

# DOE-ID NEPA CX DETERMINATION IDAHO NATIONAL LABORATORY

**SECTION A. Project Title:** Advanced Test Reactor Core Internals Changeout (CIC) Outage - 2015

**SECTION B. Project Description:**

The proposed action will provide for the sixth core internals changeout (CIC) outage of the Advanced Test Reactor (ATR), which is housed in building Test Reactor Area (TRA)-670, located at the Idaho National Laboratory (INL) ATR Complex. Activities scheduled during the CIC outage include the changeout of components in the high-flux region of the ATR core and support components, refueling, and maintenance activities.

The periodic CIC of the ATR is necessary due to the impact the high neutron flux environment has on reactor core components. Over an extended period, this neutron exposure induces components stress and growth because of new element generation. If the Department of Energy (DOE) does not periodically replace these components, safety problems can develop such that they will eventually not function as originally designed. Changeout of these components maintains the facility's safe and continued operation. The public has been made aware of the need to change the core internals part of the normal operation of the ATR. The description, operation, and environmental impacts of operating ATR were included in the 2000 "Final Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Energy Research and Development and Isotope Production Missions in the United States, Including the Role of the Fast Flux Test Reactor Facility" (DOE/EIS-0310). That description included a discussion of the need to change the ATR core internals every seven to nine years.

Scope of work for this proposed action includes, but is not limited to the following:

**Reactor Refueling** – Before changing-out core components, project personnel will remove the 40 fuel elements and store the elements in the ATR canal. Some fuel elements will be stored pending transfer to the Idaho Nuclear Technologies and Engineering Center (INTEC). Upon completion of all component change-out, project personnel will place fuel elements not sent to long-term storage back into the reactor core on an as-needed basis along with new fuel elements. DOE's National Environmental Policy Act (NEPA) implementing procedures (10 Code of Federal Regulation [CFR] 1021) identifies reactor refueling as categorically excluded, that is an activity that does not have a significant environmental impact.

**Preventative Maintenance Activities** – Maintenance activities conducted during CIC may result in like for like or functionally equivalent replacement of components that are not upgrades or improvements. Maintenance planned during the CIC includes, but is not limited to: 1) Replacing the reactor core components with a like for like item and disposing of the old core components; 2) Replacing the reactor support components (those support components outside the core that have reached the end of their design life) and disposing of the old support components.

There will be other routine maintenance activities conducted during this outage.

This evolution is preventative and required to maintain and preserve the structure in a condition suitable for the facility to be used for its designated purpose. This specific evolution does not change the planned operating duration of the ATR.

Approximate Start Date: February 2015

Project Duration: ATR personnel will conduct the CIC over a four (4) to six (6) month period, however, various facility activities and operation issues may dictate that specific activities associated with the CIC must be performed earlier or later than the indicated start date (e.g., procurement of materials, QA validations, etc.).

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

**Air Emissions:** This activity will shut down and start up a stationary air emission source. Asbestos Emissions - Project activities may disturb or remove asbestos.

**Discharging to Surface, Storm-, or Ground Water:** One of the objectives of the ATR CIC is to reduce radiological contamination in the reactor core and in the facility. ATR project personnel will send wastewaters generated during decontamination activities, including waters used during decontamination of the experimental loop piping, to the ATR Warm Waste Drain System for treatment by ion exchange in the ATR Warm Waste Treatment Facility. Following treatment, the wastewaters will be discharged to the lined TRA-715 Evaporation Pond. The treated effluent will consist of high-purity demineralized water, containing trace amounts of radionuclides, which does not contain regulated concentrations of Resource Conservation and Recovery Act (RCRA) hazardous substances as defined in 40 CFR 261.

**Disturbing Cultural / Biological Resources:** The Historic INL Architectural Properties List contains the ATR facility (building TRA-670). This list contains INL facilities and buildings that may be eligible for the National Register of Historic Places because of their exceptional importance. Activities scheduled during the ATR CIC will not involve ground-disturbing activities and/or major structural modifications or alterations to the building.

**Generating and Managing Waste:**

**Hazardous / Mixed Waste Generation** - Replacement of wires and conduit may generate limited amounts of mixed waste during the CIC such as radioactive contaminated lead or silver solder. Project personnel may reuse silver flux wires from the previous CIC.

**Radioactive Waste Generation** - Project activities will generate radioactively contaminated core and support components removed from the ATR vessel.

Project personnel will remove and replace reactor core components including, but not limited to: 1) Eight beryllium reflector blocks; 2) Sixteen outer shim control cylinders constructed of beryllium, hafnium, and stainless steel; 3) Four inner and outer flux trap baffles and one center flux trap baffle constructed of aluminum and stainless steel; 4) One aluminum neck shim housing; 5) Six stainless steel in-pile tubes; 6) Twenty-four components (neck shim and regulating rod assemblies) made of hafnium, stainless steel, and aluminum; 7) Ten pieces of stainless steel and aluminum that form the N-16 assemblies; and 8) Four gear box support beams.

Project activities will generate other radioactively contaminated wastes including anti-contamination clothing (anti-C's) rags and the cut-off ends of the fuel elements sent to long-term storage. In addition, CIC project activities will generate about 25 cubic meters of radioactive solid waste.

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**Hazardous / Radioactive Material and Waste Handling and Transportation** - ATR Complex Waste Generator Services personnel will perform a hazardous waste determination on all generated waste to apply appropriate management practices. In addition, ATR WGS personnel will determine if any of the material generated can be recycled or reused to minimize waste generation. Project personnel and ATR Complex WGS will employ safe work practices to minimize the potential for leaks and spills that could generate additional waste during handling and transportation.

**Industrial Waste Generation** - Work conducted during the ATR CIC will result in the generation of about 100 cubic feet of non-radioactive solid waste. Many of these wastes are routinely generated wastes which project personnel have already completed a hazardous waste determination using the INL Waste Determination Disposition Form (WDDF).

**PCB Waste** - Work conducted during the ATR CIC may result in the generation and handling of material coated with paint that could potentially contain PCBs. These materials will be handled in accordance with company procedure and transferred to WGS for appropriate disposition.

**Releasing Contaminants:** As part of normal facility operations, ATR personnel use chemicals for janitorial and industrial uses. These chemicals include cleaning products, gasoline or other fuel oils, coolants, lubricants, and other similar products.

**Using, Reusing, and Conserving Natural Resources:** Pollution Prevention / Waste Minimization concepts will be implemented wherever economically practicable.

<b>SECTION D. Recommended Level of Environmental Review (or Documentation) and Reference(s):</b> Identify applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.
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Note: 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, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: National Environmental Policy Act Implementing Procedures; Final Rule, Categorical Exclusions B1.14 "Refueling of an operating nuclear reactor during which operations may be suspended and then resumed," B2.5 "Safety and environmental improvements of a facility, replacement/upgrade of facility components," and, B1.3 "Routine maintenance/custodial services for buildings, structures, infrastructures, and equipment," effective August 8, 1996.

Justification: Project activities in this EC are consistent with Categorical Exclusions B1.14 "Refueling of an operating nuclear reactor, during which operations may be suspended and then resumed," B2.5 "Safety and environmental improvements of a facility, including replacement and upgrade of facility components, that do not result in a significant change in the expected useful life, design capacity, or function of the facility and during which operations may be suspended and then resumed," and B1.3 "Routine maintenance activities and custodial services for buildings, structures, rights-of-way, infrastructures, (e.g., pathways, roads, railroads), vehicles and equipment, and localized vegetation and pest control during which operations may be suspended and then resumed." Project activities are preventative and required to maintain and preserve the structure in a condition suitable for the facility to be used for its designated purpose.

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

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 11/10/2011.