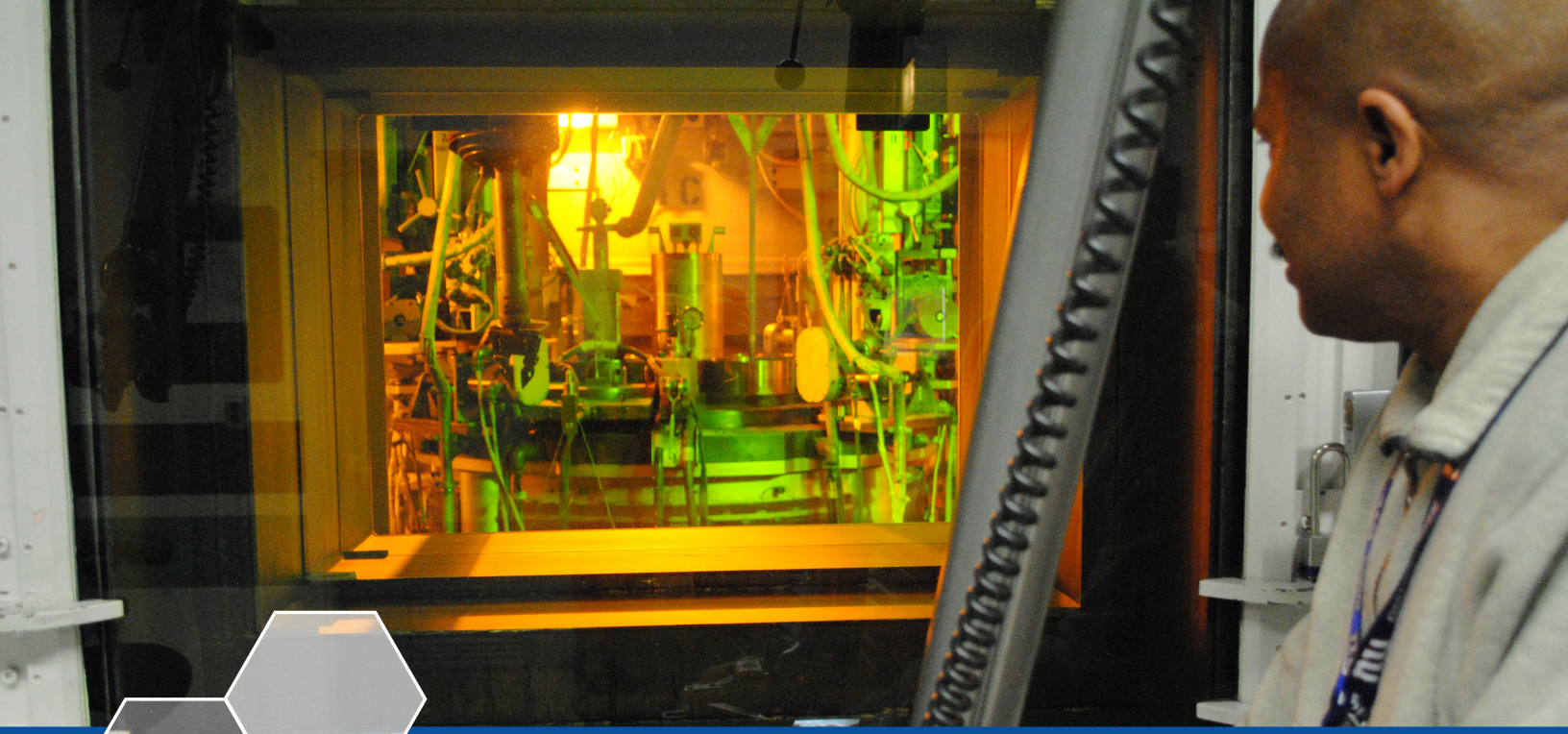

Fuel Conditioning Facility

Advanced Fuel Cycle Research On Material Separations and Waste Form Development

INL's Fuel Conditioning Facility supports work to demonstrate the technical feasibility of a nuclear recycling technique called pyroprocessing.

The Fuel Conditioning Facility (FCF) at Idaho National Laboratory's Materials and Fuels Complex supports nuclear energy research and development for the U.S. Department of Energy and other customers. FCF's unique capabilities make it an ideal facility for its primary mission to support treatment of DOE-owned sodium-bonded metal fuel.

In a secondary role, FCF also supports multi-program work related to integrated fuel cycle research and development with a focus on material recovery and waste form development.

FCF consists of two hot cells, one having an air atmosphere and the other having an inert argon gas atmosphere, which enables technicians to work safely with radioactive nuclear materials from behind 5-foot-thick shielding walls.

KEY CAPABILITIES

- Two heavily shielded hot cells equipped with remotely operated manipulators to safely handle irradiated fuels and materials
- Instruments used to prepare and size elements for treatment, such as element chopper, vacuum inspection, and the vertical assembler/dismantler
- Engineering-scale equipment including molten salt electrorefiners and high temperature furnaces capable of sodium neutralization and uranium recovery
- Systems to support handling of heavily shielded shipping casks for fuel receipt and water disposal
- Pneumatic "rabbit" system for transfer of material samples to and from MFC's Analytical Laboratory (AL) or its Hot Fuel Examination Facility (HFEF)
- Mock-up area to allow thorough testing of new remotely operated systems prior to their installation into FCF, HFEF, or AL hot cells
- Advanced Fuel Cycle R&D argon atmosphere glovebox

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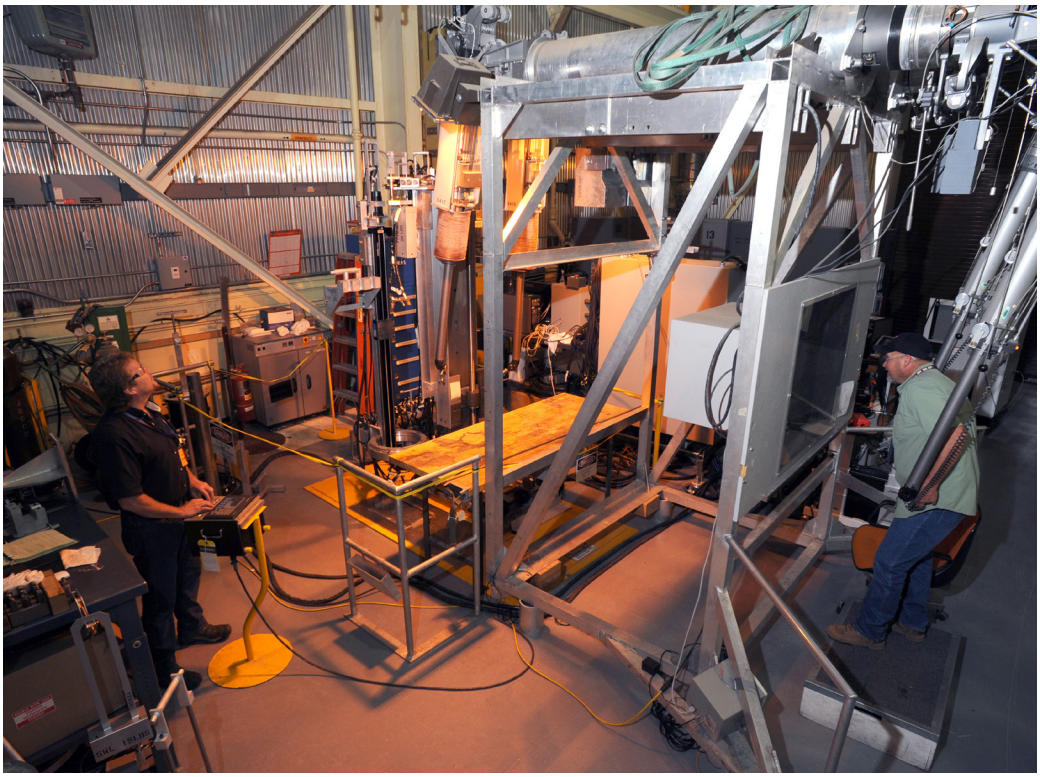
Idaho National Laboratory



FCF includes a mock-up shop where technicians can build and test new hot cell equipment before installing it into the hot cell.

TECHNICAL INFORMATION

The Fuel Conditioning Facility's (FCF) primary mission is to support pyroprocessing treatment of DOE-owned sodium-bonded metal fuel.

BASIC CAPABILITIES:

- Engineering-scale equipment for treatment of sodium-bonded metallic fuel to deactivate the reactive sodium metal, recover fissionable uranium, and separate fission and activation products for incorporation into solid waste forms suitable for geologic disposal
- Systems to support handling heavily shielded shipping casks for fuel receipt and waste disposal
- Lab-scale process development in inert atmosphere gloveboxes

KEY INSTRUMENTS:

- Electrochemical separations/sodium neutralization experimentation/ treatment via two molten salt electrorefiners
- High temperature vacuum atmosphere furnaces (cathode processor, casting furnace, & multi-function furnace)
- Pneumatic rabbit transfer system
- Canister-cutting machine
- Manipulator repair glovebox
- Vacuum inspection station/bottle cutting, production element chopper
- Air & argon atmosphere hot cells
- Suited entry repair area
- Mock-up shop

FOR MORE INFORMATION

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