

# DOE-ID NEPA CX DETERMINATION

## Idaho National Laboratory

**SECTION A. Project Title:** Irradiation Testing of Accident Tolerant Fuels (ATF) in the Advanced Test Reactor (ATR) Water Loop Rev 1

**SECTION B. Project Description and Purpose:**

This environmental checklist (EC) is being revised to add the following scope to the proposed action:

The Accident Tolerant Fuels (ATF) Project is in the pre-irradiation design validation phase for a water loop experiment, designated as ATF-2, to be irradiated in the Idaho National Laboratory (INL) Advanced Test Reactor (ATR) in 2018 as analyzed in the original EC. Prior to insertion of the ATF-2 experiment in the ATR, a Sensor Qualification Test (SQT) is required to validate sensor performance and structural stability. In order to validate the calculated /expected operation of the ATR SQT, the ATF Project has determined that an SQT mock-up assembly should be conducted out-of-pile (i.e., not in a nuclear reactor) under similar pressures and temperatures to verify the test can withstand the required test conditions prior to ATR insertion. This out-of-pile test will be conducted at the Westinghouse Advanced Loop Tester (WALT Loop) at the Westinghouse mechanical testing facility, located in Churchill, PA. This mock-up test has been designated as the WALT Loop SQT. Results from the WALT Loop SQT will provide data and input for performing the ATR SQT.

Idaho National Laboratory (INL) will conduct the activities listed below as part of this additional scope:

- Purchase and deliver coolant pump for use in the WALT Loop and perform and verify flow rate calculation of pumps
- Fabricate and ship top and bottom loop heads to bolt on to the WALT Loop
- Perform structural analysis to verify top and bottom loop heads meet requirements
- Assemble the WALT SQT test train at INL and ship test train along with a gas panel, cables, test control systems, and instrument data collection systems to the WALT Loop facility
- Maintain ownership of equipment and ship all equipment back to INL after the WALT Loop SQT experiment
- Examine structural integrity of sensors upon completion of the WALT Loop SQT
- Analyze water samples collected during WALT Loop SQT at the Westinghouse location (Westinghouse will dispose of water samples).

This additional scope will not involve radioactive shipments and does not change environmental aspects or work activities identified in the original EC.

Aside from the additional activities noted above in this revision, activities from the original scope of the proposed action remain valid.

**SECTION C. Environmental Aspects or Potential Sources of Impact:**

### Air Emissions

Experiment irradiation and PIE will be performed at the ATR and HFEF facilities, respectively. The irradiation of sealed capsules in the ATR primary coolant is not a modification in accordance with Idaho Administrative Procedures Act (IDAPA) 58.01.01.201 and 40 Code of Federal Regulation (CFR) 61 Subpart H. Normal operation of sealed experiments in ATR primary coolant is not expected to contribute to and/or cause an increase in air emissions. ATR radionuclide emissions are sampled and reported in accordance with Laboratory-wide Procedure (LWP)-8000 and 40 CFR 61 Subpart H. The irradiated experiment will be delivered to the MFC HFEF for disassembly and then undergo routine PIE. All radionuclide release data associated with the PIE portion of this experiment will be recorded as part of the HFEF continuous stack monitor and calculated and provided to Programs Environmental Support organization by January 31 of each year for the preceding calendar year as part of the INL Annual National Emission Standards for Hazardous Air Pollutants (NESHAPs) report to DOE. Releases of radioactive airborne contaminants from this process are not expected to result in an increase to the annual HFEF dose to the Maximum Exposed Individual. Therefore, no Air Permit Applicability Determination is required for the project. All experiments will be evaluated by ATR Environmental Support and Services staff, prior to insertion in the ATR. All radionuclide release data (isotope specific in curies) directly associated with this experiment will be calculated and provided to the ATR Programs Environmental Support organization by January 31 of each year for the preceding calendar year.

### Generating and Managing Waste

Irradiated sample debris and PIE waste are expected to generate research and development-related TRU waste and mixed TRU waste. TRU waste generated for the ATF-2 experiments will be less than 50 cubic inches (conservative estimate assuming all UO<sub>2</sub> fuel will be converted to TRU). Categorizing this material as waste is supported under DOE O 435.1, Att. 1, Item 44, which states "...Test specimens of fissionable material irradiated for research and development purposes only...may be classified as waste and managed in accordance with this Order...".

Small amounts of low-level waste would be generated in the form of personal protective equipment (PPE) and towels used for cleaning and polishing.

Project activities would also result in the generation of small amounts of industrial waste.

Project personnel would work with Waste Generator Services (WGS) to properly package and transport regulated, hazardous or radioactive material or waste according to laboratory procedures.

### Releasing Contaminants

All chemicals and radioactive materials will be managed in accordance with laboratory procedures.

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### 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.

**SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification:** 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"

Final Environmental Impact Statement for the Waste Isolation Pilot Plant (DOE/EIS-0026, October 1980) and Final Supplement Environmental Impact Statement for the Waste Isolation Pilot Plant (SEIS-I) (DOE/EIS-0026-FS, January 1990)

Final Waste Management Programmatic Environmental Impact Statement [WM PEIS] (DOE/EIS-0200-F, May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997)

**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."

The impacts of transporting and disposing of waste resulting from defense activities that was placed in retrievable storage pursuant to a 1970 Atomic Energy Commission policy (see Section 1.2) and TRU waste that was reasonably expected to be generated by ongoing activities and programs was analyzed in DOE/EIS-0026 (October 1980) and the Final Supplement Environmental Impact Statement for the Waste Isolation Pilot Plant (SEIS-I) (DOE/EIS-0026-FS, January 1990).

NEPA coverage for the transportation and disposal of waste to WIPP are found in DOE/EIS-0200-F (May 1997) and Waste Isolation Plant Disposal Phase Supplemental EIS (SEIS-II) (DOE/EIS-0026-S-2, Sept. 1997), respectively. The 1990 ROD also stated that a more detailed analysis of the impacts of processing and handling TRU waste at the generator-storage facilities would be conducted. DOE has analyzed TRU waste management activities in DOE /EIS-200-F (May 1997). The WM PEIS analyzes environmental impacts at the potential locations of treatment and storage sites for TRU waste; SEIS-II addresses impacts associated with alternative treatment methods, the disposal of TRU waste at WIPP and alternatives to that disposal, and the transportation to WIPP. (SEIS-II also includes potential transportation between generator sites.)

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: 2/7/2017