

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: A dedicated facility for direct visualization of bubble dynamics in molten salts – University of Puerto Rico - Mayaguez

SECTION B. Project Description

The University of Puerto Rico at Mayaguez (UPRM) proposes to procure, assemble, and test the equipment needed to create a dedicated facility to enable experiments to correlate bubbles and bubbles clusters size, dynamics, composition, terminal velocity, temperature, environmental pressure and composition and purity with their aerosol production at bursting, at temperatures from operating conditions up to 1000 °C. These experiments are needed to improve the design and safety of molten salt nuclear reactors. UPRM's Bubble Dynamics Laboratory (BDL) houses equipment required for bubble visualization and characterization that complements the apparatus that will be acquired under this project to study bubble dynamics and aerosolization in molten salts. The apparatus proposed to be assembled will be specifically located in the Particle Image Velocimetry Laboratory (PIV) laboratory. In addition to the educational and research benefits to UPRM students and faculty, theoretical and computational research groups in academia and DOE will benefit from the results obtained from this facility, as well as industries developing molten salt nuclear technologies.

SECTION C. Environmental Aspects / Potential Sources of Impact

The university has procedures in place to handle any waste that will be generated through this project. The action would 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: 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, fabricating, installing and testing equipment in a facility dedicated to conducting experiments in the field of molten salt multiphase dynamics.

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.