

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Radiation Effects on High Thermal Conductivity Fuel Surrogates – University of Tennessee

SECTION B. Project Description

The University of Tennessee, in collaboration with Oak Ridge National Laboratory (ORNL), proposes to examine three main scientific feasibility issues associated with high conductivity composite fuels. The first task is to examine the role of nanoscale dimensions on the suppression of grain boundary cracking in irradiated HCP ceramic materials. The second task is to evaluate whether a suitable operational temperature window might exist for high thermal conductivity composite phases in fuel systems. The third task will explore the irradiated phase stability of fine-scale ceramic additives embedded in a surrogate fuel.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – Neutron irradiated CeO₂ composite surrogates will be handled and disposed using standard DOE procedures at ORNL.

Chemical Use/Storage / Chemical Waste Disposal – Minor use/disposal of standard lab chemicals such as ethanol is anticipated.

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 investigation of the radiation effects high thermal conductivity composite fuels.

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 06/18/2015