



The Center for Advanced Energy Studies fosters seamless research coordination between INL and its university partners.



Fuel fabrication capabilities at the Materials and Fuels Complex enable the creation of virtually any fuel type.



INL expertise in identifying and reducing vulnerabilities in industrial control systems is internationally recognized.

Changing the World's Energy Future



INL Overview

Idaho National Laboratory stands out as a distinctly capable science and technology resource. Notably, the lab serves as the nation's command center for advanced nuclear energy research, development, demonstration and deployment. The lab is home to the unparalleled Advanced Test Reactor and associated assets for post-irradiation examination, fuel fabrication, materials testing and

development assets. Leveraging these and numerous other distinguishing features, the lab and its roughly 4,200 scientists, engineers and support staff build on the potential and promise of ideas that can benefit the real world.

A Proud Past and High-Performing Present

INL is one of only 10 multiprogram national laboratories owned by the U.S. Department of

Energy. Geographically, INL is the largest lab — the 890-square-mile desert Site also serves as a national environmental research park. INL performs work in support of DOE's mission to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions.

In the early days, INL was known as the National Reactor Testing Station. Since 1949, the Idaho site has been the location of many pioneering developments in the area of nuclear energy. The world's first usable amount of electricity from nuclear energy was generated in 1951.

Over the years, 52 mostly first-of-their-kind reactors were built at Idaho's national laboratory, creating the largest concentration of reactors in the world. After fulfilling their research missions, most have since been decommissioned.

Although INL today reports up through DOE's Office of Nuclear Energy, the lab conducts a wide range of activities supporting several DOE offices and other federal agencies.

Nuclear Science and Engineering

INL is the leading laboratory in basic and applied nuclear and radiological science research and applications. Both DOE and other public and private entities request the expertise and assistance of INL's leading nuclear scientists to address critical needs. For example, INL functions as a centralized technology integrator for DOE's Fuel Cycle Research & Development program.

INL has nearly 70 years of experience in nuclear reactor plant design, operations and decommissioning, and nuclear materials processing. The lab's expertise is routinely sought by national and international customers. These standout capabilities are key to supporting DOE's Light Water Reactor Sustainability and Gateway for Accelerated Innovation in Nuclear (GAIN)

programs. All INL nuclear operations are based on a long tradition of safe and cost-effective operations.

National Security Research and Testing

INL's applied engineering discipline and build-test-build problem-solving approach help the departments of Energy, Defense and Homeland Security as well as industry partners solve significant national security challenges in critical infrastructure protection and nuclear nonproliferation.

The laboratory's signature capabilities, expertise and unique infrastructure assets support efforts to secure industrial control systems from cyber and physical threats, develop advanced nuclear facility safeguards, and design advanced wireless sensors and protocols.

INL's 890-square-mile infrastructure test range and co-located laboratories provide an ideal backdrop for conducting significant national security demonstrations and experiments. Test facilities include an isolatable utility-scale power grid loop, a comprehensive cellular network, vast nuclear materials testing and analysis facilities, a bulk explosives test bed, and an Unmanned Aerial Vehicle runway.

Energy and Environmental Sustainability

An overarching thrust of INL research is energy security — the nation's greatest challenge for the 21st century. Energy security includes resource security, economic stability and long-term environmental sustainability. Scientists and

engineers are exploring solutions to grand challenges in the areas of clean energy development, competing water resource management, and carbon life-cycle options in order to get the right type of energy to the right place at the right time.

INL researchers are configuring and testing hybrid energy systems to increase the range of beneficial energy options, and to demonstrate that renewable, fossil and nuclear energy systems can be successfully and effectively integrated for greater efficiencies. They also validate the efficiency of using clean energy sources to recycle captured carbon dioxide into chemical feedstocks and consumer goods.

Still others in the lab's research community are poised to overcome key barriers facing the U.S. bioenergy industry — by harnessing cellulosic biomass resources and enabling the production of biofuels and other renewable value-added products.

Mainstream research is significantly expanding DOE's ability to evaluate new battery technologies through applied research, development and diagnostics. This work leads to advanced batteries that live longer, are safer and are more cost-effective for electric-drive vehicles.

For more information

866-495-7440

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