

REGULATORY ISSUES ASSOCIATED

WITH LICENSING A HIGH-LEVEL WASTE REPOSITORY

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ABSTRACT

The Nuclear Waste Policy Act of 1982 (NWP), 42 U.S.C. §§ 10101-10226, requires the Department of Energy to obtain a license from the Nuclear Regulatory Commission authorizing the construction of a repository for deep geologic disposal of high-level radioactive waste and spent nuclear fuel. The Act contemplates a Commission decision on DOE's application within three years of the date of submission. In order to provide a sensible regulatory framework for licensing the repository and to meet the prescribed schedule, the Commission has planned a number of rulemaking initiatives. These rules will provide the regulatory context in which a repository application will be considered.

BACKGROUND

The regulatory context in which the Nuclear Regulatory Commission will consider an application from the Department of Energy for approval to commence construction of a permanent deep high-level radioactive waste repository is established by four principal statutes: The Atomic Energy Act of 1954, as amended, 42 U.S.C §§ 2011-2259; The Energy Reorganization Act of 1974, as amended, 42 U.S.C. §§ 5801-5891; The National Environmental Policy Act of 1969, as amended, 42 U.S.C. §§ 4321-4346; and The Nuclear Waste Policy Act of 1982, 42 U.S.C. §§ 10101-10226. There are, of course, other state and federal statutes which govern various aspects of a repository licensing decision. A compendium of the many rules and statutes applicable can be found in section 10 of DOE's draft project decision schedule issued in July 1985. For purposes of this discussion, however, the focus will be on the regulatory issues associated with implementing the principal statutes governing NRC's and DOE's repository licensing activities.

The Atomic Energy Act provides the statutory basis for the Commission's exercise of licensing and regulatory authority over byproduct, source, and special nuclear material. The Act also governs the procedure by which the public at large can participate in licensing decisions. The Commission's rules governing the licensing of a repository application reference the AE Act and assume the use of hearing procedures which are consistent with § 189 of the Act.

The Energy Reorganization Act abolished the Atomic Energy Commission and established two agencies, NRC and now DOE, to perform the functions assigned by the Atomic Energy Act. In the reorganization, the NRC was given licensing authority over DOE for four specific activities: Demonstration Liquid Metal Fast Breeder reactors, other demonstration nuclear reactors not in existence on the date the Act was passed, facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from licensed activities,

and retrievable surface facilities authorized for long-term storage of DOE's high-level radioactive waste.

The National Environmental Policy Act applies to all federal agencies who propose major federal actions. It requires the preparation of an environmental impact statement in draft which is circulated to other involved federal agencies and to the public for comment. Upon receipt of comments, a final statement is prepared to accompany the existing agency review process. The Council on Environmental Quality is charged with responsibility for advising the President on the adequacy of the federal programs in achieving the policies of NEPA. CEQ has published guidelines for federal agencies to follow in implementing their environmental regulations. Both NRC and DOE have regulations which implement the CEQ guidelines on the impact statement process.

The Nuclear Waste Policy Act specifically modifies some of the procedural requirements previously applicable under the AEA, the Reorganization Act, and NEPA. NWP, however, is primarily directed at establishing schedules and timetables for accomplishing activities leading to the selection, authorization, construction, and operation of a repository. While it is a landmark piece of legislation, it gives little new authority to the Commission. NWP's legal significance is the schedule and process established which is designed to reach a decision on the most suitable design and location for a high-level radioactive waste deep geologic repository (hereinafter repository). It is the schedule and procedure which keeps steady pressure on DOE and NRC to identify regulatory issues and set in motion processes designed to resolve them. Most of the legal difficulties presented in such issues, however, arise under the other three statutory schemes.

There are a myriad issues which need to be resolved. This paper will address only those which are likely to be the most significant over the next year or so. The discussion of each will be somewhat

simplistic since the analysis and documentation which would be necessary to cover the issue in depth would exceed the time and space allotted. The particular issues which seem timely at present include the Commission's authority to define "high-level radioactive waste", the need to modify licensing procedures and practices, the implementation of EPA standards, and the role of States and Indian Tribes in the ongoing interactive process.

DEFINITION OF HIGH-LEVEL RADIOACTIVE WASTE

The NWPA defines HLW as:

- (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.

The definition in paragraph A has been used by the Commission since 1970 in its regulations. (10 CFR Part 50 Appendix F) The term "high-level radioactive waste" was not statutorily defined until 1972 when the Commission's definition appeared in the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. § 1402). In that act, however, Congress broadened the definition to include unprocessed spent fuel. The definition has been the standard understanding since. Problems with the scope of the definition have arisen, partly because of some other related legislation and partly because of the evolution of technical thinking about disposal technologies.

The Low Level Radioactive Waste Policy Amendments Act of 1985 (42 U.S.C. § 2021b) were signed by the President on January 15, 1986. In the LLWPA the term "low-level radioactive waste" is defined as radioactive material that:

- (A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material [Mill Tailings]; and
- (B) the Nuclear Regulatory Commission, consistent with existing law and in accordance with paragraph (A), classifies as low-level radioactive waste.

The LLWPA makes low-level radioactive waste disposal a state responsibility to the extent it qualifies as Class C or below under the Commission's regulations in 10 CFR Part 61. Part 61 develops Classes A-C based on concentrations of long-lived radionuclides for which institutional controls can not be expected to be effective and concentrations of shorter-lived radionuclides where institutional controls, waste form and disposal methodologies are effective. The Commission's rules contemplated considering above Class C wastes for shallow-land disposal on a case by case basis. The recent LLWPA amendments, however, now make such wastes a federal responsibility. Consequently, there currently is a category of so-called "orphan wastes" which are neither HLW nor LLW as those terms are currently defined.

The Commission's staff was planning to address the definition issue with a proposed notice of rulemaking which would address these issues. The recent LLWPA amendments, however, provide for DOE to report to Congress its recommendations for ensuring the safe disposal of all radioactive waste designated a federal responsibility. The report is due in January 1987 and must include:

- (A) identification of the waste involved including source, volume, and concentration,
- (B) identification of federal and non-federal options for safe disposal;
- (C) actions proposed to insure safe disposal;
- (D) description of costs;
- (E) identification of options for ensuring that generators bear costs of disposal.

This development makes it less likely that the rulemaking to refine the definition of HLW will be initiated this year because of the obvious difficulties associated with predicting the proper course before the DOE report is prepared.

LICENSING PROCEDURES AND PRACTICES

The NWPA does not contain provisions which specifically alter the procedures which the NRC is required to follow under the Atomic Energy Act. Consequently, Section 189 of the AEA which provides for adjudicatory hearings on licensing applications when requested by interested persons is applicable to DOE's application for construction approval. The NWPA, however, does have three significant provisions which substantially affect the NRC's traditional licensing practices. First, NWPA provides for a three year period for NRC licensing with provisions for a fourth if NRC seeks Congressional approval. Second, States and Indian Tribes are given a special role. Third, the NEPA review process is specially tailored to require only one impact statement to be prepared by DOE and adopted by NRC.

The three year licensing period allowed for NRC decision is the outside time frame contemplated in DOE's current project decision schedule. The 1985 draft schedule shows only 27 months for NRC review and approval. Significantly, no contested reactor licensing review which follows the same adjudicatory model which DOE must follow has been accomplished in three years. The three year period must allow for staff review, followed by hearings, followed by Commission review and decision. Staff currently estimates that its technical review of a complete application will require 14 months. The Commission, if it receives views of participants, has been requiring four to six months to reach a decision. Thus, an adjudicatory hearing has to be started and completed in 18 months or under to meet and three year schedule. For a 27-month schedule, the hearing must be accomplished in less than a year. This has never been done in a heavily contested nuclear proceeding.

Several rulemaking strategies are being considered to address the issues presented by the statutory schedule. Under current rules service of process through the mails requires 15 days each time a motion or other related document is filed. Five days are allowed for all parties to receive a

document. Responses are allowed with five days allowed for board and parties to receive them. The Board's decision is mailed and five days are allowed for receipt. Electronic Mail could eliminate these times if all parties had access to compatible protocols and equipment. This could eliminate three months of the time required to conduct contested proceedings. Discovery rules, particularly those devoted to document production, are another source of time intensive effort. Under existing rules a document production request in a large case (the HLW proceeding will be massive) can require 12-18 months of manual effort. Large file rooms have to be established by each party and time has to be provided to manually sort and select records at the site of production. With multiple well-financed parties this means extensive travel, scheduling, review, and motion practice. If a central document on-line data base were available containing all discoverable document information, this time-consuming activity could be reduced substantially. If the data base were available well in advance of the start of the proceeding, document discovery procedures could be reduced to a few months.

The Commission has urged DOE to consider these time consuming processes in connection with its efforts to establish a well documented QA/QC program. DOE has agreed to study the feasibility of setting up a computerized document data base which would have the capability of producing all relevant documentation associated with its repository application.

To realize the potential time saving such an approach can offer, the Commission's Rules of Practice will require modification. Particular attention needs to be paid to procedural rules governing the requirements for document preparation and service of process. For example, the Rules currently specify typed, double-spaced, single-sided, 8½ X 11 white paper with one-inch margins. If electronic dissemination were implemented a standard might include ASCII text, 80 characters per line, carriage returns and line feeds, Asynchronous transmission with XModem protocols. Of course, standards of electronic transmission are much more uncertain at present. Consequently, the Commission is considering a negotiated rulemaking which would invite persons most likely to be affected to participate in developing the standards which would be put in place. States, affected Indian Tribes, DOE, and the interested public groups already extensively involved with HLW issues would be asked to participate.

A second issue, more difficult to negotiate but critical to reducing time considerations in the prehearing phase of an adjudicatory proceeding, is the document data base. It is fairly evident to those who have participated in a complex litigation involving millions of documents that significant time and professional resources are required to properly prepare a position when dealing with a massive document data base. Consequently, efforts are underway at NRC and DOE to develop a strategy which would be a part of the negotiated rulemaking to develop a database management system which would be on-line and available to all parties to the HLW proceeding. Document discovery would take place within the system. If feasible, the system would be the only document discovery available and all documents would be produced electronically through it. Obviously, significant details would have to be negotiated and parties would have to have confidence in the database. Given the massive document database which is expected to be available at the time of

licensing, this effort must be accomplished on an extraordinarily tight schedule to be effective.

IMPLEMENTATION OF EPA STANDARDS

Section 121 of NWA requires the Environmental Protection Agency to "promulgate generally applicable standards for protection of the general environment from offsite releases from radioactive material in repositories." EPA published final standards to implement this requirement on September 19, 1985 (50 Fed. Reg. 38066). NWA further requires NRC regulations to be consistent with the EPA standards.

NRC regulations in 10 C.F.R. Part 60 are believed to be generally consistent with EPA's standards. Part 60 was promulgated well ahead of EPA's final rule and was based in part on early drafts of the EPA standard which were available to the Commission. In the final rule, however, EPA used different terminology than NRC used in Part 60. To avoid confusion and to eliminate duplicative terminology, NRC plans to amend Part 60 to implement the final EPA standard. In addition, amendments to address the EPA's "assurance requirements" will be proposed.

EPA standards limit radiation exposure and radioactive material releases during two distinct phases of the repository. One set of standards address the period of management and operations at the repository. Another standard governs the long-term period after repository operations cease. EPA limits for repository operations are codified at 40 C.F.R. § 191.03. The "containment requirements" addressing releases to the environment after operations cease are found in 40 C.F.R. § 191.13. Individual protection requirements are in § 191.15 and ground water protection requirements are in § 191.16.

The standards for repository operations are virtually identical to those EPA promulgated for the uranium fuel cycle. (See 42 Fed. Reg. 2860, January 13, 1977) The standard limits annual dose equivalent to any member of the public to 25 millirems to whole body, 75 millirems to the thyroid, and 25 millirems to any other critical organ. 10 C.F.R. § 60.111 will be amended to include these release limits. Since the standard can be ambiguous as written, the Part 60 limit will interpret these limits as disjunctive rather than conjunction ("or" instead of "and").

EPA postclosure standards are expressed in terms of establishing a "reasonable expectation" rather than a "reasonable assurance" of meeting the specified level of performance. The explanation is that the latter term is associated with a level of confidence which is probably not appropriate for long-term analytical projections. The Commission does not have separate terminology in Part 60 relating to this standard but requires a finding of "reasonable assurance". The Commission staff plans to explain, however, that the concept of reasonable assurance as applied in projecting repository performance is different from traditional uses of the term in reactor licensing contexts. It will also be necessary to explain that the concept of reasonable assurance relates to the same level of confidence sought by EPA's term "reasonable expectation."

With respect to individual protection requirements, EPA requires in § 191.15 that they be achieved only for "undisturbed performance" of a "disposal system". The Part 60 approach does not use either

term. Rather, it refers to the "absence of unanticipated processes and events" in the "geologic repository". For practical purposes, these terms are references to the same concepts. This will have to be made clear in the proposed changes to Part 60.

The ground water protection requirements in the EPA standard is not now included in the performance objectives of 10 C.F.R. Part 60. EPA focuses on the quality of any "special source of ground water" in an area around the repository extending for five kilometers beyond the controlled area. Consistent with the Commission's approach of codifying requirements which it deems will achieve conformance with the EPA standards without reference to the standards themselves, it will be necessary to add a performance requirement to Part 60 to cover this standard.

EPA's containment requirements in § 191.13 covers releases for 10,000 years following permanent closure of the repository. Using a table listing release limits for the significant radionuclides which are derived by environmental transport and dosimetry considerations, EPA restricts releases based on the population health effects. Different release limits are established for releases with differing likelihoods of occurrence. The Commission's criteria published in 1983 indicated that information necessary for licensing would include probability distribution functions for the consequences from anticipated and unanticipated processes and events. Obviously, efforts to meet these requirements will not be based on actual measurement data but instead rely on predictive tools which have great margins of uncertainty. Consequently, while quantitative tools can be used, it will ultimately be necessary to make qualitative judgments. While it will be possible for there to be many technically respectable views of the uncertainties, the Commission staff has been considering techniques to guide judgments. One such technique is the performance of bounding analysis. Another possibility where the data is presented in the form of a cumulative probability distribution is to find that the method accurately represents the best current technical understanding.

STATES AND INDIAN TRIBE PARTICIPATION

When the Commission originally promulgated 10 C.F.R. Part 60, it contemplated that the principal procedural opportunities for States and Indian Tribes to participate in the repository selection and licensing process would be in the Commission's proceedings. NWPA, however, placed responsibility for funding mechanisms and support of State and Indian Tribes with DOE. The Act contemplates a close and ongoing relationship between DOE and the State and Indian Tribes through the mechanism of "Consultation and Cooperation". Consequently, the Commission has proposed to amend Part 60 to reflect the changed assumptions which resulted from the passage of NWPA.

Section 117 of NWPA does require the Commission to provide to the Governor and legislature of a State in which DOE proposes to locate a repository and to any affected Indian Tribes "timely and complete information regarding determinations or plans made with respect to site characterization siting, development, design, licensing, construction, operation, regulation, or decommissioning of the repository. In proposing changes to Part 60, the Commission indicated its desire to recognize the responsibilities of DOE to work with the States and Indian Tribes. In addition, the Commission noted that in view of the schedules and time constraints associated with NWPA

it appeared prudent to revise some of the procedures in Part 60 to make them more compatible with NWPA.

The Commission proposed to delete provisions in Part 60 calling for publication of a staff draft site characterization analysis. States and Indian Tribes who commented on the proposed revisions objected arguing that both a draft and final SCA should be retained because they have substantial expertise which NRC should consider before commenting to DOE on its site characterization plan. NRC staff has argued that it is generally aware of State and Tribe concerns because of the interaction process established by the Consult and Confer provisions of NWPA as well as the open meeting provisions associated with NRC/DOE procedural agreements. In its proposal for a Final Rule presented to the Commission (SECY-85-333), the staff has recommended dropping the draft SCA but allowing Tribal and State views to be submitted for NRC consideration after the issuance of DOE's SCP.

Some who commented on NRC's proposal suggested adding a provision to Part 60 which would prevent DOE from sinking shafts until the NRC, State, and Tribe comments on the SCP had been received. The Commission has deferred to DOE on interpretations of NWPA prior to submittal of an application. In this case, DOE would be the agency which has to decide this issue under Section 113(b) of NWPA.

A number of State and Indian Tribe who commented believe that the procedural amendments to Part 60 should not be finalized until rules implementing NEPA (conforming the provisions of 10 C.F.R. Part 60 with those in 10 C.F.R. Part 51) are also proposed. Others would also wait until the licensing procedural rules are ready for promulgation. The Commission staff has taken the view that these rule changes, while necessary, do not have to be promulgated simultaneously in order to provide effective opportunity to comment. A few words on the Commission's NEPA responsibilities, however, are appropriate. Section 114(f) of the NWPA provides for Commission adoption of the DOE Final Environmental Impact Statement "to the extent practicable". Other provisions of NWPA provide for judicial review of the adequacy of the DOE EIS within six months of its issuance. Consequently, the Commission will have before it a document which is "legally" adequate as an environmental impact statement at the time it determines whether to adopt. The question then becomes whether the "major federal action" the Commission has before it is the same "major federal action" considered in the DOE statement and if so, what further NEPA duty the Commission has in light of the judicially determined adequacy of the DOE EIS. Another question is the nature and extent to which the Commission is required to factor environmental issues identified in its "adopted EIS" into its decisionmaking.

There are several broad options which the Commission should consider when addressing the NEPA issue. One approach is to treat the DOE EIS as similar to the Commission's Early Site Review regulations in 10 C.F.R. Part 2. Since the DOE EIS may well have been determined adequate as a matter of law in the Federal Courts, the Commission could view that determination as sufficient for purposes of the NEPA assessment of site suitability. It therefore could adopt the statement and use it in its licensing process. Parties would be permitted to address the safety decision in the proceeding in light of the impacts identified in the statement but the statement itself would not be open to challenge unless the existence of substantial new information could be demonstrated. Another approach would be to conduct

rulemaking to specifically identify those environmental issues which the Commission would specifically review during its safety evaluation and those which it would not in light of the presumed adequacy of the DOE EIS which was adopted. The broadest approach would be to treat the EIS as an environmental report as Part 60 originally contemplated and to allow EIS contentions on the entire statement in the licensing proceeding.

No determination as to approach has yet been made by the Commission although it expects to set a schedule for rulemaking this spring which should be completed within the next year.

States and Indian Tribes have also sought changes to the Commission's Rules of Practice which would recognize them as parties to the waste proceeding. Current Commission practice is to allow government entities, such as States and Indian Tribes, to participate in adjudicatory proceedings in two alternative ways. They are able to "intervene" by setting forth specific statements of position under 10 C.F.R. § 2.714 known as "contentions". Alternatively, they can seek to participate as "interested states" under 10 C.F.R. § 2.715. In this latter case they are not required to set forth contentions nor to take any position on the issues in the

proceeding. However, if any party in the proceeding drops out, the State or Indian Tribe cannot pick up the leaving party's position without meeting the late-filed contention requirements. Some States have argued that this process lacks the certainty that they would like to have about their party status and have urged the Commission to formally codify their party status in the Part 60 procedural change. This issue will most likely become a part of the negotiated rulemaking procedure which will address Part 2 issues as noted above.

CONCLUSION

In the short time provided it is not possible to address all the issues which must be resolved through rulemaking over the next several years. The issues addressed here will be the most likely to be addressed during the remainder of this year and in 1987. The Commission's staff hopes to be able to resolve a number of significant technical issues through rulemaking before a DOE application is ready for submission. In the meantime, the issues already identified for rulemaking will require significant attention not only of the NRC but of DOE, States, Indian Tribes, and interested public groups as well.