

Fuel Manufacturing Facility

Fuel Fabrication, Nuclear Material Management

General Information

The Fuel Manufacturing Facility (FMF) is a nuclear facility that consists of multiple workrooms and a material storage vault. This facility complements a host of capabilities within the Materials and Fuels Complex at Idaho National Laboratory, the nation's lead nuclear energy research lab.

FMF was constructed in 1986 for the purpose of housing binary (i.e., uranium and zirconium) fuel and its associated equipment to fabricate the driver fuel for the Experimental Breeder Reactor-II (EBR-II). With the shut-down of the EBR-II reactor, this equipment was removed and the focus at FMF transitioned to research and development (R&D) of transuranic metallic and ceramic fuels. Additionally, the material storage vault contains and supplies various INL and off-site facilities with feedstock materials.

Key Equipment/Capabilities:

4 inert gloveboxes

- Advanced Fuel Cycle Initiative (AFCI) glovebox
 - Provides the capabilities to develop transuranic metallic and ceramic fuel experiments for irradiation
 - Feedstock production/purification
 - Characterization sample fabrication
 - Equipment includes:
 - › Arc melter



Arc melting in the Advanced Fuel Cycle Initiative (AFCI) glovebox supports fabrication of experiments for irradiation at reactors such as the Advanced Test Reactor.

- › Distillation/tube furnace
- › Sintering furnace
- › Orbital welder
- › Ceramic powder mixing/pressing equipment
- Neptunium repackaging glovebox (NRG):
 - Provides the capability to recertify neptunium packages for transport to other DOE facilities
 - Supports material inspection/inventory
- Special nuclear materials (SNM) glovebox:
 - Provides the capability for uranium material recovery through the sodium separations process, which provides additional uranium feedstock material for DOE complexwide utilization
- Supports uranium material inspection/ inventory/ breakouts
- Has the capability for furnace reconfiguration (sodium separation furnace/roasting furnace)
- Transuranic breakout glovebox (TBG)
 - Supports transuranic material inspection/ inventory/ breakouts
- Radiography
 - Provides the capability for verification of experiment fabrication requirements such as fuel placement and rodlet/ capsule welding
- Vault storage
 - Receipt and storage of programmatic materials

Changing the World's Energy Future

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Technical Information

Material processing in the special nuclear material (SNM) glovebox is part of an ongoing material disposition program that supports work at INL and other DOE labs.



The Fuel Manufacturing Facility (FMF) is a hazard category 2 nuclear facility that consists of multiple workrooms and a material storage vault. The workrooms house the equipment utilized to support multiscale fuel development. The vault contains and supplies the feedstock materials used for numerous programs in multiple facilities at MFC.

Basic Capabilities:

- Transuranic metallic and ceramic fuels development
- Transuranic and enriched-uranium materials storage
- Transuranic and enriched-uranium feedstock production, purification and breakouts

Key Instruments:

- Gloveboxes:
 - Advanced Fuel Cycle Initiative glovebox (AFCI)
 - › Experiment assembly
 - › Ceramic processing
 - › Metal processing
 - › Feedstock distillation/purification
 - Special nuclear materials (SNM) glovebox
 - › Sodium separation (feedstock production)
 - Neptunium repackaging glovebox (NRG)
 - › Recertification of neptunium packages
 - Transuranic breakout glovebox (TBG)
- Radiography
- Vault storage
- Active-well neutron center
- Arc-melting furnace
- Distillation furnace
- Sintering furnace

For more information

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