

SECTION A. Project Title: Innovative Methods for Interrogation of DSC Internal Conditions– Oregon State University**SECTION B. Project Description**

Oregon State University proposes to develop innovative methods for interrogation of the Dry Storage Cask (DSC) internal conditions to assure that the design safety functions of the DSCs continue to be met during extended storage and after transportation. The proposed work takes a two-pronged approach. The team will study techniques involving only external sensors and equipment, which could be deployed on existing DSCs. In addition, small sensors located inside the canister that can be externally powered and read through the canister wall will also be investigated. Such sensors can be implemented on future DSCs providing capabilities to monitor internal conditions that are otherwise challenging to assess solely with external sensors. The sensor systems to be developed in this project can be implemented on both vertical and horizontal DSCs. The proposed research effort can be broken down into the following tasks: 1) Evaluate external sensors and sensor network for dose and temperature profile measurements; 2) Develop an external sensor system to detect fission gas release; 3) Develop and demonstrate ultrasonic through-wall communication and power delivery system; 4) Develop internal sensing systems for monitoring during long-term storage; and 5) Experimental study to evaluate sensing module performance.

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: 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 an investigation to develop innovative interrogation techniques for periodic measurements and inspection of DSC internal conditions.

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 09/07/2021.