

**SECTION A. Project Title: Studies of Lanthanide Transport in metallic Nuclear Fuels – Ohio State University****SECTION B. Project Description**

Ohio State University will conduct research to develop fundamental understanding of the lanthanide fission product migration and redistribution in advanced metallic nuclear fuels, and then provide fundamental theories for lanthanide transport control for mitigating fuel-cladding-chemical-interactions (FCCI). The research will be performed using an integrated approach: (1) experimental studies for measurements of key parameters and first principles calculations to determine, for example, lanthanide solubility in liquid cesium, sodium and cesium-sodium alloy; (2) theoretical model development for lanthanide transport in a non-isothermal single pore and porous medium to understand the observed behavior (deposition, dissolution and migration) in a single closed or open pore and porous medium; (3) further development of the multi-phase/physics BISON model.

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

Small quantities of alkaline metals (less than 10 grams) and rare earth (1 gram each) will be used in the experiments. Ohio State University will follow existing rules and regulations for the handling and disposal of those materials. The action will 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). 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 conducting university laboratory scale research.

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 08/11/2014