



INL's distinctive facilities and capabilities are central to meeting the research, development, demonstration and deployment needs of the nation's nuclear energy enterprise.

The Energy of Innovation



The National Nuclear Laboratory

As the United States accelerates its drive toward increased energy self-sufficiency, all clean and domestically available sources – including nuclear – are likely to have important roles to play. Nuclear energy systems currently provide nearly two-thirds of the emissions-free electricity in the U.S. Maintaining or even expanding the economic and environmental sustainability contributions of this clean, dependable power source will require the best efforts of industry and regulators – supported by the insights and expertise of the National Nuclear Laboratory. The laboratory – independently and impartially – provides the technical surety needed by system

manufacturers, electric utilities and regulators as they make decisions about improving and extending the operations of today's nuclear energy facilities, and refine plans for the next generation of even safer and more efficient nuclear reactors.

Idaho National Laboratory – the National Nuclear Laboratory

So what does it take to serve as the United States' National Nuclear Laboratory? We believe the answer is – a unique blend of distinctive facilities; the full range of capabilities needed for integrated nuclear energy research, development, demonstration and deployment; and an established and vibrant network of connections with other labs, industry and academia.

Where it all began

The need for a National Nuclear Laboratory was identified more than 60 years ago by the then-new Atomic Energy Commission. After an exhaustive nationwide search for a remote, secure site to conduct trailblazing research on new systems that could extract power from the atom, the commission selected a site on the high desert of eastern Idaho. It was at this site – initially known as the National Reactor Testing Station – that the nation's top nuclear scientists and engineers immediately went to work, developing new materials, systems and processes – the likes of which the world had never before seen.

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Distinctive facilities

While Idaho is where 52 mostly first-of-their-kind reactors were designed and built, decades of investment resulted in development of a comprehensive suite of allied facilities located strategically across modern-day INL's three primary research campuses:

- Advanced Test Reactor Complex, the nation's premier resource for fuels and materials irradiation testing, nuclear safety research and nuclear isotope production;
- Materials and Fuels Complex, the center of DOE's advanced nuclear fuel development initiatives and post-irradiation examination capabilities;
- Research and Education Campus, the front door to INL and center of INL's computing facilities, with a variety of research, administrative, educational and technical support facilities.

Within these three primary facility areas are more than two

dozen discrete laboratories, hot cells, assembly facilities and other structures offering at this single site an unexcelled set of capabilities – capabilities that would cost billions of dollars to replicate anywhere else.

Integrated capabilities

INL's vertically integrated capabilities and state-of-the-art instruments support a science-based approach to developing evolutionary and revolutionary new options for the entire nuclear energy enterprise.

As the United States' National Nuclear Laboratory, the lab provides a broad range of capabilities including many that are crosscutting, for example, our advanced capabilities in analytical chemistry. Our nuclear energy RD&D capabilities can be grouped into the following primary areas:

- Fuels and Materials Fabrication
- Irradiation Testing
- Pre- and Post-Irradiation Examination
- Separations and Waste Form Development

- Reactor Safety Analysis
- Modeling and Simulation
- Space and Security Power Systems

Broad connectivity

INL, the National Nuclear Laboratory, provides a one-of-a-kind research environment with unique capabilities and facilities for advancing nuclear energy. The lab – through a user facility model – makes these extraordinary assets available to leading researchers from universities, industries, national and international laboratories and research organizations, and other federal agencies. Our multidimensional, virtually connected campus environments have the up-to-date facilities and integrated capabilities that can help shape the future direction of nuclear energy technology, advance nuclear science and create technically achievable, economically competitive and environmentally sustainable options for a nation in pursuit of enhanced energy self-sufficiency.

For more information

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Data from the Energy Information Administration and Ventyx show U.S. nuclear plants produced nearly six times as much emission-free electricity as wind, solar and geothermal plants combined in 2011.

Emission-free Electricity Sources

