

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Surface Peening and Hybrid Surface Engineering Approaches to Mitigate Initiation and Resurgence of Stress Corrosion Cracking in Dry Cask Storage Stainless Steel Canisters

SECTION B. Project Description

The University of Wisconsin-Madison (UW), proposes to develop, evaluate, and competitively benchmark various surface peening technologies and associated hybrid surface engineering approaches to mitigate initiation and growth of chloride-induced stress corrosion cracking (CISCC) in manufactured stainless-steel canisters and in-service canisters for used nuclear fuel dry cask storage systems (DSCC). The research will consist of the following actions: (1) Preparation of substrate materials to investigate surface peening technologies and hybrid surface treatments; (2) Study of various surface peening technologies and hybrid surface treatments to mitigate *initiation* of CISCC; (3) Development of optimal surface peening technologies and hybrid surface treatments to mitigate growth of CISCC; (4) Electrochemical corrosion studies and CISCC evaluation of surface engineered samples; (5) Characterization and compressive stress measurements of surface engineered samples; and (6) Comparative assessment of surface peening technologies in terms of technical and economic merits including viability of on-site repair.

SECTION C. Environmental Aspects / Potential Sources of Impact

The university has procedures in place to handle any waste that will be generated through this project. The action would not create additional environmental impacts above those already permitted at the university.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of university-scale research activities to develop and evaluate surface peening technologies.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on 8/10/2020