

Idaho National Laboratory

Overview

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www.inl.gov



Historical Perspective



1949
National Reactor Testing Station established



1952
Materials Test Reactor begins critical operation



1951
Experimental Breeder Reactor I produces electricity



1955
Arco, Idaho powered by BORAX III reactor

1967
Advanced Test Reactor begins critical operation



Historical Perspective

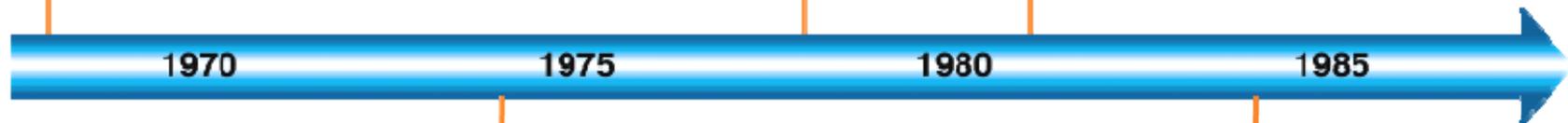


1968
NRTS
Supercomputing
Center built



1978
LOFT engineers conduct
facility's first nuclear test

1981
INEL's Raft River
Geothermal Pilot Plant
starts up



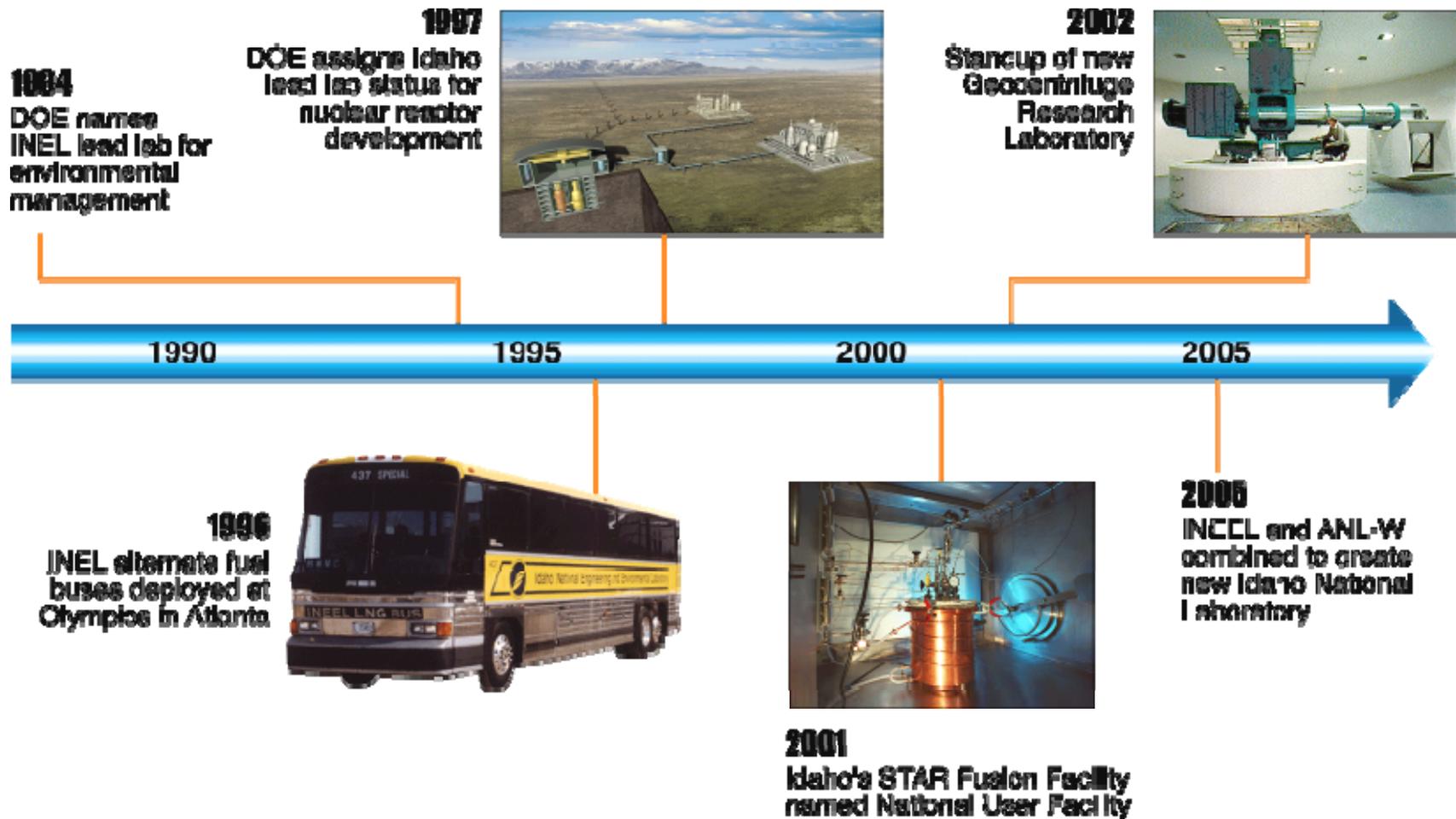
1974
NRTS renamed Idaho National
Engineering Laboratory



1984
INEL Research
Center dedicated

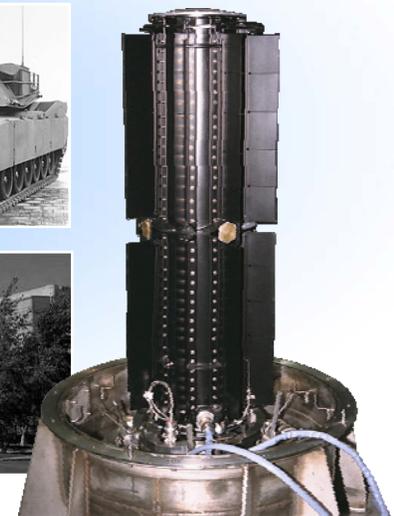
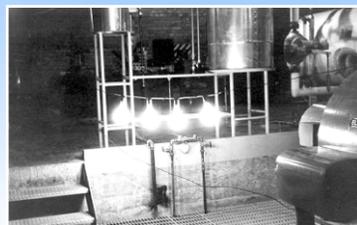
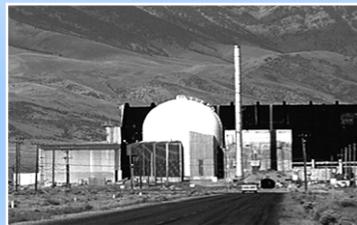


Historical Perspective



Historic Contributions

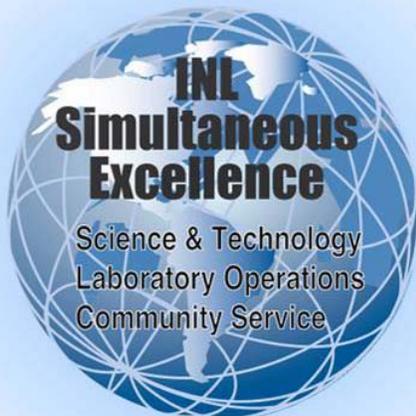
- **Proof of breeder reactor concept**
- **Development of Navy nuclear propulsion systems/operator training**
- **Design and construction of 52 nuclear reactors**
- **Production of key medical and industrial isotopes**
- **Nuclear reactor safety code development**
- **Leadership of DOE hydropower and geothermal programs**
- **Hybrid and electric vehicle testing**
- **Armor production**
- **NASA program support**



Idaho National Laboratory — Our Present

LABORATORY

Battelle
Laboratory Expertise



Nuclear Operations



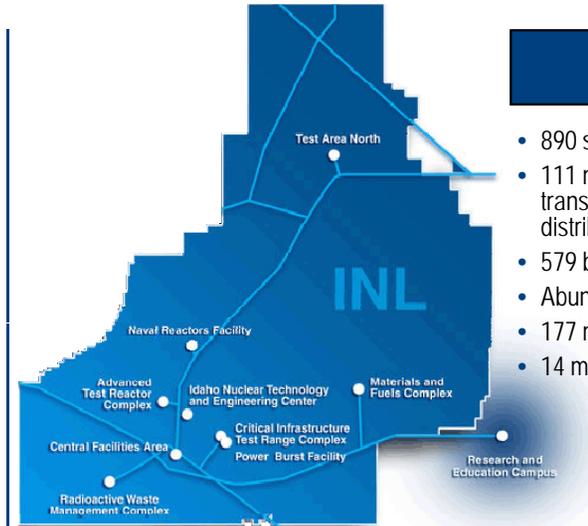
Infrastructure Management



Industry Connection



National University Consortia



SITE

- 890 square miles
- 111 miles of electrical transmission and distribution lines
- 579 buildings
- Abundant water
- 177 miles of paved roads
- 14 miles of railroad lines



4191 Employees
Business Volume \$800M



1564 Employees
Business Volume \$365M

Naval Reactors Facility
1444 Employees



850 Employees
Business Volume \$124M

Idaho National Laboratory — The National Nuclear Laboratory

Researcher and student involvement and collaboration via CAES center

- **Broad University Engagement**
 - '08: 167 interns & 18 post-doctorals
 - '09: 221 interns and 10 post-doctorals
- **ATR NSUF User's Week: 115 students, faculty, interns from 29 universities**
- **Investment in Idaho Universities: 7 new projects announced**

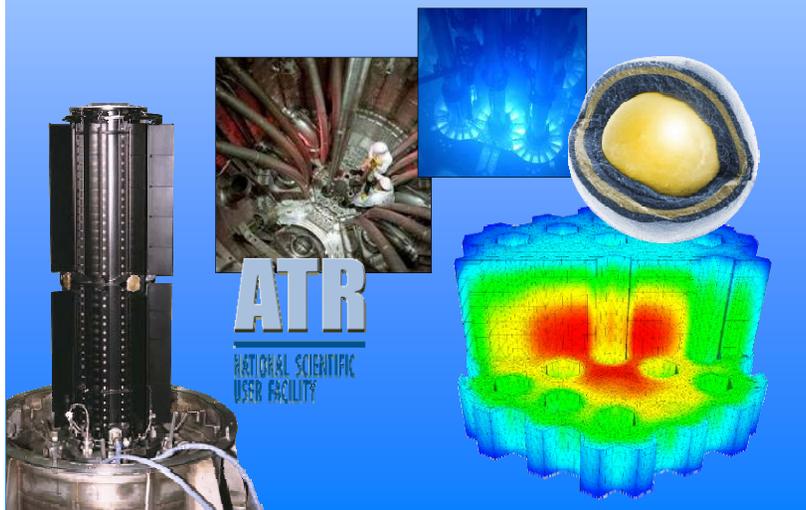


Research Programs of National Importance

Nuclear Energy

- ▶ Advanced Fuel Cycle R&D
- ▶ Next Generation Nuclear Plant (NGNP)
- ▶ ATR National Scientific User Facility
- ▶ Space Nuclear

U.S. National Nuclear Energy Laboratory and an International leader



National & Homeland Security

- ▶ Supervisory Control and Data Acquisition (SCADA) Work
- ▶ Grid Reliability and Security
- ▶ Cyber Security
- ▶ Wireless Communications
- ▶ Nuclear Nonproliferation
- ▶ Armor, Explosive Blast Protection

A leader in critical infrastructure protection and homeland security



Energy & Environment

- ▶ Hybrid Energy Systems
- ▶ Non-traditional Hydrocarbon use
- ▶ Bio-fuels and Synfuels
- ▶ Clean Energy and Water
- ▶ Battery Technology

A leader in developing solutions to energy, resources and infrastructure challenges in the State, Region and Nation



Delivering technologies that benefit our communities, state, region and country

Idaho National Laboratory — Vision

Develop world-class nuclear energy capability

INL Idaho National Laboratory

Foster education, research, industry, government and international collaborations to produce the needed investment, programs and expertise

ATR NATIONAL SCIENTIFIC ACCELERATOR FACILITY

CAES Center for Advanced Energy Studies

INL Wireless TEST BED

Battery Testing Lab

Become the Preeminent Internationally-Recognized Nuclear Energy RD&D Laboratory

Become a major center for national and homeland security technology RD&D

Become a leading clean energy systems RD&D laboratory and a regional resource

The National Nuclear Laboratory with Multi-Program Capabilities

The nuclear energy mission is the reason INL exists

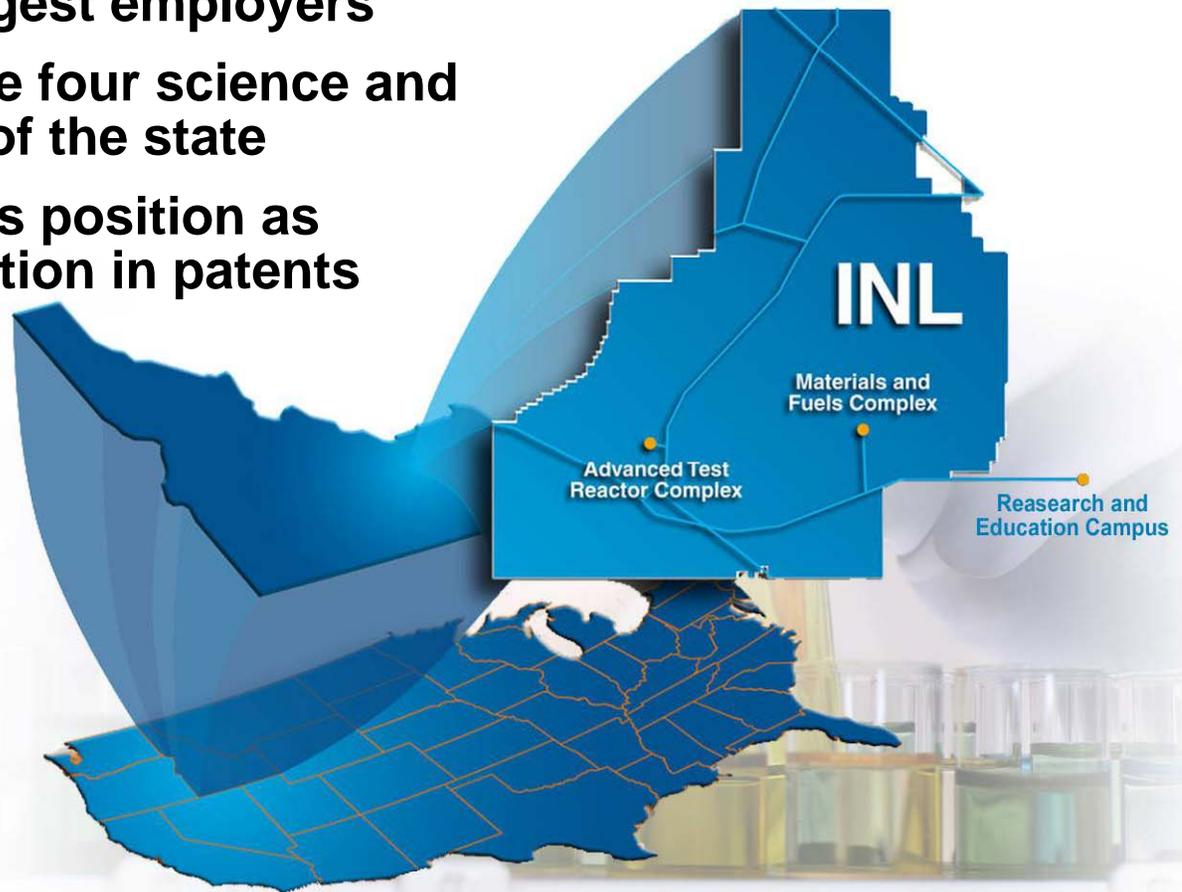
INL's Position Today — Nationally

- **One of only 10 DOE multi-program labs**
- **DOE's designated lead lab for nuclear energy research, development and demonstration**
- **A major contributor in national and homeland security**
- **Regional contributor to clean energy technologies**



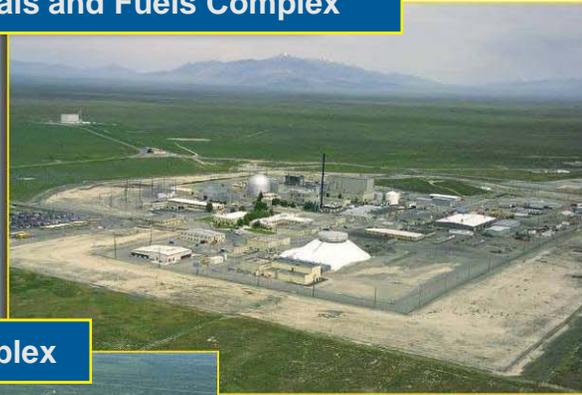
INL's Position Today — in Idaho

- **One of the state's largest employers**
- **Considered one of the four science and technology "pillars" of the state**
- **Contributes to Idaho's position as number one in the nation in patents issued per capita**

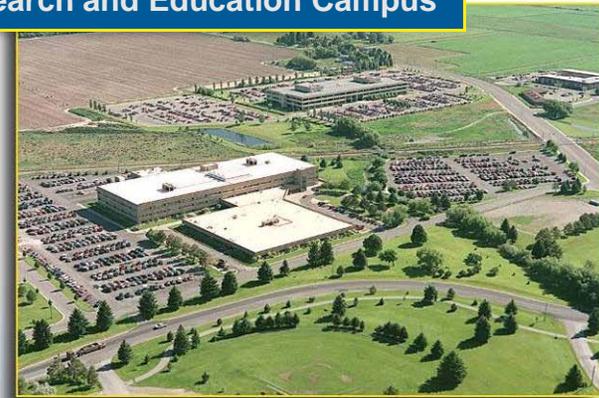


INL's Three Main Facility Areas

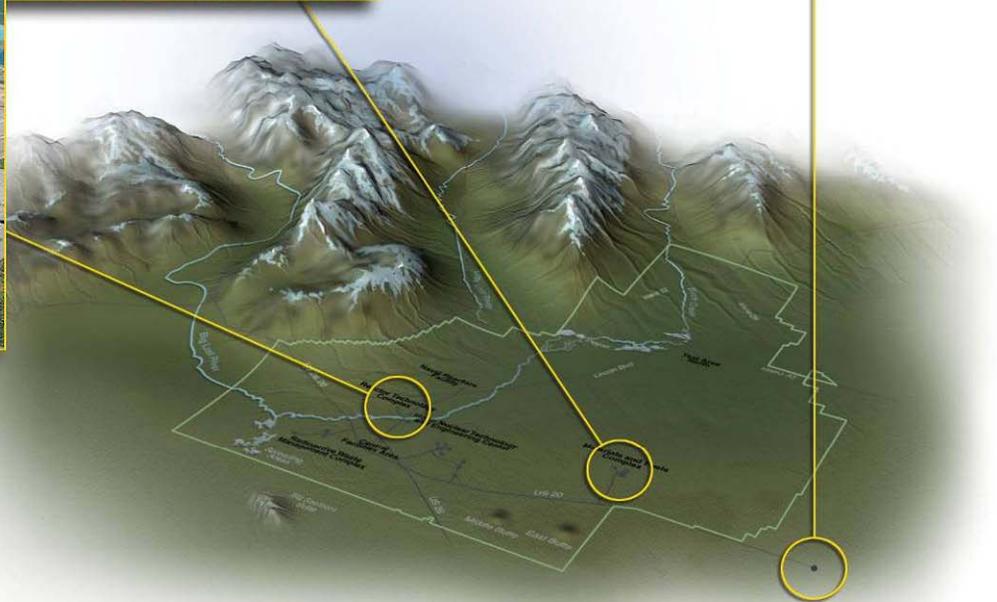
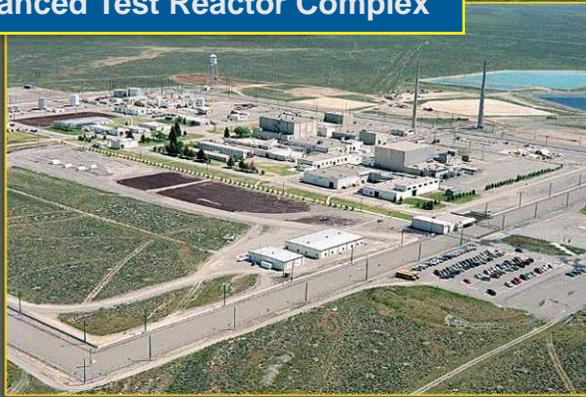
Materials and Fuels Complex



Research and Education Campus



Advanced Test Reactor Complex



Reactor Technology Complex

Key Assets:

- **Advanced Test Reactor**
 - Nation's most versatile test reactor
 - Materials and fuels testing, isotope production
 - National Scientific User Facility
- **STAR**
 - Fusion safety testing

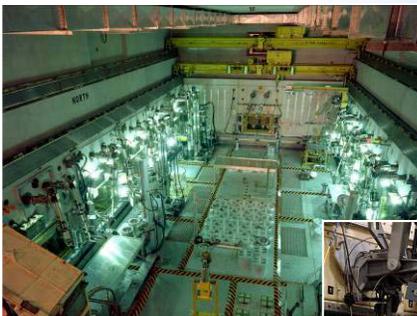


Advanced Test Reactor core

Materials and Fuels Complex

Key Assets:

- **Hot Fuel Examination Facility/Fuel Conditioning Facility**
 - Hot cells for fuel studies
- **Center for Space and Security Power Systems**
 - Assembly and testing of space batteries



Hot Fuel Examination Facility



Space and Security Power Systems Facility

Science and Technology Campus

Key Assets:

- **INL Research Center**
 - Multiprogram labs
- **Information Operations Research Center**
 - National and Homeland Security studies



Nuclear hydrogen, high temperature electrolysis



IceStorm supercomputer

INL's Major Business Centers

Nuclear Programs

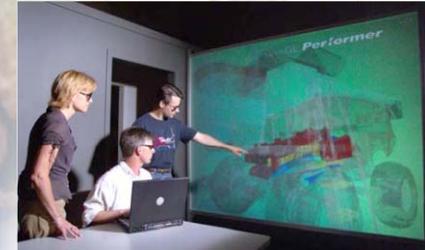
Nuclear Operations

National and Homeland Security

Energy and Environment

Specific Manufacturing Capability

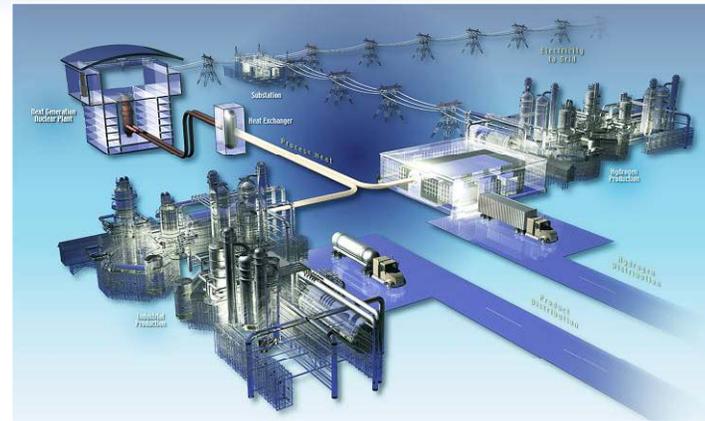
Facilities and Site Services



Nuclear Programs

Primary Responsibilities

- Lead the global nuclear energy agenda
- Lead and deliver the Next Generation Nuclear Plant
- Build the basics for the fuel cycle of the future
- Power space exploration for the nation
- Support strategic commercial partnerships
- Provide technical bases and analyses for reactor system safety and operating regulations



Nuclear Operations

Primary Responsibilities

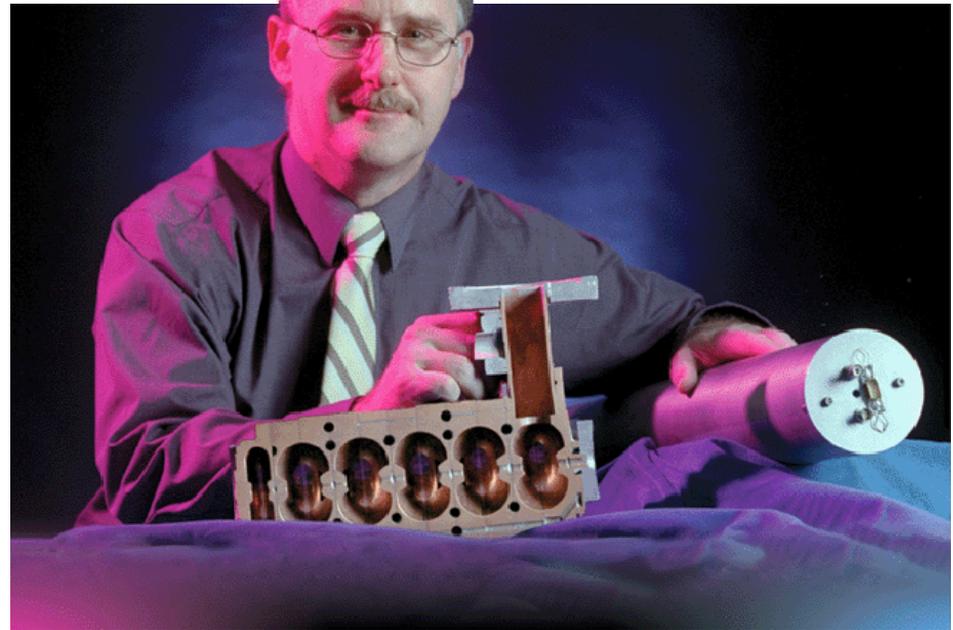
- **Maintain and operate the Advanced Test Reactor**
- **Assure primary mission fulfillment**
 - National security reactor/materials applications
 - Current generation commercial reactor support
 - Future reactor system design support
 - Medical, industrial and national interest isotope production



National and Homeland Security

Primary Responsibilities

- **Critical Infrastructure Protection** - Reduce cyber and physical risks to infrastructures
- **Nuclear Nonproliferation** - Prevent the illicit use, acquisition and transportation of radiological material
- **Defense Systems and Technology** - Develop innovative technologies and survivability solutions for military customers
- **Special Projects** - Support federal agencies through material science, information analysis / operations and engineered prototypes



Energy and Environment

Primary Responsibilities

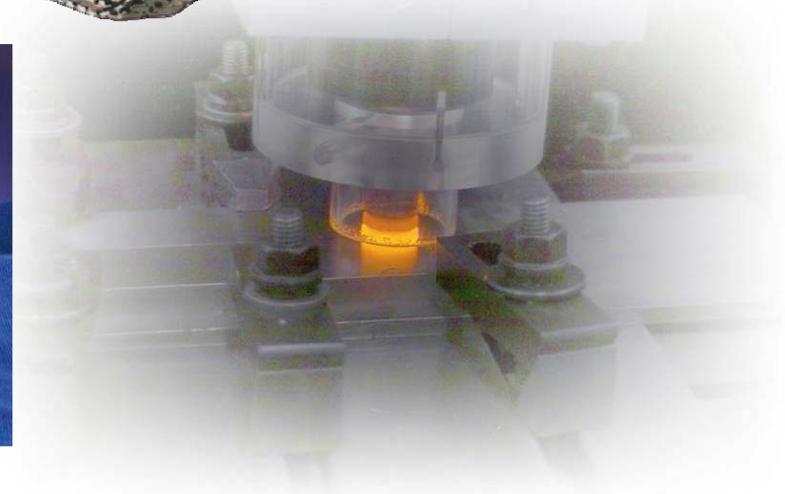
- **Establish five lab-wide distinctive scientific signature capabilities**
 - Instrumentations, Control and Intelligent Systems
 - Materials and Nuclear Fuels Science and Technology
 - Microbiological and Geological Systems Science
 - Separations and Actinide Science
 - Theory, Modeling and Simulation
- **Manage alternate and renewable energy research portfolio**



Specific Manufacturing Capability

Primary Responsibilities

- Manufacture armor packages
- Used for U.S. Army's M1-A2 Abrams Main Battle Tanks
 - Assignment first received in 1985
 - Full production achieved in 1988
 - More than 3,900 packages have been produced at the facility



Facilities and Site Services

Primary Responsibilities

- Emergency Services
- Facility Management
- R&D Support Services
- Safeguards and Security Services



INL - Future Plans

Continue conducting all operations with simultaneous excellence in science, safe operations and community service

Continue growing the business base

Modernize and consolidate research infrastructure

Invest in INL's most precious asset – its people



