

Used Fuel Storage and Transportation Issue Closure Form  
Issue Number: N-10-01

Chloride Induced Stress Corrosion Cracking

Closure Summary

Regulatory Issue Resolution Protocol (RIRP) N-10-01 on chloride induced stress corrosion cracking (CISCC) of welded stainless steel canisters for dry storage of spent nuclear fuel is resolved. The RIRP followed the resolution plan that was developed to identify technical information needs and key products from industry and the U.S. Nuclear Regulatory Commission (NRC). Numerous public meetings were held to discuss interim results, evaluate progress towards issue resolution and identify necessary revisions to the resolution plan. Key work products to address technical information needs include:

1. Testing to determine the effects of canister fabrication processes and environmental conditions including temperature, relative humidity, salt composition and surface chloride concentration.
2. Evaluation of the potential CISCC of welded stainless steel canisters using operating experience, CISCC test data, and environmental data.
3. Development of canister CISCC susceptibility assessment criteria based on system design, materials, canister loading parameters, site specific environmental conditions and time in service.
4. Aging management guidance and an example aging management program for localized corrosion and CISCC of welded stainless steel canisters

The work products developed in RIRP N-10-01 are sufficient to assess the susceptibility of welded stainless steel canisters to CISCC and provide guidance for aging management to assure that the canister safety functions are maintained.

RIRP N-10-01 is closed on August 22, 2016.

Tracking Items and Responsibility

None

Measurement of Success

The successful resolution and closure of RIRP N-10-01 was accomplished as a result of consistent effort from industry and the NRC, along with insights gained from frequent public meetings and open dialogue to address the technical issues. Work products generated to resolve RIRP N-10-01 resulted in a significant advancement in the understanding of the metallurgical and environmental factors necessary for CISCC. The advancement in understanding the technical issue was instrumental in developing susceptibility assessment criteria and aging management recommendations related to welded stainless steel canisters for dry storage of spent nuclear fuel.

Enclosure