

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Development of Self-Healing Zirconium Silicide Coatings for Improved Performance of Zirconium-Alloy Fuel Cladding – University of Wisconsin**

**SECTION B. Project Description**

The objectives of the proposed research by the University of Wisconsin will be: (1) development of Zr-silicide coatings on Zr-alloy substrates, (2) corrosion studies of Zr-silicide coatings in normal reactor environment and LOCA conditions, including a fundamental understanding of thermodynamic and kinetic pathways for evolution of self-healing multilayers, (3) radiation testing/studies of Zr-silicide coatings before and after corrosion test, and (4) modeling of corrosion of Zr-silicide coatings in reactor environments. The university will use existing facilities located at the university to test and characterize the coatings and perform ion irradiations of the coatings.

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

The action will not create additional environmental impacts above those already occurring at the university. The University has all the necessary processes and procedures in place to manage and dispose of all waste streams.

**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 zirconium-silicide coatings for improved cladding performance.

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

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 08/26/2014