

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 10, 1981



MEMORANDUM FOR: Commissioner Ahearne
FROM: Edward J. Hanrahan *EJH*
SUBJECT: CONSIDERATION OF REPROCESSING IN THE WASTE CONFIDENCE PROCEEDING

In your memorandum of February 9, 1981 you posed several questions. The first two of these related to the additional information that would be needed if high-level radioactive waste (HLW) from reprocessing of spent fuel were to be considered in the waste confidence proceeding. In a memorandum dated February 20, 1981, to the Working Group, Marshall Miller submitted a similar question. Your remaining question, which concerned the approach to obtaining additional information on other areas, will be considered in the Working Group's analysis of public comments on participants' recommendations for next steps in the proceeding.

Even though Presiding Officer Marshall Miller explicitly sustained DOE's position that the rulemaking would deal only with disposal of spent fuel and not with waste from fuel reprocessing, there is already some information on reprocessing wastes in the record. Several participants have submitted positions and information on the subject. Some of the more substantial contributions are summarized in an attached Appendix.

Although some information on storage and disposal of reprocessing wastes is already on the record, we believe that supplementary information would be needed if this issue were to be considered in this proceeding, particularly regarding the engineering design and performance of the waste forms and associated packages. Certainly it cannot be concluded that the material now in the record on the subject is complete, since the participants have not had an opportunity to focus their comments on reprocessing waste management. We believe that in order to consider formally disposal of waste from reprocessing in this proceeding, all participants should be given an opportunity to file statements of position and cross-statements on this matter.

Such a requirement for supplementation of the record could result in substantial delay. A second consideration is that supplementation of the record might be impractical because there is no major ongoing civilian program at DOE for evaluation of wastes from reprocessed fuel. DOE in

its position statement indicated that as a matter of policy its waste program is focused on the storage and disposal of spent fuel. That policy has not changed. Thus, a change in the scope of the proceeding by NRC may not lead to substantial new filings by DOE unless it first changes its policy on reprocessing. Moreover, if DOE cannot change that policy without direction from the President, then under the current situation DOE might have to report that it is not working primarily on the disposal of reprocessed waste and therefore could not point to a major "program" to assure that reprocessed waste could be disposed of safely.

Nevertheless, if reprocessing is not addressed and if there appears a significant likelihood that spent fuel will be reprocessed, some participants may contend that a proceeding confined to the safety of spent fuel disposal no longer meets the purpose of this rulemaking. In answer to such a contention we would note that if the primary purpose of this rulemaking is to maintain a reasonable basis for continued licensing of reactors, it is sufficient to consider whether spent fuel can be disposed of safely.^{1/} The associated question of will spent fuel disposal be available by 2007 does not yield an unequivocal response. This is so because this proceeding in response to State of Minnesota v. NRC has also included among its objectives a finding on the time when safe waste disposal will actually be available. If the Commission wishes to conclude that disposal facilities will be operating, say, by 2007, then it would seem the Commission should take some account of a possible change in policy to favor reprocessing. If safe waste disposal must await the resolution of the reprocessing controversy and development of a DOE program to dispose of reprocessed waste, the timing might be different from what DOE now expects for spent fuel disposal. At any rate, if there is a significant likelihood that spent fuel will not be disposed of until it has been reprocessed, for a finding on the timing of disposal the Commission would need information in the record to show when reprocessed waste will be safely disposable.

It seems desirable to us not to introduce reprocessing into this proceeding, so long as the Commission's main objectives can still be achieved. Disposal of reprocessing waste would be more appropriately considered in a proceeding to decide whether reprocessing should be permitted. The record and conclusions of the present waste confidence proceeding would presumably serve as a starting point. If reprocessing were introduced

^{1/} Even if there is a policy shift toward reprocessing, presumably the Commission would not permit reprocessing actually to take place without a finding that reprocessed waste could be disposed of safely. A finding on safe disposal of reprocessed waste would thus be needed to support a decision to allow reprocessing but is not strictly necessary to support the licensing of reactors.

into the present proceeding, a significant amount of additional time would be needed to receive supplementary statements and cross-statements. Also, the Working Group believes that even if consideration of the subject were strictly circumscribed, there would be continued pressure to draw in technical, economic, and international (nonproliferation) issues associated with the merits of reprocessing. For example, participants might seek to tie in the safety of disposing of the separated plutonium with the general waste disposal question. The Waste Confidence Proceeding does not appear to be the proper forum for addressing these issues.

cc: Chairman Hendrie
Commissioner Gilinsky
Commissioner Bradford
Marshall Miller
William Dircks
John Davis
Jack Martin
Howard Shapar
Leonard Bickwit
Samuel Chilk

APPENDIX

Many of the participants in the waste confidence proceeding (including DOE) have already addressed, to some degree, the viability of disposing of reprocessing high-level waste. In its statement of position, DOE provided information on alternative waste forms for high level waste (DOE P.S. pp. II153-160). In this regard DOE noted that, because of the continuing interest in the potential performance of specially processed waste forms it was providing a summary of the status of relevant R&D programs as additional background information.

The DOE statement summarizes work on several waste forms under development including calcine, rich clay, normal concrete, hot-pressed concrete, borosilicate glass, high-silica natural glass, clay ceramics, supercalcine, SNYROC, glass ceramics, metal matrix forms, cermets, and multibarrier forms. The DOE development program for these alternative waste forms was summarized in the statement of position and many technical references were cited.

During the course of the waste confidence proceeding, DOE served on all the parties a copy of the Final Environmental Impact Statement on the "Management of Commercially Generated Radioactive Waste." This document considers the environmental effects of the disposal of both spent fuel and fuel reprocessing wastes in considerable detail.

Other parties to the waste confidence proceeding have also presented information on HLW other than spent fuel. The Utility Nuclear Waste Management Group (UNWVG) provided a discussion of the development status of alternative waste forms in its Statement of Position (UNWVG, P.S., Document No. 2, p. III-B-17). The UNWVG presented quantitative results of studies which compared leach rates for spent fuel with those for borosilicate waste glass. The UNWVG concluded that "spent fuel can be acceptable as a waste form in anticipated repository environments even though its long-term stability and leach resistance under certain conditions is not as great as that of borosilicate glass or other waste forms."

The American Nuclear Society (ANS) and the American Institute of Chemical Engineers (AIChE) concluded that if the Commission determines that spent fuel can be disposed of, then other HLW can also be disposed of safely. ANS stated that:

"A finding of confidence in the current proceeding is sufficient to provide the Commissioners with equal or greater confidence that processed, separated high-level waste can be disposed of safely and permanently." (ANS P.S., p. 1)

In their statement of position, the AIChE concluded that:

"If a demonstration of safe spent fuel disposal can be made, then high-level radioactive waste from reprocessing of that fuel could be disposed of at least as safely." (AIChE P.S., p. 3)

However, not all participants to this proceeding share these views. The Scientists and Engineers for Secure Energy (SE₂) maintain that the leaching characteristics of spent fuel are superior to glass waste forms. They conclude that "spent fuel will be more durable than glass" as a waste form (SE₂, Suggestions for Further Proceedings, p. 18).

Two other parties, the Natural Resources Defense Council (NRDC) and the California Energy Commission, maintain that there is insufficient data at this time to select a waste form for HLW. NRDC stated that:

"A decision on the choice of waste form for ultimate disposal should not take place until sufficient data has been developed to make an adequate comparison of all the potential forms." (NRDC P.S., p. 47)

NRDC provided further elaboration on this matter in their cross-statement (NRDC CS, pp. 54-60). The California Energy Commission similarly concluded:

"That there is relatively little basic science data available to predict the long-term leaching of glass, glass-ceramic, or waste forms (CEC P.S., p. 51).