

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Correlation Between Microstructure and Mechanical Properties of Neutron-irradiated Ferritic-martensitic and Austenitic Steels – Oak Ridge National Laboratory**

**SECTION B. Project Description**

Oak Ridge National Laboratory proposes to identify and develop correlations between microstructures and mechanical properties of neutron-irradiated advanced ferritic-martensitic (FM) and austenitic steels, based on experimental results generated from this work and literature data of similar alloys, with the aid of thermodynamics, kinetics, and microstructural hardening modeling.

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

Radioactive Material Use – Neutron-irradiated samples will be tested and examined, which have radioactivity below the workable limits of hot-cells and controlled areas in relevant labs.

Radioactive Waste Generation – After completing the work, some of the tested and examined neutron-irradiated samples will be disposed following the existing guidelines. The unused samples will be returned to NSUF sample libraries or stored in controlled storage areas according to the requirements of respective sample sources.

Chemical Use/Storage – Chemicals used in research are evaluated for health and safety impact prior to use through the Research Safety Summary system of implementation and review. E-mail notifications are sent of new chemicals ordered.

Chemical Waste Disposal – A waste determination would be made for all unneeded or discarded chemicals. Based on that determination, management and disposal of those chemicals would be managed per existing waste management procedures. Pollution prevention opportunities would be pursued where available.

Hazardous Waste Generation – Etchants used in sample preparation generate small amounts of hazardous waste that have a designated waste stream.

Air Emissions – Air emissions will be managed via existing building ventilation systems per existing ORNL procedures.

**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 research aimed at developing correlations between microstructures and mechanical properties of neutron-irradiated steels.

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 6/29/2017