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Categorical Exclusion Posting No.: DOE-ID-INL-25-027

Project Title: Antares Reactor Support R1 (MFC-793 Building Modifications to Support Reactor Demonstration)

Project Description and Purpose:

Revision 1

As part of Revision 1 to ECP INL-25-027, additional scope has been identified to support reactor demonstration at MFC-793. These activities are necessary to prepare the facility for installation, operation, and support of upcoming reactor systems and associated infrastructure. The following activities are necessary to support Mk-0 testing at MFC-793:

- Temporary removal and storage of the existing Resource Conservation and Recovery Act (RCRA)-permitted water wash vessel (WWV) system to free up floor space for the reactor developer equipment, storage racks, and operating space. Removal of the vessel includes:
 - Removal of any necessary associated equipment with the system
 - Demolition of concrete pads used to support the vessel feet and support equipment.
 - Crate and storage of vessel and associated equipment pending reinstallation following reactor experiments
- Minor improvements to the facility structure to ensure the facility meets Natural Phenomena Design Criteria (NDC)-2 requirements in support of the reactor nuclear safety basis. Work includes installation of:
 - Approximately 120-ft of 4-in x 5/8-in strapping up four walls with approximately 40 fasteners
 - Approximately 40-ft of structural I-beam above roll-up doors
 - Approximately 50-ft of all-thread between structural members using fastening nuts above roll-up doors.
- Control room:
 - Preferred option is to use existing TR-51 located approximately 33ft north of MFC 793 high bay. Currently being evaluated if it meets the needs and will likely be the chosen option.
 - If evaluation of TR-51 determines that it is not suitable for control room needs – other option is placement of a temporary trailer between MFC-793 and TR-51.
 - Grading of the ground surface outside MFC-793 to provide a level surface,
 - Removal of approximately 30 ft of legacy building concrete curbing (6-in. x 6-in.),
 - Installation of four (4) temporary concrete block jersey barriers 2-ft x 4-ft x 2-ft. to anchor the temporary trailer.
- Installation of utility and instrumentation conduit/cabling to connect the control room trailer to the reactor and data collection systems. Work includes installation of:
 - Approximately 1000-ft of conduit
 - Approximately 1000-ft of cabling split among electrical (110V or higher ac, 50V or lower dc, instrumentation/control, and fiber optic)
 - Approximately six (6) penetrations through existing walls for routing conduit.
- Upgrade of the facility security door access controls to meet requirements for security/safeguards of the nuclear material used for operation of the reactor.
- Install wall heaters to remove the need for portable heaters
- Supplemental shield install over the pit. Precast panels that span the pit and stack on each other.
- Leveling anchors (or grout) under experiment in pit.
- Anchoring for securing/leveling storage racks.
- Update to the fire detection system. Upgrading to a VESDA system.

In addition to the scope outlined above, routine facility modifications may be required to support future reactor developer activities at MFC-793. These modifications may include, but are not limited to, installation or upgrades to communications systems, HVAC systems, electrical infrastructure, structural supports, and utility connections. Work may also involve running new utilities from existing sources within the area, installation of equipment foundations, and minor structural enhancements to meet operational or safety requirements.

Some activities may require limited earthwork outside the facility to support ancillary systems or infrastructure. All such work will be confined within the existing MFC fence line and will occur in previously disturbed areas.

Task 9 from the Original ECP should be updated to read the following:

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- Removal of obsolete contaminated equipment and ancillary system components
- Removal of containment curbing (requires Resource Conservation Recovery Act permit modification)
- Removal of caisson/alcohol tank
- Removal of obsolete fire protection equipment
- Removal of obsolete nitrogen tank
- Removal of obsolete steam piping
- Removal of Water Wash Vessel and associated ancillary equipment.

Original ECP

This Idaho National Laboratory (INL) project involves the technical support for the design of a nuclear microreactor that would be capable of producing up to 500 kilowatts of electricity for 4 to 6 years without refueling. Additionally, the microreactor would be able to operate in austere environments and would fill multiple commercial, Department of Defense (DoD), and National Aeronautics and Space Administration (NASA) needs.

The tasks include:

Task 1 – Procure Tristructural ISOTropic (TRISO) Fuel for the Antares Reactor Demonstration.

- Prepare High-Assay Low-Enriched Uranium (HALEU) from feedstock material provided by Antares, fabricate up to 200 kg U of TRISO fuel, and transport the TRISO fuel to INL. This fuel is needed to perform demonstration of the ANTARES reactor. It is anticipated that INL will subcontract to have the HALEU prepared and fabricated into TRISO. It is also anticipated that INL will subcontract to transport the fuel INL.

Task 2 – Provide Technical and Project Management Support to Antares during completion of this Project Task Statement (PTS).

Task 3 – Provide technical support for the ANTARES reactor design effort.

- Provide support to develop the decontamination and decommissioning plan for the Antares reactor.

Task 4 – Complete National Environmental Policy Act (NEPA) Documentation.

Task 5 – Support Development of Safety Basis Documentation Needed to support the Antares Reactor Demonstration.

- Complete the safety basis documentation needed for the reactor demonstration. This includes facility upgrades needed to support the demonstration (e.g., MFC-793) and for the operations needed to demonstrate the ANTARES reactor.

Task 6 – Provide Design Authority and Functional Organization Support for Antares Reactor Demonstration.

- Provide design authority support for demonstration of the ANTARES reactor. This includes upgrades to MFC-793, development of the safety basis documentation, demonstration of readiness to operate, and operations.
- Complete review of preliminary and final design to support operations of Antares reactor at INL.
- Provide design authority and functional organization support throughout the Antares reactor demonstration lifecycle.

Task 7 – Support development of training materials and complete training of operations personnel.

Task 9 - Complete cleanup to MFC-793 for demonstration of reactor.

- Removal of obsolete contaminated equipment and ancillary system components
- Removal of containment curbing (requires Resource Conservation Recovery Act permit modification)
- Removal of caisson/alcohol tank
- Removal of obsolete fire protection equipment
- Removal of obsolete nitrogen tank
- Removal of obsolete steam piping

Environmental Aspects or Potential Sources of Impact:

Air Emissions

NA

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Discharging to Surface-, Storm-, or Ground Water

NA

Disturbing Cultural or Biological Resources

CULTURAL: This federal undertaking aligns with INL's technical support activities which include review and oversight. The proposed activity results in no historic properties affected.

Generating and Managing Waste

Waste will include removed equipment and associated items. Items may have the potential for PCBs from paint, other PCB building materials, and PCB oil associated with electrical equipment. All waste will be packaged and dispositioned in accordance with BEA Waste Management Program (WMP) requirements and assistance from the WMP's Waste Generation Services (WGS) subcontractor.

The waste generated from this project will include contact handled low level waste (CH-LLW), which includes the following:

Caisson - 1353 cubic feet

Alcohol tank - 1131 cubic feet

Obsolete contaminated equipment including concrete curbing - 3 4x4x6 containers or 288 cubic feet

Releasing Contaminants

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

Using, Reusing, and Conserving Natural Resources

NA

Determination

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); (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Appendix B. The proposal has not been segmented to meet the definition of a categorical exclusion. Segmentation can occur when a proposal is broken down into small parts in order to avoid the appearance of significance of the total action. However, segmentation does not include proposals that are developed and potentially implemented over multiple phases where each phase results in a decision whether to proceed to the subsequent phase. There is no extraordinary circumstance related to the proposal that is likely to cause a reasonably foreseeable significant adverse effect or for which DOE does not know the environmental effect. Extraordinary circumstances are unique situations presented by specific proposals, including, but not limited to, scientific controversy about the environmental effects of the proposal; uncertain effects or effects involving unique or unknown risks; and unresolved conflicts concerning alternative uses of available resources.

References: B1.30 "Transfer actions", B1.31 "Installation or relocation of machinery and equipment", B3.6 "Small-scale research and development, laboratory operations, and pilot projects", DOE/EIS-0240 "June 1996 Final Environmental Impact Statement for the Disposition of Surplus Highly Enriched Uranium and Record of Decision (August 1996); 2007 Supplement Analysis to the EIS for Disposition of Surplus Highly Enriched Uranium (DOE/EIS-0240-SA1) and the August 2011 Amended Record of Decision "

Summary of Environmental Assessment and Finding of No Significant Impact for Exemption to Licensed Physician Requirements for BWX Technologies, Inc., Lynchburg, VA, 03-28499 (68 FR 64665).

Justification: For the DOE regulations regarding the application of categorical exclusions, including the full text of each categorical exclusion, see 10 CFR 1021.102 and Appendix B to 10 CFR Part 1021. Implementing guidance for categorical exclusions can be found in DOE's National Environmental Policy Act Implementing Procedures (June 30, 2025): (See full text in regulations and implementing procedures).

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The proposal must fit within the classes of actions listed in Appendix B to 10 CFR Part 1021 and must satisfy the conditions that are integral elements of the classes of actions therein.

There are no extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal. DOE or an applicant may modify the proposal to avoid reasonably foreseeable adverse significant effects such that the categorical exclusion would apply.

The proposal has not been segmented to meet the definition of a categorical exclusion.

Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement (DOE/EIS-0240) (“HEU EIS”) (DOE, 1996b) – The HEU EIS analyzed disposition of 200 metric tons of surplus HEU. The HEU EIS also evaluated the transportation of HEU from DOE’s Y-12 National Security Complex to likely downblending sites, including the Nuclear Fuel Services (a subsidiary of BWXT) facility, in Erwin, Tennessee, and the BWXT facility in Lynchburg, Virginia. The Supplement Analysis, Disposition of Surplus Highly Enriched Uranium (DOE/NNSA, 2007) summarized the status of HEU disposition activities conducted to date for the 200 metric tons of surplus HEU and evaluated the potential impacts of continued program implementation. Specifically in the 2007 Supplement Analysis (SA), DOE evaluated three new/revised initiatives: (1) supplying potential new end-users with low-enriched uranium (LEU) from surplus HEU (approximately 17.4 metric tons) in support of the Reliable Fuel Supply Initiative; (2) establishing new disposition pathways for HEU discard material (approximately 18 metric tons); and (3) downblending additional quantities of HEU (approximately 20 metric tons) Environmental Assessment Related to the Renewal of NRC License No. SNM-42 for BWX Technologies, Inc. (NRC, 2005) – The NRC completed an EA and FONSI in 2005 for renewing Materials License SNM-42 for BWXT, Lynchburg, Virginia. Materials License SNM-42 authorizes BWXT to possess nuclear materials, manufacture reactor fuel components, fabricate research and university reactor components, fabricate compact reactor fuel elements, perform research on spent fuel performance, and handle the resultant waste streams, including recovery of scrap uranium. The EA is relevant because the receipt of HEU and TRISO fuel production at the BWXT Lynchburg, Virginia, facility would be performed within the operating envelope of Materials License SNM-42 and within the impacts described in the EA.

B1.30 Transfer actions. Transfer actions, in which the predominant activity is transportation, provided that (1) the receipt and storage capacity and management capability for the amount and type of materials, equipment, or waste to be moved already exists at the receiving site and (2) all necessary facilities and operations at the receiving site are already permitted, licensed, or approved, as appropriate. Such transfers are not regularly scheduled as part of ongoing routine operations.

B1.31 Installation or relocation of machinery and equipment. Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts.

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.

Approved by Jason L Anderson, DOE-ID NEPA Compliance Officer on: 12/9/2025