

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: TREAT Experiment Support Building Upgrades

SECTION B. Project Description and Purpose:

Introduction

To strengthen and enhance experiment preparation and disassembly capabilities for the TREAT organization, the TREAT warehouse (MFC-723) will be modified. The facility known to this point as the TREAT warehouse will now be referred to as the TREAT Experiment Support Building (TESB), and its mission will be changed. Planned modifications to the facility are described below. These plans are in various stages of development and funding approval. Some of the proposed building modifications and operational scope may never actually come to fruition.

The TREAT warehouse was originally constructed in 1980 and has mostly been used for material storage since its construction. The facility is currently a Radiological facility.

Proposed Scope and Purpose of TESB

The purpose of the TESB will be to support assembly and disassembly of TREAT experiments. To allow this purpose to be accomplished in the TESB, additional equipment will be added to the facility. In addition, relatively minor modifications will be completed within the facility to support TREAT experiment assembly and disassembly work scope that is currently being performed at other INL facilities.

TREAT experiments are currently assembled in a variety of INL facilities including HTTL, AFF, EFF, and the TREAT reactor building. Each of these facilities support multiple missions and at times there have been bottlenecks in experiment assembly that have threatened the TREAT experiment schedule. New equipment is needed for the TESB to support the TREAT mission. Personnel from both the TREAT organization (U020) and the MFC Fuel Development organization (U110) will be involved in experiment assembly activities in TESB.

A priority list of equipment to procure for installation in TESB starting in FY21 has been prepared. Funding is available in FY21 to purchase the initial complement of equipment. Plans for purchasing additional equipment in future years are still in development.

Equipment items to be purchased in FY21 for installation in the TESB include:

- An inert-atmosphere glovebox. The TESB glovebox would be a slight modification of an existing glovebox (the Experiment Vehicle Assembly Glovebox recently installed in AFF). This enclosure will be used to assemble TREAT experiment capsules. Many of these capsules will contain fresh (unirradiated) uranium nuclear fuel in solid form. Ventilation will be controlled and purified and exhaust will be through HEPA filters.
- Supporting equipment necessary for minor modifications of the building to support glovebox installation, such as electrical conduit and gas piping.
- Helium leak testing equipment.
- A micro-TIG welder.
- A cart custom made for the purpose of pressurizing experiment capsules, similar to a cart currently in use at MFC.
- Additional ancillary equipment such as work tables, cabinets, and routine hand tools for experiment assembly.
- A bottle rack to support gas cylinder storage and use.

In addition to equipment additions in the building, some minor building modifications will be required in the near term to increase the functionality of the building. These modifications include:

- Minor demolition of existing facility structures. For example, a fence is currently mounted in the floor around the north end of the building. This will be removed.
- Modifications to support installation of inert-atmosphere glovebox. Services will be routed within the building (in the overhead space) to the glovebox, including electricity through newly installed conduit and gases through newly installed piping. A gas bottle rack will be installed on the outside of the building (on the west wall of the building near the south end). The glovebox will be mounted to the floor in the selected location, but mounts will not be intended to be permanent, as it is possible that the glovebox may be relocated in the future.
- Ventilation system modifications and minor facility repairs. Minor modifications will be performed to allow cost-effective temperature control of the building, such as wall air conditioning units in the locations of the current building air intake louvers. There are a few areas on the facility ceiling where insulation is tearing or coming loose that need to be repaired. In addition, the facility roll-up doors on the east side of the building need to be sealed to prevent moisture ingress in the building, particularly along the building floor.
- Upgrading and modernization of communication systems. In the near term, it is desired to have computer work stations available at the TESB connected to the INL computer network. There are some data connections in the TESB, but they are not currently in use. Data systems need to be checked for functionality and capacity to support near-term data needs. In addition, phones connected to the INL phone system will be added. The building loudspeaker (plant announcement) system will be upgraded to allow announcements from the TESB to the rest of the TREAT facility complex.

In addition to the equipment approved for purchase and installation in FY21 and near-term facility modifications, plans are being developed for the potential purchase and installation of additional equipment beyond FY21. These items may include:

- Additional glovebox(es). Two gloveboxes that would be beneficial for experiment assembly in the future include a glovebox with a greater internal height to allow assembly of taller experiments and a glovebox to facilitate laser welding. A glovebox to facilitate laser welding would require exhaust into a facility suspect exhaust ventilation system.
- Additional instrumentation and advanced measurement tools, including a benchtop optical microscope and a data acquisition panel to allow testing of experiment capsule instrumentation.

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- Induction brazing tools.
- A radiography source and cabinet to allow radiography testing of experiment assembly welds.
- Basic machining tools including a lathe and a mill.
- Fume hoods. These would require exhaust into a facility suspect exhaust ventilation system.

Work Scope Description

In recent years, TREAT has performed a wide variety of experiments and that variety is anticipated to increase in future years. The TESB will support assembly of many of these future TREAT experiments. These experiments involve a variety of materials including nuclear fuel. Nuclear fuel forms include various solid forms of uranium including metal, ceramic, and incorporated within TRISO (tri-structural isotropic particle fuel) particles. Uranium enrichments will include up to highly enriched uranium (HEU) with most uranium materials being less than 20% U-235. Maximum U-235 quantities being processed at a given time will be limited to less than 700 g. In addition, experiments may contain very small amounts of plutonium. It is anticipated that no pre-irradiated nuclear materials will be processed within the TESB in the near term. Processing of pre-irradiated materials will be an expansion of TESB work scope that will require additional environmental review pursuant to the National Environmental Policy Act. All activities within TESB will maintain the radiological inventories below the DOE-STD-1027-92 HC-3 threshold quantity values (TQVs). TESB is classified as a less-than-hazard-category 3 (LTHC3) radiological facility based on limiting the radiological inventory.

Activities to be performed within the TESB include experiment component assembly and disassembly. Experiments may include water or sodium installed within experiment assemblies. Fuel processing activities (sintering, grinding, machining, drilling fuel) will be minimized at TESB, if they occur at all. Fuel specimens will generally be received in solid form (often already encapsulated within cladding) to incorporate into experiments. At the TESB, experiment materials will be incorporated into assemblies (typically involving inert atmospheres) with associated instrumentation that will require testing. Most assembly will be mechanical in nature, though some welding will be required for some assemblies. Nuclear and radiological materials will be contained per standard INL radiological controls to minimize risk and exposure to workers. Work will be performed within inert atmosphere enclosure(s) when required, but frequently on bench tops as well.

Some minor disassembly of TREAT experiments following irradiation may also be performed within the TESB. These experiments will be of sufficiently low radioactivity to allow performance of work within the TESB. Disassembly may include separation of experiment capsules from the overall experiment support hardware to allow shipment of capsules to other locations for further processing. Some minor inspection and testing activities of certain materials may be performed post irradiation, such as visual and dimensional checks of structural (non-nuclear) materials and counting of specimens within radioactivity detectors.

Some waste will be generated as a result of work activities in the TESB. Most waste will be non-radioactive and typical of office and laboratory environments. Some radioactive waste, typical of laboratory activities, will be generated. Such waste will all be low-level waste, including wipes, PPE, tools, etc. Programs using the facility require project specific ECPs.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Project construction activities may involve the use of portable generators and equipment used by subcontractors. In addition, construction activities have the potential to create fugitive dust that may require dust suppression by water or other means.

Operations in the TESB will produce emissions from welding, brazing, soldering, and other experiment assembly activities and could have radiological emissions from radiological material. An Air Permit Applicability Determination (APAD) will be required.

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

MFC-723 is recommended not eligible for listing to the National Register of Historic Places per the INL Cultural Resource Management Plan. An updated eligibility determination and cultural resource review record are required for this project.

Generating and Managing Waste

Construction activities may result in the generation of small amounts of hazardous waste in the form of adhesives, paints, solvents, waste concrete, PVC or metal piping scrap, scrap wood, scrap wire, paper waste, packaging material, etc. Polychlorinated biphenyl (PCB) waste could be generated when modifying buildings built before 1982 or working with pre-1982 equipment/materials. Examples include electrical equipment/components, painted surfaces, light fixtures, caulking, joint sealer, ventilation duct gaskets, and insulation.

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Operations at the TESB may generate small amounts of hazardous waste in the form of cleaning solvents, solders, metals, scrap metal (held for recycle whenever appropriate), and small amounts of radioactive waste during the assembly of fuel tests.

The TESB will handle radioactive material, including fissile material and special nuclear material during the assembly of fuel tests that could potentially generate radioactive waste. TESB personnel will follow DOE and other regulatory requirements when handling radioactive material. Minor quantities (<1 m³) of low-level waste are estimated to be generated from initial operations to develop system capabilities. Waste generation from projects using the developed equipment and systems installed in TESB will be analyzed in project specific ECs.

TRU waste would not be generated.

Releasing Contaminants

When chemicals are used, there is the potential for chemicals to be spilled it air or soil.

Using, Reusing, and Conserving Natural Resources

Recycled materials will be used to the greatest extent practicable in the selection of materials. All materials will be reused and/or 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 D B1.15, "Support buildings."

Justification: Project activities identified in this ECP are consistent with B1.15, "Siting, construction or modification, and operation of support buildings and support structures (including, but not limited to, trailers and prefabricated and modular buildings) within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible). Covered support buildings and structures include, but are not limited to, those for office purposes; parking; cafeteria services; education and training; visitor reception; computer and data processing services; health services or recreation activities; routine maintenance activities; storage of supplies and equipment for administrative services and routine maintenance activities; security (such as security posts); fire protection; small-scale fabrication (such as machine shop activities), assembly, and

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: 3/10/2021