

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Radiation Hardened Electronics Destined for Severe Nuclear Reactor Environments – Arizona State University

SECTION B. Project Description

Arizona State University proposes to develop both board and application-specific integrated circuits (ASIC) level (radiation hardening by design) RHBD techniques for circuits destined for severe nuclear environments, specifically those that are vital to robotic circuits. The project will focus on using redundancy to achieve total ionizing dose (TID) hardness by interleaving active and recovery times for individual IC or constituent circuits.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use – The electronics developed for this project will be exposed to emanations from radioactive material such as gamma rays from cobalt-60. No radioactive waste is generated. Arizona State is licensed to possess and use the requisite radiative material.

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 evaluating irradiation effects on integrated circuits for research purposes.

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 11/14/2013