

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Friction Stir Based Repair Welding of Dry Storage Containers and Mitigation Strategies: Effect of Engineered Barrier Layers on Environmental Degradation – University of Idaho**

**SECTION B. Project Description**

The University of Idaho, in collaboration with Pacific Northwest National Laboratory, proposes to develop a friction stir based repair technique to heal cracks of stainless steel dry storage canisters (DSCs), created by the effect of stress corrosion cracking (SCC). The objectives include: (1) investigating FSW of 304L SS a potential repair welding technique of dry storage canisters; (2) optimizing the FSW parameters to introduce surface compressive stress profiles in the weldments; (3) developing a FSP method to surface alloy the 304L with nitrogen and Mo by adding CrN and Mo powders; (4) evaluating the surface compressive residual stress profile during FSW and FSP processes; (5) evaluating the localized corrosion resistance of the FSW and FSP samples as a function of temperature, chloride concentration, and surface alloy composition; and (6) evaluating the SCC behavior of the FSW and FSP samples as a function of stress, chloride concentration, and temperature at three different surface chemistries and induced compressive stress profiles.

**SECTION C. Environmental Aspects / Potential Sources of Impact**

Chemical Use/Storage/Waste Disposal - Small amounts of some chemicals, mainly acids, will be used for chemical etching to reveal microstructure in metallic materials. The University of Idaho has the EHS Office to monitor the use and storage of chemicals on-campus. EHS-established procedures will be used to take care of chemical waste disposal.

**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 to develop a friction stir based repair technique.

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 08/02/2018