

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Remote Laser Based Nondestructive Evaluation for Post Irradiation Examination of ATF Cladding – University of South Carolina**

**SECTION B. Project Description**

The University of South Carolina proposes to develop a robust remote pulsed laser (PL)-actuation and scanning laser Doppler vibrometer (SLDV)-sensing system with multifunctional capabilities for measuring cladding coating thickness of a few tens of  $\mu\text{m}$  and detecting defects underneath such as corrosion, micro-cracking, and delamination. The tasks associated with this project are (1) Theoretical foundation (understand the ultrasonic-cladding-substrates interaction mechanisms); (2) System development; (3) Capability development; (4) Sample testing; and (5) Demonstration and testing. A partnership with Westinghouse Churchill Site (WCS) and Savannah River National Laboratory (SRNL) will supply samples of chromium-coated and silicon carbide composite claddings, with and without defects, and with and without irradiation. Existing laboratory facilities and equipment will be used.

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

Hazardous Waste Generation – There is potential to generate hazardous waste due to overspray of chromium (Cr) powder during the cold spray process. Quantities of Cr powder waste up to 1 kg may be generated over the 3-year project for production of cold spray deposited Cr samples at WCS in Pittsburgh, PA. The cold spray operation is performed inside an HVAC-equipped spray booth, unbonded or excess solid Cr powder is captured by a wet dust collector with HEPA filtration. The captured Cr waste has characteristic toxicity, as defined by 40 CFR 261 regulations. Environmental Services Group of Murrysville, PA will take the Cr from WCS and dispose according to state and federal regulations.

**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 research activities to develop an NDE method for detecting corrosion, micro-cracking, and delamination in fuel rod cladding.

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 09/03/2019