

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Characterizing Fuel Response and Quantifying Coolable Geometry of High-Burnup Fuel – Oregon State University

SECTION B. Project Description

Oregon State University proposes to answer the following questions: 1) what is the actual impact of fuel dispersion in-core after fuel failure; and 2) does high burnup dispersed fuel compromise coolable geometry and long-term cooling? This study seeks to objectively answer these two questions through empirical and numerical means. The outcome of this study will yield an objective means of assessing two criteria (coolable geometry and long-term cooling) within the existing regulatory process to comprehensively understand whether it is feasible to increase burnup and while satisfying 10 CFR 50.46 (Acceptance Criteria for Emergency Core Cooling Systems for Light-water Nuclear Power Reactors). This will be accomplished while leveraging existing experimental infrastructure at Oregon State University, as well as the recently coupled BISON code and Nuclear Regulatory Commission code – TRAC/RELAP Advanced Computational Engine (TRACE). The scope of work has been organized into the following tasks: 1) Experimental Testing; 2) Modeling Development; and 3) Benchmark and Analysis.

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 occurring 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). For purposes of this category, “demonstration actions” means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. Demonstration actions frequently follow research and development and pilot projects that are directed at establishing proof of concept.

Justification: The activity consists of an investigation to develop a thermal conductivity model with BISON and TRACE which has a validated basis for use and clear bounds for which it may acceptably be utilized.

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

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 09/07/2021.