DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory

CX Posting No.: DOE-ID-INL-23-052

SECTION A. Project Title: Transient Reactor Test (TREAT) Reactor Experiment Cell (TREXC)

SECTION B. Project Description and Purpose:

The mission of the National Reactor Innovation Center (NRIC) is to accelerate the demonstration and deployment of advanced nuclear energy. NRIC is a national program led by Idaho National Laboratory (INL) that enables collaborators to harness the world-class capabilities of the U.S. National Laboratory System. NRIC is designed to bridge the gap between research, development, and the marketplace to help convert advanced nuclear reactors into commercial applications.

In addition, the Materials and Fuels Complex (MFC) at INL is a world leader in innovative nuclear energy technology and is the hub of INL nuclear energy research. Activities at MFC support core research in nuclear fuels and cladding, radiation damage in core structural materials, chemical separations and fuel recycling, nuclear nonproliferation and nuclear forensics, space nuclear power and isotope technologies, and transient testing of reactor fuels.

In support of the MFC and NRIC missions, INL needs to maintain effective nuclear Research, Development, Demonstration & Deployment (RDD&D) capabilities at MFC by providing a facility to demonstrate new microreactors of low power and perform criticality experiments. To meet these needs the proposed Transient Reactor Test (TREAT) Reactor Experiment Cell (TREXC) is being designed and constructed in the TREAT facility. The purpose of TREXC is to provide certain facilities, systems, and services that demonstrators will be able to use. A key constraint for TREXC is to protect the broader TREAT facility and its ability to support the transient testing mission. As part of TREXC, key components of TREAT infrastructure is made available to support RDD&D.

The proposed TREXC will consist of several modifications to TREAT to prepare the facility for future demonstration projects. These include:

1. North storage pit shield structures to prevent neutron activation of the concrete.
2. Pit Lid.
3. I&C infrastructure to capture and display TREXC facility data and demonstrator data.
4. Electrical power infrastructure in the form of electrical supply panel near the pit and a standby power generator.
5. Control room infrastructure including signal and data transfer between MFC720 and MFC724.
6. Ventilation in the form of a HEPA filtered and monitored exhaust.
7. Fire detection including sodium and NaK fires.
8. Neutron source for startup.
9. Radiation Monitoring.
10. Radial neutron reflectors for the demonstrator to integrate into the demonstration system.
11. Reactivity control components in the form of BeO control drums for neutron population control.
12. A system to preclude water intrusion into the pit.
13. Fire mitigation systems in accordance with the TREAT fire hazards analysis.

The first such reactor to be installed in the T-REXC will be the Microreactor Applications Research Validation and Evaluation (MARVEL). The scope of the MARVEL reactor is covered by the Environmental Assessment (EA) for MARVEL (DOE/EA-2146).

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

This ECP does not cover emissions from potential future projects, each individual project will require its own APAD.

Project activities have the potential to generate fugitive dust. The project will take reasonable precautions to control fugitive dust. If dust control methods are required, the project will record in the project records the date, time, location, and amount/type of suppressant used. Personnel are responsible for working with the Program Environmental Lead (PEL) to determine if any permitting requirements apply to generators and other equipment and, if necessary, obtaining the permit and maintaining a file of the documentation.

Mobile sources such as generators, welders, and compressors may be used temporarily (less than six months) during construction activities. These sources would be required to meet IDAPA 58.01.01.625 visible emission opacity requirements.

Discharging to Surface-, Storm-, or Ground Water

No anticipated discharges to surface, storm, or ground water. If project activities involve discharging waters at the INL site, project personnel must contact the PEL to determine required permits.

Disturbing Cultural or Biological Resources

Cultural: Pursuant to the 2023 Programmatic Agreement, this federal undertaking is excluded from Section 106 review as the proposed activity has little to no potential to cause effects to historic properties.

Generating and Managing Waste

All identified waste streams have an existing, mature disposition path, Waste Generator Services (WGS) will manage all waste. The LLW has a disposition path to the DOE Nevada National Security Site (NNSS), Clive, or Waste Control Specialists disposal facilities. The Hazardous and Universal Waste has a disposition path to one or more commercial treatment and disposal facilities. The CERCLA Waste has a disposition path to the Idaho CERCLA Disposal Facility (ICDF) or commercial disposal facilities. If Mixed Low Level Waste is generated, disposition would be available to commercial treatment and disposal facilities. Based on the volumes anticipated, these potential new waste streams are expected to have minimal impact in the INL Waste Management Program.

Releasing Contaminants

When chemicals are used during the project there is the potential for pills that could impact the environment (air, water, soil).

Using, Reusing, and Conserving Natural Resources

Project description indicates materials will need to be purchased or used that require sourcing materials from the environment. Being conscientious about the types of materials used could reduce the impact to our natural resources.

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:

B3.6 "Small-scale research and development, laboratory operations, and pilot projects"

Justification:

A new ECP and Determination is needed because: 'B3.6 Small-scale research and development, laboratory operations, and pilot projects. 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.'

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

Approved by Jason L. Anderson, DOE-ID NEPA Compliance Officer on: 8/9/2023