

Office of Nuclear Energy Mission Support Overview

Office of Nuclear Infrastructure Programs

October 13, 2017

Mission Support Overview

- Mission Support includes the planning, acquisition, operation, maintenance, and disposition of Office of Nuclear Energy owned facilities and capabilities at the Idaho National Laboratory including providing the necessary safeguards and security functions.
- Infrastructure enables NE and DOE missions to perform impactful nuclear research in a safe, secure manner to support the existing fleet, advanced reactor pipeline, and nuclear fuel cycle infrastructure
- Integrated with the research programs to ensure proper alignment and prioritization of investments
- Leverages infrastructure programs to optimize availability and provide flexibility for programmatic work

Budget Overview

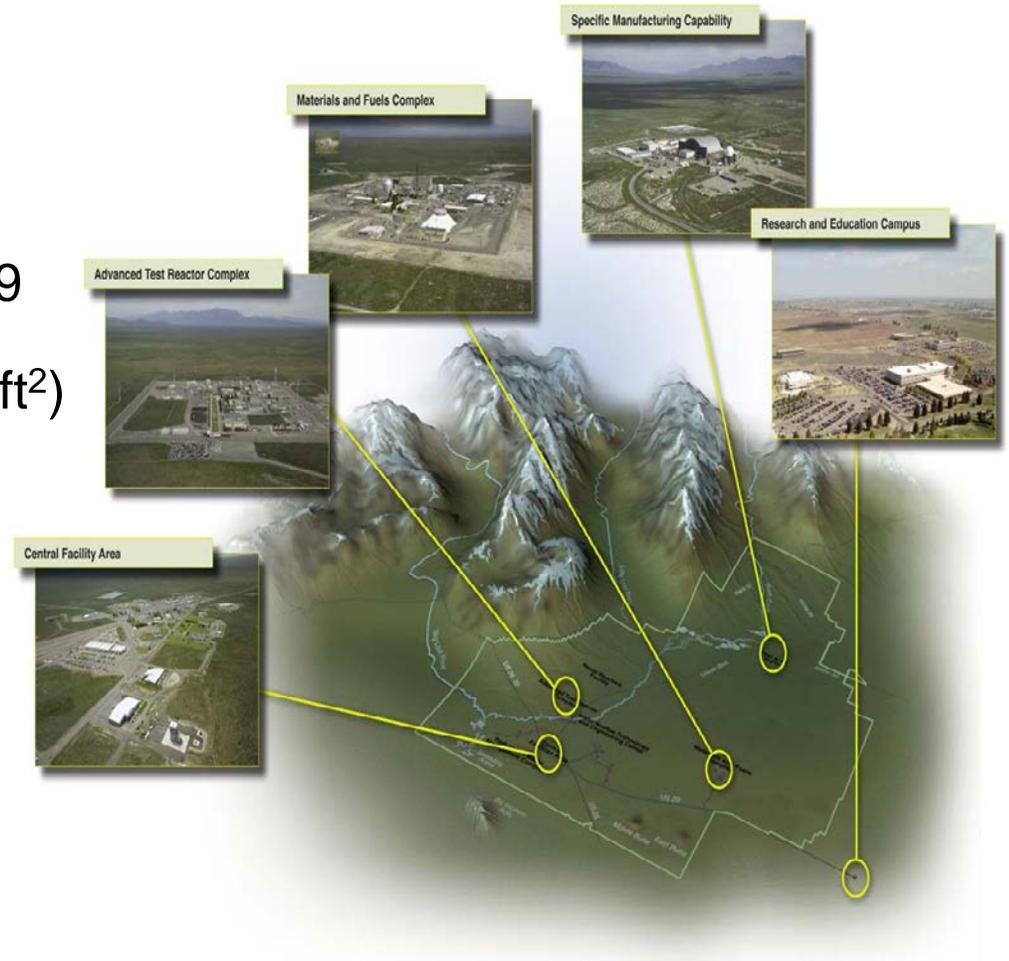
\$ in 000's

	FY 2017 Omnibus	FY 2018 Request	FY 2018 House Mark	FY 2018 Senate Mark
Idaho Facilities Management	\$237,713	\$204,140	\$244,000	\$216,202
Idaho Sitewide Safeguards & Security	\$129,303	\$133,000	\$133,000	\$129,000

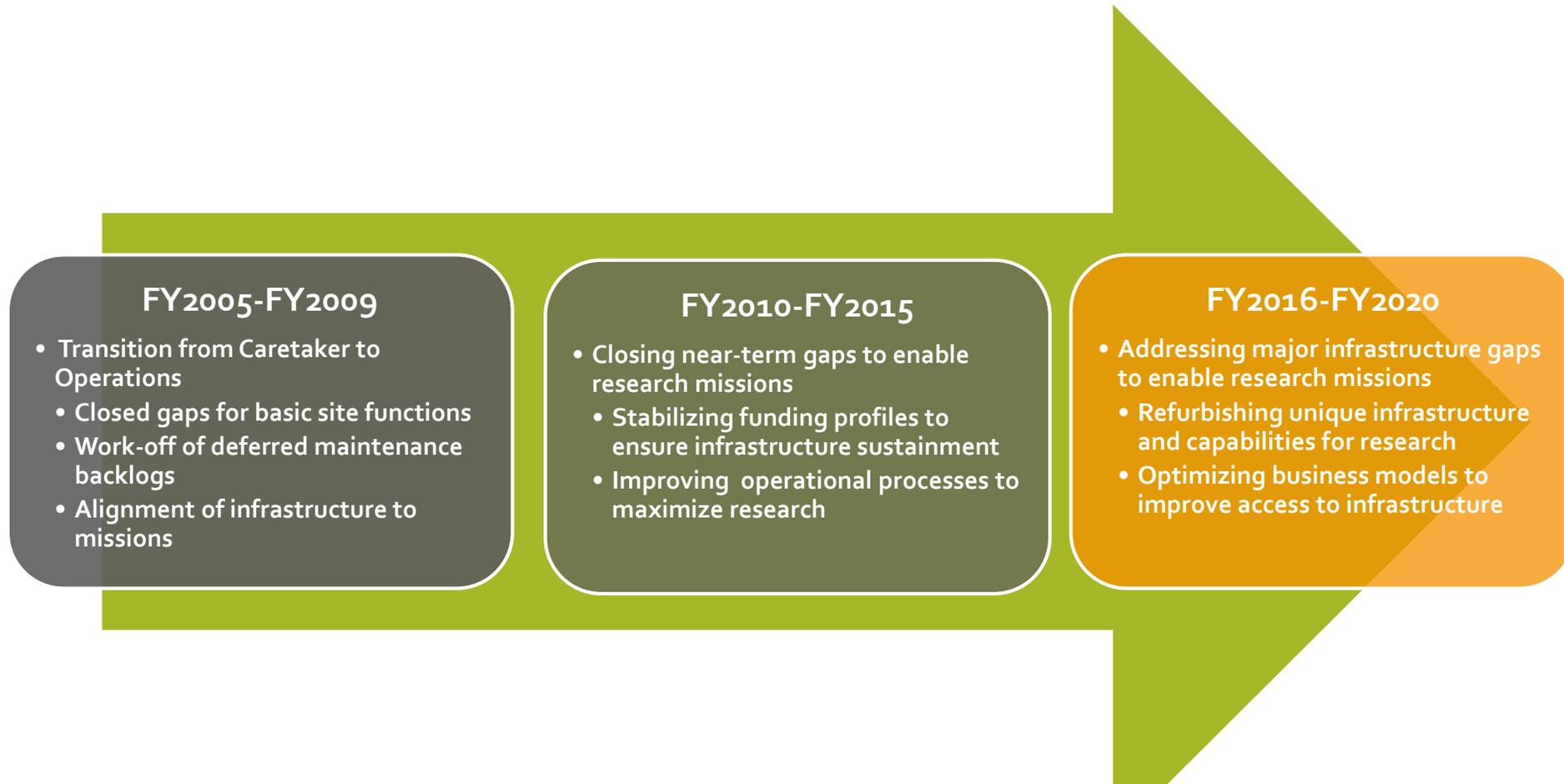
NE strives for balanced resource allocation for infrastructure and research missions, taking into account nuclear safety and security considerations

Overview of Idaho National Laboratory

- Site approximately 890 square miles
 - 98% of site land is undeveloped
- 579 buildings (5.9 million ft²) with an average age of 29 years
 - 332 Office of Nuclear Energy buildings (3.1 million ft²)
 - 3 operating research reactors and 1 undergoing resumption
- Full complement of utilities and services
 - 111 miles of electrical transmission and distribution lines with a peak load of 45 MW
 - 177 miles of paved roads
 - 21 miles of railroad lines
- Abundant water
 - Snake River Plain Aquifer about the size of Lake Erie



Evolution of INL Infrastructure



Idaho National Laboratory infrastructure continues the transition to major investments to further research missions.

Idaho Facilities Management

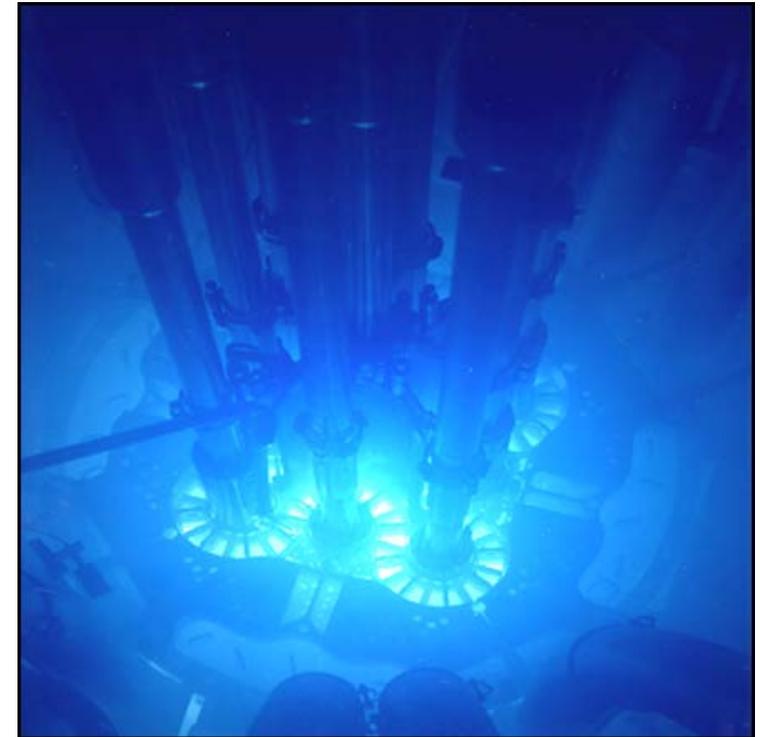
- The Idaho Facilities Management (IFM) program provides direct funding to operate and maintain site-wide nuclear infrastructure under the purview of NE
- Critical scope includes:
 - Maintaining safe and compliant nuclear research facilities
 - Addressing aging infrastructure needs
 - Addressing infrastructure gaps identified and required to fulfill research mission needs and basic site operations

The IFM program directly enables DOE research and development and national security programs by providing and maintaining operational facilities and resources in a user-ready status

INL Irradiation Capabilities

INL has four unique irradiation capabilities that support the research and development programs:

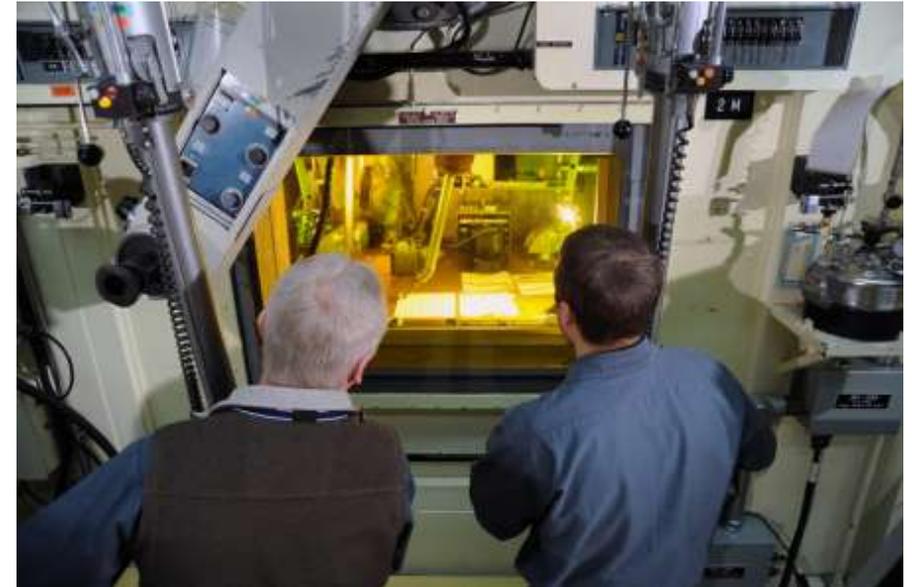
- **Advanced Test Reactor** —High thermal flux test reactor that supports accelerated testing for fuel and materials development
- **ATR Critical Facility** —Low-power version of the ATR used to verify experiment performance before being irradiated in ATR
- **Neutron Radiography Reactor** —Low-power radiography reactor located at the Materials and Fuels Complex used to perform non-destructive examinations
- **Transient Reactor Test Facility** —Designed for transient testing of fuels and structural materials, scheduled to resume operations in 2018



Advanced Test Reactor Core

INL Post-Irradiation Examination Capabilities

- INL has a wide array of post-irradiation examination (PIE) facilities that support receipt of irradiated fuels/materials, non-destructive examination, destructive examinations and analyses, and mechanical testing of highly radioactive materials
- Key Post-Irradiation Examination Facilities include:
 - **Hot Fuels Examination Facility**— A large, heavily shielded, alpha-gamma hot cell facility designed for remote examination of highly irradiated fuel and materials.
 - **Fuel Manufacturing Facility**—A nuclear facility that consists of multiple workrooms and a material storage vault focused on research of transuranic metallic and ceramic fuels
 - **Fuel Conditioning Facility**— Primary mission to support treatment of DOE-owned sodium-bonded metal fuel and also supports work to demonstrate the technical feasibility of pyroprocessing technology
 - **Irradiated Materials Characterization Laboratory**—Built to house state-of-the-art nuclear fuels and materials characterization equipment in a shielded environment to examine highly radioactive materials at the nanometer and atomic scale



MFC Hot Cell

Idaho Sitewide Safeguards & Security

- The Idaho Sitewide Safeguards and Security (S&S) Program protects nuclear materials, classified matter, Government property, and other vital assets at INL from theft, diversion, sabotage, espionage, unauthorized access, compromise, and other hostile acts that may cause unacceptable, adverse impacts on our national security; program continuity; or the health and safety of employees, the public, or the environment.
- Cost-effective, performance-based, risk-informed execution of physical and cyber security activities to enable use of special nuclear material and classified/unclassified information for research and development needs.

Idaho S&S Program directly enables DOE research and national security initiatives and goals by providing a secure environment to conduct work in an environment with ever-evolving security threats.

Summary

- Infrastructure enables NE and DOE missions to perform impactful nuclear research in a safe, secure manner
- Significant progress made to align infrastructure with programs to ensure accurate prioritization of investments
- Security infrastructure (physical and cyber) needed to ensure continued access to special nuclear materials and information for research missions (key differentiator for INL)