

REGULATORY AND ADMINISTRATIVE ACTIONS
IMPACTING ON SPENT FUEL STORAGE FUNCTIONS

Homer Lowenberg
Lowenberg Associates, Inc.
Rockville, MD 20852

ABSTRACT

Interim or longer term storage of spent fuel by utilities or the Federal government that may be required prior to disposal in a deep geologic repository may be impacted in a variety of ways by regulatory and administrative actions. The Nuclear Waste Policy Act of 1982 (NWSA) provides for interim storage of spent fuel by both utilities and the Department of Energy (DOE). The Utilities owning spent fuel have primary responsibility for interim spent fuel storage at reactor sites. The Nuclear Regulatory Commission's (NRC) Waste Confidence Rulemaking addressed the environmental and safety implications of both onsite and offsite storage of spent fuel. This NRC decision makes findings that impact on both forms of spent fuel storage and amends its regulations, 10 CFR Parts 50 and 51, covering reactor licensing and environmental protection. NRC is carrying out reviews of topical reports for dry cask storage of spent fuel at utility sites under its regulation 10 CFR Part 72. Several such reviews are under way now and additional applications are expected in 1985. It is anticipated that cask vendors will also seek certificates of compliance for transportation purposes under 10 CFR Part 71.

When a utility cannot adequately store spent fuel and the NRC determines under 10 CFR Part 53 that away from reactor (AFR) storage is necessary, then DOE is required under NWSA to provide for up to 1900 metric tons of licensed capacity at Federal facilities. Costs of interim storage and transportation by DOE will be obtained from an interim utility financed storage fund. NWSA also provides for longer term storage of spent fuel in NRC licensed monitored retrievable storage (MRS) facilities by DOE. DOE is to submit a proposal to Congress by June 1, 1985 for construction of one or more MRS facilities in accordance with NRC regulations. These and other regulatory and administrative actions will impact on activities to store spent fuel prior to its disposal.

INTRODUCTION

The schedule for when the DOE is planning to take possession of spent fuel for either interim or longer term storage or disposal is likely to be a time significantly in the future.¹ Thus the nuclear utilities are focusing increased attention on actions that will be required to handle storage of their spent fuel until that time.

Under the NWSA, utilities are assigned the responsibility for storage of spent fuel at reactor sites.² Such storage must be carried out in accordance with NRC regulations. In the event that spent fuel storage is handled within reactor facilities it must conform to the provisions of 10 CFR Part 50.³ For those cases where separate or independent spent fuel storage installations are employed, 10 CFR Part 72 of the NRC regulations must be complied with.⁴

WASTE CONFIDENCE PROCEEDING

Based upon the remand of the D.C. District Court of Appeals, the Commission initiated a generic rulemaking on the storage and disposal of spent fuel in October, 1979 that has been called the "Waste Confidence Proceeding."⁵ The purpose of this proceeding was

to assess generically the degree of assurance available that:

1. Radioactive waste can be safely disposed of,
2. When disposal or offsite storage would be available, and
3. Whether onsite storage of such wastes can be safely handled until offsite disposal or storage is available.

This proceeding, which included an assessment of the environmental and safety implications of onsite (AR) and offsite (AFR) spent fuel storage, involved about thirty interested parties and took about five years to complete. DOE, as the lead Federal agency on nuclear waste management, filed its statement in April, 1980 followed by the other participants in June of that year. Cross statements from about twenty participants were filed in August, 1980.

The NRC working group on this matter submitted its report to the Commission in early 1981 summarizing the record and its adequacy and identified key issues and controversies. Twenty participants commented on the working group report in March, 1981.

In order to simplify the ongoing proceedings, the Commission consolidated the participants into four groups:

- a. federal government,
- b. state and local governments,
- c. industry, and
- d. public interest groups.

These groups made oral arguments to the Commission in January, 1982. During the preparation of the Commission decision in this matter, the Congress enacted the NWPA which had significant effect on the decisional process and had to be factored into the final Commission findings. The Commission issued its draft decision in May, 1983 which allowed for further public comment related to the implications of the NWPA, the safety of dry spent fuel storage and its proposed amendments to 10 CFR Part 51.

The Commission's final decision in the Waste Confidence proceeding was issued in August, 1984 along with amendments to its regulations 10 CFR Part 50 and 51 to address the environmental effects of extended onsite storage of spent fuel in licensing proceedings.

The five basic Commission findings in this proceeding indicate reasonable assurance that:

1. Safe disposal of spent fuel in a mined geologic repository is technically feasible.
2. One or more geologic repositories for spent fuel will be available in the time frame of 2007 to 2009. Sufficient repository capacity will be available within 30 years of the expiration of any reactor operating license to dispose of its generated spent fuel.
3. Spent fuel will be managed in a safe manner until sufficient repository capacity is available for its safe disposal.
4. Spent fuel can be stored onsite or offsite safely and without significant environmental impacts for at least thirty years beyond any reactor's operating license.
5. Safe independent onsite or offsite spent fuel storage will be made available if needed.

These Commission conclusions will be reviewed with regard to significant or pertinent unexpected events or at least every five years until a geologic repository is available.

COMMISSION RULE CHANGES

Based upon the above Commission

findings, rule changes were enacted to its regulations 10 CFR Part 50 and 51 to address the management of spent fuel. Where a reactor operating license expires before a repository is available, the amendment to Part 50 covering reactor licensing is intended to provide adequate lead time to assure safe and environmentally acceptable spent fuel management. This is accomplished by a modification to Section 50.54 requiring the licensee to submit plans to NRC for review and approval, at least five years prior to the operating license expiration, concerning the disposition of its spent fuel. In the event that extended spent fuel storage at the reactor site after license expiration is planned, an amendment to the Part 50 license for possession only of spent fuel will be required.

In the case of Part 51, the environmental protection regulation,⁸ the Commission revised Section 51.23 to add sections (b) and (c) for procedures required in individual licensing cases. This provision continues the existing practice of limiting consideration of spent fuel environmental impacts to the license period and not requiring the discussion of environmental effects of extended storage past license expiration.

It should be noted that the same safety and environmental considerations apply to spent fuel storage facilities licensed under 10 CFR Part 72 as for storage in reactor storage pools. Thus licensing actions for spent fuel storage in new or existing facilities or expanded capacity at existing facilities will require consideration of safety and environmental impacts of such storage for the term of the requested license.

EXPANDED ONSITE STORAGE

In anticipation that expanded storage will be required at reactor sites, a number of vendors of spent fuel casks have submitted topical reports to NRC for generic review and approval of casks for dry spent fuel storage. To date five topical reports⁹ have been submitted to NRC as follows:

1. GNSI - Castor Ic - Nodular cast iron design for 16 BWR assemblies - Initial use by TVA.
2. GNSI - Castor V - Nodular cast iron design for 21 PWR assemblies - Initial use by VEPCO.
3. Westinghouse Electric Corp. - Forged steel design for 24 PWR assemblies - Initial use by VEPCO.
4. Nuclear Assurance Corp. - Stainless steel and lead design for 31 PWR assemblies - Initial use undesignated.
5. Nutech - Carbon steel canister design for 7 PWR assemblies inside of a horizontal concrete module - Eight modules planned by CP&L.

Additional submittals are expected from other vendors during 1985.

Following regulatory review, when a cask is generically approved for dry storage of spent fuel, a certificate of compliance will be issued.

The certificate of compliance can then be used by any utility in conjunction with an application for independent spent fuel storage at a specific site. Thus the actual application under 10 CFR Part 72 can in effect integrate the generic or topical cask approval with the site specific conditions to achieve an expedited approval for spent fuel storage at a particular utility facility.

Concurrent with the present NRC licensing activities proceeding under this regulation, the NRC staff is also considering revisions to Part 72 primarily to address the requirements of an MRS facility to be operated by DOE and to factor experience gained by licensing reviews and actions into an upgraded regulation. Thus NRC is anticipating increased activity in the area of spent fuel storage and is adjusting its relevant regulation to be able to carry out licensing actions in a more effective and efficient manner.

FEDERAL INTERIM STORAGE

In the event that a utility finds itself in the situation where its full core reserve capabilities may be impacted by inability to adequately store spent fuel, the NWPA requires application to the NRC for a determination of adequacy of available spent fuel storage. NRC promulgated a new part to its regulations, 10 CFR Part 53,¹⁰ to cover the requirements for consideration of such applications. In the event of an NRC finding of inadequate available spent fuel storage capability at a particular utility site, DOE is required to provide licensed storage for such fuel up to a maximum of 1900 metric tons at Federal facilities.

Since this part of the NRC regulations was promulgated about a month ago, February 11, 1985, it is appropriate to note some of its key provisions below:

- o Application for an NRC determination must be made by June 30, 1989.
- o A thirty day comment period on the application is provided.
- o Any "extraordinary costs" and any local government or public service commission commitments should be cited.
- o Only feasible storage alternatives need be considered.
- o Diligence in pursuing storage alternatives should be shown.

- o An initial determination will be made by the Executive Director of Operations.
- o At its discretion, the Commission can review the initial determination.
- o No opportunity for hearing or petition on the initial or final determination is provided.
- o Commission position on storage - Full core reserve is necessary for orderly operation of a reactor.
- o Final determination will be made within six months of application.

Any transportation of spent fuel and interim storage at a Federal facility by DOE will be paid for by an interim storage fund that will be financed by payments from the utilities requiring such services.

MONITORED RETRIEVABLE STORAGE

The NWPA recognized that longer term storage of spent fuel may be necessary before permanent disposal is achieved.¹¹ The Congress, in the act, states that monitored retrievable storage (MRS) is "a safe and reliable option" for long term storage of spent fuel. The NWPA indicates that DOE is to submit a proposal to the Congress by June of this year covering the construction of two alternative concepts at three different sites.

Early studies by DOE to carry out this mandate considered eight different technical concepts for the MRS. In early 1984 DOE selected two of the technical concepts to be the basis of its proposal to Congress. The primary concept is Sealed Storage Casks and the alternative approach is Field Drywells.

More recently DOE has analyzed its ability to meet the 1998 target for acceptance of spent fuel from utilities and has further considered the total spent fuel management system in an integrated approach to meet that goal. As a result of these studies, it appears that the functions of an MRS for receipt, handling, packaging and adapting spent fuel from multiple reactors are quite similar to the operations contemplated for a repository. Combining those aspects with the logistical considerations of safety and economics of transportation of spent fuel to the repository seems to logically point towards the need for a strategically located intermediate facility in the integrated system from both operational and flexibility standpoints.¹²

Thus it appears that an MRS or a regional receipt and handling facility or whatever you wish to call it might emerge as an important unit of the integrated spent fuel management system. Regardless of

what role or name the MRS assumes, its siting, construction and operation in accordance with NRC licensing regulations is required. As noted above, the NRC is currently modifying 10 CFR Part 72 to cover the licensing of an MRS owned and operated by DOE. It is expected that a proposed rulemaking on this regulation will be released early in 1985.

CONCLUSION

It is apparent from the above discussion that the management of spent fuel is being considered actively by the utilities and DOE, the potential licensees; the vendors of casks and transportation equipment and the regulators. The precise direction that will be selected by the industry for spent fuel management is not finalized, but clearly dry spent fuel storage either with or without rod consolidation will likely play an important role in this activity for onsite or offsite operations.

To be prepared to address the increased activity in this area, NRC has moved forward in a number of areas. In the rulemaking arena, three steps have been taken:

1. Completion of Waste Confidence Proceeding and modification of relevant Parts 50 and 51 of its regulations;
2. Promulgation of a new Part 53 to determine utility eligibility for Federal interim spent fuel storage, and
3. Revision of Part 72 for licensing of an MRS, or other similar facility.

In the licensing field generic topical reviews of casks for dry spent fuel storage are progressing on five units and applications by utilities for specific site installations will follow based upon generalized certificates of compliance.

REFERENCES

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