

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Innovative Manufacturing Process for Improving the Erosion/Corrosion Resistance of Power Plant Components via Powder Metallurgy & Hot Isostatic Processing Methods – Electric Power Research Institute**

**SECTION B. Project Description**

The objective of this project is to conduct the necessary design, processing, manufacturing, and validation studies to assess powder metallurgy/hot isostatic processing (PM/HIP) as a method to produce very large near-net shaped (NNS) components with erosion/corrosion resistant surfaces for use in nuclear and electrical power generation equipment.

- Project tasks include the following:
- Modeling of NNS Component Alloy & Mold/Can design
- Test coupon development, demonstration, and screening for surface applications
- Low alloy steel PM/HIP component development
- Nickel-based alloy PM/HIP component development
- Austenitic stainless steel PM/HIP development
- Mechanical & Metallographic Characterization
- Corrosion Testing of Testing Coupons

**SECTION C. Environmental Aspects / Potential Sources of Impact**

Chemical Use/Storage – Corrosion tests will be performed per ASTM A262, Part A which involves use of a chemical etchant (10 % oxalic acid) to bring out the microstructure of the alloy. Chemical etchants are handled per the subcontractors materials handling safety program. Tests may also include selective autoclave tests wherein the alloys are exposed to small levels of Cl- in water. Once tests are completed, the fluid can be flushed down a drain after being sufficiently diluted further with water.

**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 performing small-scale research on powder metallurgy/hot isostatic processing.

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 8/20/2012