

Dr. B. John Garrick, Chairman
Advisory Committee on Nuclear Waste
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

January 12, 2001

SUBJECT: ALLOY C-22 CORROSION STUDIES

Dear Dr. Garrick:

I am responding to your December 6, 2000, letter to the Chairman. In that letter, the Advisory Committee on Nuclear Waste (hereafter, the Committee) provided conclusions and recommendations arising from the presentations on the corrosion resistance of the nickel-based alloy C-22, by consultants to the State of Nevada at the 122nd Committee Meeting, and presentations by the Center for Nuclear Waste Regulatory Analyses (CNWRA) and by the U.S. Department of Energy (DOE) at the 123rd Committee Meeting. The Committee offered four conclusions and recommendations. The Committee's conclusions and recommendations addressed the importance of understanding the conditions under which the presence of trace elements, such as lead and mercury, could promote corrosion. The conclusions and recommendations also highlighted the need to verify that the absence of these trace elements in previous work did not bias the conclusions about the susceptibility of alloy C-22 to corrosion. In addition, the Committee identified the need for continued efforts on the part of the NRC and the CNWRA in evaluation of the performance of C-22 under the full range of conditions that occur at Yucca Mountain.

Response:

We agree that the experimental parameters the State of Nevada consultants employed are extreme and may not be representative of those expected at Yucca Mountain. Based on that we will ensure that DOE will adequately investigate the role of trace elements, such as mercury and lead, in the corrosion of C-22, under the full range of conditions expected at Yucca Mountain, and that understanding the near-field environment, the effect of trace elements, and residual stress is central to providing sound bases for extrapolation of waste package performance for more than 10,000 years. We appreciate the Committee's recognition that the NRC and CNWRA staffs are identifying conditions in which the presence of trace elements could promote corrosion and, as the Committee suggests, will verify that the absence of trace elements in previous work did not bias the conclusions about the susceptibility of C-22 to corrosion.

As articulated in the letter from the Committee in regards to the November 28, 2000, meeting between NRC/CNWRA and DOE, DOE stated that they have planned studies to assess the effects of a broad range of environmental species that may affect the waste package performance, including trace elements, and to characterize the residual stresses arising from

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fabrication and post-weld thermal treatment. As you know, it is the DOE's responsibility to provide data and appropriate documentation of this testing, however, the U.S. Nuclear Regulatory Commission/CNWRA must evaluate that data. The U.S. Nuclear Regulatory Commission's/CNWRA's plan is to conduct confirmatory studies to assess the adequacy of the information supplied by DOE and will update the Committee on our progress. We welcome the Committee's future observations and recommendations in this high-level waste area.

Sincerely,

/RA/

William D. Travers
Executive Director
for Operations

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
SECY

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