

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: SiC Ceramic Cladding Development for Accident Tolerant Fuels – Ceramic Tubular Products, LLC

SECTION B. Project Description

Ceramic Tubular Products (CTB) proposes to perform process development at each stage of TRIPLEX tube fabrication and then deliver a series of short (2 to 3 inches long) sealed TRIPLEX tubes to Westinghouse, LLC for initial corrosion testing. Pending results of this initial testing, a second set of sealed TRIPLEX clad specimens will be fabricated. The objectives of the project will be accomplished by 1. Applying the chemical vapor deposition process and new equipment to depositing an environmental barrier coating onto the ceramic matrix composite layer, 2. Adapting the polymer infiltration pyrolysis process to the composite layer of CTB's TRIPLEX clad, and then demonstrating that the resulting tubes have the required mechanical properties, 3. Developing and testing of a device which will allow non-destructive testing of a monolith tube, and 4. Investigating the possibility of depositing the fiber interface coating on SiC fiber spools as part of the initial winding operation.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage / Air Emissions – Pre-ceramic polymer will be used during the matrix infiltration process for the accident tolerant fuel cladding development program. The polymers used are liquid at room temperature and are solidified during the pyrolysis process to form the SiC matrix. The organic compounds contained in the polymer are volatilized and discharged through the exhaust/infiltration systems. The action would not create additional environmental impacts above those already permitted at the facilities.

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: B1.31 Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

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 purchasing and installing equipment for the research of accident tolerant fuel.

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

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on 6/28/2018