Leading the Way:
A More Secure Nuclear Future

Nuclear Proliferation Challenge in the 21st Century

- Safeguarding Highly-Enriched Uranium (HEU) against nuclear weapon proliferation remains a major challenge throughout the world.
- Starting in 1978, Argonne was the driving force behind the U.S. Department of Energy's (DOE's) effort to eliminate the use HEU in research reactors.
- Argonne continues to be a key player in the National Nuclear Security Administration (NNSA) Global Threat Reduction Initiative (GTRI), which works to minimize and to the extent possible eliminate the use of HEU in civil nuclear applications throughout the world.

GTRI Goals

- **CONVERT** research reactors from operation with HEU to low-enriched uranium (LEU) fuel.
- **REMOVE** and dispose of excess nuclear and radiological materials.
- **PROTECT** high priority nuclear and radiological materials from theft and sabotage.

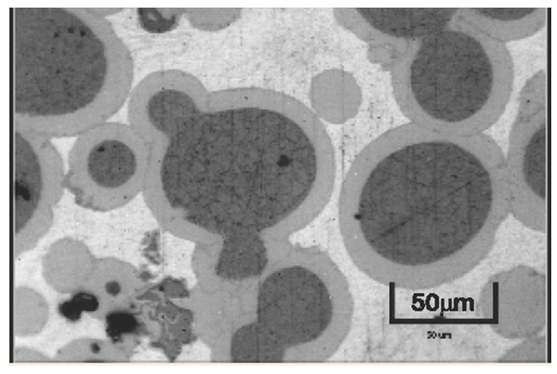
Leadership and Engineering

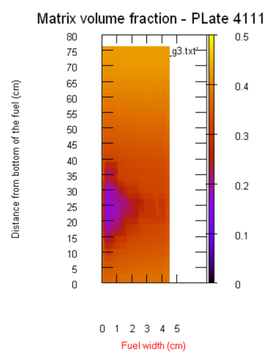
Argonne provides technical direction and engineering expertise to achieve the GTRI goals by:

- Managing engineering projects across multiple institutions.
- Developing new LEU fuels.
- Designing safe reactor cores for research and test facilities using these new fuels.
- Improving LEU-based technologies to produce the medical isotope Tecnicium-99m (Tc-99m); the world's primary diagnostic radiopharmaceutical (> 9 million procedures per year).

LEU Fuel Development

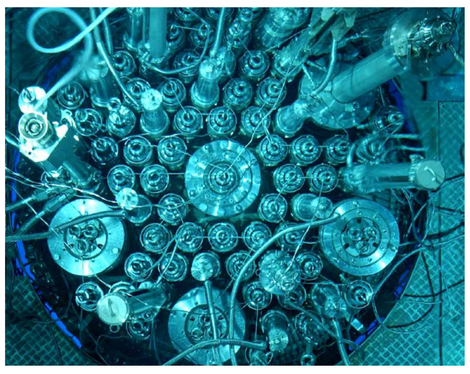
Combining analytical and experimental expertise to understand fuel behavior and develop means to eliminate or mitigate performance problems.

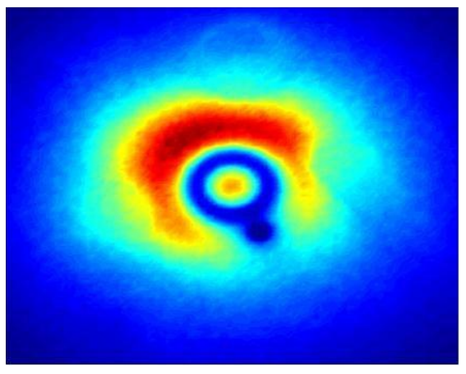


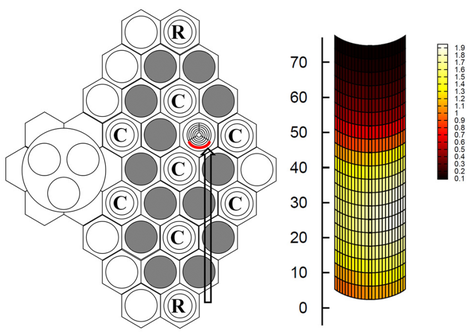


Reactor Design & Safety Analysis

Home to engineers representing all the major technical disciplines of nuclear engineering, Argonne is ideally positioned to support the complex HEU to LEU conversion analyses.







GTRI and Argonne have made the world more secure by:

- Eliminating the use of HEU in **81** research reactors in **35** countries, thereby decreasing the worldwide threat of nuclear proliferation.
- Reducing the U.S. dependence on HEU-based production of the medical isotope Tc-99m.
- Improving the cooperation between the United States and other global nuclear powers.

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