

**SECTION A. Project Title: Phase Equilibria and Thermochemistry of Advanced Fuels: Modeling Burnup Behavior****SECTION B. Project Description**

The proposed activities would evaluate cladding materials that may be used in more advanced accident tolerant fuels. Prospective materials that are being considered to improved accident tolerance include silicon carbide composites and ferritic alloys (Fe-Cr-Al base compositions). Thus the proposed effort will develop thermochemical models and values, supported with targeted experiments, to evaluate the various fuel-cladding systems.

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

The University of South Carolina has procedures in place to handle radioactive materials and 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 proposed action consists of research and development on new cladding materials for accident tolerant fuels.

Approved by Jason Sturm, DOE-ID Acting NEPA Compliance Officer on 7/05/2016