DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-19-004

SECTION A. Project Title: Establishing Modular In-Chamber Electron Beam Welding – Electric Power Research Institute

SECTION B. Project Description

The Electric Power Research Institute (EPRI) proposes to develop a Modular In-Chamber Electron Beam Welding (MIC-EBW) approach that can be used to join large-diameter, thick-section components such as reactor vessels, steam generators, and pressurizers. Using this approach, components welds up to 10 ft in diameter can potentially be completed in less than 90 minutes, compared to several weeks with conventional welding technologies. The effort will include:

1. Process Planning – welding, inspection, and manufacturing
    - Process planning for assembly of the reactor pressure vessel components is essential to ensure that all relevant tasks are fully considered.
2. Design/Manufacture pumping states of an electron beam (EB) system
    - This task will focus on both the design and manufacture of the vacuum pumping stage of the EBW system.
3. Design/Manufacture EB Gun Stage and Slide Module and 5 ft diameter demonstration
    - In this task, the EB gun and slide stage module will be designed and manufactured. The MIC-EBW system will be demonstrated at the equipment manufacturer's site using a 5 ft diameter rotary table positioned inside a vacuum chamber. The demonstration will include welding on thick carbon steel rings sufficient to demonstrate the MIC-EBW gun and slide capability.
4. Design vacuum seals for modular ring sections
    - This task will focus solely on the "design of the vacuum sealing technology" to accommodate large-diameter modular ring sections without leakage.

SECTION C. Environmental Aspects / Potential Sources of Impact

Industrial waste will include metal chips generated from maching, welding electrodes, and general metal drops from cutting, and lubricants. Only minor volumes of material would be generated and will be disposed of as general waste.

Air Emssions may include welding fumes and grinding dust.

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 activities aimed at developing a new welding approach for large-diameter 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 02/12/2019