

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: SMR Reactor Vessel Manufacture/Fabrication/Demonstration Project – Electric Power Research Institute

SECTION B. Project Description

The Electric Power Research Institute (EPRI), in collaboration with Oak Ridge National Laboratory, Nuclear-AMRC, and Sheffield Forgemasters proposes to 1) develop, test and demonstrate new methods for manufacture/fabrication of critical reactor pressure vessel (RPV) components which would enable vessel sections to be produced in a timeframe of less than 12 months, 2) eliminate up to 40% from the cost of manufacturing/fabricating a small modular reactor (SMR) RPV, while reducing the schedule by over 18 months, and 3) explore the acceleration of the deployment of a SMRs in the USA and UK (and ultimately throughout the world) through a project that will produce critical sections of a 2/3rds scale SMR.

Six critical advanced manufacturing technologies that will be employed for the SMR Manufacture/Fabrication include:

- Powder metallurgy/hot isostatic pressing (PM-HIP) to consolidate large components
- Electron Beam Welding (EBW) and Reduced Pressure Electron Beam (RPEB) Welding
- Advanced Machining practices, including cryogenic machining
- Diode Laser Cladding
- Elimination of DMWs
- Bulk Additive Manufacturing

SECTION C. Environmental Aspects / Potential Sources of Impact

Air Emissions – Emissions to air will be generated through the heat treatment process. These are regulated through the site’s environmental permit which sets emission limits. Emission monitoring is undertaken on site to ensure that all emissions to air are within set limits.

Water/Well Use – Water will be used for equipment cooling and will appropriately recycled.

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 testing new manufacturing/fabrication technologies with a goal of producing critical assemblies of a 2/3 scale SMR reactor pressure vessel.

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 4/17/2017