

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Experimental Determination of Helium/Air Mixing in Helium Cooled Reactor –University of Michigan**

**SECTION B. Project Description**

The University of Michigan, in collaboration with the University of Idaho, proposes to examine the mixing and venting of helium and reactor-cavity air after a loss-of-forced-cooling accident due to a break in the primary coolant pressure boundary via three investigations.

1. Near-field experimental examination of He/Air mixing behavior and air ingress in the event of a break associated with the cross vessel.
2. Far-field experimental examination of He/Air mixing behavior within the cavity between the reactor vessel and the power conversion vessel and the containment in the event of a break associated with the cross vessel.
3. Computational Fluid Dynamic (CFD) modeling of He/Air mixing behavior to inform or identify placement of instrumentation for experimental work

To address gaps in experimental and modeling work, experimental scaled reactor system mockups (test cells) shall be built and installed. Mixing and venting of helium and reactor-cavity air in the Reactor Pressure Vessel (RPV) volume and the corresponding cavity will be modeled.

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

Radioactive Material Use – A sealed 15 Ci Iridium gamma source will be used. The University of Michigan OSHA department handles use and disposal. The source is covered by an existing NRC license.

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 the mixing and venting of helium and reactor-cavity air after a loss-of-forced-cooling accident.

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