January 28, 2013

Dr. J. Sam Armijo, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: RESPONSE TO THE OCTOBER 26, 2012, EXECUTIVE DIRECTOR FOR OPERATIONS LETTER REGARDING TECHNICAL INFORMATION NEEDS AFFECTING POTENTIAL REGULATION OF EXTENDED STORAGE AND TRANSPORTATION OF SPENT NUCLEAR FUEL

Dear Dr. Armijo:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter dated December 19, 2012, regarding the staff's response to conclusions and recommendations of the Advisory Committee on Reactor Safeguards (ACRS) regarding technical information needs for regulation of extended storage and transportation of spent nuclear fuel.

In your letter, you stated that the staff's response was satisfactory with the following two exceptions:

(1) The response made no reference to the issue of potential preventive maintenance techniques to mitigate stress corrosion cracking (SCC).
(2) The response made no reference to the updating of guidance to ensure that future dry cask storage systems (DCSSs) destined for service in marine environments are fabricated using materials and processes known to significantly reduce the potential for SCC. You also stated that NUREG-1927, "Standard Review Plan for Renewal of Spent Fuel Storage Systems Licenses and Certificates of Compliance," does not provide any explicit guidance on SCC for DCSSs in a marine environment, and requested the staff to consider the ACRS recommendations further.

The NRC staff would like to clarify its response to the above comments.

The NRC staff is actively addressing SCC in a variety of ways. The staff issued Information Notice 2012-20 "Potential Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel and Maintenance of Dry Cask Storage System Canisters," dated November 14, 2012 (ADAMS Accession No. ML12319A440), to formally communicate SCC concerns to applicants, licensees, and Certificate of Compliance (CoC) holders. The NRC staff is performing environmental tests and residual stress analysis to further define the conditions under which this failure mechanism may be of concern. The NRC staff has also begun a Non-Destructive

Examination (NDE) feasibility study to help define appropriate NDE methods for detection of SCC in DCSS canisters. The NRC staff has been interacting with industry through the Nuclear Energy Institute, Electric Power Research Institute, and other industry organizations to further understand these areas of concern and collect field data. Preventative maintenance techniques may also mitigate SCC, and the NRC staff has encouraged industry to consider such methods. Staff will require preventative maintenance measures if they are necessary. However, any preventative techniques must be thoroughly tested and reviewed by the applicant and found acceptable by NRC staff prior to incorporation into a licensee's program, to ensure that unintended consequences do not result.

The NRC staff agrees with the ACRS position that aging management programs (AMPs) for DCSSs should address the potential for SCC in austenitic stainless steel canisters exposed to marine environments. Title 10 of the *Code of Federal Regulations* (10 CFR) 72.42(a)(2) and 10 CFR 72.240(c)(3), for specific licensees and CoC holders, respectively, require that the renewal application include a description of the AMP for management of issues associated with aging that could adversely affect structures, systems, and components (SSCs) important to safety. As described in Section 3.4 of NUREG-1927, renewal applications should include the identification of materials, environments, potential aging effects, and appropriate aging management activities for each in-scope SSC.

The staff acknowledges that NUREG-1927 does not specifically address the potential for SCC in austenitic stainless steels. However, NUREG-1927 does provide general guidance that applies to conditions such as SCC in austenitic stainless steel in a marine environment. In addition to a revision to NUREG-1927, the NRC staff also acknowledges that NUREG-1536, "Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility," and NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities," also require revision or supplementation with interim staff guidance on SCC in marine environments. These revisions may be of particular interest due to the recent 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste," change in maximum license period for initial and renewal licenses from 20 years to 40 years (see 10 CFR 72.42, "Duration of License; Renewal;" 10 CFR 72.230(b); 10 CFR 72.238, "Issuance of an NRC Certificate of Compliance;" and 10 CFR 72.240(a)).

The NRC staff will continue to refine its guidance so that reviews of license and CoC renewal applications that involve potential SCC of austenitic stainless steel canisters exposed to marine environments are more completely defined, consistent, and predictable. The NRC staff will also consider the need for additional guidance on materials selection, monitoring, surveillance, and maintenance.

The NRC staff appreciates ACRS comments and recommendations. We look forward to continued work with the Committee as the staff evaluates future updates to staff guidance.

Sincerely,

/RA MWeber for/

R. W. Borchardt
Executive Director
for Operations

cc: Chairman Macfarlane
Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
SECY

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