UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 12, 2024

MEMORANDUM TO: Shana Helton, Director
Division of Fuel Management
Office of Nuclear Material Safety and Safeguards

FROM: Michele Sampson, Director
Division of Engineering
Office of Nuclear Regulatory Research

McKirgan, John signing on behalf of Sampson, Michele on 07/12/24

SUBJECT: IMPENDING PUBLICATION OF TECHNICAL LETTER REPORT TLR-RES/DE/REB-2024-10 TITLED "ASSESSING UNCERTAINTY IN MODELING CHLORIDE-INDUCED STRESS CORRISION CRACKING"

In response to User Need Request NMSS-2021-004 "Regulatory Research Supporting Aging Management of Chloride-Induced Stress Corrosion Cracking of Stainless-Steel Canisters," (Agencywide Documents Access and Management System (ADAMS) under Accession Number ML21054A044) Office of Nuclear Regulatory Research (RES) has completed the technical letter report (TLR) on "Assessing Uncertainty In Modeling Chloride-Induced Stress Corrosion Cracking." A copy of the final is enclosed.

The TLR provides an assessment of the effect of uncertainties in the measurement of three critical parameters when modeling chloride-induced stress corrosion cracking (CISCC) on horizontal spent nuclear fuel canisters. The critical parameters examined are: (1) Limiting relative humidity for corrosion initiation (RH_L), (2) salt deposition rate (DD), and (3) threshold crack tip stress intensity factor (K_{th}). The report found that of the three critical parameters, uncertainty in the DD resulted in the largest variation in the time to crack initiation and time to reach a through-wall crack. The TLR also compares three CISCC crack growth rate (CGR) models and identifies sources of data for the parameterization of potential probabilistic fracture mechanics models.

Staff representatives from the Division of Spent Fuel Management in the Office of Nuclear Materials Safety and Safeguards have reviewed drafts of this TLR and provided valuable comments. The final version of the TLR addresses all comments to the satisfaction of the reviewers. Nonetheless, please feel free to notify the contact identified below if you have any questions concerning the impending public release of the report. RES has established an online quality survey to collect feedback from user offices on the usefulness of RES products and services.

CONTACT: Christopher Nellis, RES/DE/REB
301-415-5973

This survey can be found online at the hyperlink: RES Quality Survey. I would appreciate the responsible manager completing this short survey within the next 10 working days to present your office's views of the delivered RES product. Please share any concerns with me or the Division of Engineering contact listed below, so that they may be addressed.

If additional information is required, please contact Christopher Nellis of my staff at 301-415-5973 or Christopher.Nellis@nrc.gov.

Enclosure:
1. TLR-RES/DE/REB-2024-10, "Assessing Uncertainty in Modeling Chloride-Induced Stress Corrosion Cracking"

TLR-RES_DE_REB-2024-10: Assessing Uncertainty in Modeling Chloride-Induced Stress Corrosion Cracking DATE July 12, 2024

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DATE	Jul 1, 2024	Jul 5, 2024	Jul 12, 2024	

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