



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

OCT 01 1984

MEMORANDUM FOR: Hubert J. Miller, Chief
Repository Projects Branch
Division of Waste Management, NMSS

FROM: Frank A. Costanzi, Chief
Waste Management Branch
Division of Radiation Programs
and Earth Sciences, RES

SUBJECT: REQUEST FOR INFORMATION FROM DOE

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We have reached a point in our HLW waste package research program for salt repositories that requires some specific information of DOE for us to proceed efficiently. In particular, we need answers to the following questions:

1. For the present reference designs for steel overpacks, what range of carbon content is being considered by DOE? We have seen several estimates at various times, but need a definitive design.
2. For the present reference designs for steel overpacks, what is the anticipated maximum gamma flux at the outside surface of the overpack; or alternatively, what is the maximum anticipated dose in the backfill or salt in terms of rads per hour?
3. For the salt/brine compositions being studied, what effects are radiolysis of the brine and radiolysis of the salt followed by reaction of the brine, expected to have on concentrations of major oxidizing species, pressure of hydrogen, and concentrations of chlorine-containing species? For what temperatures are these estimates developed? Are the estimates based on the assumption of impenetrability of the bulk salt to gases? If not, how is leakage accounted for?
4. If the estimates of the effects of radiolysis of the salt provided in response to (3) are extrapolations from data collected at higher dose rates than those anticipated in the repository environment, how are the results going to be extrapolated in light of the Brookhaven data of Levy and Swyler showing that use of the Jain-Lidiard model for extrapolation of radiolytic fields of sodium from high dose rates to low dose rates is nonconservative.

WM Record File 106 WM Project 16
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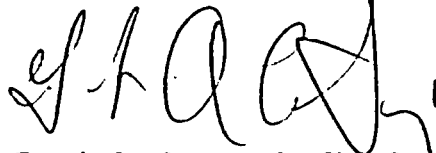
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5. Is there a general trend in the effects of radiolysis on pitting corrosion rates in brines in the alloys of the reference overpacks, and if so what is it? That is, does gamma irradiation at levels judged to be relevant to plans for the salt repository tend in general to make pitting more severe or less severe and if so by what factor?

It seems to us that in their testing program DOE will have developed answers to questions 1 and 2 and at least partial answers to questions 3 and 4. Indeed, at a 1983 Columbus meeting a member of the DOE/NPO staff said that she would provide an answer to 2 and some information in response to 3. Question 5 may be unanswered, however, the extensive parallel work on Ti alloys for defense waste ought to shed some light on this question.

Please try to obtain this information from DOE as soon as possible. Lack of input from DOE could lead to waste or inefficiency in our program because we cannot adequately focus on the actual conditions which will be present in a potential repository. If you have any questions on this request, please contact Dr. Michael McNeil on X74636.



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