

**Project Title: Multifunctional Laser Processing for Repair and Mitigation of Pitting and Cracks in Welded
SECTION A. Stainless Steel Dry Storage Canisters****SECTION B. Project Description**

The University of Nebraska proposes to develop a strategic solution that combines laser cleaning and laser peening for removal of surface contamination and mitigation of pitting and stress corrosion cracking (SCC) in welded stainless steels, and protection from further corrosion. The project will complete the following actions: (1) develop a laser processing system for cleaning and peening of the welded stainless steel of dry storage canisters (DSCs); (2) develop a laser cleaning process to remove surface salts and rust, and mitigate pitting from welded stainless steels; (3) develop a laser peening process to mitigate SCC, preventing DSCs from further corrosion; (4) conduct performance tests on the DSC steels treated by multifunctional laser processes to confirm the improved corrosion resistance; and (5) integrate fiber optics with a prototype robotic system for DSC surface 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 solutions for laser cleaning and peening for removal of surface contamination and mitigation of pitting and stress corrosion cracking in welded stainless steels.

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