

IDAHO NUCLEAR TECHNOLOGY AND ENGINEERING CENTER

INTEC is a 200-acre U.S. Department of Energy facility whose 1,100 skilled workers are primarily focused on four areas:

- safely storing spent nuclear fuel
- preparing spent nuclear fuel for shipment to an off-site repository

- developing technology to safely treat high-level and liquid radioactive waste
- remediating past environmental releases

INTEC is also a focal point for implementing the DOE's 1995 Idaho Settlement Agreement with the state of Idaho and the

Environmental Protection Agency. The key objectives of this agreement are

- to remove all spent fuel from Idaho by the end of 2034, and
- to treat all high-level waste currently stored at INEEL so that it is ready to be moved out of Idaho by 2035

Spent nuclear fuel is stored safely under water at the Idaho Nuclear Technology and Engineering Center. The water both shields the material and provides cooling as the fuel gives off heat.



In April 2001, INTEC completed receipt and storage of the last of 29 shipments of Three Mile Island-Unit 2 spent fuel and debris from the INEEL's Test Area North. In so doing, the INEEL met a milestone of the 1995 Settlement Agreement. The agreement provides the framework for many INEEL objectives in the safe interim storage of nuclear materials, and their ultimate removal from Idaho for permanent storage. It provides milestones with specific dates by which its various objectives must be met. The TMI-2 fuel transfer project was completed six weeks ahead of schedule.

The Idaho High Level Waste & Facility Disposition Environmental Impact Statement is scheduled to be issued later this year. It will identify the preferred method for treating about one million gallons of liquid sodium-bearing waste at INTEC as well as newly generated waste. It also will identify the preferred technical approach to determine treatment methods for 4,400 cubic meters of solid high-level

waste calcine that is also stored at INTEC, and address disposition options for facilities associated with the waste.

INTEC's missions strongly support DOE national missions and objectives. Environmental restoration and remediation at INTEC will fulfill the U.S. Department of Energy's commitment to the nation to clean up the Cold War legacy of nuclear wastes. The safe storage of nuclear materials is critical to DOE's efforts to prevent the proliferation of nuclear weapons. Because of its 50-year history of nuclear engineering and technology development, INTEC is well-suited for storing spent nuclear fuels and developing new technologies in support of DOE objectives to move these materials from interim storage to a safe, permanent disposal site away from the INEEL.

Employees

The Idaho Nuclear Technology and Engineering Center is located two miles northeast of the Central Facilities Area at the Idaho National Engineering and Environmental Laboratory. Bechtel BWXT Idaho, LLC operates INTEC for the U.S. Department of Energy. About 1,100 people work at INTEC during day, weekend and off



shifts. Varying numbers of construction workers may also be on site. The employee pool has strong skills in managing, storing and handling spent nuclear fuels, engineering of nuclear processes and technologies, environmental compliance, mechanical engineering, waste management, chemical and radiological analyses, risk assessment and safety analysis, process chemistry and radioactive waste storage and processing.

Facilities

The primary facilities at INTEC include:

Building **CPP-666** is primarily a spent fuel storage area consisting of six pools for storing spent nuclear fuel. Radioactive spent fuel is stored underwater in pools containing some 3 million gallons of water. The water provides protective shielding and cooling. Eventually, all spent fuel will be removed from underwater storage pools and placed in a dry storage system and prepared for shipment to a national nuclear waste repository.

INTEC occupies 200 acres in the middle of the INEEL's 890 square mile reservation.

The **TMI-2 Independent Spent Fuel Storage Installation (ISFSI)** is a dry storage area licensed by the Nuclear Regulatory Commission for spent fuel and debris from the Three Mile Island commercial nuclear reactor accident.

Following the TMI accident in 1979, fuel and debris were transferred to the INEEL's Test Area North for examination, study and storage. The ISFSI provides safe, environmentally secure, aboveground storage for the spent fuel and debris, which is kept in metal canisters inside concrete vaults.

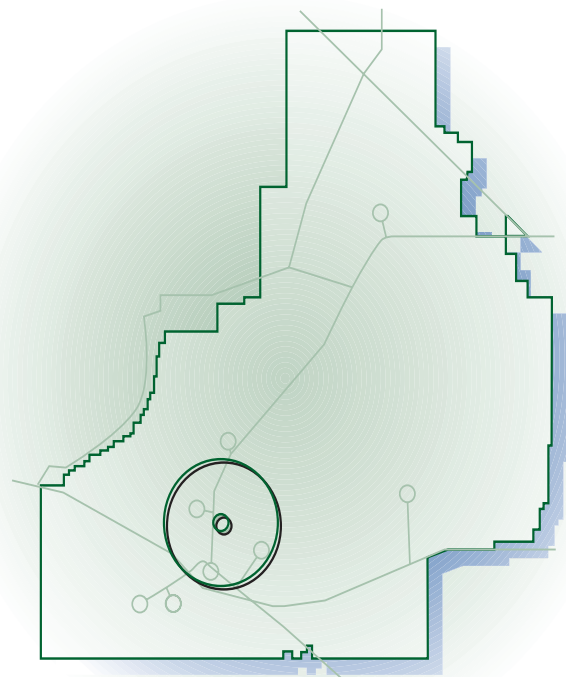
The **Remote Analytical Laboratory** is a world-class, state-of-the-art facility for remote examination of hazardous and radioactive materials. RAL was designed for the safe laboratory analysis of radioactive samples to support many INTEC operations. Working remotely, scientists and technicians can safely prepare samples and analyze hazardous and radioactive materials. The facility is among the foremost of its kind in the world, with 3,500 square feet of shielded remote laboratory space.

The **High-Level Waste Tank Farm** includes 11 underground stainless steel storage tanks used to store the radioactive liquid waste generated during the reprocessing of spent nuclear fuel and plant decontamination work. Most of the tank farm

liquid has been calcined, reducing the volume and converting it to a more stable solid form. About one million gallons of liquid waste remains stored in underground tanks. The tanks are extremely corrosion-resistant. No leakage has been detected from the tanks. The tanks are encased in concrete vaults which have sumps and leak detection. One tank is always kept empty for use as a transfer backup should a problem develop with one of the other 10 tanks. Some leaks from transfer lines outside the tanks have occurred, and this drives the current cleanup program. Under an agreement with the state of Idaho, the

waste must be removed from the tanks by 2012. DOE is currently evaluating technologies to accomplish that.

The **603 Fuel Storage Building** contains the Irradiated Fuel Storage Facility, which dry stores fuel that is incompatible with underwater storage. The IFSF has 636 storage positions and is over half full. The majority of the spent fuel stored there came from the Fort St. Vrain commercial reactor in Colorado. These shipments stopped in 1991. Current and projected receipts include foreign and domestic research reactor fuel and spent fuel from two INEEL facilities – the



Materials Test Reactor canal and the Power Burst Facility. Building 603 also houses three pools once used for underwater storage of spent nuclear fuel. The pools were constructed in the 1950s and served as the primary spent fuel storage facility until the CPP Fuel Storage Building opened in 1984. Fuel once in underwater storage at Building 603 has been removed.

The New Waste Calcining Facility (NWCF) once converted liquid high-level radioactive waste from the Tank Farm into a granular solid similar in consistency to sand. This sand-like material was transferred to large stainless steel structures encased in thick concrete vaults called bin sets. Calcining achieved significant volume reduction from liquid to solid. The calciner was shut down in May 2000. Now several processes take place at NWCF. Among them are evaporation of radioactive liquids prior to final treatment, treatment of debris contaminated with radioactive and hazardous materials, treatment of high efficiency particulate air (HEPA) filters

and decontamination of radioactive contaminated equipment.

History

INTEC was established in the 1950s to reprocess spent fuel from government reactors. Over the years, the facility recovered more than \$1 billion worth of highly enriched uranium, which was returned to the government fuel cycle. In addition, an innovative high-level liquid waste treatment process known as calcining was developed at INTEC. Calcination reduced the volume of liquid radioactive waste generated during reprocessing and placed it in a more-stable granular solid form.

INTEC underwent an ambitious modernization during the 1980s, when safer, cleaner and more efficient facilities were built to replace most major INTEC facilities. In April of 1992, DOE announced that the changing world political situation and the lack of demand for highly enriched uranium made reprocessing no longer necessary. DOE has decontaminated and dismantled some INTEC facilities, and is evaluating the best ways to decontaminate and dismantle others.

Inactive INTEC Facilities/ Processes

The Fluorinel Dissolution Facility includes a “hot cell” with six-foot-thick concrete walls, where spent fuel formerly was dissolved in an acid solution. When reprocessing ended in 1992, uranium and hazardous materials were flushed from the facility. New missions for this facility are under consideration.

– **The INTEC 601/602**

Processing Corridors were used to chemically extract highly enriched uranium (HEU) from dissolved spent fuel during reprocessing and to solidify the recovered HEU for shipment off site. Because DOE discontinued reprocessing in 1992, these facilities have been flushed to remove uranium and hazardous materials. **The Fuel Processing Restoration (FPR)** Project would have replaced these fuel processing facilities. FPR was about 40 percent complete when construction stopped in 1992, but the project was discontinued in a manner that preserves the facility for possible use in future research and development missions.

Distances

Distance to nearby cities or other INEEL facilities:

53 miles (85 kilometers) west of Idaho Falls.

10 miles (16 kilometers) northwest of Atomic City.

25 miles (40 kilometers) southeast of Arco.

30 miles (48 kilometers) southwest of Mud Lake.

More information — For more information, or to request a tour or an INEEL speaker, please call toll-free 1-800-708-2680.