

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: High Temperature Embedded/Integrated Sensors (HiTEIS) for Remote Monitoring of Reactor and Fuel Cycle Systems – North Carolina State University**

**SECTION B. Project Description**

North Carolina State University, in collaboration with the University of Florida, proposes to 1) develop and evaluate high temperature (> 600°C) embedded/integrated sensors (HiTEIS) for wireless monitoring of temperature, vibration, water level, pressure, and structural integrity, in applications in reactor and fuel cycle systems; 2) investigate laser ultrasound; 3) implement nuclear environment compatible secured remote communication for HiTEISs; 4) verify the HiTEIS technology in reactor and fuel cycle environments.

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

Chemical Use/Storage / Chemical Waste Disposal - Solvents, epoxies, and some ceramic powders are used for grinding. The chemical disposal will consist of lapping and grinding process associated slurry, which is picked up by the university waste handling team regularly.

Radioactive Material Use/Radioactive Waste Generation – The NCSU PULSTAR test reactor and associated facilities, including radiation labs will be used to irradiate materials and perform post irradiation examination. The PULSTAR is equipped to handle irradiated materials and is supported by operational and radiation protection staff. North Carolina State 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 permitted 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: 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 aimed at developing high temperature sensors for applications in reactor and fuel cycle systems.

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 08/22/2017