

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Advanced Surface Plasma Nitriding for Development of Corrosion Resistant and Accident Tolerant Fuel Cladding – Texas A&M Engineering Experiment Station

SECTION B. Project Description

Texas A&M proposes to develop a hollow cathode plasma nitriding technique. Starting with alloys Grade 92, Alloy 709, HT-9, T-91, and Zircaloy 2/4, the team will apply an advanced surface plasma nitriding technique to convert alloy surface layers into nitride layers for better structural integrity and compatibility with both coolants and nuclear fuels. Both treated and untreated samples will be irradiated by using Fe self-ions or dual beams of Fe ions and He ions, up to extreme damage levels and various temperatures.

SECTION C. Environmental Aspects / Potential Sources of Impact

Texas A&M 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 aimed at investigating a corrosion resistant and accident tolerant fuel cladding technique.

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

Approved by Jason Sturm, DOE-ID Deputy NEPA Compliance Officer on 06/09/2015