

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Establishment of an Integrated Advanced Manufacturing and Data Science Driven Paradigm for Advanced Reactor Systems – BWX Technologies, Inc.**

**SECTION B. Project Description**

BWX Technologies, Inc. (BWXT), in collaboration with Oak Ridge National Laboratory, proposes to develop a process for nuclear design and manufacturing through the integration of advanced software with additive manufacturing (AM) processes. The project will use a combination of in-situ process monitoring technologies, modeling, and data analytics to rapidly develop processing conditions for HastelloyR X and molybdenum used in reactor core and other primary system components and to demonstrate component-level qualification, leading to certification of nuclear materials configured in complex geometries. BWXT will purchase an electron beam melting AM machine and perform non-destructive and destructive examination on complex geometries developed by the AM-build process.

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

BWXT does not expect to generate appreciable quantities of waste. The metallic powder used in AM will be converted to solid shapes. It is expected that most of the shapes will be retained, catalogued, and inventoried for future reference. Non-usable pieces will be recycled. BWXT 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.

**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 research and development aimed at investigating additive manufacturing of complex nuclear reactor components.

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 07/23/2018