

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Development of Novel Functional Graded Transition Joints for Improving the Creep Strength of Dissimilar Metal Welds in Nuclear Applications – Lehigh University**

**SECTION B. Project Description**

The objectives of Lehigh University research is to: 1) Develop design and processing methods for fabricating novel Graded Transition Joints (GTJs) that eliminate failures that occur due to enhanced carbon diffusion and high thermal stresses, 2) Establish a database of creep life and improved creep life models of GTJs that are supported by new techniques for measuring localized strain in the presence of composition and microstructure gradients, and 3) Apply this information to initiate code acceptance by the American Society of Mechanical Engineers (ASME) for use of GTJs in the VHTR application. The GTJs will be tested using new high temperature tensile and creep tests developed by the university.

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

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 laboratory scale tests of two alloy joints for potential future use in nuclear reactors.

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 08/18/2014