DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory

CX Posting No.: DOE-ID-INL-19-091 R1

SECTION A. Project Title: THOR-M Phase I Experiment at TREAT

SECTION B. Project Description and Purpose:

Revision 1:

The Metallic (M) fuel experiments utilizes a newly developed sodium environment module termed the Temperature Heat sink Overpower Response (THOR) module. Thus, the series is part of the THOR-M series ("M" like historical TREAT tests in Mk-III sodium loop). The M series tests will be comprised of Transient Overpower and Loss of Flow experiments (M-TOP and M-LOF). The M-TOP experiments are covered in the original EC below. This revision focuses on the M-LOF experiments.

The THOR-M experiment proposed action aims to commission the THOR capsule for testing irradiated fuels while investigating high burnup fuel performance to fill data gaps in the experimental database. The experiments will include specimens irradiated in Experimental Breeder Reactor (EBR)-II to varying burnup. The experiments will investigate fuel performance for various overtemperature conditions to represent accident conditions with special focus on conditions corresponding to loss of flow (LOF). The transient conditions will push fuel powers and/or temperatures at specified rates to investigate fuel failure and related degradation.

The proposed experiment tests sodium-cooled fast reactor pin specimens of U-Zr and/or U-Pu-Zr fuel alloys at power/thermal conditions extending to fuel failure. These tests will begin to explore experiments that were of interest in historical R&D programs, which were never completed. This testing will support the development of expertise, modeling and experimentation methods, and interpretation techniques for metallic fuels. Ultimately, these tests will inform the development and validation of fuel performance models and fuel safety criteria, that will benefit potential industry deployment of these fuels.

Project personnel complete pretest assembly, post-test disassembly, and post-irradiation examination (PIE) at the Hot Fuel Examination Facility (HFEF) at the Materials and Fuel Complex (MFC). Low radioactivity shipping to and from the Transient Reactor Test Facility (TREAT) uses approved transfer/shipping containers (e.g., HFEF-15 Cask).

The Department of Energy (DOE) evaluated the environmental impacts of transient irradiations in the TREAT reactor, including 1) transporting experiment materials between MFC and TREAT, 2) pre- and post-irradiation radiography, 3) PIE of test components at HFEF or other MFC facilities, and 4) waste generation and disposal in the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Resumption of Transient Testing of Nuclear Fuels and Materials (DOE/EA-1954, February 2014).

After PIE, irradiated test pin segments and PIE remnants will be stored with other similar DOE-owned irradiated materials and experiments at MFC, most likely in the HFEF or the Radioactive Scrap and Waste Facility (RSWF) in accordance with DOE's Programmatic SNF Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (FEIS) and ROD (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). Ultimate disposal of the irradiated test pin segments and PIE remnants will be along with similar DOE-owned irradiated materials and experiments currently at MFC Categorizing this material as waste is supported under Department of Energy Order (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...".

In addition, to complete proposed work activities, it is necessary for the project to use the HFEF hot cell which contains both defense and nondefense related materials and contamination. Project materials will come into contact with defense related materials. It is impractical to clean out defense related contamination, and therefore, waste associated with project activities is eligible for disposal at the Waste Isolation Pilot Plant (WIPP). National Environmental Policy Act (NEPA) coverage for the transportation and disposal of waste to WIPP are found in 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), respectively. The 1990 ROD also stated that a more detailed analysis of the impacts of processing and handling transuranic (TRU) waste at the generator-storage facilities would be conducted. The Department has analyzed transuranic (TRU) waste management activities in the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) (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

Packaging, repackaging, transportation, receiving, and storing used nuclear fuel and R&D for used nuclear fuel management is covered by DOE's Programmatic Spent Nuclear Fuel (SNF) Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (EIS) and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). The analyses include those impacts related to transportation to, storage of, and research and development related to used nuclear fuel at the INL (see Tables 3.1 of the SNF Record of Decision (May 30, 1995) and Table 1.1 of the Amended Record of Decision [February 1996].

The environmental impacts of transferring LLW from the INL Site to the Nevada National Security Site were analyzed in the 2014 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (DOE/EIS-0426) and DOE's Waste Management Programmatic EIS (DOE/EIS-200). The fourth Record of Decision (ROD) (65 FR 10061, February 25, 2000) for DOE's Waste Management Programmatic EIS established the Nevada National Security Site as one of two regional LLW and MLLW disposal sites.

Original EC:

This environmental checklist (EC) covers a series of sodium fast reactor (SFR) experiments in the Transient Reactor Test (TREAT) Facility at Idaho National Laboratory (INL) to meets goals identified in the fuel safety plan for the Department of Energy (DOE) Advanced Fuels Campaign (AFC). These SFR experiments utilize a heat sink device to test integral fuel behavior for Transient Overpower (TOP) conditions postulated for SFRs. INL proposes to perform these tests using a compact static sodium environment.

Background

Transient overpower events relate to a range of operating and accident conditions resulting from increases in fuel power. Typical TOP conditions of interest for SFRs are very low probability events called beyond design basis accidents (BDBA). A classic BDBA is the unprotected TOP (UTOP), which can result in benign metal fuel behaviors due to inherent safety mechanisms in modern SFR designs. In general, experimental studies supply overpower conditions under varying reactor rates and maximum cladding temperature targets to evaluate fuel behaviors.

In an assumed UTOP scenario, a control rod is withdrawn from the core resulting in reactivity insertion and power rising above normal levels. This causes the core and coolant to heat and introduces negative reactivity to return reactor power to equilibrium using the heat rejection rate of the system. Proper reactor design allows enough heat removal to prevent fuel failures. To fully understand SFR fuel system behavior and potential failure mechanisms, experiments simulate hypothetical scenarios where power ramp rates are much greater than design scenarios.

Objectives

INL needs to complete the proposed experiment series to obtain in-pile data on metal fuel behaviors during TOP conditions. This experiment series requires a heat-sink based testing capability. The specific experiment objectives are listed below:

1. Commission a heat sink testing capability for TREAT to test advanced fuels
    a. Establish a baseline on unirradiated specimens for comparing to historical fuel performance results
    b. Qualify experiment instrumentation
    c. Quantify the resolution of the current TREAT hodoscope to measure fuel elongation during transient experiments.
2. Explore advanced metal fuel behavior under TOP conditions
    a. Investigate Fuel-Cladding Mechanical Interaction (FCMI) for He-bonded annular fuels
    b. Evaluate potential material relocation behavior for annular fuels (potential for slumping in the central core).

These experiments re-establish in-pile transient testing of metal fuels at TREAT and support further testing using a simplified heat-sink device. The project focuses on establishing expertise, methods, and computational tools to support transient experiment design and interpretation for metal fuels.

Test Series Description

Test Matrix

Table 1 presents a test matrix and fuel performance goals. The proposed tests use unirradiated fuel in stainless steel (SS) cladding with constant smear density ~75%. Cylindrical geometries will be sodium bonded while annular geometries will be helium bonded. The first two columns describe specimen configuration. The last four columns prescribe targeted experiment conditions. For these tests, specimen heat rates are not specified, but time vs temperature history is the most important test design metric. Cladding temperatures are a priority second to fuel centerline. The radial temperature gradient in the fuel is also be considered a prime design metric. Some columns are left To Be Determined (TBD), pending further analysis and design development.

Table 1: Experiment Test Matrix for MTOP-1 Series. All specimens will be in a non-irradiated state. The targeted length of all fuel specimens is TBD.

Test #	Fuel Composition / Enrichment / Geometry	Fuel OD / ID** Cladding OD / ID (mm)	Internal Pin Pressure (MPa)	Initial Cladding Temp (K)	Peak Cladding Temp (K)	Time to Peak Cladding Temp (s)	Peak Average Temperature (K)
MTOP-1A1*	U-10Zr / TBD / Cylindrical	5.0/- 6.9 /5.7	0.1 MPa	500-850	900	25 (TBD)	TBD
MTOP-1A2	U-10Zr / TBD / Cylindrical	5.0/- 6.9 /5.7	0.1 MPa	500-850	1100	100	TBD
MTOP-1B	U-10Zr / TBD / Cylindrical	5.0/- 6.9 /5.7	TBD	500-850	1400	8	TBD
MTOP-1C	U-10Zr / TBD / Cylindrical	5.0/- 6.9 /5.7	TBD	500-850	1400	25	TBD
MTOP-1D	U-20Pu-10Zr / TBD / Cylindrical	5.0/- 6.9 /5.7	TBD	500-850	1400	25	TBD
MTOP-1E	U-10Zr / TBD / Annular	TBD/TBD 6.9/5.7	TBD	500-850	1100	8	TBD
MTOP-1F	U-10Zr / TBD / Annular	TBD/TBD 6.9/5.7	TBD	500-850	1400	25	TBD

*The objective of this test is to perform calorimetric measurements to establish an energy coupling factor.
**Annular Fuel will have dimensions for both OD and ID.

Figure 1 shows several TOP scenarios that may occur in a typical SFR with metal fuel. INL intends to use the temperature and time to temperature targets listed in Table 1 to replicate the temperature trends in Figure 1 while focusing on trends that can be recreated within TREAT's capability and which bound other scenarios (i.e. the dark blue and light orange trends in Figure 1). The onset of rapid eutectic cladding penetration ~1350-1400 K gives some worst case FCMI and fuel relocation behavior and are of interest for tieback tests as other claddings, liners, and fuels are tested in the future. These tests also support quantifying the TREAT hodoscope's resolution and ability to detect fuel relocation.

Figure 1. Various TOP scenarios of interest.

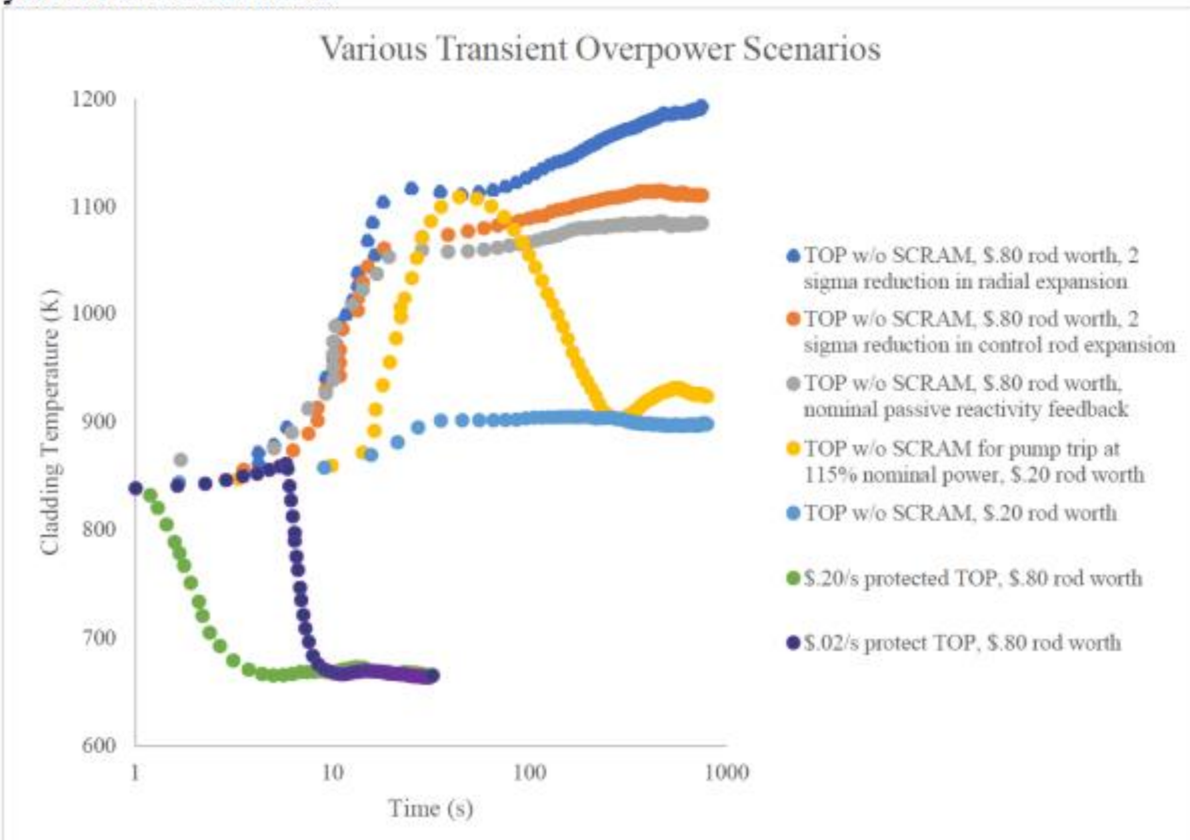


Table 1 represents the targeted testing program INL proposes to use to commission a Temperature Heat-sink Overpower Response (THOR) module to support tests that can be tied back to historical experimental results. The sequence and parameters in Table 1 are subject to change as INL designs and develops the MTOP-1 experiment. INL anticipates using MTOP-1A1 to identify the energy coupling factor between reactor power and test power through calorimetric measurements to verify the study meets targeted specimen temperatures. The remaining experiments evaluate different fuel types and geometries under different ramp times and temperatures corresponding to TOP scenarios and cladding failure thresholds. The experiments use cylindrical U-10Zr fuels as the benchmark for other fuel compositions and geometries. The selected ramp rates correspond to historical M-series tests and the planned M8 test. One test targets a relatively long ramp condition, never explored in TREAT, but with a timescale more prototypic to SFR BDBA events. Test MTOP-1B represents conditions of the historical M-series tests. This test ties back to historical experiments and supports comparing the heat sink testing approach to a flowing sodium loop.

Test MTOP-1A2 and MTOP-1C allow INL to compare the conditions that bookend the expected failure threshold for SS316. The former test explores studying longer term transient behavior more prototypic for SFR events. MTOP-1B and -1C give a comparison of fast and slow ramp rates. MTOP-1D focuses on a ternary fuel composition for additional comparison, important for evaluating energy deposition in Pu-bearing specimens and performance differences.

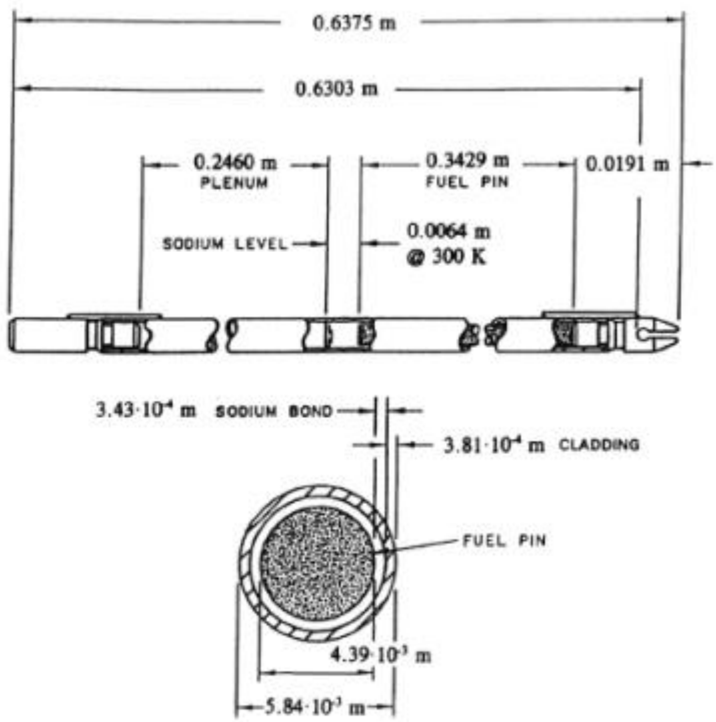
The last two tests, MTOP-1E and -1F, evaluate performance of advanced fuel forms having no sodium bond in the fuel pin at two different ramp rates. Other than fuel geometry, these experiments will be near identical to MTOP-1A2 and -1C for comparison. The design has little gap between fuel and cladding and utilizes an annular configuration to accommodate irradiation-induced swelling.

INL uses modeling results to complete and finalize the proposed test matrix. Some important parameters require more study, including enrichment (power coupling), fuel radial temperatures, initial temperatures, and initial internal pin pressure.

Test Specimen

The test pin represents a miniature length SFR fuel pin, prototypic in the radial dimension. For the MTOP-1 irradiation test series, the test pin contains fuel in the form of fuel slugs, a sodium or inert gas bonding agent, and a gas plenum. INL manufactures cladding material from SS and fuel forms as outlined in Table 1. While proposed fuel dimensions are prototypic, INL may evaluate small deviations to explore new fuels (i.e. annular fuels) or fuels with differing sodium annuli between the fuel and cladding. Regardless of fuel form and dimension, INL proposes to verify a fuel's viability in the test and its value in achieving objectives. Test device constraints bound the maximum axial and radial dimensions. Prototypic design data are given in Figure 2.

Figure 2. The metal alloy fuel design used in the Experimental Breeder Reactor (EBR)-II.



Fabrication

INL proposes fabricating test specimens from EBR-II fuel pins (see Figure 2) or other in-stock material. INL anticipates fuel pin geometry and composition similar to that specified in Figure 2 and the Versatile Test Reactor (VTR) design. INL will consider fuel specimen/pin dimensions in the axial and radial directions during fabrication to support modeling and comparison with PIE and will record individual fuel masses and plenum pressures.

Experiment Design

The test or experiment has several components: the neutron environment, the experiment vehicle, the experiment module, and the specimen. The TREAT Facility supplies the neutron environment. TREAT's unique neutron environment allows a variety of transient power shapes and durations.

Test Device

INL designed the Minimum Activation Retrievable Capsule Holder (MARCH) to deliver a flexible platform for inserting distinct test modules into TREAT. The MARCH containment structure, termed the Broad Use Specimen Transient Experiment Rig (BUSTER), houses various modules, including a high temperature heater module and multi-capsule assemblies. INL designed the THOR module to support near prototypic heat transfer conditions, especially TOP conditions. THOR is suspended inside BUSTER at the appropriate elevation to achieve the desired transient outcomes (i.e., near TREAT midcore with consideration of optimizing hodoscope measurements). The THOR design accomplishes near prototypic heat transfer and low uncertainty measured response.

The THOR module uses low activation materials where possible and is capable of housing a single fuel pin up to 12 inches in length with prototypic pin diameter. The fuel pin geometry spans the view of at least three hodoscope detectors in the vertical direction and at least one hodoscope detector in the horizontal. Experiments involve placing a relatively large heat sink material with similar properties to the module inside to allow for prototypic heat rejection.

The module can be filled with sodium or an inert gas with a sodium annulus between the fuel pin and the heat sink material.

Instrumentation

THOR offers a platform to test instrumentation in representative temperature ranges and other environmental conditions. Table 2 lists instrumentation in the THOR.

With this test series, INL aims to develop TREAT hodoscope strategies that allow INL to better quantify fuel movement and elongation in the experiment. INL may evaluate other instrumentation during the MTOP-1 experiments to give greater resolution to the resulting phenomenon or to test the instrumentation viability.

Irradiation Test Conditions

TREAT can generate large power pulses on the order of tens of thousands of megawatts within seconds and can also operate at steady state power up to 120 kW for several hours. For MTOP-1, INL proposes to operate TREAT to best achieve desired temperature targets and distributions. INL may also use flux shaping collars and heat sink or insulation materials to achieve flux and temperature profiles. The reactor or a heater installed around the test device can assist in achieving initial temperature conditions.

Characterization

Post-Irradiation Examinations (PIE)

PIE characterizes the fuel and cladding following irradiation. INL measures radial and axial cladding strain and investigates dimensional and microstructural changes if cladding is breached. INL uses cross-sectional microscopy to study fuel constituent relocation and Focused-Ion-Beam to sample radial locations for gamma spectroscopy and radiochemistry analysis to evaluate energy deposition in the specimen.

PIE includes visual examination, gamma scan and gamma scan tomography, neutron radiography/tomography, radiochemistry with focused ion beam preparations, and optical metallography; dimensional measurements, sectioning, and electron microscopy. PIE delivers data on fuel relocation, slumping, elongation, and fuel/cladding strain and failure locations. INL will compare data gathered during the experiment from in-core instrumentation and the hodoscope with PIE results to determine adequacy of instrumentation and whether the in-core data supports a prediction in the PIE results. Quantifying the resolution of the hodoscope is also needed.

Fuel Performance Analysis

INL proposes using the BISON fuel performance code to support safety analysis of the experiment. The strategy explores the relationship of test design to prototypic fuel behaviors, performs parameter studies that support experiment design, and predict experiment performance to align with objectives. Modeling results also support instrumentation strategies within the experiment. The modeling effort with a fuel performance code helps identify gaps in the tool capabilities.

Early modeling guides test designs that best produce desired radial temperature distributions and temperature trends to complete development of the test matrix. INL will compare SFR TOP predictions with historical M-series test results and use these models to explore fuel behaviors such as FCMI under planned conditions, especially in relation to annular fuel designs free of a sodium annulus between fuel and cladding. The modeling also explores predicting fuel centerline temperatures based on measurements made in the heat sink. The temperature predictions are important for evaluating potential fuel slumping behavior in annular fuels.

INL will adapt the pre-test predictions for as-run conditions to calculate final modeling results. And will compare online and PIE data to model predictions to finalize experiment conclusions and aid development of the fuel behavior model.

INL proposes performing the first THOR experiment series using fresh fuel specimens. INL expects beginning irradiated fuel testing in FY21. The current schedule target for irradiating these experiments in TREAT is summer of 2020.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

The proposed action has the potential to generate radiological emissions from irradiation in TREAT. Air emissions are anticipated to be minor, and emissions from this project will not exceed the dose estimate in DOE/EA-1954, Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials.

The TREAT irradiation activities are not modifications in accordance with Idaho Administrative Procedures Act (IDAPA) 58.01.01.201 and 40 Code of Federal Regulation (CFR) 61 Subpart H. All experiments will be evaluated by Environmental Support and Services staff.

In 2019, the effective dose equivalent to the offsite maximally exposed individual (MEI) from all operations at the INL Site was calculated as .0559 mrem/yr, which is 0.56% of the 10-mrem/yr federal standard and was calculated using all sources that emitted radionuclides to the environment from the INL site. The emissions are bounded by the analysis in the 1995 EIS, which estimated the annual cumulative doses to the maximally exposed worker, offsite maximally exposed individual (MEI), and the collective population from DOE's decision to implement the preferred alternative (DOE/EIS-0203). The potential air emissions and human health impacts associated with the proposed action would be smaller than and are bounded by the impacts presented in the 1995 EIS.

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

TREAT (MFC-720) is eligible for listing on the National Register of Historic Places (NRHP) and is considered a Category 1 historic property; as such, all project activities associated with the building must undergo cultural resource review (CRR).

Generating and Managing Waste

Operations also have the potential to generate mixed waste. Mixed waste, if generated, is accumulated and stored in accordance with Federal and state regulations, treated if required, and disposed at an off-site permitted/licensed facility.

The proposed activities could generate <1 m3 of transuranic (TRU) waste and < 1 liter of sodium waste.

Releasing Contaminants

Whenever chemicals are used there is a potential to spill to soil, water, or the air.

Using, Reusing, and Conserving Natural Resources

All materials will be reused and recycled where economically practicable. All applicable waste will be diverted from disposal in the landfill where conditions allow.

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 to subpart D, items B3.6, "Small-scale research and development, laboratory operations, and pilot projects"

Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Resumption of Transient Testing of Nuclear Fuels and Materials (DOE/EA-1954, February 2014).

Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement and Record of Decision (DOE/EIS-0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS- 0203-SA-02) and the Amended Record of Decision (1996)

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, September 1997)

Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (DOE/EIS-0426, December 2014).

Justification:
The proposed R&D activities are consistent with CX 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); 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 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."

DOE evaluated the environmental impacts of transient irradiations in the TREAT reactor, including 1) transporting experiment materials between MFC and TREAT, 2) pre- and post-irradiation radiography, 3) PIE of test components at HFEF or other MFC facilities, and 4) waste generation and disposal in the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Resumption of Transient Testing of Nuclear Fuels and Materials (DOE/EA-1954, February 2014).

After PIE, irradiated test pin segments and PIE remnants will be stored with other similar DOE-owned irradiated materials and experiments at MFC, most likely in the HFEF or the Radioactive Scrap and Waste Facility (RSWF) in accordance with DOE's Programmatic SNF Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (FEIS) and ROD (DOE/EIS- 0203, 1995) and supplemental analyses (DOE/EIS-0203-SA-01 and DOE/EIS-0203-SA-02) and the Amended Record of Decision (February 1996). Ultimate disposal of the irradiated test pin segments and PIE remnants will be along with similar DOE-owned irradiated materials and experiments currently at MFC. Irradiated sample debris and secondary waste could total as much as 20-30 Kg. Categorizing this material as waste is supported under Department of Energy Order (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...".

NEPA coverage for the transportation and disposal of waste to WIPP are found in the 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), 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. The Department has analyzed TRU waste management activities in the Final Waste Management Programmatic Environmental Impact Statement (WM PEIS) (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.

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

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer on: 05/20/2021