

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Advanced Test Reactor 2A Loop Chemistry Control

SECTION B. Project Description:

Research and Development (R&D) experiments associated with the National Scientific User Facility (NSUF) at Advanced Test Reactor (ATR) require a primary loop chemistry similar to that found in the commercial nuclear power industry pressurized water reactor (PWR). The initial chemistry control parameters selected by the NSUF program required a loop pH of approximately 5.6 to 8.6 with no chemical additives. However, during the irradiation cycles for Electric Power Research Institute (EPRI) (EPRI)-1, EPRI-2, and EPRI-3 experiments, the experiment delta pressure increased. During post irradiation examination, it was shown that the test specimens had been subjected to corrosion product deposition. The purification flow rate in the Loop 2A is too low to control corrosion product transport, so a chemistry control change is needed.

The proposed action would modify pressurized water loop chemistry control specifications for Loop 2A in order to avoid corrosion deposition on R&D experiments. The Loop 2A chemistry specification would be revised to include a lithium hydroxide monohydrate (LiOH) to minimize the corrosion product deposition noticed in the EPRI experiments.

Loop 2A was initially operated with a neutral pH (5.6 to 8.6) and a mixed bed containing a strong acid cation-exchange resin in the hydrogen form and strong base anion-exchange resin in the hydroxide form. The proposed action would change the resin beds from H+ to Li+ based resin by feeding a LiOH solution into the loop until the resin is saturated with Li.

After conditioning/saturating the resin bed with Li, the concentration of LiOH in the loop would be maintained at approximately 1 ppm.

Project Start Date: May 2015

Project End Date: May 2015

Project Cost: Approximately: \$1,000.00

SECTION C. Environmental Aspects or Potential Sources of Impact:

Generating and Managing Waste - All waste generated from this activity will be managed in accordance with laboratory procedures. Pollution prevention/waste minimization will be implemented where economically practicable to reduce the volume and/or toxicity of waste generated. All waste generated will be transferred to Waste Generator Services (WGS) for appropriate disposition. All waste generated from these activities will have an identified disposition path prior to it being generated.

Releasing Contaminants – All chemicals will be managed in accordance with laboratory procedures.

Using, Reusing, and Conserving Natural Resources - All material will be reused and/or recycled where economically practicable. All applicable waste would be diverted from disposal in the landfill when possible. Project personnel would use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible. The project would practice sustainable acquisition, as appropriate and practicable, by procuring construction materials that are energy efficient, water efficient, are bio-based in content, environmentally preferable, non-ozone depleting, have recycled content, and are non-toxic or less-toxic alternatives.

SECTION D. Determine the Recommended Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

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, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References: 10 CFR 1021, Appendix B, B3.6 "Small-scale research and development, laboratory operations and pilot projects"

Justification: Project activities are consistent with 10 CFR 1021, Appendix B, 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 deployment."

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on: 5/26/2015