

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: High-Efficiency Electrochemical Test Facility for Corrosion and Hydrodynamic Analysis in Molten Salts – Brigham Young University

SECTION B. Project Description

Brigham Young University (BYU) proposes to construct and operate a High-Efficiency Electrochemical Test (HEET) facility that would utilize two rotating cylindrical electrodes (RCE) in separate high-temperature electrochemical cells to provide high throughput testing of materials and measurement of physical properties in molten salts. The HEET facility will provide valuable data for the development of molten salt reactors (MSR), as well as method development and parameter selection in preparation for hot cell work and irradiation studies. The HEET facility, which will be housed in a newly constructed engineering building, will contain a dedicated glovebox that will provide an inert atmosphere for all measurements of molten salts. The glovebox will be equipped with two overhead motors, two multi-zone furnaces and two potentiostats to support simultaneous RCE experiments. The glovebox would also contain a high-temperature pycnometer to provide supporting density data for property measurements using the RCE. In combination the RCE and pycnometer can measure density and viscosity of molten salts. Independently, the RCE can measure corrosion rates. Construction and operation of the HEET facility will further enhance BYU nuclear engineering minor and research programs.

SECTION C. Environmental Aspects / Potential Sources of Impact

The office of risk management ensures safe and proper disposal of unwanted chemical and radioactive material. The office of risk management also provides training for the proper handling of chemicals and radioactive materials. A standard operating procedure for the laboratory also governs the handling of chemicals and radioactive materials in specific applications in the PI's laboratory. Chemicals and waste will be on the order of hundreds of grams (<1 kg).

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: B1.31 Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

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). For purposes of this category, "demonstration actions" means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment. Demonstration actions frequently follow research and development and pilot projects that are directed at establishing proof of concept.

Justification: The activity consists of procuring, constructing and operating a facility to measure salt properties, test materials, examine instrumentation performance under flowing conditions and benchmark computational models.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer, on 07/23/2021.