

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Development of Versatile Liquid Metal Testing Facility for Lead-cooled Fast Reactor Technology – University of Pittsburgh

SECTION B. Project Description

The University of Pittsburgh, in collaboration with Westinghouse Electric Company (WEC), Los Alamos National Laboratory (LANL), Argonne National Laboratory (ANL), Energia Nucleare ed Energie Alternative (ENEA), and the University of Manchester (UoM), proposes to 1) develop a versatile liquid lead testing facility, and 2) experimentally test material corrosion behavior and ultrasound imaging technology in liquid lead with the aid of computational simulations. This project will support deployment of lead-cooled fast reactor (LFR) technology by studying erosion/corrosion at a temperature range applicable to the reactor design and demonstrating liquid lead chemistry control and ultrasonic under-lead viewing equipment. Samples of materials will be placed into the lead pool to examine the overall corrosion mechanism of the structural metals and the effect of the coolant chemistry and flow conditions on the materials' integrity up to 750°C. The project will construct a new, pool-type liquid lead test facility at the University of Pittsburgh and test existing under-sodium viewing equipment from ANL to determine applicability to liquid lead environment.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage – Chemicals such as ethanol and acetone will be used for cleaning samples. They will be stored in a chemical storage cabinet which will be regularly inspected by the Environmental Health and Safety Department of the University of Pittsburgh.

Chemical Waste Disposal – Chemical waste will be collected and treated by the Environmental Health and Safety Department of the University of Pittsburgh.

Hazardous Waste Generation – Lead will be used in the laboratory experiment, and the applicable environmental regulations for disposal will be followed. Hazardous waste, including lead, will be treated through the Environmental Health and Safety Department. If needed, they will contact a third party for responsible disposal.

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 activities to improve scientific understanding of erosion and corrosion phenomena in liquid lead.

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 09/03/2019