SPENT FUEL STORAGE

Intent To Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel

From the early days of the nuclear power industry in this country, electric utilities planning to construct and operate light water nuclear power reactors contemplated that the used or spent fuel discharged from the reactors would be chemically reprocessed to recover the remaining quantities of fissile and fertile materials (uranium and plutonium), and that the materials so recovered would be recycled back into fresh reactor fuel. It was contemplated by the nuclear industry that spent fuel would be discharged periodically from operating reactors, stored in onsite fuel storage pools for a period of time to permit decay of radioactive materials contained within the fuel and to cool, and periodically shipped offsite for reprocessing. Typically, space was provided in onsite storage pools for about one and one-third nuclear reactor cores. Assuming a four-year reactor fuel reload cycle, such onsite storage pools were planned to hold an average of one year's discharge with sufficient remaining capacity to hold a complete core should unloading of all of the fuel from the reactor be necessary or desirable because of operational difficulties. Under normal operating conditions, an average of five years' discharge could be accommodated before the pool were filled.

Persons planning to conduct commercial reprocessing of spent reactor fuels provided sufficient storage capacity for the spent fuels at their facilities to allow some operational flexibility. Typically, space has been provided or planned for several spent fuel core reloads. Three commercial reprocessing plants have been planned for operation in the United States. The only such plant that has actually operated, Nuclear Fuel Services (NFS) plant at West Valley, New York, was shut down in 1972 for extensive alterations and expansion. There is a pending proceeding before the Nuclear Regulatory Commission (Commission) on NFS's application for a permit to construct these alterations and expansion (docket no. 50-201). The second plant, General Electric Company's Midwest Fuel Recovery Plant at Morris, Illinois, has never operated and is in a decommissioned condition. The third plant, Allied General Nuclear Services' (AGNS) proposed plant in Barnwell, South Carolina, is under construction and is the subject of pending proceedings before the Commission regarding the continuation, modification or suspension of the construction permit from an environmental protection standpoint, and the possible issuance of an operating license (docket no. 50-332), as well as a related matter (docket no. 70-1729).

On May 8, 1975, the Nuclear Regulatory Commission published a notice in the FEDERAL REGISTER setting forth its provisional views that, subject to consideration of comments, (1) a cost-benefit analysis of alternative safeguards programs should be prepared and set forth in draft and final environmental impact statements before a Commission decision is reached on wide-scale use of mixed oxide (recycle plutonium) fuels in light water nuclear power reactors, (2) there should be no additional licenses granted for use of mixed oxide fuel in light water nuclear power reactors except for experimental purposes, (3) with respect to light water nuclear power reactor fuel cycle activities which depend for their justification on wide-scale use of mixed oxide fuel in light water nuclear power reactors, there should be no additional licenses granted which would foreclose future safeguards options or result in unnecessary "grandfathering" and (4) the granting of licenses would not be precluded for fuel cycle activities for experimental and/or technical feasibility purposes.

In light of the status of the three planned commercial reprocessing plants in the United States, as outlined above, the earliest that spent fuel reprocessing could begin on a commercial basis, if authorized, would be late 1976. This assumes that the pending licensing proceedings are completed and licenses issued by this date. However, the spent fuel pools at a number of reactors may soon be filled, and still other reactors will have their pools filled before the end of 1978. Accordingly, even if limited reprocessing should begin in late 1976, there would still be a shortage in spent fuel storage capacity.

The existing pools at the GE and NFS reprocessing plants have some remaining marginal licensed storage capacity which may be able to accommodate the fuel discharges from some reactors; any increases planned at these plants may not be sufficient for industry in the future. Consequently, there is the possibility of a future shortage in licensed spent fuel capacity regardless of the outcome of the proceedings on the May 8th notice.

The Commission has not promulgated any regulation which specifies a given size for on-site reactor spent fuel pools; however, proposals by reactor licensees to significantly change the manner of spent fuel storage or spent fuel pool size would be subject to licensing review by the Commission. In the event that a particular on-site spent fuel pool should become filled, and no alternative form of spent fuel storage could be found,

the reactor would be eventually forced to shut down and "store" the last spent reactor fuel in the reactor pressure vessel. While no serious adverse consequences to the public health and safety, the common defense and security, or the environment would likely result, the reactor shutdown would, of course, remove the plant from service, and this in turn could adversely affect the electric utility's ability to meet electrical energy needs, or force the utility to operate other plants that are less economical to operate or which have greater environmental impact, and thereby adversely affect the public interest.

There appear to be a number of possible alternatives for increasing spent fuel storage capacity including, among other things, increasing the storage capacity at present reactor sites, and construction of independent spent fuel storage facilities. The shortage of spent fuel storage capacity will occur at individual reactors, and the Commission could adequately address the issues involved on a case-by-case basis within the context of individual licensing reviews. Indeed, the Commission has not, to date, found it necessary, in the discharge of its licensing and related regulatory functions, to develop any overall program of action to deal with the problem. The Commission does, however, have the discretion to deal with issues of this type on a generic basis through the exercise of its rulemaking authority and/or the issuance of a "generic" environmental impact statement. Rulemaking proceedings and/or the issuance of a generic environmental impact statement might, as appropriate, serve as the context for the promulgation of more definitive criteria regarding size and design of spent fuel pools and/or the licensing of independent spent fuel storage facilities, and for consideration of possible revision of the fuel cycle environmental impacts set forth in 10 CFR § 51.20(e) in light of additional spent fuel storage and attendant transportation. Also, the possible implications of increased spent fuel storage on the options available for intermediate and long-term storage of nuclear waste materials could profitably be examined within this context.

One group of interested organizations (Natural Resources Defense Council, Sierra Club, and Businessmen for the Public Interest) has requested the Commission to prepare a generic environmental impact statement on the handling and storage of spent reactor fuel and related matters (letter to L. V. Gossick from Anthony Z. Roisman, dated May 20, 1975, copy on file at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C.)

While the Commission believes, as earlier indicated, that the matter of spent fuel storage capacity can adequately be addressed on a case-by-case basis within the context of individual licensing reviews, it also believes that, from the standpoint of longer range policy, this matter can profitably be examined in a broader context. It views the preparation of a generic environmental impact statement as a suitable vehicle for such an examination. Notice is hereby given that a generic environmental impact statement on the handling and storage of spent light water power reactor fuels will be prepared by the Commission. The statement will focus on the time period between now and the mid 1980's and will address:

(1) The magnitude of the possible shortage of spent fuel storage capacity;

(2) The alternatives for dealing with the problem, including, but not necessarily limited to:

(a) Permitting the expansion of spent fuel storage capacity at power reactors;

(b) Permitting the expansion of spent fuel storage capacity at reprocessing plants;

(c) Licensing of independent spent fuel storage facilities;

(d) Storage of spent fuel from one or more reactors at the storage pools of other reactors;

(e) Ordering that generation of spent fuel (reactor operation) be stopped or restricted;

(3) A cost-benefit analysis of the alternatives listed in (2), along with any other reasonably feasible alternatives, including:

(a) Impacts on public health and safety and the common defense and security;

(b) Environmental, social, and economic costs and benefits;

(c) Commitments of resources;

(d) Implications regarding options available for the intermediate and long-term storage of nuclear waste materials;

(e) Relationship between local short-term uses of the environment and long-term productivity;

(4) The impacts of possible additional transportation of spent fuel that may be required should one or more of the alternatives be adopted;

(5) More definitive standards and criteria to govern the licensing of one or more of the alternatives for dealing with the problem; and

(6) Possible amendments to 10 CFR § 51.20(e).

If appropriate, rulemaking proceedings on items (5) and (6) listed above, or on other issues related to the handling and storage of spent reactor fuel, will be initiated on or about that time of issuance of the draft generic environmental impact statement.

The Commission has also given careful consideration to the question whether licensing actions intended to ameliorate a possible shortage of spent fuel storage capacity, including such actions as the issuance of operating license amendments to permit increases in the storage capacity of reactor spent fuel pools or reprocessing plant spent fuel storage pools, or the licensing of independent spent fuel storage facilities, should be deferred pending completion of the generic environmental impact statement. Such a deferral was requested in the letter on behalf of Natural Resources Defense Council, Sierra Club, and Businessmen for the Public Interest noted above. In considering this matter, the Commission had two basic objectives in mind: on the one hand, the generic impact statement should not serve as a justification for a fait accompli; on the other hand, the public interest considerations associated with such a deferral should be carefully weighed. The Commission has concluded that there should be no such general deferral, and that these related licensing actions may continue during the period required for preparation of the generic statement subject to certain conditions. In reaching this conclusion, the Commission has considered the following specific factors:

(1) It is likely that each individual licensing action of this type would have a utility that is independent of the utility of other licensing actions of this type;

(2) It is not likely that the taking of any particular licensing action of this type during the time frame under consideration would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other individual licensing action of this type.

(3) It is likely that any environmental impacts associated with any individual licensing action of this type would be such that they could adequately be addressed within the context of the individual license application without overlooking any cumulative environmental impacts;

(4) It is likely that any technical issues that may arise in the course of a review of an individual license application can be resolved within that context; and

(5) A deferral or severe restriction on licensing actions of this type would result in substantial harm to the public interest. As indicated, such a restriction or deferral could result in reactor shutdowns as existing spent fuel pools become filled. It now appears that the spent fuel pools of as many as ten reactors could be filled by mid-1978. These ten reactors represent a total of about 6 million kilowatts of electrical energy generating capacity. The removal of these reactors from service could reduce the utilities' service margins to a point where reliable service would be in jeopardy, or force the utilities to rely more heavily on less economical or more polluting forms of generation that would impose economic penalties on consumers and increase environmental impacts.

The Commission expects that any licensing action intended to ameliorate a possible shortage of spent fuel storage capacity during this interim period would be accompanied by an environmental impact statement (10 CFR § 51.5(a)) or impact appraisal (10 CFR § 51.5(c)) tailored to the facts of the case. Since the Commission's general conclusions with respect to the five factors, as set forth above, may not fit the factual circumstances of particular licensing actions, the five factors will be applied, weighed and balanced within the context of these statements or appraisals in reaching licensing determinations.

Dated at Washington, D.C. this 10th day of September 1975.