

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Radiation-induced Swelling and Microcracking in SiC Cladding for LWRs – University of Wisconsin

SECTION B. Project Description

The University of Wisconsin proposes to provide a fundamental basis for continuum models of swelling by measuring the distribution of defect clusters of all sizes and modeling their contribution to swelling and to combine the model of swelling with simulations of microstructural evolution to predict the effect of swelling on microcracking in SiC. The objectives will be accomplished through an integrated research effort that brings together multiscale materials simulations and experiments. Experiments will be carried out on 4H (hexagonal, single crystal) and 3C (cubic, polycrystalline) SiC samples irradiated with Si and C ions.

SECTION C. Environmental Aspects / Potential Sources of Impact

The University of Wisconsin 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 radiation-induced swelling and microcracking in SiC cladding.

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 06/17/2015