

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



Fuel Conditioning Facility

Waste Forms Separations

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.

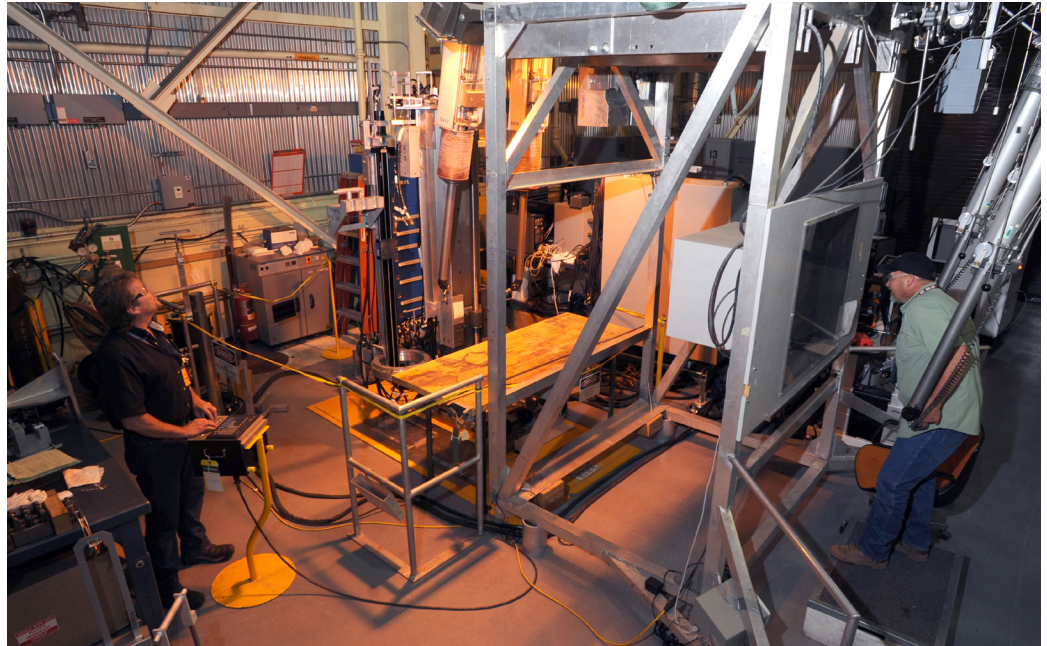
In a secondary role, FCF also supports work to refine the technical feasibility of pyroprocessing technology for treating used nuclear fuel for DOE's Fuel Cycle Research and Development Program.

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
- Systems to support handling of heavily shielded shipping casks for fuel receipt and water disposal
- Hot repair area equipped with remotely operated decontamination equipment, a specialized manipulator repair facility, and other maintenance and waste-handling equipment
- 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
- Room 26 research glovebox for Joint Fuel Cycle development

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



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

In a secondary role, FCF supports work to refine the technical feasibility of pyroprocessing technology for treating used nuclear fuel for DOE's Fuel Cycle Research and Development Program. Pyroprocessing refers to a family of technologies involving high-temperature chemical and electrochemical methods for separation, purification, and recovery of fissile elements from used nuclear fuel. FCF also has been one of the largest user facilities at MFC branching out to perform other research and fuel development processes.

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.

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
- Hot repair area equipped with remotely operated decontamination equipment, a specialized manipulator repair facility, and other maintenance and waste-handling equipment

KEY INSTRUMENTS:

- Electrochemical separations/sodium neutralization experimentation/treatment
- Pneumatic rabbit transfer system
- Canister-cutting machine
- Remote uranium casting furnace
- Manipulator repair glovebox
- Vertical assembler/dismantler (VAD), vacuum inspection station/bottle cutting, production element chopper, blanket element chopper
- Hot cells
- Suited entry repair area
- Mock-up area

FOR MORE INFORMATION

General contact

Robert Belcher

208-533-7971

robert.belcher@inl.gov

Michael Iervese

208-533-7908

michael.iervese@inl.gov

www.inl.gov

A U.S. Department of Energy
National Laboratory

