicable adopt, a final environmental impact *statement* prepared by DOE at the time of its recommendation to the President for the development of a repository at a particular site. Section 114, 42 U.S.C. 10134. The recommendation for development of a repository includes, as a minimum, the obtaining of a license from NRC to receive and possess wastes. The environmental impact statement must therefore address not only the environmental effects of construction but those of repository performance as well. This is reflected in the statutory direction to the Commission to adopt the environmental impact statement, to the exent practicable, "in connection with the issuance by the Commission of a construction authorization and license for such repository."

DOE will therefore be required to submit an environmental impact statement instead of an environmental report. The Commission may nevertheless be unable to adopt that statement, with respect either to the construction authorization or the license, unless it has been supplemented to take into account significant new information such as that developed during the course of construction as part of the performance confirmation program or significant changes in the plans of DOE since the time of its site recommendation to the President. *See* 40 CFR 1502.9(c)(1) (CEQ regulations). Accordingly, the proposed rules provide for the timely submission by DOE of supplemental environmental impact statements as needed.

The information to be contained in an environmental impact statement is set out in section 102(2) of NEPA itself, and the submission of such information is not required by the proposed rules. The scope of alternatives to be considered in the EIS is restricted, however, to take into account the limitations in section 114(f) of the Nuclear Waste Policy Act, 42 U.S.C. 10134(f), with respect to the need for a repository, the time of the initial availability of a repository, alternatives to the isolation of waste in a repository, and the identification of alternate sites. Moreover, the proposed rule requires DOE to inform the Commission of the extent to which, pursuant to section 119, 42 U.S.C. 10139, the environmental impact statement may have been found to be adequate or inadequate and the extent to which, under that section, issues related to the adequacy of the environmental impact statement may remain subject to judicial review.

Because one of the alternatives available to the Commission is denial of the application, the environmental impacts of such denial need to be addressed. Even though denial of an application involves action by the Commission, it is proper for the environmental impacts to be addressed by DOE, since the lead agency is required by CEQ regulations to include reasonable alternatives not within its jurisdiction. 40 CFR 1502.14(c).

The Commission has not included any specific requirements for the submission of environmental information by petitioners for rulemaking. The only rules likely to have significant environmental effects would be technical requirements and criteria to be used in licensing; as already noted, such rules would be exempt from the requirement of environmental review under NEPA. Section 121(c), 42 U.S.C. 10141(c). In a particular case, however, environmental information could be required, if needed to comply with law, pursuant to the general language of 10 CFR 51.41.

Preparation of Environmental Impact Statements

The NRC regulations include a group of sections that prescribe a procedure for preparation and distribution by the NRC of draft and final environmental impact statements. With respect to materials licenses, these requirements apply to certain specified categories of NRC actions other than the issuance of a construction authorization or license to receive and possess high-level radioactive waste at a geologic repository. 10 CFR 51.80 (citing

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least in part, for the disposal of waste from civilian nuclear waste activities. Section 8, 42 U.S.C. 10108. Under the Act, however, high-level radioactive waste resulting from atomic energy defense activities is to be disposed of in such repositories, along with civilian wastes, unless the President finds that a separate facility is required. The President has determined that such a separate facility is not needed. In the light of these developments, the Commission believes that it is sufficient to limit the scope of this action to those facilities that may be situated and constructed in accordance with the Nuclear Waste Policy Act.

[4] See § 51.22(d). Conforming amendments would be made to § 51.21 and in the caption of § 51.22.

§ 51.20(b)(7)–(12)). Because NRC, under the Nuclear Waste Policy Act, will in general have no need to prepare its own environmental impact statement, the proposed amendments would provide (in accordance with CEQ regulations) for the distribution of the EIS, if and as adopted by the Commission, only as a final statement.

NEPA Procedure and Administrative Action

Although the procedures established in Part 51 are designed for the case in which NRC prepares its own environmental impact statement, they can equally well be applied in the situation where the EIS is prepared in the first instance by a license applicant. Thus, no action will be taken by the Commission until necessary documents have been filed—in this case by DOE rather than NRC—with the Environmental Protection Agency. See 10 CFR 51.100. NRC will not take action concerning the proposal which would have an adverse environmental impact until a record of decision is issued. See 10 CFR 51.101. A record of decision will be prepared as part of the initial or final decision on issues adjudicated in formal hearings. See 10 CFR 51.102. The record of decision will state the decision, including alternatives considered and the relevant factors upon which preferences among the alternatives are based. See 10 CFR 51.103. In the case of the adoption of a EIS prepared by DOE concerning a geologic repository, the relevant factors would include the special provisions of the Nuclear Waste Policy Act.

In addition to these rules of general application, Part 51 includes specific procedural provisions for different categories of licensing actions. A new § 51.109 would be added to describe the NEPA procedure to be followed with respect to licenses issued under 10 CFR Part 60.

The basic premise of § 51.109 is that it is practicable to adopt the EIS prepared by DOE if that statement is adequate to meet the requirements of section 102(2)(C) of NEPA. The focus of the procedure, therefore, is the presiding officer's determination of the extent to which it is practicable to adopt the DOE EIS. To the extent adoption is practicable, the issues would be excluded from independent NRC inquiry. The adoption of the statement does not necessarily mean that NRC would independently have arrived at the same conclusions on matters of fact or policy. And, of course, the adoption of the EIS would have no probative weight with respect to any safety findings that the Commission must make under 10 CFR Part 60.

It would still be proper to consider NEPA contentions with respect to significant matters that arose after issuance of the EIS. But note, even in this regard, that if there are significant new circumstances or information relevant to environmental concerns and bearing on the action proposed by DOE or its impacts, DOE would be obliged to prepare a supplemental EIS that would be subject to adoption by the Commission under the same standards as the original document. Challenges to DOE's supplement should be adjudicated in the courts of appeals, pursuant to section 119 of NWPA, in the same manner as challenges to the original EIS.

The Commission fully expects that supplementation of the EIS by DOE will resolve any new circumstances or information that might arise, and that supplementation by the NRC will not be necessary. Nevertheless, in theory there might be situations when NRC must prepare a supplemental environmental impact statement. Under the proposed regulations, such action might be initiated by the staff before the hearing or might be found to be necessary in light of the record of the proceedings after the hearing. The former case is addressed in § 51.26(c), the latter (implicitly) in § 51.109(e). In each situation, though, the standards for adoption set out in § 51.109(c) would be observed.

The proposed rules provide a structured mechanism to address NEPA concerns in a licensing hearing. This is the presentation of the staff position with respect to the practicability of adoption, which appears in § 51.109(a)(1). As noted above, it is expected that DOE would, where necessary, supplement its EIS. Accordingly, the staff position is likely to be that it is practicable for the Commission to adopt the DOE EIS, as it may have been supplemented by DOE and as filed with the Commission. Nevertheless, in some situations, the staff position could be that it is not practicable to adopt the DOE EIS, as it may have been supplemented, in which case an NRC EIS would be required. In that event, the staf is under an obligation to have prepared the necessary final EIS so as to be able to present its position on matters within the scope of NEPA. Whatever the staff position may be, any other party may seek to have the issue regarding practicability of adoption resolved by the presiding officer, but any contentions to that effect must set forth the basis of the claim under the criteria set out in the proposed rule. Moreover, it is contemplated that the procedures that would be used by the presiding officer to resolve disputes regarding adoption would resemble those employed to rule on motions to reopen records. See 10 CFR 2.734.

Several situations in which adoption of DOE's EIS is impracticable could conceivably arise. For example, if the Commission were to impose license conditions requiring DOE to take actions other than those which DOE had proposed, the Commission would need to consider the environmental impacts of such actions in accordance with NEPA. However, the Commission does not anticipate imposition of license conditions with significant environmental impacts. Under NWPA, DOE has the primary responsibility for consideration of environmental matters; and if significant changes from DOE's original proposal are needed, the Commission believes that DOE should amend its license application and supplement its EIS, precluding any need for NRC supplementation. Should DOE fail to do so, the Commission might deny DOE's application rather than impose license conditions requiring NRC supplementation of DOE's EIS. In theory, though, it would still be possible for NRC to prepare its own EIS. The scope of the review would be limited, however, to the actions being required by the Commission. It is not intended that other environmental issues would be reopened and relitigated in the licensing proceeding.

Another situation in which NRC would prepare a supplemental EIS relates to new information which it regards as significant even though DOE may not have treated it as such. We recognize that DOE's failure to supplement the EIS might arguably be viewed as a final action, so that objecting parties might have to seek review in the courts within the statutory 180-day review period, with any failure to do so barring later challenge in NRC proceedings. But such a reading of the law would have undesirable consequences upon NRC administrative proceedings. It would require NRC to decide whether or not adoption is practicable on the basis of factual and legal considerations (pertaining to DOE's duty to supplement the EIS and, in particular, the time such duty may have arisen), which go far beyond the materials otherwise requiring NRC review. Accordingly, NRC proposes to prepare a supplemental EIS, if DOE is not doing so, whenever NRC regards

such a supplemental EIS to be required by law.[4]

Furthermore, the Commission will review any statements in the DOE environmental impact statement relating to radiological concerns. If such statements are inconsistent with the facts found by the Commission on the basis of the record of the proceedings, the Commission will specifically determine whether or not the findings constitute "significant and substantial new information or new considerations" which, under the rule, would render the environmental impact statement to that extent inadequate. The statement will be supplemented where required by law, or otherwise will be deemed modified to the extent necessary, in accordance with Commission practice. *Citizens for Safe Power v. NRC*, 524 F.2d 1291, 1294, n. 5 (D.C. Cir. 1975); *Public Service Company of New Hampshire* (Seabrook Station, Units 1 & 2), CLI-78-1, 7 NRC 1, 29 (1978).

The Commission would make its own NEPA findings, including an independent balance of relevant factors, "to the extent that it is not practicable to adopt" the DOE EIS—that is, to the extent that the Commission finds that the balance of these factors would be affected by the new information or new considerations involved. This procedure is consistent with 10 CFR 51.41, which states that the Commission "will independently evaluate and be responsible for the reliability of any information which it uses."

Public Information

Sections 51.116 through 51.118 concern public notices about the preparation of an environmental impact statement. They apply in any situation in which a notice of intent to prepare an EIS is prepared "in accordance with § 51.26." But, as discussed above, § 51.26 would be amended so as to apply only when NRC itself intends to prepare an EIS. Since the EIS with respect to a repository would be prepared by DOE rather than by NRC, the notice provisions of §§ 51.116—51.118 would not come into play. Section 51.118 would be amended, however, to require circulation of a final environmental impact statement, if and when adopted by NRC.

Commenting

It is the policy of the Commission to comment on draft environmental impact statements prepared by other Federal agencies, consistent with the provisions of 40 CFR 1503.2 and 1503.3. 10 CFR 51.104. The Commission intends to follow this policy in connection with the draft environmental impact statement prepared by DOE in connection with a geologic repository recommendation. The submission of such comments is specifically called for, in fact, by the Nuclear Waste Policy Act. *See* Sec. 114(a)(1)(D), 42 U.S.C. 10134(a)(1)(D).

NRC will comment on environmental issues even though those issues may be precluded from litigation in the licensing proceedings. The reason for this is that an inadequate EIS may be set aside in the course of judicial review. Should this occur, it would of course not be practicable for the Commission to adopt it. If NRC has objections or reservations about the DOE proposal on grounds of environmental impact, it will specify the mitigation measures it considers necessary to withstand challenge in court. The theory underlying such comments is that if the EIS is found not to be adequate, in the course of judicial review, NRC could not adopt it and, in the absence of suitable revisions or supplementation, the Commission could not issue a construction authorization or license. *See* 40 CFR 1503.3(d) (duty to specify mitigation measures considered necessary to allow license to be granted).

Ordinarily an agency that receives comments from another agency must consider them, but it may exercise its discretion in determining how they should affect the decision at hand. In principle, therefore, DOE could in some cases reject comments made by NRC on grounds that might be unsatisfactory to the Commission. Still, the Commission's comments will be a matter of public record and will be available for consideration during judicial and Congressional review of DOE's EIS and related actions. The Commission regards these forums, rather than the NRC usual review, to be the appropriate place, under NWPA, for review of DOE's responses to comments as well as other matters related to the EIS.

Responsible Official

No change is required in the provision establishing responsibilities within NRC for NEPA compliance.

Conforming Amendments

Several changes to Part 60 of the Commission's regulations are needed in order to reflect the provisions of the Nuclear Waste Policy Act, as amended, that deal with environmental review.

Under the Nuclear Waste Policy Act DOE is required to prepare an environmental impact statement instead of an environmental report. Several changes to Part 60 are proposed to reflect this direction. Revisions to the environmental impact statement would take the form of "supplements" instead of the "amendments" or "updates" referred to in the existing rule.

The requirement in § 60.15 that multiple sites be characterized is eliminated so as to conform to the provisions of the Amendments Act.

The language of the findings for the issuance of the construction authorization requires consideration of costs and benefits and consideration of alternatives. § 60.31(c). This language would not be changed. However, it should be understood that a determination that it is practicable to adopt the DOE environmental impact statement will necessarily result in the specified environmental finding that the action called for is issuance of the construction authorization.

The construction authorization is to include such conditions as the Commission "finds to be necessary to protect * * * environmental values." 10 CFR 60.32(a). The Commission would include such conditions only where the environmental impact statement (as it may have been supplemented) specifically calls for them. In principle, the incorporation of appropriate conditions in the construction authorization could enhance environmental protection, since NRC would then have a basis to inspect, and take enforcement action where needed, to assure that the conditions are observed. However, we doubt that the adequacy of the EIS would ever depend upon NRC's being vested with this authority. DOE can describe in the EIS—and in fact it must describe—the mitigation measures which are proposed to assure protection of the environment. Should DOE subsequently fail to implement these measures, affected parties can seek redress against DOE in the courts. Moreover, the written agreements to be entered into between DOE and the States and affected Indian tribes under section 117(c) of the Nuclear Waste Policy Act, 42 U.S.C. 10137(c), provide a supplemental channel for identifying and resolving environmental concerns on an ongoing basis without direct NRC participation. Our approach, therefore, will be to require the observance of environmental protection conditions where the environmental impact statement which we adopt provides for the Commission to include such conditions in the

[4] The Commission once again emphasizes that, under NWPA, DOE has the primary responsibility to supplement an EIS to take significant new information into consideration. This obligation is reflected in the proposed revision to § 60.24(c).

construction authorization (or license), but if it is practicable for us to adopt an EIS that makes no provision for NRC to impose and enforce such conditions, we would not on our own initiative find such conditions to be necessary. Even if NRC comments on the DOE proposal had specified mitigation measures considered necessary to allow NRC to grant a construction authorization or license, these measures generally would not be incorporated as licensing conditions; for, as discussed above, the basis for NRC's comments was that the measures were necessary for the EIS to be considered " adequate" by the courts, and it is expected that this issue would already have been resolved.

The rules of practice (10 CFR Part 2) also need to be amended to take account of DOE's submission of an environmental impact statement instead of an environmental report. Because the EIS must conform to statutory requirements, and because its completeness would have been subject to challenge in court prior to filing with NRC, a completeness determination by NRC at the time of docketing is unnecessary, and provision for such determination would be omitted. As in the case of Part 60, reference would be made to "supplements" rather than "amendments" to the environmental impact statement.

Petition for Rulemaking

The States of Nevada and Minnesota have petitioned the Commission to amend 10 CFR 60.24 so as to adopt DOE's environmental impact statement only if such adoption "would not compromise the independent responsibilities of the Commission to protect the public health and safety under the Atomic Energy Act of 1954". 50 FR 51701, December 19, 1985 (PRM-60-2A). (The language proposed by the petitioners also includes several matters which would be considered by the Commission in making the foregoing determination). In this regard, the Commission notes its resolve that adoption of the environmental impact statement must not compromise its independent responsibilities under the Atomic Energy Act. Adoption of the rules proposed herein would be fully consistent with this resolve.

The matters identified by petitioners for consideration by the Commission relate largely to the adequacy of the procedures followed by DOE in implementing the Nuclear Waste Policy Act and in preparing its EIS. Nevertheless, as stated in the cited Federal Register notice, the Commission will give further consideration, in this rulemaking proceeding, to the issues raised by the petitioners, as they may relate to this agency's responsibilities. Generally, the Commission proposes to deal with these issues in a manner consistent with the discussion above.

Any person desiring to comment on the rulemaking petition, insofar as it relates to 10 CFR 60.24, should do so as part of this rulemaking proceeding.

Environmental Impact: Categorical Exclusion

The NRC has determined that this proposed regulation is the type of action described in categorical exclusion 10 CFR 51.22(c) (1) and (3). Therefore, neither an environmental impact statement nor an environmental assessment has been prepared for this proposed regulation.

Paperwork Reduction Act Statement

The proposed rule contains no information collection requirements and therefore is not subject to the Paperwork Reduction Act (Pub. L. 96-511).

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certified that this rule, if adopted, will not have a significant economic impact on a substantial number of small entities. The only entity subject to regulation under this amended rule is the U.S. Department of Energy.

List of Subjects

10 CFR Part 2

Administrative practice and procedure, Antitrust, Byproduct material, Classified information, Environmental protection, Nuclear materials, Nuclear power plants and reactors, Penalty, Sex discrimination, Source material, Special nuclear material, Waste treatment and disposal.

10 CFR Part 51

Administrative practice and procedure, Environmental impact statement, Nuclear materials, Nuclear power plants and reactors, Reporting and record keeping requirements.

10 CFR Part 60

High-level waste, Nuclear power plants and reactors, Nuclear materials, Penalty, Reporting and record keeping requirements, Waste treatment and disposal.

Issuance

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, the National Environmental Policy Act of 1969, as amended, the Nuclear Waste Policy Act of 1982, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR Part 51, and related conforming amendments to 10 CFR Parts 2 and 60.

PART 2—RULES OF PRACTICE FOR DOMESTIC LICENSING PROCEEDINGS

1. The authority citation for Part 2 is revised to read as follows:

Authority: Secs. 161, 181, 68 Stat. 948, 953, as amended (42 U.S.C. 2201, 2231); sec. 191, as amended, Pub. L. 87-615, 76 Stat. 409 (42 U.S.C. 2241); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841); 5 U.S.C. 552.

Section 2.101 also issued under secs. 53, 62, 63, 81, 103, 104, 105, 68 Stat. 930, 932, 933, 935, 936, 937, 938, as amended (42 U.S.C. 2073, 2092, 2093, 2111, 2133, 2134, 2135); sec. 114(f), Pub. L. 97-425, 96 Stat. 2213, as amended (42 U.S.C. 10134(f)); sec. 102, Pub. L. 91-190, 83 Stat. 853, as amended (42 U.S.C. 4332); sec. 301, 88 Stat. 1248 (42 U.S.C. 5871). Sections 2.102, 2.103, 2.104, 2.105, 2.721 also issued under secs. 102, 103, 104, 105, 183, 189, 68 Stat. 936, 937, 938, 954, 955, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2233, 2239). Section 2.105 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Sections 2.200-2.206 also issued under secs. 186, 234, 68 Stat. 955, 83 Stat. 444, as amended (42 U.S.C. 2236, 2282); sec. 206, 88 Stat. 1246 (42 U.S.C. 5846). Sections 2.600-2.606 also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853, as amended (42 U.S.C. 4332). Sections 2.700a, 2.719 also issued under 5 U.S.C. 554. Sections 2.754, 2.760, 2.770 also issued under 5 U.S.C. 557. Section 2.790 also issued under sec. 103, 68 Stat. 936, as amended (42 U.S.C. 2133) and 5 U.S.C. 552. Sections 2.800 and 2.808 also issued under 5 U.S.C. 553. Section 2.809 also issued under 5 U.S.C. 553 and sec. 29, Pub. L. 85-256, 71 Stat. 579, as amended (42 U.S.C. 2039). Subpart K also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2239); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154). Appendix A also issued under sec. 6, Pub. L. 91-560, 84 Stat. 1473 (42 U.S.C. 2135). Appendix B also issued under sec. 10, Pub. L. 99-240, 99 Stat. 1842 (42 U.S.C. 2021b et seq.).

2. In § 2.101, paragraphs (f) (1), (2), (5), and (7) are revised and (f)(4) is removed and reserved to read as follows:

§ 2.101 Filing of application.

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(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 impact statement required in connection therewith pursuant to Subpart A of 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 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.

• • • • •

(4) [Reserved]

(5) If a tendered document is acceptable for docketing, the applicant will be requested to (i) submit to the Director of Nuclear Material Safety and Safeguards such additional copies of the application and environmental impact statement as the regulations in Part 60 and Subpart A of Part 51 of this chapter require, (ii) serve a copy of such application and environmental impact statement 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 to be located within a municipality, on the chief executive of the county (or to the Tribal organization, if it is to be located within an Indian reservation), and (iii) make direct distribution of additional copies to Federal, State, Indian Tribe, 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 to the application, however, may include revised pages to previous submittals and, in such cases, the recipients will be responsible for inserting the revised pages.

• • • • •

(7) Amendments to the application and supplements to the environmental impact statement 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 impact statement.

• • • • •

PART 51—ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC LICENSING AND RELATED REGULATORY FUNCTIONS

3. The authority citation for Part 51 is revised to read as follows:

Authority: Sec. 161, 68 Stat. 948, as amended (42 U.S.C. 2201); secs. 201, as amended, 202, 88 Stat. 1242, as amended, 1244 (42 U.S.C. 5841, 5842).

Subpart A also issued under National Environmental Policy Act of 1969, secs. 102, 104, 105, 83 Stat. 853–854, as amended (42 U.S.C. 4332, 4334, 4335); and Pub. L. 97–606, Title II, (2 Stat. 3033–3041. Section 51.22 also issued under sec. 274, 73 Stat. 688, as amended by 92 Stat. 3036–3038 (42 U.S.C 2021) and under Nuclear Waste Policy Act of 1982, sec. 121, 96 Stat. 2228 (42 U.S.C. 10141); Secs. 51.43 and 51.109 also issued under Nuclear Waste Policy Act of 1982, sec. 114(f), 96 Stat. 2216, as amended (42 U.S.C. 10134(f)).

4. In § 51.20, existing paragraph (b)(13) is redesignated as paragraph (b)(14) and a new paragraph (b)(13) is added to read as follows:

§ 51.20 Criteria for and identification of licensing and regulatory actions requiring environmental impact statements.

• • • • •

(b) • • •

• • • • •

(13) Issuance of a construction authorization and license pursuant to Part 60 of this chapter.

• • • • •

5. Section 51.21 is revised to read as follows:

§ 51.21 Criteria for and identification of licensing and regulatory actions requiring environmental assessments.

All licensing and regulatory actions subject to this subpart require an environmental assessment except those identified in § 51.20(b) as requiring an environmental impact statement, those identified in § 51.22(c) as categorical exclusions, and those identified in § 51.22(d) as other actions not requiring environmental review. As provided in § 51.22(b), the Commission may, in special circumstances, prepare an environmental assessment on an action covered by a categorical exclusion.

6. Section 51.22 is amended, by revising the heading and adding a new paragraph (d), to read as follows:

§ 51.22 Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review.

• • • • •

(d) In accordance with section 121 of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10141), the promulgation of technical requirements and criteria that the Commission will apply in approving or disapproving applications under Part 60 of this chapter shall not require an environmental impact statement, an environmental assessment, or any environmental review under subparagraph (E) or (F) of section 102(2) of NEPA.

7. In § 51.26, paragraph (a) is revised and a new paragraph (c) is added, to read as follows:

§ 51.26 Requirement to publish notice of intent and conduct scoping process.

(a) Whenever the appropriate NRC staff director determines that an environmental impact statement will be prepared by NRC in connection with a proposed action, a notice of intent will be prepared as provided in § 51.27, and will be published in the Federal Register as provided in § 51.116, and an appropriate scoping process (see §§ 51.27, 51.28 and 51.29) will be conducted.

• • • • •

(c) Upon receipt of an application and accompanying environmental impact statement under § 60.22 of this chapter (pertaining to geologic repositories for high-level radioactive waste), the appropriate NRC staff director will include in the notice of docketing required to be published by § 2.101(f)(8) of this chapter a statement of Commission intention to adopt the environmental impact statement to the extent practicable. However, if the appropriate NRC staff director determines, at the time of such publication or at any time thereafter, that NRC should prepare a supplemental environmental impact statement in connection with the Commission's action on the license application, the procedures set out in paragraph (a) of this section shall be followed.

8. A new § 52.67 is added to read as follows:

§ 51.67 Environmental information concerning geologic repositories.

(a) In lieu of an environmental report, the Department of Energy, as an applicant for a license or license amendment pursuant to Part 60 of this chapter, shall submit to the Commission any final environmental impact statement, and any supplement thereto, which the Department prepares in connection with any geologic repository developed under Subtitle A of Title I of the Nuclear Waste Policy Act of 1982.

(b) The final environmental impact statement which accompanies the Department of Energy's recommendation to the President to approve a site for a geologic repository shall be submitted to the Commission at the time and in the manner described in § 60.22 of this chapter. Such statement shall be prepared in accordance with the provisions of section 114(f) of the Nuclear Waste Policy Act of 1982. The statement shall include, among the alternatives under consideration, denial of a license or construction authorization by the Commission.

(c) Under applicable provisions of law, the Department of Energy is

required to supplement its final environmental impact statement whenever the Department makes a substantial change in its proposed action that is relevant to environmental concerns or determines that there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. The Department shall submit any supplement to its final environmental impact statement to the Commission at the time and in the manner described in § 60.22 of this chapter.

(d) Whenever the Department of Energy submits a final environmental impact statement, or a final supplement to an environmental impact statement, to the Commission pursuant to this section, it shall also inform the Commission of the status of any civil action for judicial review initiated pursuant to section 119 of the Nuclear Waste Policy Act of 1982. This status report, which the Department shall update from time to reflect changes in status, shall:

(1) State whether the environmental impact statement has been found by the courts of the United States to be adequate or inadequate; and

(2) Identify any issues relating to the adequacy of the environmental impact statement that may remain subject to judicial review.

9. A new § 51.109 is added to read as follows:

§ 51.109 Public hearings in proceedings for issuance of materials license with respect to a geologic repository.

(a)(1) In a proceeding for the issuance of a license to receive and possess source, special nuclear, and byproduct material at a geologic repository operations area, the NRC staff shall present its position on whether it is practicable to adopt, without further supplementation, the environmental impact statement (including any supplement thereto) prepared by the Secretary of Energy. If the position of the staff is that supplementation of the environmental impact statement by NRC is required, it shall file its final supplemental environmental impact statement with the Environmental Protection Agency, furnish that statement to commenting agencies, and make it available to the public, before presenting its position. In discharging its responsibilities under this paragraph, the staff shall be guided by the principles set forth in paragraphs (c) and (d) of this section.

(2) Any other party to the proceeding who contends that it is not practicable to adopt the DOE environmental impact statement, as it may have been supplemented, shall file a contention to that effect in accordance with § 2.714(b) of this chapter. Such contention must be accompanied by one or more affidavits which set forth factual and/or technical bases for the claim that, under the principles set forth in paragraphs (c) and (d) of this section, it is not practicable to adopt the DOE environmental impact statement, as it may have been supplemented. The presiding officer shall resolve disputes concerning adoption of the DOE environmental impact statement by using, to the extent possible, the criteria and procedures that are followed in ruling on motions to reopen under § 2.734 of this chapter.

(b) In any such proceeding, the presiding officer will determine those matters in controversy among the parties within the scope of NEPA and this subpart, specifically including whether, and to what extent, it is practicable to adopt the environmental impact statement prepared by the Secretary of Energy in connection with the issuance of a construction authorization and license for such repository.

(c) The presiding officer will find that it is practicable to adopt the environmental impact statement prepared by the Secretary of Energy unless:

(1)(i) The action proposed to be taken by the Commission differs from the action proposed in the license application submitted by the Secretary of Energy; and

(ii) The difference may significantly affect the quality of the human environment; or

(2) Significant and substantial new information or new considerations render the environmental impact statement inadequate. New information or new consideration shall not be deemed to render the environmental impact statement inadequate, for purposes of this paragraph, if the new information or new considerations have been addressed in a supplemental environmental impact statement that the Secretary of Energy has submitted to the Commission in accordance with the provisions of this chapter.

(d) To the extent that the presiding officer determines it to be practicable to adopt the environmental impact statement prepared by the Secretary of Energy, such adoption shall be deemed to satisfy all responsibilities of the Commission under NEPA and no further consideration under NEPA or this subpart shall be required.

(e) To the extent that it is not practicable to adopt the environmental impact statement prepared by the Secretary of Energy, the presiding officer will:

(1) Determine whether the requirements of section 102(2) (A), (C), and (E) of NEPA and the regulations in this subpart have been met;

(2) Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken;

(3) Determine, after weighing the environmental, economic, technical and other benefits against environmental and other costs, whether the construction authorization or license should be issued, denied, or appropriately conditioned to protect environmental values;

(4) Determine, in an uncontested proceeding, whether the NEPA review conducted by the NRC staff has been adequate; and

(5) Determine, in a contested proceeding, whether in accordance with the regulations in this subpart, the construction authorization or license should be issued as proposed.

(f) In making the determinations described in paragraph (e) of this section, the environmental impact statement will be deemed modified to the extent that findings and conclusions differ from those in the final statement prepared by the Secretary of Energy, as it may have been supplemented. The initial decision will be distributed to any persons not otherwise entitled to receive it who responded to the request in the notice of docketing, as described in § 51.26(c). If the Commission or the Atomic Safety and Licensing Appeal Board reaches conclusions different from those of the presiding officer with respect to such matters, the final environmental impact statement will be deemed modified to that extent and the decision will be similarily distributed.

(g) The provisions of this section shall be followed, in place of those set out in § 51.104, in any proceedings for the issuance of a license to receive and possess source, special nuclear, and byproduct material at a geologic repository operations area.

10. In § 51.118, the existing text is redesignated as paragraph (a) and a new paragraph (b) is added, to read as follows:

§ 51.118 Final environmental impact statement—Notice of availability.

(a) • • •

(b) Upon adoption of a final environmental impact statement or any supplement to a final environmental impact statement prepared by the Department of Energy with respect to a

geologic repository that is subject to the Nuclear Waste Policy Act of 1982, the appropriate NRC staff director shall follow the procedures set out in paragraph (a) of this section.

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

11. The authority citation for Part 60 is revised to read as follows:

Authority: Secs. 51, 53, 62, 63, 65, 81, 161, 182, 183, 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, 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846); secs. 10 and 14, Pub. L. 95–601, 92 Stat. 2951 (42 U.S.C. 2021a and 5851); sec. 102, Pub. L. 91–190, 83 Stat. 853 (42 U.S.C. 4332); secs. 114, 121, Pub. L. 97–425, 96 Stat. 2213, 2228, as amended (42 U.S.C. 10134, 10141).

For the purpose of section 223, 68 Stat. 958, as amended (42 U.S.C. 2273), §§ 60.10, 60.71 to 60.75 are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

12. In § 60.15, paragraph (c) is removed and paragraph (d) is redesignated as paragraph (c).

13. In § 60.21, paragraph (a) is revised to read as follows:

§ 60.21 Content of application.

(a) An application shall consist of general information and a Safety Analysis Report. An environmental impact statement shall be prepared in accordance with the Nuclear Waste Policy Act of 1982, as amended, and shall accompany the application. Any Restricted Data or National Security Information shall be separated from unclassified information.

• • • • •

14. Section 60.22 is revised to read as follows:

§ 60.22 Filing and distribution of application.

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

(b) Each portion of such application and any amendments, and each environmental impact statement and any supplements, shall be accompanied by 30 additional copies. Another 120 copies shall be retained by DOE for distribution in accordance with written instructions from the Director or the Director's designee.

(c) DOE shall, upon notification of the appointment of an Atomic Safety and Licensing Board, update the application, eliminating all superseded information, and supplement the environmental impact statement if necessary, and serve the updated application and environmental impact statement (as it may have been supplemented) as directed by the Board. At that time DOE shall also serve one such copy of the application and environmental impact statement on the Atomic Safety and Licensing Appeal Panel. Any subsequent amendments to the application or supplements to the environmental impact statement shall be served in the same manner.

(d) At the time of filing of an application and any amendments thereto, one copy shall be made available in an appropriate location near the proposed geologic repository operations area (which shall be a public document room, if one has been established) for inspection by the public and updated as amendments to the application are made. The environmental impact statement and any supplements thereto shall be made available in the same manner. An updated copy of the application, and the environmental impact statement and supplements, shall be produced at any public hearing held by the Commission on the application, for use by any party to the proceeding.

(e) The DOE shall certify that the updated copies of the application, and the environmental impact statement as it may have been supplemented, 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.

15. In § 60.24, the section heading and paragraphs (a) and (c) are revised to read as follows:

§ 60.24 Updating of application and environmental impact statement.

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

• • • • •

(c) The DOE shall supplement its environmental impact statement in a timely manner so as to take into account the environmental impacts of any substantial changes in its proposed actions or any significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

16. In § 60.31, the introductory paragraph is revised to read as follows:

§ 60.31 Construction authorization.

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

• • • • •

17. In § 60.51, the introductory portion of paragraph (a), and paragraph (b), are revised to read as follows:

§ 60.51 License amendment for permanent closure.

(a) DOE shall submit an application to amend the license prior to permanent closure. The submission shall consist of an update of the license application submitted under §§ 60.21 and 60.22, including:

• • • • •

(b) If necessary, so as to take into account the environmental impact of any substantial changes in the permanent closure activities proposed to be carried out or any significant new information regarding the environmental impacts of such closure, DOE shall also supplement its environmental impact statement and submit such statement, as supplemented, with the application for license amendment.

Dated at Rockville, Maryland this 29th day of April 1988.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

54 FR 30049
Published 7/18/89
Comment period expires 9/18/89.

Preserving the Free Flow of Information to the Commission

See Part 30 Proposed Rule Making

55 FR 12374
Published 4/3/90.
Comment period expires 6/18/90.

Willful Misconduct by Unlicensed Persons

See Part 30 Proposed Rule Making

55 FR 13542
Published 4/11/90

Willful Misconduct by Unlicensed Persons (correction)

See Part 30 Proposed Rule Making

PART 60

DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES; LICENSING PROCEDURES

PETITIONS FOR RULEMAKING

50 FR 18267
Published 4/30/85
Comment period expires 7/1/85

10 CFR Part 60

[Docket No. PRM-60-2]

States of Nevada and Minnesota; Filing of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Receipt of Petiton for Rulemaking from the States of Nevada and Minnesota.

SUMMARY: The Nuclear Regulatory Commission is publishing for public comment this notice of receipt of a petition for rulemaking. This petition, filed by the States of Nevada and Minnesota, and dated January 21, 1985, was docketed by the Commission on January 28, 1985, and assigned Docket No. PRM-60-2. The petitioner requests that the Commission adopt a regulation governing the implementation of certain environmental standards which have been proposed by the Environmental Protection Agency.

DATE: Comment period expires July 1, 1985. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except as to comments received on or before this date.

ADDRESSES: All persons who desire to submit written comments concerning the petition for rulemaking should send their comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.

Single copies of the petition may be obtained free by writing to the Division of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

The petition, copies of comments, and accompanying documents to the petition may be inspected and copied for a fee at the NRC Public Documents Room, 1717 H Street, NW, Washington, DC.

FOR FURTHER INFORMATION CONTACT: John Philips, Chief, Rules and Procedures Branch, Division of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7086 or Toll Free: 800-368-5642.

SUPPLEMENTARY INFORMATION:

Background

I. Statement of Grounds and Interest

The State of Nevada filed this rulemaking petition as a state notified pursuant to the Nuclear Waste Policy Act (NWPA), that a potentially acceptable site for a repository has been identified within the state.

The State of Nevada avers that it may become affected for purposes of participation in site characterization, pursuant to section 113 or the NWPA. The State of Minnesota joins this petition as a state informed that it is being considered for site characterization for second repository. The State of Minnesota avers that it may be directly affected by the substance of standards for the development of repositories. The States of Nevada and Minnesota ground this petition on their respective interest in, and the prevailing responsibility for, the protection of the future health and safety of their citizens.

II. Statement in Support of Petition

The petitioner notes that the NWPA, enacted by Congress on December 20, 1982, and approved by the President on January 7, 1983, requires that the President recommend a first, high-level nuclear waste respository location to Congress by March 31, 1987 (section 114(a)(2)(A), 42 U.S.C. 10134(a)(2)(A)) or March 31, 1988, if he determines an extension is necessary (section 114(a)(2)(B), 42 U.S.C. 10134(a)(2)(B)). The Nuclear Regulatory Commission (Commission) must act upon an application for construction authorization for that repository by January 1, 1989, or within three years of the application's filing (section 114(d)(1), (2), 42 U.S.C. 10134(d)(1), (2)). The President's recommendation must be based upon Department of Energy (DOE) site characterization at a site which must have been recommended by January 1, 1985 (section 112(b)(1)(D), 42 U.S.C. 10133(b)(1)(D)). Site characterization must be performed

pursuant to a plan reviewed by the Commission and the affected state (section 113(b)(1), 42 U.S.C. 10133(b)(1)) before characterization begins. That plan must include criteria to be used by DOE to determine the "suitability of such candidate site for the location of repository, developed pursuant to (section 112(a)." (section 113(b)(1)(A)(iv); 42 U.S.C. 10133(b)(1)(A)(iv)). DOE's section 112(a) guidelines, as concurred in by the Commission on June 22, 1984 (49 FR 28130) require that evidence used to apply those guidelines include "analysis of expected repository performance to assess the likelihood of demonstrating compliance with 40 CFR Part 191 and 10 CFR Part 60. . . ." Section 121(a) of the NWPA requires Environmental Protection Agency (EPA) to promulgate by rule, not later than one year after the date of the enactment of the NWPA, or January 7, 1984, "generally applicable standards for protection of the general environment from offsite releases from radioactive material in repositories." The EPA published a proposed rule, "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" on December 29, 1982 (47 FR 58196). The proposed rule contained a section entitled "Assurance Requirements—40 CFR 191.14." According to petitioner, such assurance requirements are clearly "generally applicable standards" within the meaning of section 121(a) of NWPA.

In response to its published notice of proposed rulemaking, EPA received objections regarding the authority of EPA to promulgate the proposed "Assurance Requirements." These objections were based on legal arguments that section 121(a) of the NWPA specifically clarifies that EPA's authority to promulgate the proposed rule arises "under other provisions of law." Those "other provisions of law" include the Atomic Energy Act of 1954, as amended and the President's Reorganization Plan No. 3 of 1970. According to petitioner, the essence of the objection was that Reorganization Plan No. 3 placed within the Federal Radiation Council, which is no longer in existence, rather than EPA, the authority for requirements such as those contained within proposed 40 CFR 191.14.

The statutory deadline for the promulgation of the EPA standards has passed without promulgation of the standards. Petitioner states that the primary reason for that failure is the jurisdictional dispute over EPA's authority to issue the requirements contained in 40 CFR 191.14. The petitioner states that because proposed 40 CFR 191.14 contains generally applicable standards for the protection of the general environment for offsite releases from radioactive materials in repositories, the EPA should proceed to finalize 40 CFR Part 191. It is also argued that DOE could not make nomination decisions or recommendations for characterization until EPA standards are final.

Petitioner asserts that disputes as to the question of authority preclude EPA from issuing its final standards. The petitioner states further that the general authority of the Commission to protect the health and safety of the public against radiation hazards under the Atomic Energy Act endows the Commission with the power to enact regulations of the nature contained in proposed 40 CFR 191.14 notwithstanding the question over EPA's authority. Therefore, the petitioner suggests that since no objections have been raised regarding the substance of proposed 40 CFR 191.14, and because the proposed rule does provide confidence that the containment requirements of 40 CFR 191.13 would be met by a repository, the NRC should enact under its authority the proposed regulations originally published by EPA on December 29, 1982 (47 FR 58196), thereby removing the jurisdictional issue as an impediment to the EPA"s promulgation of the proposed section. According to the petition, once this impediment is removed, the EPA could move to final adoption of its rule. The petition also recites certain proposed Commission findings, including a finding that the EPA's standards must be final before environmental assessments can be finally published and before DOE may nominate a site or recommend a site for characterization.

III. Conclusion

The assurance requirements referred to by the petitioner have been the subject of prior consideration by the Commission. As a result of such consideration, the Commission on May 17, 1984, directed the staff to continue discussions with EPA on those assurance requirements, with the objective of coming to a mutual agreement on provisions that could be incorporated into 10 CFR Part 60.[1] If the NRC and EPA staffs arrive at such agreement, appropriate rule changes will be recommended to the Commission. If approved by the Commission, such changes will be published in the Federal Register. There would be an opportunity for further public comment before the final amendments are adopted.

As a matter of orderly administrative procedure, the Commission may elect to continue its efforts to resolve any outstanding differences with EPA, and to deny the instant petition. This would avoid duplicative, and indeed possibly conflicting, rulemaking activities. The issues raised in the petition would not be disregarded, but would, on the contrary, be considered in the development of rules acceptable to EPA which the Commission may propose for adoption. Commenters are invited to express their views as to the appropriateness of this course of action.

Dated at Washington, DC this 25th day of April, 1985.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Assistant Secretary of the Commission.

[1] The Commission direction to the staff, along with other pertinent materials, has been placed in the file of this proceeding.

50 FR 51701
Published 12/19/85
Comment period expires 2/18/86.

10 CFR Part 60

[Docket No. PRM-60-2A]

States of Nevada and Minnesota; Filing of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Receipt of Amended Petition for Rulemaking from the States of Nevada and Minnesota.

SUMMARY: The Nuclear Regulatory Commission is publishing for public comment this notice of receipt of a petition for rulemaking that amends an earlier petition for rulemaking (PRM-60-2) filed with the Commission on January 21, 1985. This amended petition, filed by the States of Nevada and Minnesota, and dated September 30, 1985, was docketed by the Commission on October 3, 1985, and assigned Docket No. PRM-60-2A. The petitioner requests the Commission to amend its repository licensing regulations to incorporate the equivalent substance of the assurance requirements as issued in the final Environmental Protection Agency (EPA) Standards.

DATE: Comment period expires February 18, 1986. Comments received after this date will be considered if it practical to do so, but assurance of consideration cannot be given except as to comments received on or before this date.

ADDRESSES: All persons who desire to submit written comments concerning the petition for rulemaking should send their comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attention: Docketing and Service Branch.

Single copies of the petition may be obtained free by writing to the Division

of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

The petition, copies of comments, and accompanying documents to the petition may be inspected and copies for a fee at the NRC Public Document Room, 1717 H Street, NW, Washington, DC.

FOR FURTHER INFORMATION CONTACT: John Philips, Chief, Rules and Procedures Branch, Division of Rules and Records, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7086 or Toll Free: 800-368-5642.

SUPPLEMENTARY INFORMATION:

Background

I. Statement of Grounds and Interest

The State of Nevada filed this amended rulemaking petition as a State notified pursuant to the Nuclear Waste Policy Act (NWPA), that a potentially acceptable site for a repository has been identified within the state. The State of Nevada avers that it may become affected for purposes of participation in site characterization, pursuant to § 113 of the NWPA.

The State of Minnesota joins this amended petition as a state informed that it is being considered for site characterization for a second repository. The State of Minnesota avers that it may be directly affected by the substance of standards for the development of repositories.

The States of Nevada and Minnesota ground this petition on their respective interest in, and the prevailing responsibility for, the protection of the future health and safety of their citizens.

II. Issues Raised in PRM-60-2 and 60-2A

PRM-60-2

The petitioner filed the original petition (PRM-60-2) with the Commission on January 21, 1985. The petitioner requested the Commission to adopt a regulation governing the implementation of certain environmental standards which had been proposed by the Environmental Protection Agency. The NRC published a notice of the petition for rulemaking in the Federal Register on April 30, 1985 (50 FR 18267) and requested comments. The comment period closed on July 1, 1985. Six comments were received in response to the notice.

PRM-60-2A

The petitioner states that this amendment to PRM-60-2 is based on the intervening action of the Environmental Protection Agency (EPA) on September 19, 1985 (50 FR 38066), in which the EPA issued final standards for protection of the general environment from offsite releases from radioactive material in repositories. The petitioner hopes to accomplish two objectives in this amendment: (1) To place before the Commission the substance of the assurance requirements, in terms of amendments to 10 CFR Part 60, which the EPA's recently published standards failed to make applicable to NRC licensees, i.e. Department of Energy (DOE) high-level waste repositories; (2) to propose to the Commission requirements and considerations for the process of adopting the DOE Environmental Impact Statement.

III. Proposed Commission Findings

The petitioner states that during the pendency of the EPA rulemaking, significant interaction occurred between Commission and EPA staff regarding which was the proper agency to adopt rules in the nature of "assurance requirements" that would apply to Commission licensees, to insure against the inherent uncertainties in selecting, designing and licensing waste disposal systems that must be very effective for more than 10,000 years. The Petitioner indicates that the two agencies agreed informally, and the EPA standard as finally issued provides, that assurance requirements are an appropriate mechanism to better guarantee that numerical standards will be realized; that the NRC was the more appropriate agency to adopt such standards as they apply to NRC licensees; and that the NRC approach would be to integrate the essence of EPA's earlier proposed rules into the repository licensing provisions of 10 CFR Part 60. Further, the Petitioner states that since evidence used by DOE to apply the siting guidelines includes analysis of expected repository performance to assess the likelihood of demonstrating compliance with the EPA standard, the rule proposed herein must be in place in order that DOE may design its site characterization plan in a manner consistent with the siting guidelines. The Petitioner proposes that the Commission make findings accordingly.

IV. The Petitioner Proposes the Following Amendments to 10 CFR Part 60:

1. Add definitions to § 60.2:

( ) "Active institutional control" means any measure other than a passive institutional control performed to: (1) Control access to a site, (2) perform maintenance operations or remedial actions at a site, (3) control or clean up releases from a site; or (4) monitor parameters related to geologic repository performance and compliance with standards limiting releases of radioactivity to the accessible environment.

( ) "Passive institutional control" means: (1) permanent markers placed at a site, (2) public records and archives, (3) government ownership and regulations regarding land or resource use, and (4) other methods of preserving knowledge about the location, design, and the contents of a geologic repository.

2. Add § 60.21(c) "Content of [license] application" and renumber remaining sections:

(9) A general description of the program for post-permanent closure monitoring of the geologic repository.

3. Add a new § 60.24(c), (d) and reletter the remaining subsection as (e).

(c) The Commission shall evaluate the environmental impact statement required by 42 U.S.C. 10134(f) and 10 CFR 60.21(a) to determine whether its adoption by the Commission would not compromise the independent responsibilities of the Commission to protect the public health and safety under the Atomic Energy Act of 1954 (42 U.S.C. 2011, *et. seq.*). In making such a determination, the Commission shall consider:

(1) Whether the Department of Energy has complied with the procedures and requirements of the Nuclear Waste Policy Act (42 U.S.C. 10101 *et. seq.*).

(2) Whether the alternative sites proposed in the environmental impact statement are bona fide alternative sites; that site characterization under 42 U.S.C. 10133 has been completed at such sites; and that the Secretary, after site characterization is complete, or substantially complete, at such sites, has made a preliminary determination that such sites are suitable for development as repositories consistent with the guidelines promulgated pursuant to 42 U.S.C. 10132.

(3) Whether the consideration of the alternative sites considered in the environmental impact statement included consideration of the natural properties that are expected to provide better isolation of the wastes from the accessible environment for 100,000 years after disposal; and whether the analyses used by the Department of Energy to compare the capabilities of different sites to isolate wastes were based upon the following:

(i) Only the undisturbed performance of the disposal system has been considered;

(ii) The performance of the waste packages and waste forms planned for the disposal system was assumed to be the same from site to site and assumed to be at least an order of magnitude less effective than the performance required by 10 CFR 60.113; and

(iii) No credit was taken for other engineering controls intended to correct preexisting natural flaws in the geologic media (e.g., grouting of fissures shall not be assumed, but effective sealing of the

shafts needed to construct the repository shall be assuemd).

(4) Whether the disposal systems considered, selected or designed will keep releases to the accessible environment as low as reasonably achievable, taking into account technical, social and economic considerations.

(d) If the Commission determines that adoption of the environmental impact statement would compromise the independent responsibilities of the Commission, then the Commission shall consider fully the environmental impact of the selection of the proposed site as required by 42 U.S.C. 4321, *et. seq.*

4. Revise § 60.51(a)(1) "License amendment for permanent closure" as follows:

(1) A detailed description of the program for post-permanent closure monitoring of the geologic repository in accordance with § 60.144. As a minimum, this description shall:

(A) Identify those parameters that will be monitored;

(B) Indicate how each parameter will be used to evaluate the expected performance of the repository;

(C) Describe those monitoring devices which will indicate the likelihood that standards limiting releases of radioactivity to the accessible environment may not be met.

(D) Discuss the length of time over which each parameter should be monitored to adequately confirm the expected performance of the repository;

(E) Indicate how the results of post-permanent closure monitoring will be shared with affected State, Indian tribal and local governments.

5. Add a new subsection to § 60.52(c) "Termination of license" and renumber current § 60.52(c)(3) as 60.52(c)(4).

(3) That the results available from the post-permanent closure monitoring program confirm the expectation that the repository will comply with the performance objectives set out at Sections 60.112 and 60.113.

6. Modify § 60.113 by adding:

(d) In any event, however, and notwithstanding the provisions of (b) above, the geologic repository shall incorporate a system of multiple barriers, both engineered and natural, each designed or selected so that it complements the others and can significantly compensate for uncertainties about the performance of one or more of the other barriers. 'Barrier' means any material or structure that prevents or substantially delays movement of water or radionuclides.

7. Add a new § 60.114 "Institutional Controls":

Neither active nor passive institutional controls shall be deemed to assure compliance with the overall performance objective set out at § 60.112 for more than 100 years after disposal. However, the effects of passive institutional controls may be considered in assessing the likelihood and consequences of processes and events affecting the geologic setting.

8. Add a new § 60.122(c)(18) and renumber later sections:

(18) The presence of significant concentrations of any naturally-occurring material that is not widely available from other sources.

9. Add a new § 60.144 "Post-Permanent Closure Monitoring":

A program of post-permanent closure monitoring shall be conducted and shall provide for monitoring of all repository characteristics which can reasonably be expected to provide substantive confirmatory information regarding long-term repository performance, provided that the means for conducting such monitoring will not degrade repository performance. This program shall be continued until termination of a license which shall not occur until the Commission is convinced that there is no significant concern which could be addressed by further monitoring.

V. Statement in Support

The Petitioner states that the rules proposed here are substantively equivalent to the EPA assurance requirements (which, by their terms, do not apply to NRC licensees), with one very notable exception: proposed 10 CFR 60.24(c). The Petitioner points out that this proposed new section relates to NRC review and adoption of DOE's environmental impact statement (EIS), a document developed in DOE's *selection* of a repository site. EPA's proposed 40 CFR 191.14(e) dealt with site selection, as NRC staff recognized in comments published by EPA in "Background Paper: Potential Changes in 10 CFR 60 to Replace Assurance Requirements in 40 CFR 191, March 21, 1985". NRC staff, however, found that DOE's site selection guidelines, 10 CFR 960.3-1-5, adequately address this issue. Nevada and Minnesota are concerned, and the Petitioner believes that the Commission should also be, that DOE's site selection process may not produce bona fide alternatives for consideration in DOE's EIS because of DOE's current interpretation of section 114(f), 42 U.S.C. 10134(f). Petitioner asserts if it does not, NRC's "independent responsibilities . . . to protect the public health and safety under the Atomic Energy Act of 1954" (section 114(f), 42 U.S.C. 10134(f)) will be implicated. The National Environmental Policy Act, 42 U.S.C. 4321, *et seq.* together with the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011, *et seq.* require the *Commission* to consider bona fide alternatives, even if section 112 of the Nuclear Waste Policy Act, 42 U.S.C. 10132, does not require DOE to do so. Petitioner believes the rule proposed here would guarantee that bona fide alternatives were evaluated by the NRC, if not also DOE. The "low as reasonably achievable" releases concept has also been reintroduced in this context. The bases for DOE's consideration of natural properties expected to provide better isolation have also been introduced.

The Petitioner states that in adopting the language of section 114(f) of the NWPA, Congress did not change the requirement for consideration of bona fide alternatives in an EIS. It merely narrowed the universe of all alternatives which DOE must consider in the final EIS, from all sites reasonably available to only those three sites which has been characterized, and for which the Secretary had made a preliminary determination as to site suitability. The Petitioner believes that a site which the Secretary has determined to be unsuitable for development as a repository, or, conversely, at which the Secretary was unable to make a preliminary determination of suitability, is simply not an alternative. The Petitioner believes the Secretary's responsibilities, under either the NWPA or NEPA, to consider alternative sites, is simply not met by the consideration of three sites, one or two of which were determined at any time to be unsuitable for development as repositories. The Petitioner states further that neither would the Commission's responsibilities be carried out in such a case, and thus such a result would severely jeopardize the Commission's ability, under section 114(f), to adopt the Secretary's final EIS in order to meet the Commission's legal obligations under NEPA.

VI. Notice Regarding Related Actions

The Commission presently has underway rulemaking actions which, when finalized, will address the concerns expressed by the petitioner. The Commission is now preparing to publish proposed amendments to 10 CFR Part 60 to eliminate inconsistencies between the EPA standard and the rule (see *Unified Agenda of Federal Regulations*, Current and Projected Rulemaking—Elimination of Inconsistences between NRC Regulations and EPA standards—OMB Regulation Identifier Number 3150-AC03, 50 FR 44992, October 29, 1985). The Commission anticipates that the proposed rule would incorporate the EPA "assurance requirements" in Part 60, to the extent appropriate, satisfying that aspect of the petitioner's request. The remaining aspect of the petitioner's request, adding a provision to Part 60 relating to NRC review and adoption of DOE's environmental impact statement, falls within the scope of a separate,

ongoing rulemaking which would amend Part 51 to conform to provisions of the Nuclear Waste Policy Act concerning environmental review in HLW geologic repository licensing procedures (see *Unified Agenda of Federal Regulations*, Current and Projected Rulemaking—Part 51 Conforming Amendments—OMB Regulation Identifier Number 3150-AC04, 50 FR 44992, October 29, 1985). Accordingly, commenters are advised that further consideration of the issues raised by the petitioner will be deferred for consideration in the rulemaking actions referred to above. The present schedule calls for the publication of these two proposed rules within nine months. Any comments received in response to this notice would, in that event, be incorporated in the administrative record for those proceedings.

Dated at Bethesda, Maryland, this 16th day of December, 1985.

For the Nuclear Regulatory Commission.

Samual J. Chilk,

Secretary of the Commission.

➢ 55 FR 28771
Published 7/13/90
Comment period expires 10/11/90.

10 CFR Part 60

[Docket No. PRM-60-3]

Department of Energy; Receipt of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking: Notice of receipt.

SUMMARY: The Nuclear Regulatory Commission (NRC) is publishing for public comment a notice of receipt of a petition for rulemaking which was filed by the U.S. Department of Energy (DOE). The petitioner requests that the NRC amend its regulations pertaining to the disposal of high-level radioactive wastes in geologic repositories to include a specific dose criterion for design basis accidents. The petitioner believes this would facilitate the development and licensing of a geologic repository for high-level radioactive waste.

DATES: Submit comments by October 11, 1990. Comments received after this date will be considered if it is practical to do so but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: Submit written comments to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Docketing and Service Branch.

For a copy of the petition, write the Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

The petition and copies of comments received may be inspected and copied for a fee at the NRC Public Document Room, 2120 L Street NW., (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Michael T. Lesar, Chief, Rules Review Section, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7758 or Toll Free: 800-368-5642.

SUPPLEMENTARY INFORMATION:

Background

On April 19, 1990, the U.S. Department of Energy (DOE) filed a petition for rulemaking with the Commission. Pursuant to 10 CFR 2.802, this petition was docketed by the Commission on April 26, 1990, and has been assigned Docket No. PRM-60-3.

The petition pertains to the requirements that would apply to DOE as the licensee for a geologic repository for high-level radioactive waste developed pursuant to the Nuclear Waste Policy Act, as amended, 42 U.S.C. 10101 et seq. As a licensee, DOE would be subject to the licensing requirements contained in 10 CFR part 60. In its petition, DOE observes that § 60.21(c)(3)(ii) requires that the Safety Analysis Report for a repository include a description and analysis that considers "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," yet part 60 does not provide numerical dose criteria to use in identifying the need for engineered safety features and for determining their adequacy. The petitioner believes that specific accident dose criteria are necessary to reduce the uncertainties in the current regulation and to provide specific guidance for the protection of public health and safety.

The Suggested Amendments

The petitioner requests that the NRC amend 10 CFR part 60 to include quantitative accident dose criteria of 5 rem effective dose equivalent, with a limit of 50 rem on the committed dose equivalent to any organ. To accomplish the desired amendment, the petitioner suggests that definitions be added for "preclosure control area," "committed dose equivalent," "committed effective dose equivalent," and "effective dose equivalent." The petitioner believes these definitions are needed to support the application of accident dose criteria.

The petitioner also believes there is a need to include a revision to the current definition of "important to safety." The specific amendments suggested by the petitioner are as follows:

1. In § 60.2, the definition of "important to safety" is revised and definitions of "committed dose equivalent," "committed effective dose equivalent," "effective dose equivalent," and "preclosure control area" are added to read as follows:

Section 60.2 Definitions.

• • • • •

Committed dose equivalent, means the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

Committed effective dose equivalent, means the sum of the products of the weighing factors applicable to each of the body organs or tissues which are irradiated and the committed dose equivalent.

* * * * *

Effective dose equivalent, means the sum of the products of the dose equivalent to the organ or tissue and the weighing factors applicable to each of the body organs or tissues which are irradiated.

* * * * *

Important to safety, with references to structures, systems, and components, means those engineered structures, systems, and components the failure of which could result in a release of radioactive material that produces and effective dose equivalent of 0.5 rem or greater to an individual located at or beyond the nearest boundary of the preclosure control area for an accident that could occur at any time until the completion of permanent closure. All engineered safety features shall be included within the meaning of the term "important to safety."

* * * * *

Preclosure control area, means the area immediately surrounding the repository facilities for which the licenses exercises authority over its use during the period up to completion of permanent closure. This area may be traversed by a highway, railroad, or waterway, so long as appropriate and effective arrangements are made to control traffic and to protect public health and safety.

* * * * *

2. In § 60.111, paragraph (a) is amended by removing "at all times," paragraph (b) is redesignated as paragraph (c), and a new paragraph (b) is added to read as follows:

Section 60.111 Performance of the geologic repository operations area through permanent closure.

* * * * *

(b) Accident analysis. The geologic repository operations area shall be designed such that any individual member of the public located at or beyond the nearest boundary of the preclosure control area shall not receive a radiation dose from direct exposure and inhalation greater than 5 rem effective dose equivalent or 50 rem committed dose equivalent to any organ from any accidents considered in the design of the repository that could occur at any time until the completion of permanent closure.

* * * * *

Supporting Information

The purpose of this proposed amendment is to establish quantitative accident dose criteria and to provide pertinent definitions to facilitate application of these criteria.

The petitioner considers the current rule deficient in that it does not contain the numerical dose criteria needed to determine design adequacy. The petitioner believes that the absence of quantitative accident dose criteria creates programmatic uncertainties associated with the design of the geologic repository operations area and the procurement of long lead-time items based on that design and that uncertainty could result in major redirection of design efforts and possibly affect the schedule for development of a geologic repository.

The petitioner points out that considerable knowledge and experience in the type of handling operations that will occur at a repository exists. In particular, activities at a geological repository would be similiar to activities that occur at other nuclear facilities, including several facilities licensed by the NRC, and others operated by DOE. These activities will include the receipt, handling, transfer, and storage of highly radioactive materials, principally spent nuclear fuel assemblies and canisters of vitrified high-level radioactive waste. Similar or identical operations with highly radioactive materials are, or have been, performed routinely at facilities for independent storage of spent nuclear fuel.

The petitioner maintains that its proposed repository dose criteria are within the range of accident dose criteria established by the NRC for similar activities. In claims that proposed dose criteria would be consistent with the 5 rem criteria established by the NRC for accidents at facilities for independent storage of spent nuclear fuel and high-level radioactive waste (10 CFR part 72) and even more conservative than the 6.25 rem criteria for nuclear power plant fuel handling accidents, including accidents involving drops of heavy loads on fuel handling accidents, including accidents involving drops of heavy loads on fuel assemblies or safety-related systems, components, or equipment. (For further information, DOE refers to NUREG–0800, Standard Review Plan, and NUREG–0612, Control of Heavy Loads at Nuclear Power Plants). Postulated accident scenarios include crane failures and other waste handling accidents that may result in damage to the waste canister such that there is a breach of confinement barrier.

The petitioner considers the 5 rem effective dose equivalent accident dose criteria to be supported by accepted radiological protection criteria. DOE proposes that the 5 rem accident dose criteria be expressed in the form of effective dose equivalent, as defined by the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRPM), and be applied to the sum of the effective dose equivalent from external exposure and the committed effective dose equivalent from intake of radionucludes. To avoid nonstochastic effects, DOE is proposing that the accident dose criteria include a limit of 50 rem on the committed dose equivalent to any organ. For dosimetric purposes, DOE recommends that the dose criteria be applied to a member of the public who is generally representative of the exposed population (i.e., reference man), as is done with other NRC accident criteria. The exposure pathways to which the accident dose criteria would apply should be limited to direct irradiation and inhalation.

In the petitioner's view, the accident dose criteria should be applied at the boundary of a newly defined preclosure control area. The restricted area defined in 10 CFR 60.2 is used for both the area to be controlled in case of a radiological accident and the area controlled under normal operations. The petitioner believes that this area is unnecessarily large for application of normal access controls and radiological monitoring. To reduce the size of this area to size that the petitioner deems more appropriate, it would be necessary to establish separate boundaries for the two controlled zones (i.e., accident and routine access control). For a repository, DOE proposes to define the location for application of the accident dose criteria and the "important to safety" threshold as the "preclosure control area" boundary.

The petitioner believes that establishment of accident dose criteria would not change the intent of the 0.5-rem "important to safety" threshold for classification. However, in its view, the current definition of "important to safety" would need to be modified to be consistent with other changes it has suggested. The current definition could be interpreted to mean that an accident resulting in a radiation dose of 0.5 rem

or greater must be mitigated: "those engineered structures, systems, and components essential to the prevention or *mitigation* of an accident * * *" (10 CFR 60.2, emphasis added). The threshold for determining the need for mitigation through the use of engineered safety features is the accident dose criterion, not the "important to safety" threshold. The petitioner suggests modification of the current definition "important to safety" to make it consistent with the proposed accident dose criterion by incorporating the effective dose equivalent concept and the new preclosure control area boundary.

Related NRC Regulatory Initiative

In the NRC Regulatory Agenda (NUREG-0936, Vol. 8, No. 4, published January 1990) and in the Unified Agenda of Federal Regulations (55 FR 17174; April 23, 1990), the NRC has announced a contemplated rulemaking action that would establish additional preclosure regulatory requirements for high-level waste geologic repositories (RIN 3150-AD51). The subject matter of the DOE petition relates closely with the actions under consideration by the NRC as part of this rulemaking effort.

The NRC approach to this related regulatory initiative includes plans to:

1. Perform a functional analysis of a geologic repository using a systematic approach. This functional analysis would include an evaluation of the preclosure operations phase of a repository.
2. Identify in this analysis the functions necessary to protect the health and safety of the workers and the public during normal conditions and abnormal conditions (e.g. design bases accidents/events).
3. Develop repository operational criteria for each function necessary to protect the health and safety of the workers and public.
4. Compare these repository operational criteria to the current criteria in 10 CFR part 60 to help identify any potential regulatory uncertainties.
5. Use the results of the functional analysis and comparison studies as a basis for consideration of any potential rulemaking.

The NRC is in the process of obtaining studies that would address potential regulatory uncertainties in this area. The results of these studies would be made available as NUREG reports. These studies would provide technical support for any regulatory action that may be needed. The NRC estimates that these reports would be available after November 1991.

Although DOE's petition does address areas of concern similar to those addressed in the NRC regulatory initiative described above, the petitioner's approach to establishing design critieria for structures, systems, and components important to safety differs markedly from that contemplated by the NRC. In applying the approach of the petitioner, it would be possible to have no structures, systems, and components important to safety if the nearest boundary of the preclosure control area were sufficiently distant. This could encourage extending the boundary of the preclosure control area in order to justify less effective safety design and quality assurance measures and result in inferior structures, systems, and components in the geologic repository operations area. While this approach might be adequate for protection of the general public, it would ignore the safety of the workers.

In contrast, in applying the approach proposed by the NRC staff, the scope of, and the design critieria for, structures, systems, and components important to safety would be derived from a consideration of the functional requirements of the repository system. In addition, critieria for a preclosure controlled area that takes into account postulated accident conditions may be developed as a matter apart from the question of structures, systems, and components important to safety. The corresponding provisions in 10 CFR Part 72 may be considered as possible models for regulatory language in this context.

Comments are solicited with respect to the NRC's regulatory initiative as well as the DOE petition.

Dated in Rockville, Maryland, this 9th day of July, 1990.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

55 FR 32639
Published 8/10/90

10 CFR Part 60

[Docket No. PRM-60-3]

Department of Energy; Correction of Receipt of Petition for Rulemaking

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; Notice of receipt, Correction.

SUMMARY: This document corrects a notice of receipt of petition for rulemaking filed by the U.S. Department of Energy which was published in the Federal Register on July 13, 1990 (55 FR 28771). This action is necessary to correct two typographical errors.

FOR FURTHER INFORMATION CONTACT: Michael T. Lesar, Chief, Rules Review Section, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7758.

In the Federal Register of July 13, 1990, in the center column of page 28773, make the following corrections:

1. In the eighth line of the first complete paragraph of the document "the" should be changed to read "that."
2. In the tenth line of the second complete paragraph remove the word "that."

Dated at Bethesda, Maryland, this 3rd day of August 1990.

For the Nuclear Regulatory Commission.

David L. Meyer,

Chief, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration.

➤ 55 FR 51732
Published 12/17/90
Comment period expires 3/18/91

10 CFR Part 60

[Docket No. PRM-60-4]

Definition of the Term "High-Level Radioactive Waste"

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking.

SUMMARY: The States of Washington and Oregon request that the Commission revise the definition of the term "high-level radioactive waste" so as to establish a procedural framework and substantive standards by which the Commission will determine whether reprocessing waste, including in particular certain waste stored at the U.S. Department of Energy's site at Hanford, Washington, is high-level radioactive waste and therefore subject to the Commission's licensing authority.

DATES: Submit comments by March 18, 1991. Comments received after this date will be considered if it is practical to do so, but consideration cannot be given except as to comments received on or before this date.

ADDRESSES: Submit comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attention: Docketing and Service Branch. For a copy of the petition, write: Rules Review Section, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

FOR FURTHER INFORMATION CONTACT: Michael T. Lesar, Chief, Rules Review Section, Regulatory Publications Branch, Division of Freedom of Information and Publications Services, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone: 301-492-7758 or Toll Free: 800-368-5642.

SUPPLEMENTARY INFORMATION:

Petitioners' Request

The petitioners request that the Commission amend 10 CFR 60.2 to clarify the definition of "high-level radioactive waste" (HLW) and the definition of "HLW facility." The petitioners request that the Commission—

1. Establish a process to evaluate the treatment of defense reprocessing wastes in tanks so that such wastes will not be considered HLW if, prior to disposal, each tank is treated to remove the largest technically achievable amount of radioactivity; and

2. Require that the heat produced by residual radionuclides, together with the heat of reaction during grout processing (if employed as a treatment technology), will be within limits established to ensure that grout meets temperature requirements for long-term stability for low-level waste forms.[1]

The petitioners seek clarification that the disposal of wastes treated to this standard is not disposal in a "HLW facility" as presently defined in 10 CFR 60.2. The petitioners state that should the Commission regard 10 CFR Part 50, Appendix F as the controlling regulation to determine whether a waste is HLW, that the Commission also modify that definition as proposed in the petition.

Basis for the Petition

The petitioners state that this rulemaking is based, in part, on section 202 of the 1974 Energy Reorganization Act, which defines Commission authority over retrievable surface storage facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by DOE which are not used for, or are part of, research and development activities. The petitioners further state that the Congressional definition of the term "high-level radioactive waste" in the Nuclear Waste Policy Act (NWPA) 42 U.S.C. 10101 (12) gives the Commission the authority to define whether wastes are "highly radioactive material" or "solids derived from [liquid reprocessing wastes] that contain fission products in sufficient concentrations."[2]

According to the petitioners, legislative history reveals that Congress intended the Commission to license defense reprocessing tank wastes at the point of long-term storage or disposal. The petitioners note that low fraction wastes resulting from pretreatment of tank wastes are scheduled to be grouted and disposed of in land-based grout vaults on the Hanford site in accordance with regulations developed under the Resource Conservation and Recovery Act (RCRA). The petitioners believe that if such wastes are HLW, they clearly fall under the Commission's licensing jurisdiction under section 202 (4) of the Energy Reorganization Act of 1974.[3]

Reasons for Petition

The petitioners point out that the present definition of HLW in the Commission's regulations is based upon the source of the waste. According to petitioners, while HLW may be differentiated from "incidental waste," the legal basis for doing so must derive from NWPA, specifically 42 U.S.C. 10101 (12) (A), which refers to a "sufficient concentrations" criterion for classification.[4] The petitioners claim that incidental waste source is impossible to ascertain due to mixing in defense tanks and the unavailability of accurate records. They point out, in particular, that over the last 45 years, mixing of wastes from different sources has complicated the classification of Hanford tank wastes, including double-shell tank wastes. Moreover, the petitioners state that radionuclide inventories are estimates and subject to substantial uncertainty. Variables contributing to the uncertainty include incomplete and inaccurate records, the lack of actual fuel and/or waste analyses, and an incomplete understanding of the chemistry and pathways in reprocessing and waste treatment processes. The petitioners assert that neither DOE, the Commission, nor the petitioners have adequate information regarding the radioactive portion of the double-shell tank waste. The petitioners believe that the Commission needs to establish both a procedure and a standard for making an evaluation as to whether waste are HLW on a tank-by-tank basis.

The petitioners assert that the proposed amendment is essential to provide protection of the future health and safety of the citizens of the Pacific Northwest.

Petitioners' Proposal

The petitioners suggest that the definitions of "High-Level Radioactive Waste" and "HLW Facility" in 10 CFR 60.2 be revised and a new appendix A be added to 10 CFR part 60. The specific language suggested by the petitioners reads as follows:

1. In § 60.2, the definitions of "High-Level Radioactive Waste" and "HLW Facility" are revised to read as follows:

§ 60.2 Definitions.

* * * * *

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; provided that if, prior to disposal, defense reprocessing tank wastes are treated to remove the largest technically achievable amount of radioactivity on a tank-by-tank basis (as provided in appendix A), the treated residual fraction shall be considered an incidental waste and therefore not HLW.

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).[3]

* * * * *

2. A new Appendix—A is added to part 60 to read as follows:

Appendix A—Procedures For Determining Largest Technically Achievable Treatment

At least one year before a tank of defense reprocessing wastes containing high-level waste components is treated, pretreated or blended prior to permanent disposal, DOE shall submit the following to the Commission and the affected state and publish in the Federal Register:

1. Data on physical characteristics of the waste, including density and percent solids, inorganic and organic constituents, and radiochemistry (e.g., gamma energy analysis, total alpha, total beta);

2. Volumetric data on untreated waste, on volume changes expected as a result of treatment, pretreatment or blending activities and the expected volume of the final waste form (grout, saltcrete or vitrified waste);

3. A description of the treatment processes, including an estimated mass balance for each process, and estimated percent recovery for each separation, and concentrations of major waste components before and after treatment;

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[1] Grout is a fluid mixture of cementitious materials and liquid waste that sets up as a solid mass and is used for waste fixation and immobilization.

[2] For an analysis of this provision, see "Definition of 'High-Level Radioactive Waste'" (advance notice of proposed rulemaking, 52 FR 5992, February 27, 1987) and subsequent rulemaking documents (proposed amendments to 10 CFR part 61, 53 FR 17709, May 18, 1988; final amendments to 10 CFR part 61, 54 FR 22578, May 25, 1989).

[3] It should be noted, however, that the Commission has jurisdiction only if the facilities are of the types described in section 202(4).

[4] Note, however, the Commission's statement, at 52 FR 5995, February 27, 1987, that classification, under the cited provision "would be irrelevant in determining whether such wastes must be disposed of in licensed disposal facilities."

[3] These are DOE "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". Facilities for the long-term storage or disposal of incidental wastes resulting from treatment of defense reprocessing wastes are not HLW facilities.

4. The proposed grout or saltcrete formulation, together with heat transfer calculations for the waste form; and

5. To the degree possible, treatment system models similar to the attached grout system model should be used to present data and describe processes.

At least six months before a tank of defense reprocessing tank wastes containing high-level waste components is pretreated, treated or blended prior to permanent disposal in near-surface or deep geologic facilities, the Commission shall require a license under section 202(4) of the Energy Reorganization Act, 42 U.S.C. 5842 (4) unless the Commission, on a tank-by-tank basis determines the following:

1. The DOE has demonstrated that the largest technically achievable amount of activity from the tank will be isolated for vitrification prior to permanent disposal; and

2. That use of permanent shallow land disposal for the tank waste will be limited to the incidental waste portion, which is the activity remaining after the largest technically achievable amount of activity has been removed; and

3. That the treatment, pretreatment and blending processes described in the DOE submittal will achieve the stated separation and/or recovery efficiencies; and

4. That the treatment, pretreatment and blending processes described in the DOE submittal are proven, cost effective, state-of-the art processes, which are capable of removing the largest technically achievable amount of activity.

Petitioners' Conclusions

The petitioners state that rulemaking procedures are necessary to determine the nature of the incidental, lesser radioactive fraction of wastes and that rulemaking is appropriate to establish a procedural framework and substantive standards by which particular wastes will be assessed. The petitioners contemplate that particular determinations of how specific wastes will be characterized under these general standards can be left to individual adjudicative proceedings.

The petitioners believe that the amendments suggested by their petition would protect human health and the environment, would facilitate meaningful Commission involvement in the ultimate disposal and/or long-term storage of Hanford double-shell tank waste, and would support implementation of the Hanford Federal Facility Agreement and Consent Order.

Request for Comments

Commenters are invited to address, among other things, the desirability and appropriateness of (1) The proposed substantive standard ("remove the largest technically achievable amount of radioactivity on a tank-by-tank basis"), (2) the proposed procedure for applying that standard, and (3) an amendment to 10 CFR part 60 (in view of the scope defined in 10 CFR 60.1) vis-a-vis the adoption of a new Part or amendment to some other existing Part of NRC regulations.

Dated at Rockville, Maryland, this 11th day of December 1990.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,

Secretary of the Commission.

PART 60

DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES IN GEOLOGIC REPOSITORIES; LICENSING PROCEDURES

STATEMENTS OF CONSIDERATION

52 FR 31601
Published 8/21/87
Effective 8/19/87

Statement of Organization and General Information

See Part 1 Statements of Consideration

52 FR 49362
Published 12/31/87
Effective 2/1/88

Completeness and Accuracy of Information

See Part 2 Statements of Consideration

53 FR 4109
Published 2/12/88
Effective 2/12/88

Relocation of NRC Offices–NMSS, OI and GPA

See Part 30 Statements of Consideration

53 FR 19240
Published 5/27/88
Effective 7/26/88

Retention Periods for Records

See Part 4 Statements of Consideration

53 FR 43419
Published 10/27/88
Effective 10/27/88

Relocation of NRC's Public Document Room; Other Minor Nomenclature Changes

See Part 1 Statements of Consideration

54 FR 27864
Published 7/3/89
Effective 8/2/89

10 CFR Parts 2, 51, and 60

RIN 3150-AC04

NEPA Review Procedures for Geologic Repositories for High-Level Waste

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission is adopting procedures for implementation of the National Environmental Policy Act with respect to geologic repositories for high-level radioactive waste. In accordance with the Nuclear Waste Policy Act of 1982, as amended, the Commission will adopt, to the extent practicable, the final environmental impact statement prepared by the Department of Energy that accompanies a recommendation to the President for repository development. The rule recognizes that the primary responsibility for evaluating environmental impacts lies with the Department of Energy; and, consistent with this view, it sets out the standards and procedures that would be used in determining whether adoption of the Department's final environmental impact statement is practicable.

EFFECTIVE DATE: August 2, 1989.

FOR FURTHER INFORMATION CONTACT: James R. Wolf, Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Telephone (301) 492–1641.

SUPPLEMENTARY INFORMATION: Under applicable law, the Nuclear Regulatory Commission exercises regulatory authority with respect to the development, operation, and permanent closure of one or more geologic repositories for high-level radioactive waste and spent nuclear fuel. In connection with the exercise of this authority, the Commission is required by the National Environmental Policy Act of 1969 (NEPA), to give appropriate consideration to the environmental impacts of its actions. The scope of such consideration and the procedure to be followed by the Commission in fulfilling its NEPA responsibilities are addressed by the Nuclear Waste Policy Act of 1982, as amended (NWPA). This statute directs the Commission to adopt the environmental impact statement (EIS) prepared by the Department of Energy (the applicant for the NRC license with respect to the repository) "to the extent practicable," with the further proviso that adoption of DOE's EIS shall be deemed to satisfy the Commission's NEPA responsibilities "and no further consideration shall be required." The Commission has been engaged in rulemaking to implement this statutory framework.

The Commission accordingly undertook a careful review of the text and statutory history of the pertinent provisions of the Nuclear Waste Policy Act. The results of this review were presented in the notice of proposed rulemaking published in the Federal Register on May 5, 1988, 53 FR 16131. As summarized therein:

(1) The Commission will conduct a thorough review of DOE's draft EIS and will provide comments to DOE regarding the adequacy of the statement.

(2) If requested by Congress pursuant to the NWPA, the Commission will provide comments on DOE's EIS to the Congress with respect to a State or Tribal notice of disapproval of a designated site.

(3) The NRC will find it practicable to adopt DOE's EIS (or any DOE supplemental EIS) unless:

(a) The action proposed to be taken by the NRC differs in an environmentally significant way from the action described in DOE's license application, or

(b) Significant and substantial new information or new considerations render the DOE EIS inadequate.

(4) The DOE EIS will accompany the application through the Commission's review process, but will be subject to litigation in NRC's licensing proceeding only where factors 3(a) or 3(b) are present.

In accordance with NWPA, the primary responsibility for evaluating environmental impacts lies with DOE, and DOE would therefore be required to supplement the EIS, whenever necessary, to consider changes in its proposed activities or any significant new information.

The Commission received nine letters of comment in response to its notice of proposed rulemaking. The commenters were the State of Nevada (Nuclear Waste Project Office), the U.S. Department of Energy, the Council on Environmental Quality, the U.S. Environmental Protection Agency, and several private organizations (the Nevada Nuclear Waste Task Force, the Environmental Defense Fund, the Southwest Research and Information Center, the Sierra Club, and the Edison Electric Institute).

After reviewing and giving careful consideration to all the comments received, the Commission now adopts, in substantial part, the position set forth in its earlier notice. In particular, the Commission continues to emphasize its view that its role under NWPA is

oriented toward health and safety issues and that, in general, nonradiological environmental issues are intended to be resolved in advance of NRC licensing decisions through the actions of the Department of Energy, subject to Congressional and judicial review in accordance with NWPA and other applicable law. The Commission anticipates that many environmental questions would have been, or at least could have been, adjudicated in connection with an environmental impact statement prepared by DOE, and such questions should not be reopened in proceedings before NRC.

State of Nevada Comments

We begin with the comments presented by the State of Nevada not only because of its important sovereign interests, but because of the fundamental nature of the issues that are raised. In Nevada's view, NRC "poses, analyzes and answers the wrong question." According to Nevada, the question is how NRC should perform its own, independent, NEPA responsibilities and not how NRC should review and approve the adequacy of DOE's EIS.

Having posed the question in terms of responsibilities under NEPA, Nevada reviews the many cases that hold that where a major federal action involves two or more federal agencies, each agency must evaluate the environmental consequences of the entire project and determine independently whether the statutory requirements have been satisfied. NRC is not relieved from the responsibility of making such an independent determination, according to the State, because it would still be able to carry out its licensing responsibilities in a manner consistent with law. NRC, which is directed by NWPA to adopt the DOE environmental impact statement "to the extent practicable," need only do so to the extent that it is otherwise within the customary practice of the agency.

The views of the State bring the question into sharp focus. If the issue were properly to be posed as Nevada urges—i.e., with an assumption that the Commission's NEPA responsibilities are not modified by NWPA—then the regulatory language suggested in its comment letter would have merit. But the Commission firmly believes that the law was intended to have all matters associated with the environmental impacts of repository development considered and decided, to the fullest extent practicable, apart from NRC licensing proceedings. As explained when the proposed rule was published, this interpretation is supported both by the specific legislative and judicial review procedures built into the statutory structure and by the accompanying legislative history. The Commission believes that the result is sensible. Concerns arising under NEPA—if not resolved through the negotiation procedures established by NWPA—would be adjudicated early, with finality, and with every reasonable argument being capable of being advanced to the oversight of Congress and the courts. From that point on, in the absence of substantial new information or other new considerations, it would be proper to inquire only whether the specific detailed proposal of the Department of Energy could be implemented in a manner consistent with the health and safety of the public. The resolution of issues in this manner for purposes of NEPA would in no event affect the framing or decision of health and safety issues, under the Atomic Energy Act, in NRC licensing proceedings.[1]

Although quite different statutory schemes are involved, we perceive a parallel with issues raised in *Quivira Mining Company* v. *NRC*, 866 F.2d 1246 (10th Cir. 1989). That case concerned regulations adopted by NRC pursuant to the Uranium Mill Tailings Radiation Control Act of 1978. It considered, among other things, the extent to which NRC, in giving the "due consideration to economic costs" required by the statute, could rely upon a cost-benefit study previously carried out by the Environmental Protection Agency to support EPA's rulemaking responsibilities. The Commission concluded that since the agencies' actions coincided in material respects, all statutory language would retain significant force and effect, and the time period allowed for the issuance of its regulations was inadequate for an independent study, Congress did not wish to require the NRC to perform a second cost-benefit analysis. The Court found the legislative history, as well as the statutory language, to be ambiguous on the question; as such, it upheld the NRC construction. Here, given the identity of the actions being considered by the two agencies (DOE and NRC), we believe it to be a fair reading of Congressional intent that NRC can adequately exercise its NEPA decisionmaking responsibility with respect to a repository by relying upon DOE's environmental impact statement. As in *Quivira Mining*, the timing requirement—under NWPA, a three-year licensing process for a unique facility, involving standards of exceptional complexity, requiring disputatious predictions of future human activity and natural processes for thousands of years—supplies practical support for our interpretation. Congress did not speak to the precise question of the standard to be used in deciding whether adoption of DOE's environmental impact statement is practicable; and if our construction is not the only one that might be proposed, it seems to us to be, at a minimum, "permissible."

Once DOE's EIS has been adopted, the statute expressly relieves the Commission from further consideration of the environmental concerns addressed in the statement. Congressional review of a State's resolution of disapproval—should such a resolution be passed—would permit (and, most likely, virtually ensure) that issues other than those to be adjudicated under the Atomic Energy Act would have been considered and weighed. Under these circumstances, it would do no violence to national environmental policy to proscribe further examination in administrative proceedings.

Council on Environmental Quality Comments

The Commission invited the Council on Environmental Quality to comment on the proposed rule. The conclusion of CEQ was similar to that of the State of Nevada. In particular, CEQ read the phrase "to the extent practicable" to mean that NRC should make an independent evaluation of the DOE environmental impact statement, adopting some or all of it as appropriate so as to avoid unnecessary duplication. From the Commission's perspective, though, the position does not fully take into account the detailed scheme for environmental review established by NWPA. Neither the related provisions of the statute (including, for example, those dealing with legislative and judicial review and establishing time frames for Commission decisionmaking) are analyzed, nor is there any examination of the legislative history which, as described in the preamble to the proposed rule, supports our point of view. We continue to believe that it is clear—at least in the debates of the House of Representatives with respect to the bill which, with amendments, was enacted into law—that the Commission role was intentionally to be directed to health and safety issues to the exclusion, absent new information or new considerations, of issues arising under NEPA.

It is worth noting, though, that CEQ recognizes that the Commission might "defer" to a court finding that the DOE environmental impact statement is adequate. This is certainly close, if not identical to, the Commission's position

[1] The State took exception to the standard for completeness of information in a license application—viz. the "reasonably available" standard of 10 CFR 60.24. Although the matter is not strictly at issue in this rulemaking, the Commission regards the State's concern in this regard to be overdrawn. While information may be sufficient to meet the requirements of § 60.24, this in no way implies that such information will prove to be sufficient to meet the applicant's burden of persuasion under § 60.31.

that a judicial finding of adequacy would preclude further litigation of the matter in NRC licensing proceedings.

Comments of Environmental Organizations

The environmental organizations' comments included a number of arguments similar to those of the State of Nevada with respect to the Commission's customary NEPA responsibilities. As already indicated, it is our view that Congress intended, under NWPA, for NRC to accept the DOE EIS in the absence of substantial new considerations or new information. We reject the suggestion made by the Sierra Club that the approach we have outlined amounts to an abdication of any Commission responsibility.

In addition, however, a number of comments of somewhat narrower scope were submitted by environmental organizations (as well as by the State of Nevada) and are addressed here.

One matter that particularly concerned the private Nevada Nuclear Waste Task Force involved the relationship between the judicial process and the Commission's administrative process. The Task Force cautioned that NRC should not rely on there having been a court ruling with regard to the adequacy of DOE's environmental impact statement in advance of the Commission's licensing decision (when a judicial finding of inadequacy, affecting much or little of the EIS, could be treated as a new consideration). In fact, such reliance is not essential. It is our expectation that, under NWPA, a petition for review of the EIS would need to have been filed roughly contemporaneously with DOE's submission of a license application to NRC, and that judgment might have been entered within the three years envisaged for Commission licensing. Whether or not this proves to be the case is not controlling, for the standard for adoption does not rest upon collateral estoppel principles. Similarly, we find it beside the point to speculate regarding the possibility that a reviewing court might delay its decision on the adequacy until it sees the NRC conclusions in the licensing proceeding. Such delay would not stand in the way of the Commission's taking final action.

Although we thus do not rest our position upon the availability of a prior judgment of a court, we reiterate our view, as described in the preamble to the proposed rule, that such a judgment, if entered, would be controlling on the question of the adequacy of the EIS; and if the EIS were found to be adequate, it would be practicable for the Commission to adopt it.

We were criticized for suggesting that members of the public might be precluded from raising issues anew on the grounds that they had been represented by State officials in prior judicial proceedings. This position was claimed to be inconsistent with NRC intervention rules which, it is correctly argued, traditionally consider the interests of the state in which a facility is located as being distinguishable from the interests of particular members of the public who may be affected by the issuance of a license. Our first response is that our case law with respect to standing for purposes of intervention does not necessarily apply in the context of collateral estoppel or issue preclusion, where the policies of repose come into play. But, in addition, we would reach the same result even if informed members of the public were not constrained by the putative prior judgment against the state; for in that event their failure to pursue their claims within the 180 days specified by section 119 of NWPA would operate as a bar.

The Commission's position that failure to challenge DOE's environmental impact statement promptly in the courts bars subsequent challenge to that EIS in NRC proceedings was also criticized. Commenters suggested, instead, that affected parties may decide for reasons of litigative strategy or otherwise to contest questions regarding the repository in NRC licensing proceedings rather than by going to court about the DOE environmental impact statement. But such a unilateral decision on their part cannot operate as a means to circumvent the clear policy of the NWPA requiring prompt adjudication of the issues raised by the EIS. When there has been a full and fair opportunity to raise the challenge, a party's failure to avail itself should in our view be regarded as an abandonment of its right to do so many years later. *See Oregon Natural Resources Council* v. *U.S. Forest Service*, 834 F.2d 842, 847 (9th Cir. 1987).

There is force to a commenter's suggestion that our proposed rules failed to take account of an EIS having been prepared in connection with a Negotiator-selected site, in which case the Commission review would be governed by section 407 of NWPA, as amended, 42 U.S.C. 10247, instead of section 114, 42 U.S.C. 10134. One difference, as pointed out by the comment, is that for a Negotiator-selected site DOE makes no formal recommendation to the President and the President makes no decision with respect to approval of the site. This difference alone would not affect the approach we take to discharging our NEPA responsibilities, in part because we would expect early judicial review to be available even in the absence of a Presidential decision. In this regard, NWPA authorizes a civil action to review any EIS prepared with respect to "any action" under the applicable subpart and, given our perspective on the intended allocation of functions between DOE and NRC, "any action" could include the Secretary of Energy's submission of an application to the Commission. We think the intent of Congress, as evidenced by the considerable parallelism of the language employed, was generally to establish the same sort of role for the Commission with respect to any site—whether at Yucca Mountain or at a Negotiator-selected location. We recognize that it is our obligation "to consider the Yucca Mountain site as an alternate to (the Negotiator-selected site) in the preparation of" an EIS. This obligation will be discharged, though, to the extent of our adoption of the DOE environmental impact statement, provided that the alternative sites were addressed therein.

One aspect of the Negotiator-selected site provisions does have to be taken into account, however. For a Negotiator-selected site, a Commission decision to adopt the environmental impact statement must be made "in accordance with § 1506.3 of Title 40, Code of Federal Regulations,"—a limitation that we found not to apply to the EIS submitted under section 114 of NWPA. Under the cited section of the CEQ regulations, the Commission may only adopt the DOE statement if it is "adequate." While a judicial decision on the point would be controlling, we would otherwise need to make an independent judgment in accordance with established practice. The final regulations reflect this possibility. In passing, though, we observe that we find nothing anomalous in having this responsibility in the case of a Negotiator-selected site but not in the case of the Congressionally-designated site at Yucca Mountain, for in the latter case there are opportunities for State disapproval and Congressional consideration that serve to provide a forum outside the Department for the evaluation of environmental concerns.

We are not persuaded by the comment that took exception to our requirement that needed supplements to the EIS would, as a general rule, have to be prepared by DOE—and that DOE's failure to comply with this requirement might be grounds for denial of a construction authorization. It seems to us that such supplementation by DOE would ordinarily be appropriate whenever, in the light of new information or new considerations, its proposed action may give rise to significant environmental impacts that were not addressed in its original EIS.

We were urged to reconsider our position with respect to the imposition of license conditions directed at mitigation of adverse environmental impacts. We had suggested that DOE could itself be held accountable for compliance with the mitigation measures described in its EIS, so that

there was no need for them to be subject to litigation in NRC proceedings. The basis for our position is that the departure from planned mitigation measures may well be a major Federal action having significant environmental impacts, which would necessitate the preparation of an environmental impact statement for a project that was otherwise determined to be without significant impact. But, in any event, we see no basis for employing our regulatory authority in this instance to police DOE's compliance with its mitigation plans; it will be subject to no more and no less oversight from interested persons than would be the case for many other developmental projects carried out, after preparation of appropriate environmental documentation, by Federal departments and agencies. To permit the mitigation measures to be litigated in NRC administrative proceedings—legitimate as this may be in other contexts—would run counter to the direction of the NWPA. It would bring in through the back door at least some of the contentions which, in our view, were to be settled in other forums.

An argument was made that amended section 114(f)(6)—which provides that "the Commission" need not consider enumerated factors in any EIS prepared with respect to a repository—indicates that Congress intended for NRC to issue its own EIS. The language in question appears to have been designed as an editorial measure, lacking substantive effect. The legislative history, cited with the proposed rule, demonstrates that no important change was being made in NRC's NEPA responsibilities, which under the 1982 statute were limited in the manner we have described. The statutory language is not surplusage, for NRC may have an obligation to prepare a supplemental EIS where there are new considerations or new information.

Department of Energy Comments

The Department of Energy, which is the prospective applicant affected by the proposed rules, agreed that NWPA counsels against wide-ranging independent examination by NRC of environmental concerns during the course of the licensing proceedings. DOE also concurred with NRC's view that a judicial determination of adequacy of an EIS precludes further litigation of that issue and that failure to raise an issue within the time set out in NWPA bars later challenge. The other DOE comments call for some clarification of the Commission's intentions, but do not prompt any fundamental change of the position that had previously been outlined.

For example, we can put to rest DOE's concern that NRC might defer its acceptance review of the license application until the entire judicial review process on the EIS had run its course. Under the amendments, both as proposed and as adopted, the acceptance review applies only to the completeness of "the application," not "the application or environmental report" as under existing 10 CFR 2.101(f)(2).

We believe we can also satisfy DOE's concern with respect to our mention, at 53 FR 16132, that there may be a need for "multiple EIS's." The point being made was not that NRC might need to prepare its own EIS when DOE had already done so, but that the licensing process may involve more than one major federal action (for example, the construction of the repository on the one hand and the emplacement of waste on the other) that could necessitate the preparation of a supplemental EIS if not an entirely new one, if the impacts of such actions are not evaluated or properly encompassed in the initial EIS.

The responsibility for supplementation was another point of contention. DOE—along with some of the other commenters—argued that it would be inappropriate for it to be obliged to supplement its completed EIS in order to satisfy any independent NEPA responsibilities of the Commission. We agree with this statement. But, as DOE itself acknowledges, it might need to supplement the EIS if it were to make a substantial change in the proposed action or if significant new circumstances or information were to become available. That is all that is required by the regulatory language (10 CFR 60.24(c)).

However, in support of its position, DOE suggested that NRC adoption under the NWPA provisions was related specifically to the EIS "submitted as part of the Department's recommendation to the President." But the language of Section 114(f) quite clearly applies to "any environmental impact statement prepared in connection with a repository proposed to be constructed" by DOE under NWPA.

DOE is correct in pointing out that a supplemental EIS would not necessarily be required in the event of a substantial change in the proposed action, where the change and the impacts thereof had previously been considered in the original statement.

The principal remaining issue raised by DOE's comments concerns the appropriate role of NRC in DOE's NEPA activities. DOE suggests that NRC should be a "cooperating agency," a role that the Council on Environmental Quality has recognized as being appropriate in the licensor-licensee context. We are not persuaded. The present situation is unique because—unlike the customary licensor-licensee situation—the particular statute guiding our approach (i.e., NWPA) removes the balancing of environmental considerations from our independent judgment. Under these circumstances, it strikes us as particularly out of place for NRC to undertake the kind of critical evaluation that a "cooperating agency" should perform in the preparation of an EIS. The Commission, nevertheless, has jurisdiction and expertise that it can, and will, bring to DOE's attention as a commenting agency through the entire DOE NEPA process. We shall not hesitate, in particular, to raise concerns that might subsequently also require adjudication, under the standards of the Atomic Energy Act, in our licensing proceedings. Other issues, of course, can be identified in our comments as well. In other words, NRC as a commenting agency can and will play an important constructive role all the while from the scoping stage through preparation of the environmental impact statement; but as the sole responsibility for weighing the environmental impacts in support of a recommendation to the President is vested in DOE, DOE properly should be the agency with formal sponsorship of the EIS as well.

We respond, finally, to DOE's claim that the requirement for DOE to inform the Commission of the status of legal action on the repository is unnecessary, since this information is a matter of public record. As a general rule, the applicant has the burden of placing on the record those factual matters upon which NRC decisions may be predicated. Although we have not placed sole reliance upon principles of issue preclusion (collateral estoppel), it remains our position that a final judgment of a reviewing court with respect to the adequacy of the DOE final environmental impact statement would be controlling and would support our adoption of such FEIS. Accordingly, it is appropriate for DOE to report on the status thereof.

Industry Comments

Comments received from Edison Electric Institute generally supported the Commission's view that its essential responsibility under NWPA is to address radiological safety issues under the Atomic Energy Act, and that the requirements of NEPA were substantively modified as they apply to the high-level nuclear waste program.

We decline to follow EEI's suggestion that issues related to adoption of DOE's environmental impact statement be made prior to the hearing process and outside the adjudicatory arena. As we have noted before, the impact statement does not simply "accompany" an agency recommendation for action in the sense

of having some independent significance in isolation from the deliberative process. Rather the impact statement is an integral part of the Commission's decision. It forms as much a vital part of the NRC's decisional record as anything else. *Public Service Company of Oklahoma* (Black Fox Station, Units 1 and 2), CLI-80-31, 12 NRC 264, 275 (1980). Even though the range of issues to be considered in the hearing may be limited, the formal function of the environmental impact statement as an element of the licensing decision remains.

However, we find merit in EEI's proposal to fix an early schedule for the NRC staff to present its position on the practicability of adoption and for other parties to file contentions with respect to the practicability of adoption. Accordingly, the final rule requires the NRC staff to present its position on adoption at the time that the notice of hearing is published in the Federal Register. Any contentions filed by any other party to the proceeding must be filed within thirty days after the notice of hearing is published. In the event that "substantial new considerations or new information" subsequently arises, contentions concerning the practicability of adopting DOE's EIS that are filed after the 30-day deadline established in the rule must be accompanied by a demonstration of compliance with the late filing criteria in 10 CFR 2.1014.

Changes from the Proposed Rule

Section 51.67 Environmental Information Concerning Geologic Repositories

This section is revised to provide for the submission of environmental impact statements, pursuant to Title IV of NWPA, as amended, with respect to a Negotiator-selected site. A further change reflects DOE's comment that supplement would not be required where a modification to its plans had been previously addressed by its EIS.

Section 51.109 Public Hearings in Proceedings for Issuance of Materials License with Respect to a Geologic Repository

In the final rule, paragraph (a) incorporates a schedule for the staff to present its position on the practicability of adoption of the DOE environmental impact statement, and for the filing of contentions with respect thereto. Consistent with the recently-completed LSS (Licensing Support System) rulemaking, a period of thirty days after notice of hearing is provided for the submission of contentions.

Paragraph (c) is revised so that the special criterion for adoption, as discussed herein, will apply only with respect to the geologic repository at the Yucca Mountain site. Any EIS for a Negotiator-selected site would be excluded from the application of this paragraph. A conforming change appears in paragraph (d).

Paragraph (e) is modified to emphasize that the Commission's customary policies will be observed except for adoption of an EIS prepared under Section 114. This is achieved by the insertion of the cross-reference ("in accordance with paragraph (c)") in the introductory clause. As the language has been modified, it permits the adoption of other DOE environmental impact statements with respect to a Negotiator-selected site in accordance with generally applicable law. This includes observance of the procedures outlined in 40 CFR 1506.3. This is addressed adequately in Appendix A to 10 CFR Part 51, Subpart A, and requires no further elaboration in the text of the rule.

Petition for Rulemaking

The Commission's earlier notice invited comments upon the related portions of a petition for rulemaking submitted by the States of Nevada and Minnesota, PRM-60-2A, 50 FR 51701, December 19, 1985. With the exception of the State of Nevada, none of the comments received by the Commission in response to the notice addressed the petition as such. The State of Nevada referred to the petition, recognized that some of the considerations therein have been mooted, and urged that alternative language be considered in the proposed rule, in place of that which they had recommended in the petition.

The section of the petition which provides language pertaining to the adoption of DOE's EIS (i.e., Section IV.3) is denied. However, the issues identified by the petition regarding the criteria and procedures for adoption of DOE's EIS have been considered in this proceeding. Although the language being promulgated differs from that proposed by the petitioners, the Commission is in full agreement with the petitioners' argument that adoption of DOE's EIS must not compromise the independent responsibilities of NRC to protect the public health and safety under the Atomic Energy Act of 1954. Our rulemaking approach is in fact designed to enhance our ability to address these health and safety issues as effectively and objectively as possible.

Environmental Impact: Categorical Exclusion

The NRC has determined that this regulation is the type of action described in categorical exclusions 10 CFR 51.22(c)(1) and (3). Therefore, neither an environmental impact statement nor an environmental assessment has been prepared for this regulation.

Paperwork Reduction Act Statement

This final rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget approval numbers 3150-0021 and 0127.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 USC 605(b)), the Commission certifies that this rule will not have a significant economic impact on a substantial number of small entities. The only entity subject to regulation under this amended rule is the U.S. Department of Energy.

List of Subjects

10 CFR Part 2

Administrative practice and procedure, Antitrust, Byproduct material, Classified information, Environmental protection, Nuclear materials, Nuclear power plants and reactors, Penalty, Sex discrimination, Source material, Special nuclear material, Waste treatment and disposal.

10 CFR Part 51

Administrative practice and procedure, Environmental impact statement, Nuclear materials, Nuclear power plants and reactors, Reporting and record keeping requirements.

10 CFR Part 60

High-level waste, Nuclear power plants and reactors, Nuclear materials, Penalty, Reporting and record keeping requirements, Waste treatment and disposal.

Issuance

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, the National Environmental Policy Act of 1969, as amended, the Nuclear Waste Policy Act of 1982, as amended, and 5 U.S.C. 553, the NRC adopts the following amendments to 10 CFR Part 51, and related conforming amendments to 10 CFR Parts 2 and 60.

55 FR 10397
Published 3/21/90.
Effective 4/20/90

Preserving the Free Flow of Information to the Commission

See Part 30 Statements of Consideration

> 56 FR 40664
> Published 8/15/91
> Effective 9/16/91
>
> *Revisions to Procedures to Issue Orders; Deliberate Misconduct by Unlicensed Persons*
>
> **See Part 2 Statements of Consideration**