

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Determination of Critical Heat Flux and Leidenfrost Temperature on Candidate Accident Tolerant Fuel Materials – Massachusetts Institute of Technology**

**SECTION B. Project Description**

Massachusetts Institute of Technology proposes to quantify critical heat flux (CHF) under normal and off-normal light water reactor (LWR) conditions in potential accident tolerant fuel (ATF) cladding materials, characterize the Leidenfrost point temperature at atmospheric pressure in cladding materials, develop ATF-materials –specific correlations to be implemented in various LWR simulation software, and evaluate the viability of each ATF material for use in LTA/LTR irradiation programs.

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

Water/Well Use / Discharge of Wastewater – the project foresees flow boiling experiments using de-ionized (DI) water. Each experiment requires approximately 10 liters of water, adding up to a total amount of approximately 3 m<sup>3</sup>. The water used in the experiments is not contaminated and can be disposed with the non-hazardous liquid waste stream.

**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 on candidate ATF materials under normal and off-normal conditions.

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 6/28/2017