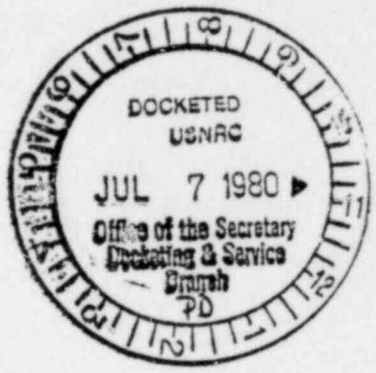

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE PRESIDING OFFICER

In the Matter of	)	
	)	
PROPOSED RULEMAKING ON THE STORAGE AND DISPOSAL OF NUCLEAR WASTE	)	PR-50, 51 (44 Fed. Reg. 61,372)
	)	
	)	
(Waste Confidence Rulemaking)	)	

SUMMARY STATEMENT OF POSITION OF THE UTILITY NUCLEAR WASTE MANAGEMENT GROUP- EDISON ELECTRIC INSTITUTE

(DOCUMENT 1 OF 4)

July 7, 1980

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SUMMARY STATEMENT OF POSITION OF THE UTILITY NUCLEAR WASTE MANAGEMENT GROUP- EDISON ELECTRIC INSTITUTE

I. Summary of Position and Conclusions

As stated in its Notice of Proposed Rulemaking, the Nuclear Regulatory Commission (the "Commission" or "NRC") has undertaken this proceeding

> to assess generically the degree of assurance now available that radioactive waste can be safely disposed of, to determine when such disposal or off-site storage will be available, and to determine whether radioactive wastes can be safely stored on-site past the expiration of existing facility licenses until off-site disposal or storage is available.[1/]

In its Statement of Position, filed on April 15, 1980, the Department of Energy ("DOE" or "Department") -- which has the statutory mandate and responsibility for the disposal of such waste -- stated that it would demonstrate in this proceeding that:

1. Spent nuclear fuel from licensed facilities ultimately can be disposed of safely off-site.

2. Disposal facilities will be in operation between 1997 and 2006, and the initial increment of off-site storage facilities can be in operation by 1983.

3. Spent nuclear fuel from licensed facilities can be stored safely either on-site or off-site until disposed of ultimately.2/

The Utility Nuclear Waste Management Group and the Edison Electric Institute ("UNWMG-EEI") support the position expressed by DOE and, in fact, believe that disposal facilities can be in operation earlier than the time frame indicated by the Department. However, it is the basic view of the UNWMG-EEI that -- in spite of the desirability of establishing disposal facilities in a timely fashion -- for purposes of this proceeding the precise time frame within which a repository will be operational is not of critical importance. As will be demonstrated in this proceeding, there is reasonable assurance that spent fuel can be stored in a safe and environmentally sound manner, either on-site or off-site, for as long a period as national policy may dictate. It will also be demonstrated that there is reasonable assurance that spent fuel can be safely disposed of in a geologic repository without environmental harm, and that the

schedule for the establishment of a repository is principally dependent upon policy decisions as to the extent of review which will precede the selection of a specific site.

This document (the "Summary Document") summarizes the UNWMG-EEI position in this proceeding as presented in much greater detail in the following three accompanying documents, which are also a part of UNWMG-EEI Statement of Position:

- "The Capability for Disposing of High-Level Wastes Safely" (the "Disposal Capability Document");
- "Long-Term Safety of Nuclear Waste Disposal: A Basis for Confidence" (the "Basis for Confidence Document"); and
- "The Capability for the Safe Interim Storage of Spent Fuel" (the "Storage Capability Document").

Based upon the extensive information and analysis contained in these documents, and the DOE Statement of Position, the UNWMG-EEI conclude that the Commission should find reasonable assurance that:

(1) Spent nuclear fuel from licensed facilities can be disposed of in a safe and environmentally acceptable manner;

(2) The Federal government's programs for establishing geologic repositories are an effective and reasonable means for developing a safe and environmentally acceptable disposal system;

(3) Spent nuclear fuel from licensed facilities can be stored in a safe and

environmentally acceptable manner on-site or off-site until disposal facilities are available;

(4) Sufficient additional storage capacity for spent nuclear fuel from licensed facilities will be established;

(5) Interim storage systems for spent nuclear fuel from licensed facilities will be integrated into an acceptable operating system up to and including disposal if such disposition becomes national policy;

(6) The Federal government's schedules for the establishment of a geologic repository to be operational sometime between 1997 and 2006 are conservative and capable of acceleration such that a facility could be made available significantly earlier;

(7) The initial increment of Federal off-site spent fuel storage facilities can be in operation by 1983; and

(8) No aspect of either spent fuel storage or waste disposal would be prohibitively expensive and, hence, unavailable.

Accordingly, the Commission should adopt a rule providing that neither the safety nor environmental implications of maintaining spent fuel on-site beyond the anticipated expiration of a nuclear reactor license need be considered in any individual licensing proceeding.

II. Background

A. History and Scope of Proceeding

This rulemaking was initiated by the Commission in

response to the decision of the United States Court of Appeals for the District of Columbia Circuit in Minnesota v. NRC, 602 F.2d 412 (1979). In addition, it is also a continuation of previous proceedings[3] conducted by the Commission in this area.[4]

In Minnesota v. NRC the D.C. Circuit remanded to the Commission two licensing actions for consideration of whether an off-site solution to the question of high-level nuclear waste will be available by the years 2007-09. These dates marked the expiration of the operating licenses for the Vermont Yankee and Prairie Island nuclear plants to which the Commission had granted authorization to increase on-site spent fuel storage facilities. If the Commission could not determine that an off-site solution would be available, consideration of whether spent fuel could be stored at the site beyond such dates would be required.[5]

As a result, the Commission decided to undertake a generic reconsideration of the radioactive waste question so that it could

(1) reassess its confidence that safe off-site disposal of radioactive waste from licensed facilities will be available;

(2) determine when any such disposal or off-site storage will be available; and

(3) if disposal or off-site storage will not be available until after the expiration of the licenses of certain nuclear facilities, determine whether the wastes generated by those facilities can be safely stored on-site until such disposal is available.[6/]

After hearing arguments at the prehearing conference held on January 29, 1980, the Presiding Officer sustained the position of DOE that this proceeding should consider, as the representative case, the disposal of high-level nuclear wastes as they are contained in spent nuclear fuel taken from commercial power reactors.[7/] As indicated at the prehearing conference, UNWMG-EEI strongly believe that, because of its high energy resource value, spent fuel should be reprocessed on the basis of both economic and resource conservation considerations.[8/] However, it is clear that, as far as this proceeding is concerned, the Commission need only find reasonable assurance that spent fuel can be stored safely and that the wastes contained therein can be adequately disposed of by any one, single method. Conclusions and findings based on a representative case involving the storage and disposal of spent fuel are thus fully

adequate to support a finding of confidence; although UNWMG-EEI remains convinced that the ultimate disposal of high-level waste will, in fact, be in the form of waste separated from reprocessed spent fuel.[9/]

The Presiding Officer's rulings also served to confirm that low-level waste and uranium mill tailings are not within the scope of the rulemaking, and that the safety of the transportation of spent fuel is beyond the ambit of this proceeding.[10/] Further, as previously specified in the Notice of Proposed Rulemaking, economic issues are relevant only to the extent that a waste disposal model will not be considered realistically available if it would be prohibitively expensive to build and operate such a facility.[11/]

As prescribed in the Notice of Proposed Rulemaking, participants' initial submittals -- their "statements of position" -- will be followed by cross-statements.[12/] These will then be followed by participant suggestions as to "further proceedings, additional areas of inquiry or further data or studies."[13/] Additional proceedings will then be conducted in accordance with an order to be issued by the Commission with the assistance of the Presiding Officer.[14/]

B. Involvement of UNWMG-EEI

The UNWMG is a group of 39 utilities that succeeded the Utility Waste Management Group ("UWMG") and the Radioactive Waste Management Group ("RWMG"),[15] both of which have long been active in the field of nuclear waste management. EEI is the association of investor-owned utility companies, organized in 1933, whose members provide more than 77 percent of the nation's electricity and serve about 67 million electric power customers. EEI serves as the principal forum where electric utility members exchange information on developments in their business, and maintains liaison between the industry and the Federal government. EEI has provided input on nuclear programs on behalf of its members for many years and has sponsored studies on various aspects of nuclear power. Recent EEI involvement in nuclear waste activities related to this proceeding includes the submittal of comments on the reports of the President's Interagency Review Group on Nuclear Waste Management (IRG); the DOE's Draft Environmental Impact Statement on Storage of U.S. Spent Power Reactor Fuel (DOE/EIS-0015-D); proposed 10 CFR Part 72 on independent spent fuel storage facilities; and, in conjunction with the UWMG, comments on the Draft Environmental Impact Statement on

Management of Commercially Generated Radioactive Waste (DOE/EIS-0046-D).

The UWMG was originally established in 1976 to encourage and assist governmental agencies in the development of constructive solutions to radioactive waste management problems. It made recommendations to, reviewed proposals of, and otherwise cooperated in nuclear waste related activities not only of the Commission, but of the IRG (including its subgroups), the Environmental Protection Agency (EPA), and DOE as well. Relevant submittals of the UWMG include comments on proposed 10 CFR Part 72 concerning licensing requirements for spent fuel storage at an independent spent fuel storage installation, and comments on the proposed portions of 10 CFR Part 60 concerning procedural rules for the licensing of geologic repositories. In addition, on September 13, 1979, the UWMG, EEI and the RWMG filed recommendations with the Commission concerning its announced intent to undertake the instant proceeding.

The RWMG was also established in 1976. Its purpose was to monitor Federal government programs concerning the storage and disposal of spent fuel and high level radioactive

waste, and to take steps to assure that those programs were implemented effectively and expeditiously. Toward this end the RWMG worked closely with both Federal agencies and Congress, as well as the scientific and technical community. The RWMG participated in rulemaking proceedings before both the Commission and the EPA and appeared in DOE hearings. Its representatives testified before Congressional committees and otherwise worked for the development of a sound legislative program for spent fuel storage and radioactive waste disposal. Utilities in the RWMG also participated in the litigation of important cases relating to radioactive waste management, including State of Minnesota v. NRC, 602 F.2d 412 (D.C. Cir. 1979), and Natural Resources Defense Council v. NRC, 582 F.2d 166 (2d Cir. 1978).

Accordingly, UNWMG-EEI represent a broad base of expertise in the area of nuclear waste management with a history of interest, involvement and accomplishment.

In preparing this Statement of Position, the UNWMG-EEI also made use of a broad base of expertise from outside of their own membership. The Disposal Capability Document

was prepared under the overall direction of Nuclear Safety Associates, Inc., with important contributions provided by a number of organizations including Jay L. Smith Company, Inc., Science Applications Incorporated, Westinghouse Electric Corporation, Exxon Nuclear Company, Inc., and the American Nuclear Energy Council. The Basis for Confidence Document was prepared by The Analytic Sciences Corporation ("TASC"), while the Storage Capability Document was compiled with the assistance of the General Electric Company and Westinghouse Electric Corporation. The submittal thus represents not only the experience and expertise of a large group of concerned and involved electric utilities, but a broad base of nuclear industry technical expertise as well.

III. Confidence in the Safe Disposal of Spent Fuel or High-Level Waste

The Disposal Capability Document first explains the basic requirements of a waste disposal system, then discusses alternative systems and presents the rationale for selecting a reference system (deep geologic disposal). The major portion of the document considers such a system in terms of its specific components, i.e., the site selection process; waste form and packaging; additional

engineered barriers; repository design and construction; waste emplacement; repository closure; and post-closure monitoring. Appropriate institutional issues, such as Federal-State consultation processes, and the availability schedule and costs of a repository system, are also discussed.

The Basis for Confidence Document focuses primarily on three related areas: the positive results obtained from safety assessments of nuclear waste disposal; the major issues affecting confidence in these results; and the technical basis underlying acceptance of these results as being conservative insofar as public health and safety are concerned.

As summarized below, taken together these two documents substantiate a high level of confidence that waste -- either as contained in spent fuel or in the form of reprocessing waste -- can be safely disposed of.

A. Disposal Capability Document

The basic requirements of a waste disposal system are considered in the Disposal Capability Document by taking into account the types and levels of radiation exposure that society finds acceptable, and then comparing the performance of prospective components of an overall geologic

repository system to the natural barriers surrounding an existing source of potential exposure: a uranium ore body. Reasonable risk levels with respect to possible radiation exposure of the general public, in the event of releases from the system, are suggested based on comparison with natural variations in background radiation.

In order to better understand the needed repository system performance, it is shown that natural radioactive decay makes a high degree of containment necessary for only about five hundred years. A new analytical method (involving the degree of isotopic retention required of the system, i.e., the "Retention Quotient") is also developed and presented as a useful tool for assessing the ability of the system to meet performance criteria. Utilizing the natural system barriers of a uranium ore body as a benchmark, the document demonstrates that it is entirely feasible to provide combinations of natural and engineered barriers in a geologic repository which will adequately protect public health and safety. (Section I).

Against this backdrop, alternatives to geologic systems for the ultimate disposal of waste are discussed. Very deep hole, rock melting, reverse well, outer space, ice sheet, island and sub-seabed disposal are considered.

Among these alternatives, only sub-seabed disposal emerges as a concept presently worthy of further consideration. However, it is clear that such a system cannot now be relied upon for waste disposal. Accordingly, a deep geologic disposal repository utilizing spent fuel as the waste form -- consistent with the defined scope of this proceeding -- is considered as a reference system for further analysis. (Section II).

The general approach utilized for discussing and evaluating the technology for each component of the waste disposal system is to characterize its status as revealed by the results of work in both the United States and abroad. Perceived "gaps and uncertainties" regarding the technology are then identified, along with the status of ongoing Federal programs in these areas. Also included are an assessment of the significance or relevance of any questions, and consideration of mitigating measures which could be employed if deemed necessary. Finally, conclusions are reached relating to the confidence the UNWMG-EEI believe is justified in the technology.

With respect to site identification and characterization, a high level of confidence exists that sites for a repository can be both identified and characterized in a

timely manner, and with adequate assurances of safe construction, operation, and long-term containment. Proven methods and technology are available for the largest part of the required work including -- most significantly -- the preliminary needs of site identification. Perceived gaps and uncertainties relate chiefly to a misunderstanding of the period over which a relatively high degree of containment is required, and to the current lack of site specific data. Further, the National Waste Terminal Storage (NWTS) Program for site selection and characterization is highly likely to identify favorable candidate sites. (Section III.A).

As for waste form and package, options are available for the disposal of spent fuel or solidified high-level waste. These include a variety of metallic and non-metallic cannister/overpack materials, and both glass and ceramic forms of solidified reprocessing waste. In addition, a multiplicity of stabilizers -- such as helium, to improve thermal and/or mechanical properties -- are available and, depending upon the nature of the waste form and the remainder of the waste package, can be selected to maximize waste package performance. (Section III.B). Further, if additional engineered barriers, such as

emplacement hole liners or sleeves, grouts or special backfills, are technically required, numerous materials are available for accomplishing specific physical and/or chemical functions in order to assure that overall performance requirements are met. (Section III.C).

Repository design and construction can conservatively proceed now on the basis of present knowledge. A variety of methods are currently available for the measurement of physical and mechanical properties of rock; and a combination of laboratory and in situ testing can adequately characterize rock properties. Induced stresses due to excavation can be predicted and controlled, and temperature profiles can be accurately calculated. The thermal source term can be adjusted by the specification of waste age and cannister spacing. There are no substantial problems associated with the technology for retrievability over whatever period deemed required. (Section III.D). Similarly, the technology for the handling and emplacement of wastes in a controlled, safe manner is well developed and presents no problems. In fact, techniques and equipment for handling waste cannisters in an underground environment have already been demonstrated as a result of Project Salt Vault. (Section III.E).

Finally, with respect to repository closure and post-closure monitoring, technology and analytical methods are well advanced. A substantial body of information and experience in the plugging and sealing of boreholes and shafts is available from operations in the petroleum and mining industries. Ongoing and planned NWTS programs are addressing special needs associated with longevity requirements for repositories, as well as geochemical investigations, modeling and analytical work. This program, coupled with field testing, will assure that seals can be designed and emplaced in a manner consistent with performance requirements of the overall repository system. (Section III.F).

The main goal of post-closure monitoring will be the identification of any human activity in the area, rather than detection of the extremely unlikely movement of radionuclides. More importantly, however, analytical models are now available to predict the long-term behavior of repositories with a high degree of confidence. When applied in a very conservative way to unlikely accident scenarios, they predict human exposure levels well below natural background. (Section III.G).

DOE's present programs for the establishment of a

repository are focusing upon all of the matters requiring attention, and DOE's forecast of potential operational dates is conservative. In particular, the UNWMG-EEI believe that the scope and extent of review of alternative media and sites prior to establishing the first repository need not be as extensive as presently contemplated by DOE and that, therefore, a repository could well be operational before 1997. In any event, the DOE forecast of potential operational dates includes ample allowance for uncertainties. (Section IV.A).

Both civilian power and defense related nuclear programs -- and, thus, nuclear waste management -- are vital to national interests. Although the institutional and programmatic aspects of nuclear waste management are complex, considerable progress has been made by involved institutions toward resolving potential obstacles to the timely and successful siting, licensing, construction and operation of geologic repositories. While the pace has been slow, the Administration is committed to achieving coordination of the activities of Federal agencies and to providing an effective role for State and local governments. Congressional funding of waste management programs and legislative initiatives demonstrate the the U.S.

Congress will be a constructive force in fostering and assuring the timely resolution of problems. There is no reason to believe that our institutions and their processes will fail to deal successfully with nuclear wastes; particularly in view of the profound national interest perspective which is a pervasive element of every aspect of the institutional deliberations. (Section IV.B).

In addition to establishing confidence in the technological base for the disposal of nuclear waste, it is also necessary to determine that the costs associated with such disposal are not so great as to preclude construction and operation of the system. The total cost of waste disposal is estimated to be less than 1 mill/kwh. Clearly, this cost does not represent a major contribution to electric power production expenses and, accordingly, does not present any major obstacle to the implementation of a disposal system. (Section V).

B. Basis for Confidence Document

The Basis for Confidence Document, which is a close companion to the Disposal Capability Document, presents a detailed treatment of the grounds for confidence in the long-term safety of nuclear waste disposal.

The report begins with a comprehensive summary of prior long-term safety assessment studies. These assessments employ mathematical modeling techniques to predict long-term consequences to the public of nuclear waste disposal. The most realistic and reliable analyses predict doses which are a small fraction of natural variations in background radiation even under conditions which assume the partial failure of engineered and geologic barriers. The most conservative and pessimistic analyses predict levels of exposure that are no greater than those experienced from certain naturally deposited uranium ore bodies. Collectively, the studies provide a firm basis for assessing the status of knowledge concerning nuclear waste disposal risks. All of the studies are shown to support positive conclusions with respect to long-term public health and safety. (Section 1).

Important issues affecting confidence in analyses of disposal safety are also considered. These issues are primarily a consequence of the very long time periods over which risk predictions are made. Doubts that have been expressed regarding the safety of disposal stem from a concern over predictions covering such long periods of time. This issue is first addressed by presenting a number of

reasonable comparisons to other known hazards or phenomena, such as non-radioactive toxic wastes and natural ores. The comparisons provide a useful perspective on the hazard potential of nuclear waste. Next, sources of uncertainty in predictive results are considered in detail. Issues involving events that could occur and affect waste containment are explored, including a discussion of possible human action scenarios. The role of testing and research as a means for reducing uncertainties is described, including the need for developing a perspective on the costs and benefits of data acquisition and analysis. Finally, an overview is presented on how and why a "systems approach" can lead to fully acceptable repository siting, design and performance. (Section 2).

The report also considers the concepts of and relationship between confidence and conservatism. Within this context a technical basis for confidence in the results of safety assessments is developed. Such confidence is grounded on conservatism in analyses, conservatism in repository siting and design, and the existence of multiple barriers to waste release which provides defense-in-depth against the migration of radioactive materials. A review of major past experimental evidence demonstrates that

confidence in the results of predictive analyses is justified. (Section 3).

C. Conclusions

Based on the detailed analyses contained in the Disposal Capability and Basis for Confidence Documents the following summary conclusions can be drawn:

(1) An acceptable nuclear waste disposal system must protect the public now and in the future from undue risk of excessive radiation exposure. Radiation risks equivalent to those associated with the exposure of populations to a small fraction of the natural variations in background would appear to be a reasonable, rational general criterion for the degree of radiation protection that should be provided by a suitable waste disposal system.

(2) Based on a conservative, detailed examination and evaluation of all significant system components, there is a high degree of confidence that the desired protection can be provided by a system for the disposal of spent fuel or a solidified waste form, in appropriately located, designed, constructed and operated repositories in suitable deep geologic formations.

(3) Repository sites can be identified and conservatively evaluated with a high degree of confidence in their long-term stability and integrity with respect to naturally occurring disruptive and transportive phenomena.

(4) Technology exists for the practicable, conservative implementation and application of every component of an overall geologic repository system.

(5) Where so-called "gaps and uncertainties" in technology are perceived to exist, they are readily amenable to conservative bounding and can be compensated for by a wide range of operational approaches and engineered barriers. The final design, construction and operating parameters of a geologic repository will be based on site-specific data and on the results of ongoing developmental programs. No scientific or technological "breakthrough" is required for the proper use and application of data and information as it is acquired.

(6) Conservatism in analyses, conservatism in repository siting and design, and the existence of multiple barriers to waste release provide a high level of confidence that the potential risks to the public of a geologic repository have been properly assessed.

(7) DOE's present programs for the establishment of a repository are focusing upon all of the matters that need to be addressed, and DOE's forecast of operational dates in 1997-2006 includes ample allowance for any uncertainties, including institutional considerations. An earlier operational date could be achieved by narrowing the scope and extent of review of alternative media and sites.

(8) The total cost of waste disposal will be less than 1 mill/kwh and will not present any major obstacle to the implementation of a disposal system.

IV. Confidence in the Safe Storage of Spent Fuel

A. Storage Capability Document

The Storage Capability Document addresses the safe storage of spent fuel at reactor sites and other locations until such time as facilities for the ultimate, off-site disposal of such fuel are available. The document describes storage technology primarily in terms of water basin storage, and contains a discussion of both the historical background and technical experience associated with this type of storage. Water basin storage systems are not complex and involve straightforward, well-known and well-developed techniques and technologies in their design, construction and utilization. Both stainless steel and Zircaloy clad fuels have been maintained in water basin storage for considerable lengths of time. Research and historic experience confirm the ability of spent fuel to withstand extended periods of storage in water basins. (Section III).

Next, the magnitude of present storage capacity and projections of future need are considered. Options for meeting storage demands are discussed, and the technical factors associated with an ability to maintain spent fuel in storage for extended periods are considered in detail. More specifically, various projections of spent fuel

discharge rates are presented against a backdrop of existing storage capacity and methods available for expansion, including the reracking of existing storage pools at reactors, construction of at-reactor spent fuel storage facilities, and the use of away-from-reactor spent fuel storage pools. The straightforward, proven technical principles available for meeting the requirements of spent fuel storage are discussed in terms of the low energy generation rates involved, stable nature of fuel in the storage pool environment, and fuel pool siting and system design considerations. (Section IV, V and VI).

Finally, the document considers the capability available for spent fuel storage in terms of overall management and costs. The use and expansion of existing reactor spent fuel storage pools, plus the development of at-reactor independent spent fuel pools and away-from-reactor facilities, are all discussed in terms of institutional considerations, scheduling, logistics and cost. Although the timing of Congressional action and the length of NRC licensing reviews are difficult to predict, it is shown that the first Federal away-from-reactor spent fuel storage facilities can be in operation by 1983. (Sections VII and VIII).

B. Conclusions

Based on the detailed analysis contained in the Storage Capability Document the following summary conclusions can be drawn:

(1) Spent fuel storage in water-filled basins -- either at a reactor's spent fuel pool, a separate at-reactor pool, or an away-from-reactor (AFR) facility -- is a safe, proven technology capable of storing spent fuel for many decades. Additional options, such as dry storage, can provide the capability to safely store spent fuel for even longer periods.

(2) Spent fuel handling and storage capability is now available and will continue to be available, as necessary, to accommodate the spent fuel being generated from reactors in operation, under construction and planned.

(3) The initial increment of Federal off-site spent fuel storage facilities can be in operation by 1983.

V. Storage and Disposal System Integration

Spent fuel management will involve the interim storage of fuel at reactors and AFR sites and subsequent shipment to permanent repositories. The individual components of an integrated spent fuel management system are interactive, with the needed availability, capacity, etc. of one component affecting the availability, capacity, etc. of other

components. It is clear, however, that an integrated system can be fashioned to accommodate the continuing production of spent nuclear fuel.

Under one scenario, most reactor fuel will be stored by utilities at reactor fuel pool installations. Through the year 1996, there will be a need for 13,300 MTU of storage at AFR facilities.[16/] Assuming, conservatively, that the first repository begins receiving spent fuel in mid-1997, and that subsequent repositories commence operations at 3-year intervals thereafter, the maximum AFR storage capacity needed would be 20,000 MTU.[17/] Assuming, for example, large AFR spent fuel pools with 10-year lead times, adequate interim storage would be no problem.[18/] Other scenarios are also readily achievable.

Spent fuel, of course, will have to be shipped from reactors either to interim storage facilities and then to permanent repositories, or directly to the repositories themselves. This will require the availability of adequate numbers of spent fuel shipping casks. The precise number of casks and their timing depends upon the particular strategy chosen, including the need to ship spent fuel to AFR's, the timing and loading/unloading capability of the AFR's, and the timing and loading capability of permanent

repositories. Utilizing existing casks, transportation requirements imposed can be met until at least the late 1980's.[19] A higher capacity for spent fuel transportation will be required once repositories become available, since shipments can be expected from both reactor storage pools and AFR storage facilities.[20] Under one scenario about 44 rail casks and 14 truck casks will be required by 1997. These will increase to a peak of 203 rail casks in 2005 and 43 truck casks in 2010.[21] As a general rule, it can be assumed that it will require about two years to deliver a spent fuel shipping cask after an order has been placed. Provided that casks are ordered on a timely basis, there appears to be no reason why all of the necessary casks cannot be provided.[22]

Detailed logistical requirements will depend upon the results of the development of a total waste management system optimized in terms of cost and benefits. However, for any set of reasonable assumptions, logistical considerations do not appear to be a limiting factor.

REFERENCES

1. 44 Fed. Reg. 61,372, 61,373 (1979).

2. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, p. I-4.

3. In connection with a petition for rulemaking filed by the Natural Resources Defense Council the Commission considered earlier the related question of the likelihood that waste disposal will be accomplished safely, and at that time it found reasonable assurance that methods of safe permanent disposal of high-level waste would be available when they were needed. 42 Fed. Reg. 34,391 (1977), pet. for rev. dismissed sub nom. NRDC v. NRC, 582 F.2d 168 (2nd Cir. 1978). However, in denying the NRDC petition, the Commission announced its intent to reassess this finding periodically.

4. 44 Fed. Reg. 61,372-73 (1979).

5. Minnesota v. NRC, 602 F.2d 412, 418 (D.C. Cir. 1979).

6. 44 Fed. Reg. 61,373 (1979).

7. Tr. 112-19; In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, First Prehearing Conference Order, February 1, 1980, pp. 9-10.

8. See Tr. 112-19; In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Summary of UWMG-EEI Positions Re Subjects Identified in Notice of Prehearing Conference, January 28, 1980, pp. 3-4.

9. Because spent fuel is more difficult to handle than solidified reprocessing waste, the showing which has been made that spent fuel can be disposed of also supports a conclusion that reprocessing waste can be handled.

10. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, First Prehearing Conference Order, February 1, 1980, pp. 10-99.

11. 44 Fed. Reg. 61,372, 61,373 (1979).

12. See also In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, First Prehearing Conference Order, February 1, 1980, p. II.

13. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, First Prehearing Conference Order, February 1, 1980, p. 12.

14. Id.; 44 Fed. Reg. 61,372, 61,374 (1979).

15. See generally, In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Notice of Reconstitution and Change of Name of the Utility Waste Management Group (UWMG) to the Utility Nuclear Waste Management Group (UNWMG) and Answer of the UNWMG-EEI to the State of Minnesota and State of Wisconsin Motions for Extension of Time, May 16, 1980.

16. See In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, pp. V-24, VI-2 to -3; Interim Storage of Spent Fuel, July 7, 1980, pp. 11-13.

17. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, p. VI-3.

18. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, The Capability for the Safe Interim Storage of Spent Fuel, July 7, 1980, § VII.B.

19. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, p. VI-9; The Capability for the Safe Interim Storage of Spent Fuel, July 7, 1980, § VIII.

20. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, p. VI-9.

21. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, pp. VI-9 to -11.

22. In the Matter of Proposed Rulemaking on the Storage and Disposal of Nuclear Waste, Statement of Position of the United States Department of Energy, April 15, 1980, p. 11; The Capability for the Safe Interim Storage of Spent Fuel, July 7, 1980, § VIII.