

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Critical Heat Flux Studies for Innovative Accident Tolerant Fuel Cladding Surfaces – University of Wisconsin

SECTION B. Project Description

The University of Wisconsin proposes to investigate the critical heat flux (CHF) phenomenon for surfaces of accident tolerant fuel (ATF) cladding materials that are presently being considered for implementation. The CHF and surface heat transfer phenomena investigated in the proposed research will be central to defining safety margins during normal operation and accident scenarios in nuclear reactors. The objectives of the proposed research will be:

- 1: Preparation of candidate ATF cladding materials' heat transfer surfaces
- 2: Surface characterization of candidate ATF cladding materials
- 3: Pool boiling and pressurized quench tests of candidate ATF cladding materials
- 4: Flow boiling tests for CHF of ATF cladding materials under prototypical reactor conditions
- 5: Modeling of boiling and CHF for ATF cladding surfaces

SECTION C. Environmental Aspects / Potential Sources of Impact

The university 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 critical heat flux for surfaces of accident tolerant fuel cladding material.

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 06/29/2017