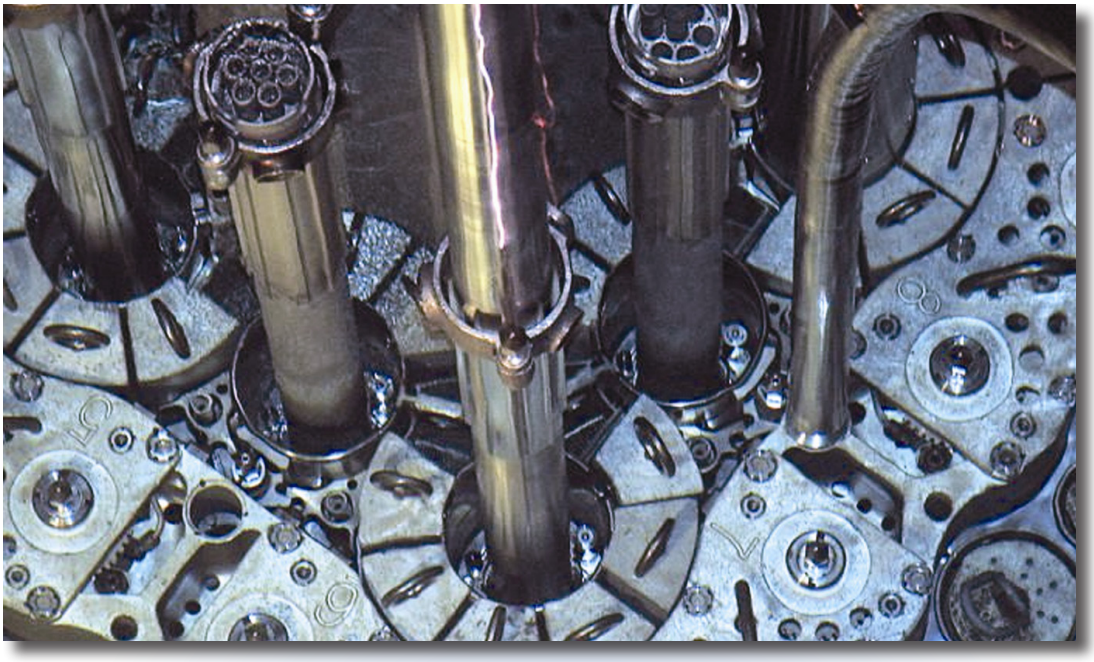

The Advanced Test Reactor, with its unique serpentine core, is the center of INL's nuclear energy R&D capabilities.

Advanced Test Reactor

Meeting U.S. nuclear energy research challenges

As the national laboratory for the U.S. Department of Energy's Office of Nuclear Energy (DOE-NE), Idaho National Laboratory serves a unique role in U.S. nuclear energy research, providing its capabilities and infrastructure as a shared resource for the entire nuclear energy enterprise. INL's capabilities center around the Advanced Test Reactor (ATR), located at the ATR Complex on the INL Site 40 miles west of Idaho Falls.

Many uses

The ATR is the only U.S. research reactor capable of providing large-volume, high-flux neutron irradiation in a prototype environment, and the reactor makes it possible to study the effects of intense neutron and gamma radiation on reactor materials and fuels. ATR has many uses, supporting a variety of government and privately sponsored research.

- ***National security***

  Over the years, ATR has provided the critical testing capability that has helped develop the U.S. Navy's nuclear propulsion program. The Navy remains a key customer and user of ATR, and testing there has contributed to the exceptional operational performance of the nuclear-powered fleet.

- ***Reactor type***

  The ATR is a pressurized water test reactor that operates at low pressure and low temperature. It contains a beryllium reflector to help concentrate neutrons in the core, where they are needed for fuels and materials testing.

- ***Design features***

  ATR's unique serpentine core allows the reactor's corner lobes to be operated at different power levels, making it possible to conduct multiple simultaneous experiments under different testing conditions. Other key features:

  – Large test volumes – up to 48 inches long and 5 inches in diameter
  – 77 testing positions
  – High neutron flux
  – Fast/thermal flux ratios ranging from 0.1 – 1.0
  – Constant axial power profile
  – Power tilt capability for experiments in same operating cycle
  – Individual experiment control

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The Energy of Innovation

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