

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: The Design and Investigation of Novel Mechanical Filters for Molten Salt Reactors – Abilene Christian University**

**SECTION B. Project Description**

Abilene Christian University (ACU) proposes to characterize the hydraulic properties of sintered nickel filters for molten salt in a simple filter design, measure the effectiveness of *in-situ* method for filter regeneration to reduce or eliminate the need for filter replacement and develop and evaluate multiple novel filter designs to facilitate radiation surveying, monitoring, remote handling, and filter replacement and cooling when needed. The final objective is to design, build, and test at least one promising prototype novel filter for comparison with the simple design. Initial investigation of media properties will use a filter of standard size and media geometry. For testing regeneration (backwash) capabilities, a more robust design will be used to allow a reverse flow. For the design of novel filters, specifications include the ability to shield and cool the filter during removal and a surveying process for fissile material which will likely involve active shielded gamma ray spectroscopy to overcome the high background. The three types of filters that may be able to support operation in a molten salt reactor are the foaming filter, centrifugal filter, and cooled filter. The tasks associated with this project are (1) Characterization of filter media; (2) Characterization of *in-situ* cleaning effectiveness; and (3) Novel prototype design, construction, and testing. Existing and already-in-construction laboratory facilities will be used.

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

**Chemical Use/Storage** – The proposed work involves the use of small quantities of chemicals (<1000 kg). Use and storage will be under the direction of ACU’s office of Environmental Health and Safety.

**Chemical Waste Disposal** – The proposed work involves the use of small quantities of chemicals (<1000 kg). Disposal of spent chemicals will be by ACU’s office of Environmental Health and Safety.

**Hazardous Waste Generation** – The proposed work involves the use of small quantities of chemicals (<1000 kg). Hazardous wastes generated will be disposed of by ACU’s office of Environmental Health and Safety.

**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 develop a novel molten salt filter.

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 08/21/2019