

Action Needed to Approve Advanced Test Reactor Spent Fuel Plan

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A report to congressional committees

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What GAO Found

The Department of Energy (DOE) faces two challenges affecting Advanced Test Reactor (ATR) operations in the near term. First, the National Nuclear Security Administration's (NNSA) Office of Naval Reactors (Naval Reactors) is finding it increasingly difficult to meet testing requirements due to the age of the ATR, according to Naval Reactors officials. Second, Idaho National Laboratory's spent fuel management facility that stores ATR spent fuel is nearing capacity. However, while DOE is working to fund the facility reconfiguration, DOE has not yet completed its evaluation of its Idaho Operations Office's plan to reconfigure the facility to store spent fuel beyond 2030 when the facility will reach capacity. If DOE continues to delay approval of a reconfiguration plan to enable continued storage of ATR spent fuel after 2030, it risks a suspension of ATR operations, which provides vital testing capability that supports the Navy's nuclear-powered fleet of submarines and aircraft carriers.

Apart from the fuel storage issue, between June 2019 to March 2022 DOE identified three project options—through its Thermal Test Reactor Capability (TTRC) project—to maintain, modify, or replace the ATR and ensure an enduring thermal test reactor capability to meet the Navy's and other users' requirements through the mid- 2080s. The options were to (1) maintain and repair the ATR through the mid-2080s, (2) modify the ATR to improve its performance, or (3) replace the ATR with a new test reactor. DOE's cost estimates for these project options ranged from \$4.9 billion to \$19.8 billion.

Department of Energy's Advanced Test Reactor Complex and Interior View of the Idaho National Laboratory Spent Fuel Management Facility



Source: Department of Energy. | GAO-26-107969

In December 2025, DOE Office of Nuclear Energy officials told GAO the agency had suspended the TTRC acquisition project. They said that the plan, for now, is to maintain the ATR and improve its reliability to ensure operations until at least the early 2050s. GAO found that this new approach, similar to but less expensive than the first of the project options it identified, would cost approximately \$1.26 billion over 20 years. However, DOE officials noted uncertainties in their estimate that may lead to higher costs. For example, DOE's estimate to replace heat exchangers in the early 2040's is technically complex and its estimate is primarily based on engineering judgement rather than a detailed, bottom up, cost analysis. DOE officials said they would continue to refine their approach along with cost estimates to meet ATR user requirements.

Why GAO Did This Study

DOE's Advanced Test Reactor started operating in 1967 at the Idaho National Laboratory. It is the only U.S. test reactor capable of meeting nuclear fuel and structural material testing requirements for the joint U.S. Navy and NNSA Naval Nuclear Propulsion Program, which supports the Navy's nuclear-powered fleet of submarines and aircraft carriers. DOE and Naval Reactors identified an enduring mission need for a thermal test reactor capability through the mid-2080s, and began planning to address this need in 2019.

Senate Report 118-188 to accompany S. 4638, a bill for the National Defense Authorization Act for Fiscal Year 2025, includes a provision for GAO to review DOE's plans and estimated costs to continue operating or replace the ATR and report on any challenges associated with implementing these plans. This report examines (1) the status of ATR operations, (2) options DOE identified for ensuring an enduring thermal test reactor capability and associated costs, and (3) the status of DOE's plan for doing so. GAO reviewed ATR and TTRC project documents, toured the ATR, and interviewed DOE and Naval Reactors officials as well as other users of the ATR.

What GAO Recommends

GAO is recommending that DOE complete its evaluation of the Idaho Operations Office's research and test reactor spent fuel storage facility reconfiguration plan to enable continued storage and management of ATR spent fuel after 2030 and without an interruption to ATR operations. DOE concurred with this recommendation and detailed action it has planned to address it.