

INEEL OVERVIEW

The Idaho National Engineering and Environmental Laboratory is a U.S. multiprogram research and development center that supports the DOE's missions and business lines of environmental quality, energy resources, science and technology, and national security. The eastern boundary of the INEEL Site – an 890-square-mile government reservation – is 32 miles west of Idaho Falls, Idaho. Other INEEL facilities are in Idaho Falls, a city of about 50,000 people. The laboratory employs about 7,500 people at eight

major applied engineering, interim storage and research and development facilities.

Established in 1949 as the National Reactor Testing Station, the INEEL was once the site of the world's largest concentration of nuclear reactors. Fifty-two test reactors — most of them first-of-a-kind — were built and operated, including the Navy's prototype nuclear propulsion plant. Of these, three are still operating. The Advanced Test Reactor at the INEEL's Test Reactor Area is used for important materials

testing and the production of medical and industrial isotopes. The other two operating reactors are the ATR-C, which is a full-scale, low-power version of the Advanced Test Reactor, and the NRAD reactor, which is used for neutron radiography, at Argonne National Laboratory–West.

In 1951, the INEEL achieved one of the most significant scientific accomplishments of the century — the first use of nuclear fission to produce a usable quantity of electricity at Experimental Breeder Reactor

The INEEL consists of eight major facilities scattered across an 890-square-mile reservation which is also a national environmental preserve.



No. 1. EBR-I is now a Registered National Historic Landmark open to the public during the summer. Later INEEL missions included the reprocessing of spent nuclear fuel to recover valuable uranium for the U.S. government, and the disposal/storage of wastes from reprocessing and transuranic wastes from the nation's nuclear weapons production during the Cold War.

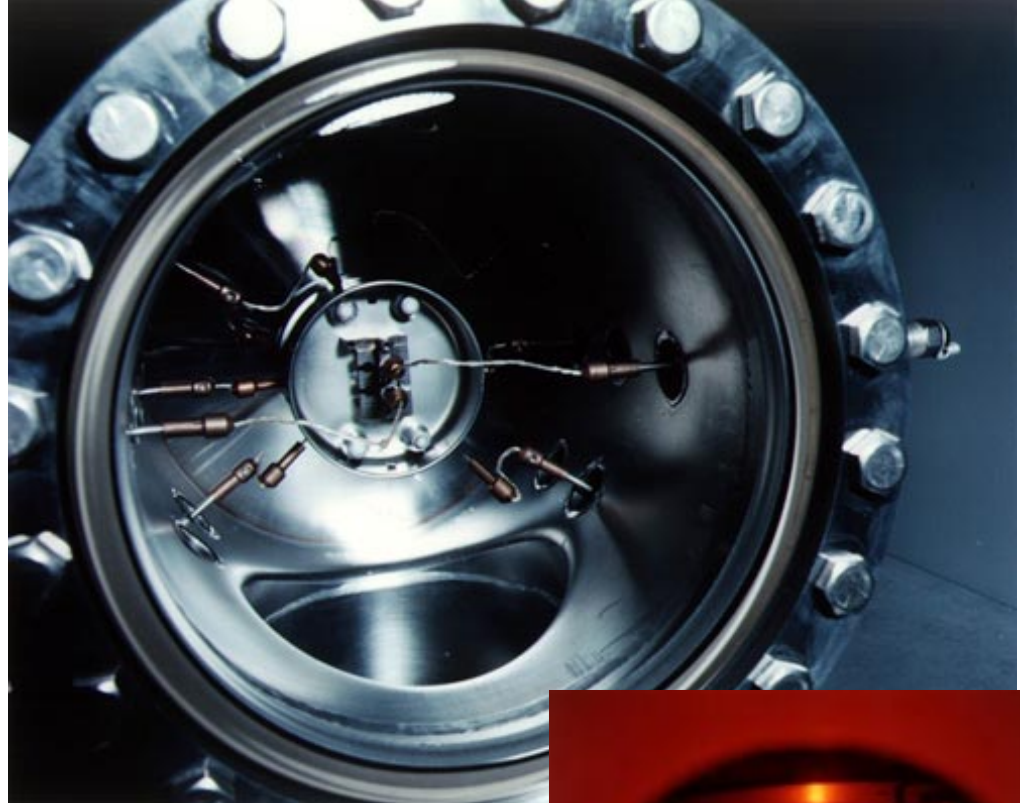
The INEEL today continues to perform complex missions for the nation in a safe and cost-effective manner. Among these are:

- Delivering science-based, engineered solutions to challenging environmental, national security, and other key challenges the nation faces
- Responsibly completing environmental restoration of the INEEL
- Providing leadership and support to optimize the value of DOE's Environmental Management investments and the INEEL's strategic partnerships
- Enhancing the INEEL's scientific and technical talent, facilities, and equipment to best serve the nation and the Northwest region
- Performing subsurface science in support of DOE's energy and environmental missions
- Nuclear energy research and development, including work on Generation IV," the next generation of safe, efficient nuclear reactors for electricity production
- Producing armor for the M1A1 Abrahms tank, the nation's main battle tank
- Developing advanced waste treatment, storage and



"Star Ready" on the flag at left refers to INEEL's Voluntary Protection Program, where worker involvement is the key to safe laboratory operations.

INEEL scientists and engineers use complex, sensitive equipment to engineer breakthrough technologies. One such technology is the inert gas atomization process seen at lower right.



disposal technologies for
DOE and the nation

The INEEL also is a National Environmental Research Park, one of only seven in the nation. All lands within its boundaries constitute a protected outdoor laboratory for conducting ecological studies.

Administration

Management and operation of much of the INEEL is the responsibility of private



contractors working under the direction of the U.S. Department of Energy, Idaho Operations Office. Bechtel BWXT Idaho, LLC (BBWI) is the prime contractor. The University of Chicago operates Argonne National Laboratory—West and reports to DOE’s Chicago Operations Office. Bechtel Bettis, Inc. operates the Naval Reactors Facility that reports to DOE’s Pittsburgh Naval Operations Office.

Vision

The vision for the INEEL is to be an enduring national

resource that delivers science and engineered solutions to the world’s environmental, energy and security challenges. The lab also focuses on technology research and development, environmental research, applied engineering and systems integration, and the transfer and commercialization of energy and environmental technologies.

Major Activities

The INEEL supports the Department of Energy’s four main business lines of environmental quality, energy

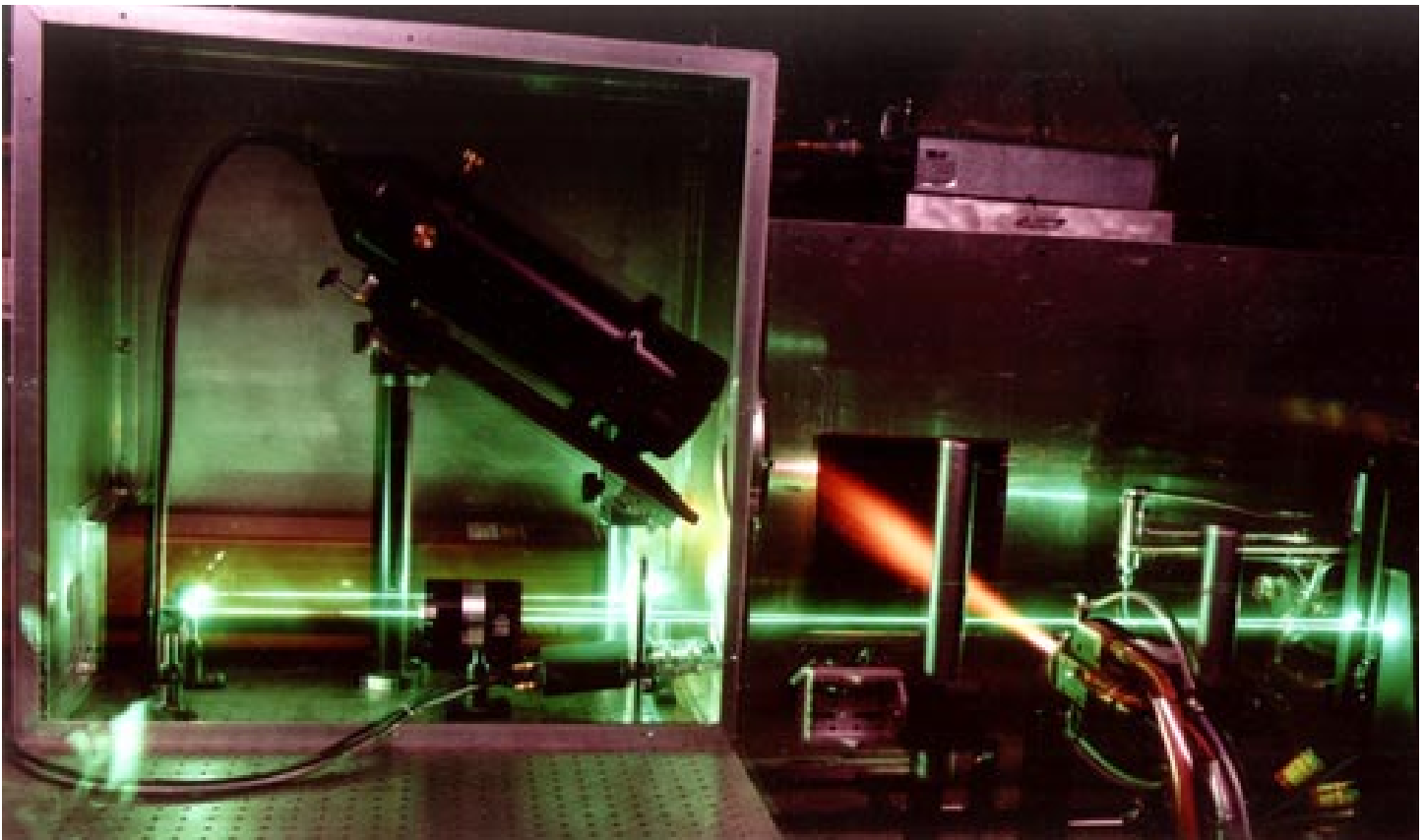
resources, science and technology, and national security with a full spectrum of scientific research and development, environmental management operations, energy efficiency and renewable energy projects, and national security.

Environmental Quality

Environmental Management

— The INEEL is the nation’s lead laboratory in the critically important areas of environmental management and mixed waste. The INEEL is committed to minimize the

A green laser beam intersects the fan-like flame of a plasma torch in a remotely-done experiment.



At INEEL's Test Area North, workers make armor for the Army's M-1 Abrahms tanks. The workers have a 100 percent quality acceptance rate for the armor.



environmental impact of today's operations and efficiently remediate the INEEL reservation in the wake of past operations. INEEL has a proven track record in developing, demonstrating, and deploying environmental technologies and is often called on to help meet regional, national and international environmental restoration and waste management needs. In so doing, the INEEL actively demonstrates DOE's commitment to improving the nation's environment. INEEL — in partnership with DOE's Savannah River Technology Center — also is leading the DOE complex-wide effort to more closely integrate technology development with specific environmental

restoration and waste management objectives, all to get work done faster and at lower cost.

Nuclear Materials Disposition

— With more than 50 years of expertise in nuclear research and development, the INEEL is uniquely positioned to help the nation resolve its pressing nuclear materials disposition challenges. Its highly skilled technical employees and modern interim storage facilities have earned it a key role in developing and demonstrating the new technologies needed for safe off-site disposal of these materials.

Energy Resources

The INEEL and Argonne National Laboratory West share the responsibility as the DOE lead laboratories for nuclear energy. As such INEEL plays a key role in designing, developing, and engineering the next generation of nuclear reactors, with an emphasis on safety, efficiency, protecting the environment, and nonproliferation of fissionable materials. But the INEEL's energy programs go beyond the nuclear field. The Laboratory also does significant research in renewable energy, energy efficiency, improving hydropower systems, and geothermal energy use. Another project in partnership with

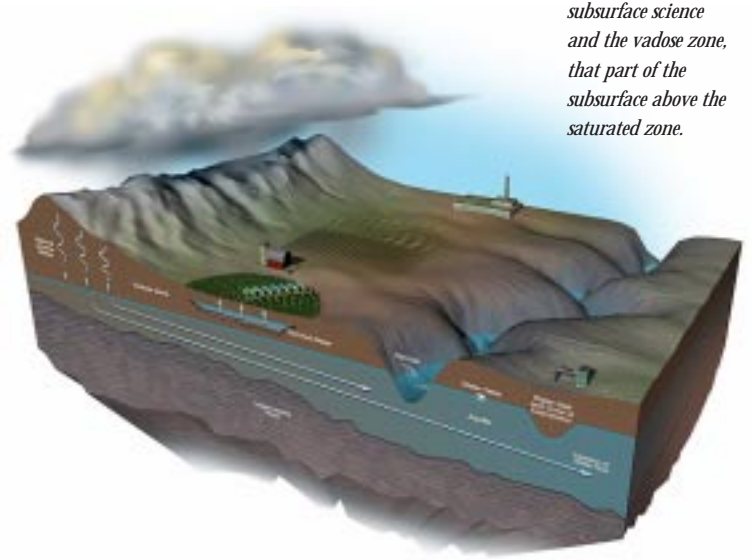
private industry focuses on the use of liquefied natural gas to power buses and commercial vehicles while reducing vehicle emissions. The INEEL has one of the nation's largest fleets of alternate-fueled vehicles, consisting of more than 100 cars, trucks and 50-passenger buses.

Science and Technology

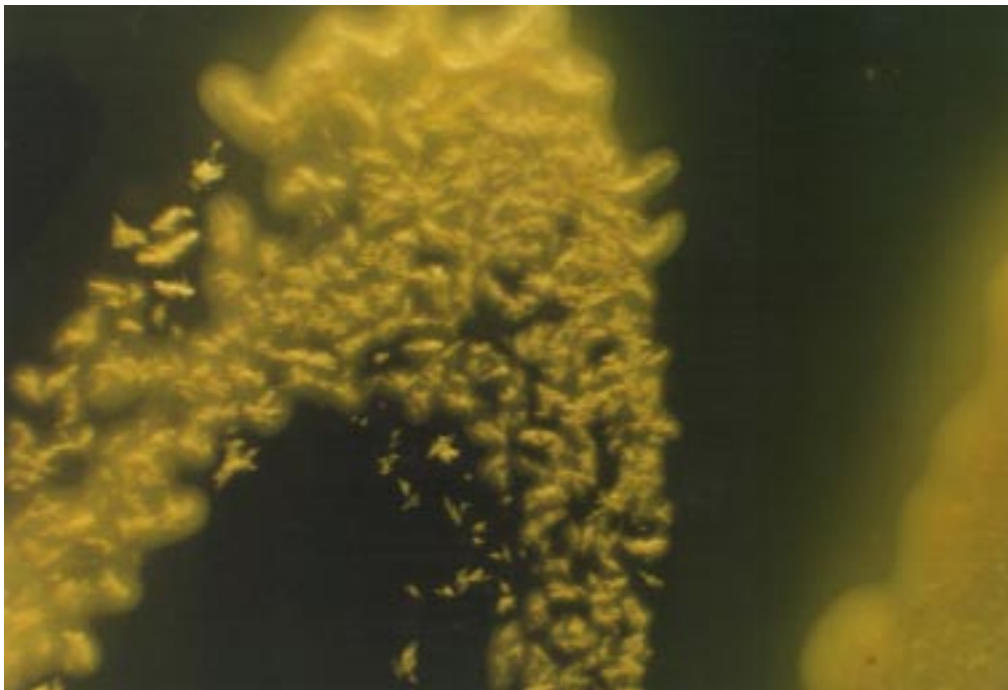
Nuclear Reactor Science and Technology — The world's demand for electricity is predicted to grow at an annual rate of 3 percent through 2015 (about 1.4 percent annually in the U.S. through 2020). With no greenhouse gas emissions, nuclear energy is one of the few large-scale, proven technologies

capable of meeting the world's aggressive carbon emission reduction goals. INEEL plays a key role in designing the nation's next generation of safe, proliferation-resistant reactors. Another INEEL contribution to clean energy is the code now used worldwide to assess the safety of operating nuclear reactors. Called RELAP5, it was developed at the INEEL.

Applied Engineering — As the premier engineering lab among the United States' national laboratories, the INEEL stands out for its ability to provide systems engineering and integration expertise. Major work in this area includes engineering scientific solutions to complex environmental problems, assuring structural integrity of buildings and



An artist's cutaway sketch shows the complex geology underlying the INEEL reservation. INEEL conducts extensive research in subsurface science and the vadose zone, that part of the subsurface above the saturated zone.



INEEL scientists have developed a way to compost explosive residues found in many gunnery and bombing ranges. A safe chemical and nutrient soup feeds bacteria which break down TNT, RDX and other explosives into harmless substances.

bridges, and engineering of nuclear materials and systems.

INEEL Science Research — INEEL scientists and engineers conduct basic and applied research in the environmental sciences, chemical sciences, materials processing, biotechnology and physical sciences. In addition, INEEL workers apply science to solving advanced problems in such diverse areas as groundwater pollution, electric vehicle efficiency, the detection, identification and disposal of unexploded ordnance, welding efficiency in industrial processes, spray forming of tools and dies, and agricultural efficiency.

Subsurface Geosciences Laboratory — An exciting development at INEEL in 2001 has been the release of \$400,000 in Department of Energy funding for preliminary design work on the Subsurface Geosciences Laboratory. The SGL will be a modern laboratory facility focusing the expertise of leading scientists toward understanding the basic science of the Earth's subsurface. Their work will be vital to solving the nation's underground pollution problems, and achieving the maximum benefits of harnessing and using the many biogeochemical processes and unique materials in the Earth's subsurface.

Technology

Commercialization — The INEEL leverages technologies developed in support of national DOE missions to obtain, where possible, a derived benefit for the private sector. The INEEL has an aggressive commercialization program to move laboratory technologies into private industry and academia. Among many notable results of efforts in this area are a more environmentally benign way to extract phosphate from ore and a more effective way to remediate oil spills.

National Security

The INEEL is an innovator in science-based and integrated engineering systems for national security and intelligence within DOE, other government agencies, and industrial partners. With its Advanced Test Reactor, INEEL supports the Naval Reactors and Naval Nuclear Propulsion programs. The INEEL's Specific Manufacturing Capability also serves national defense, manufacturing armor for the M1-A1, the nation's main battle tank. INEEL also conducts research, development, and deployment to improve the security of citizens, infrastructures, and nations. The INEEL's threat mitigation R&D includes

chemical demilitarization and operations; command and control; explosives, chemical, biological, currency, and other contraband materials detection; nuclear-related environmental initiatives; and advanced information science. The INEEL's advanced technology systems focus on nonproliferation and intelligence based on materials science, chemical and biological threat detection/analysis, nuclear material detection, electrical systems and control, infrastructure and software engineering. The laboratory also conducts analysis, develops and delivers integrated systems, and provides intelligence and policy support for national security decision-makers.

Major Facilities

Argonne National Laboratory-West — ANL-W, part of Argonne National Laboratory operated by the University of Chicago, conducts research and development and operates facilities for DOE. Research is focused on areas of national concern including energy, nuclear safety, spent nuclear fuel treatment, nonproliferation, decommissioning and decontamination technologies and nuclear material disposal.

INEEL Research Center — INEEL scientists and engineers explore environmental sciences, chemical sciences, materials processing, biotechnology and physical sciences. IRC employees are involved in electric vehicle testing, improving methods to detect nuclear warheads and identifying biodegradable products for stripping metals. IRC and the nearby Interim Engineering Demonstration Facility together serve as the focal point for programs aimed at securing future clean energy supplies, increasing energy efficiency, enhancing environmental quality and improving America's industrial competitiveness.

Idaho Nuclear Technology and Engineering Center — INTEC provides safe interim storage for government-owned spent nuclear fuels. Spent fuel and core debris from the Three Mile Island accident are safely stored in concrete vaults here. Other facilities at INTEC include waste storage bins and a state-of-the-art remote analytical laboratory. The INTEC currently develops new approaches and technologies to prepare spent fuel and other nuclear materials for eventual disposal in a national repository. It also is the center for the INEEL's High-Level Waste treatment program. INTEC scientists pioneered the process used to reduce liquid radioactive waste to a dry

granular powder for safer storage. Today, work continues to determine the best final treatment and disposition for the dry powder, which is stored in stainless steel bins at INTEC. In the past, this facility also reprocessed spent nuclear fuel, recovering more than \$1 billion worth of useable uranium for the U.S. government. The reprocessing mission ended in 1992 with the end of the Cold War.

Naval Reactors Facility — NRF is the birthplace of the U.S. nuclear Navy. Beginning in the early 1950s, prototype reactors for both submarines and surface ships were developed and operated here. Until May 1995, NRF served as a school for officers and enlisted personnel destined for service aboard nuclear-powered ships. NRF also receives and examines naval spent fuel, and works together with other INEEL facilities to continually improve nuclear propulsion systems.

Waste Reduction Operations Complex — WROC is housed in an area formerly used for reactor operations. The complex consists of the Waste Engineering Development Facility, the Mixed Waste Storage Facility and the Waste Experimental Reduction Facility. These facilities provide for the safe treatment, storage and recycling of the INEEL's radioactive, mixed and industrial/commercial wastes.

The Waste Experimental Reduction Facility, used to incinerate wastes to reduce volume, ceased incineration operations in 2000. Sizing and compaction of wastes still take place there.

Radioactive Waste Management Complex — Strategies for waste storage, processing and disposal are studied at RWMC. The Advanced Mixed Waste Treatment Facility now being built here will be used to safely compact and package radioactive wastes. British Nuclear Fuels Limited, Inc. will operate this facility, retrieving approximately 65,000 cubic meters of mixed transuranic waste in temporary storage at the Transuranic Storage Area. It will treat the waste to meet environmental laws and disposal criteria, and package the waste for shipment to the Waste Isolation Pilot Plant in New Mexico. RWMC's Stored Waste Examination Pilot Plant is a state-of-the-art examination/certification facility for wastes being shipped to WIPP.

Test Area North — TAN, located at the northern end of the INEEL Site, consists of facilities for handling, storing, examining and doing research on spent nuclear fuel. TAN also houses the Specific Manufacturing Capability Project, which makes armor packages for Army tanks.

Test Reactor Area — TRA,

one of the world's most sophisticated nuclear materials testing complexes, has extensive facilities for studying the effects of radiation on materials, fuels and equipment. The Advanced Test Reactor located here produces a neutron flux that allows simulation of long-duration radiation effects. ATR also produces important medical, research and industrial isotopes.

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

Media Contact:

John Walsh

Idaho National Engineering and Environmental Laboratory

(208) 526-8646

jhw@inel.gov