

**SECTION A. Project Title: Development of LWR Fuels Enhanced Accident Tolerance – Westinghouse Electric Company LLC****SECTION B. Project Description**

The Westinghouse team, which includes General Atomics, Idaho National Laboratory (INL), Massachusetts Institute of Technology (MIT), Texas A&M University, Edison Welding Institute, Los Alamos National Laboratory, and Southern Nuclear Operating Company, will work to develop fuel and cladding concepts with strong potential to replace the currently used Zr + UO<sub>2</sub> fuel system with and enhanced accident tolerant fuel. This will be done by investigating a new fuel system comprised of a cladding capable of surviving high temperatures and significantly reducing any in-core reactions with steam and a high density fuel of increased U-235 content still at a 5% enrichment and increased thermal conductivity.

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

**Radioactive Material Use** – LANL will handle radioactive material under approved integrated work documents which document the relevant procedures, handling limits, and safety procedures. They are currently only intending to have fresh fuel material, depleted for this first project, and will ship the material to TAMU. TAMU will receive uranium nitride powders from Los Alamos National Laboratory and uranium silicide powders from INL and manipulate the powders to develop a fabrication methodology for the proposed nitride-silicide composite. TAMU has formal procedures in place for storage, use, and disposal of uranium. The TAMU Environmental Health & Safety Department manages all aspects of radioactive material procurement, shipping and receiving, inventory, and waste management. INL's primary role includes fabrication and characterization of enriched U<sub>3</sub>Si<sub>2</sub> pellets for future irradiation testing in the ATR. Pellets will be fabricated by INL using DOE-owned materials, and the pellets will be owned by DOE. The irradiated pellets and PIE samples will remain DOE property and will ultimately be disposed of by DOE along with other DOE-owned irradiated materials and samples.

**Radioactive Waste Generation** – The cladding samples will be irradiated at the MIT reactor. After irradiation, the samples will be disposed of under their license.

**Industrial Waste Generation** – The chemical vapor infiltration (CVI) operation will be performed at a General Atomics site that does internal R&D using CVI services. Off-gases are scrubbed as part of the process, neutralized and discharged as industrial waste.

**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.

MIT NRC License R-37

Texas A&M NRC License 42-09082-09

Justification: The activity consists of evaluating light water reactor fuel 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 9/25/2012

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