DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-19-072

SECTION A. Project Title: Irradiation-assisted Stress Corrosion Cracking of PWR-irradiated Type 347 Stainless Steel – Westinghouse Electric Company

SECTION B. Project Description

Westinghouse Electric Company, in collaboration with the University of Michigan – Ann Arbor (UMAA), proposes to 1) Determine the irradiation-assisted stress corrosion cracking (IASCC) susceptibility of Type 347 stainless steel as a function of neutron damage to improve IASCC predictive capabilities, and 2) Examine the relative IASCC behavior of austenitic stainless steel in two different pressurized water reactor (PWR) water chemistries. Westinghouse currently has a selection of Type 347 stainless steel baffle-former bolts in their Hot Cell facility which show a range of irradiation damage levels well-suited to this study with the possibility of more specimens being acquired at a later date. Westinghouse will fabricate the disk specimens, which are several small disks cut from the shaft of the same baffle-former bolt. The resulting sets of samples will have effectively equivalent radiation dose and service conditions which will enable the effects of the chemical environment (lithium hydroxide vs. potassium hydroxide) to be compared. Existing laboratory facilities and equipment will be used.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use/Radioactive Waste Generation – Previously-irradiated stainless steel (radioactive material) will be machined into test specimens in the Westinghouse Churchill hot cell facility. This process will generate machining chips from the radioactive material which will be disposed of as radioactive waste. The samples (weighing approximately 2.5 grams) will be shipped to the UMAA for testing. UMAA has established procedures for conducting these tests. Once testing is complete, the samples will be returned to Westinghouse Churchill. The Westinghouse Churchill Environmental Health and Safety (EHS) group provides and enforces procedures for the safe handling and disposal of radioactive materials. All waste is properly labeled and stored prior to collection by EHS. Such waste is disposed of through qualified vendors for transportation and disposal.

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 activities to improve ability to predict failures due to IASCC in Type 347 stainless steel and determine whether substituting potassium for lithium in the pH control could lengthen the service life of this material.

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 08/29/2019