

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Integration of Nuclear Material Accounting Data and Process Monitoring Data for Improvement on Detection Probability in Safeguarding Electrochemical Processing Facilities – Oregon State University

SECTION B. Project Description

Oregon State University, in collaboration with Virginia Tech University, proposes to (1) develop accurate predictive models for converting electrochemical sensor signals into material concentrations in the molten salt while the electrorefiner (ER) is operating; (2) validate the developed sensor model via experiments, collect available data, and build databases for process monitoring (PM) and Nuclear Material Accounting (NMA) data; (3) refine a previously developed dynamic ER model to include uncertainty analysis; (4) develop methods to predict near-real time radiation-based signatures using well-benchmarked Monte Carlo codes, in conjunction with our ER model, which allow generation of PM residuals based on radiation-based non-destructive assay (NDA) signals; and (5) utilize the Separations and Safeguards Performance Model (SSPM) to quantitatively study the benefits of the integration of NMA and PM data based on output from our models.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – Radioactive check sources will be used to test detector response.

Chemical Use/Storage and Waste Disposal – Proposed research project will involve the storage and use of chemicals (solid salt). All chemicals will be stored, labeled, and used in accordance with university Environmental Health and Safety (ESH) guidelines. The chemical waste is solid salt containing RE chloride and KCl and LiCl. The waste salt disposal will follow the University EHS guidelines.

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 university-scale research activities aimed at integrating PM and NMA data for safeguarding electrochemical reprocessing facilities.

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 08/03/2018