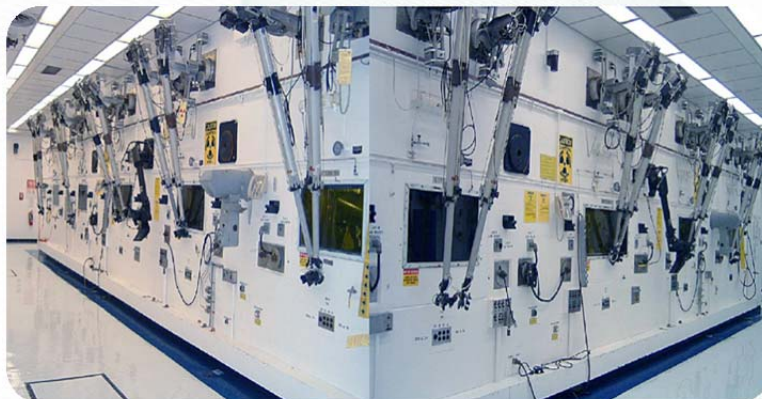


Irradiated Fuels Examination Laboratory

Specifications	
Hot Cells	6 hot cells Scanning Electron Microscope cell Irradiated Microsphere Gamma Analyzer cell Core Conduction Cooldown Test Facility Cell
Viewing Window	Lead glass and mineral oil
Cell Construction	High-density concrete used for front, rear, and top shielding
Ventilation	HEPA filtered
Services Available	Process and service compressed gases, air, demineralized water, process water, recirculating heating and cooling water, steam, vacuum, and electrical services
Intercell movement	Two small diameter horizontal transfer stations are used for small objects while larger items are transferred through the shielded airlock door system
Material Handling	Master-slave manipulators

Description

The Irradiated Fuels Examination Laboratory (IFEL), located in Building 3525, was initially designed and constructed in 1963 to permit the safe handling of increasing levels of radiation in the chemical, physical, and metallurgical examination of nuclear reactor fuel elements and reactor parts. The IFEL is classified as a Category 2 nuclear facility.



Capabilities

- Receipt and handling of irradiated materials (fuel or nonfuel in shielded casks)
- Capsule disassembly
- Nondestructive and destructive testing of irradiated materials
- Full-length Light Water Reactor (LWR) fuel post-irradiation examination
- Repackaging of spent nuclear fuel
- Packaging and shipment of irradiated materials (on-site and off-site)
- Examination and testing activities such as metrology; metallographic sample preparation by sectioning, grinding, and polishing; optical and electron microscopy; gamma spectrometry; and other physical and mechanical properties evaluations as appropriate to the experimental objectives of a particular program
- Safety testing of High Temperature Gas Reactor (HTGR) fuel
- Automated sorting and analysis of HTGR fuel particles using gamma spectrometry
- Testing grid pinching and lateral constraint effects on spent nuclear fuel during transportation

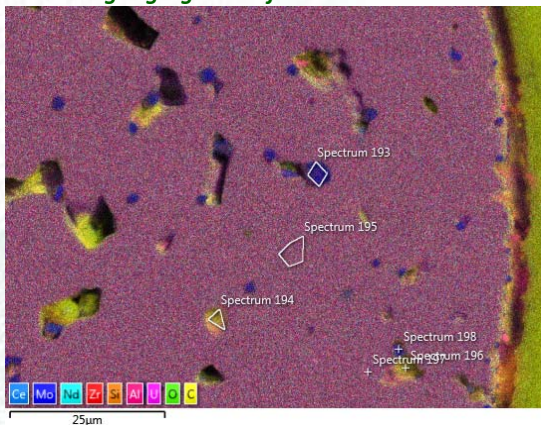
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Overlay EDS map of irradiated TRISO fuel kernel showing segregation of Mo



Rim Structure in High Burnup Commercial LWR Fuel (~70 MWd/kg U)



Cladding-Pellet Interface

Date: April 2015