

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Advancements Towards ASME Nuclear Code Case for Compact Heat Exchangers – University of Wisconsin

SECTION B. Project Description

The University of Wisconsin proposes to enable the accelerated commercialization of advanced manufactured compact heat exchangers for use in nuclear systems. This will be accomplished by:

- Development of rules and regulations for use of CHX in ASME section III
- Experimental studies and experiment validation of full inelastic finite element analysis of diffusion welded compact heat exchangers.
- Design, fabrication, and testing of CHX under prototypic conditions with detailed assessment of QA requirements.
- Non-destructive testing and evaluation of CHX during construction, after construction as well as in-service inspection.
- Destructive pressure testing and evaluation of multiple prototypic CHX with post-test analysis compared to NDE evaluation.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Waste Generation – Some activation of materials may occur during neutron radiography measurements. These materials will be dealt with under the University of Wisconsin reactor license.

Chemical Use/Storage – Several gases, sodium, and salts will be used to test heat exchangers. These chemicals are controlled under the University of Wisconsin’s chemical safety procedures. Approximately 5 gal. of sodium and 5 gal. of nitrate salts will be used.

Water/Well Use – Water usage is typical with operation of a lab environment (10 gal/day)

Discharge of Wastewater - Water usage is typical with operation of a lab environment (10 gal/day)

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 investigating compact heat exchangers for use in nuclear systems.

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 07/10/2017