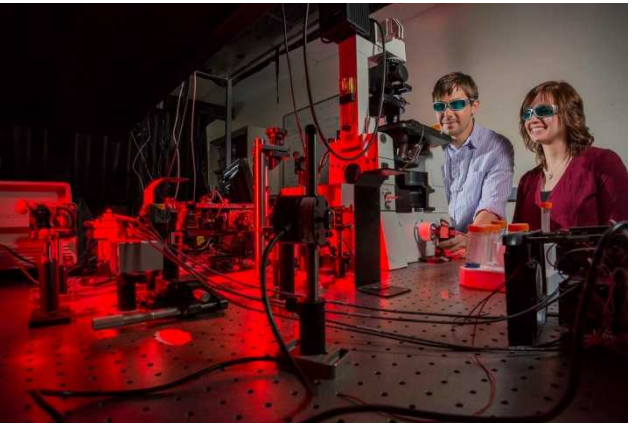
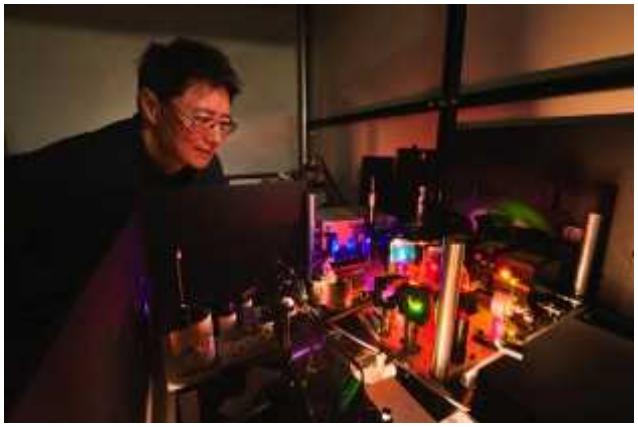
SAND2016-3711PE

Exceptional service in the national interest

Sandia National Laboratories





Sandia overview and perspective on the Academic Alliance

Rob Leland

Vice President, Science & Technology

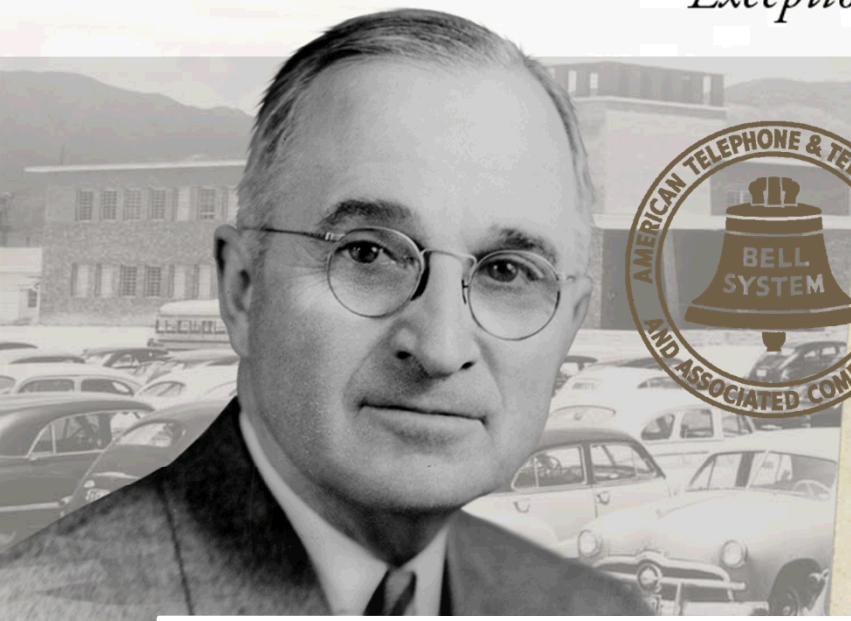
Chief Technology Officer

U.S. DEPARTMENT OF ENERGY | NNSA

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND2016-2148 PE

Sandia's history

Exceptional service in the national interest



THE WHITE HOUSE
WASHINGTON

May 13, 1949

Dear Mr. Wilson:

I am informed that the Atomic Energy Commission intends to ask that the Bell Telephone Laboratories accept under contract the direction of the Sandia Laboratory at Albuquerque, New Mexico.

This operation, which is a vital segment of the atomic weapons program, is of extreme importance and urgency in the national defense, and should have the best possible technical direction.

I hope that after you have heard more in detail from the Atomic Energy Commission, your organization will find it possible to undertake this task. In my opinion you have here an opportunity to render an exceptional service in the national interest.

I am writing a similar note direct to Dr. O. E. Buckley.

Very sincerely yours,

Harry Truman

Mr. Leroy A. Wilson,
President,
American Telephone and Telegraph Company,
195 Broadway,
New York 7, N. Y.

to undertake this task. In my opinion you have here an opportunity to render an exceptional service in the national interest.

- **July 1945:** Los Alamos creates Z Division
- Nonnuclear component engineering
- **November 1, 1949:** Sandia Laboratory established

Sandia: A Federally Funded Research and Development Center (FFRDC)

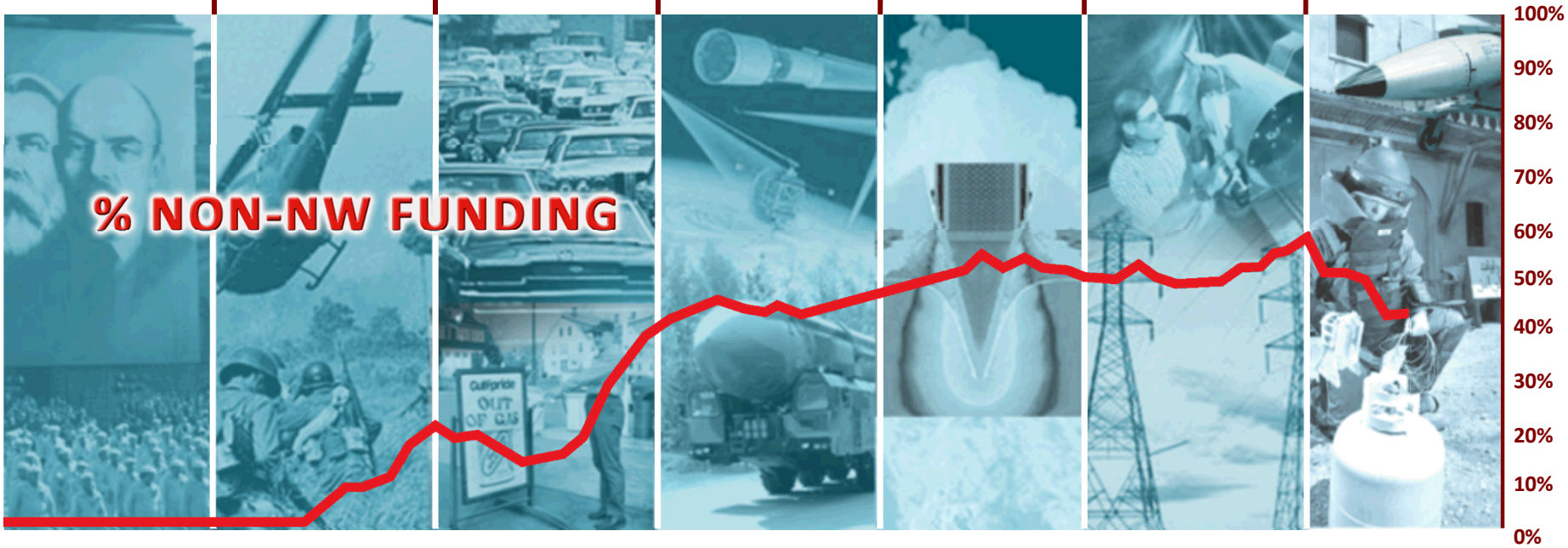
- **FFRDC: an entity sponsored under a broad charter by one or more government agencies**
  - Perform, analyze, integrate, support, and/or manage basic or applied research and/or development
  - Operate in the public interest with objectivity and independence, free from organizational conflict of interest
  - Maintain core competencies in missions of national significance
  - Types: R&D laboratories, study and analysis centers, and systems engineering and integration centers
  - 41 FFRDCs in the nation serve 10 different agencies in defense, homeland security, energy, aviation, space, health and human services, and tax administration

- **FFRDCs are important to the nation**
  - Comprehensive knowledge of sponsors' needs
  - Ability to respond to emerging needs/anticipate future critical issues
  - Objectivity to produce thorough, independent analyses
  - Uninterrupted, long-term support based on a continuing relationship
  - Broad access to sensitive government and commercial proprietary information
  - Ability to respond quickly to address urgent and high-priority challenges

Sandia's mission work reflects evolution of national security challenges

Sandia National Laboratories

1950s	1960s	1970s	1980s	1990s	2000s	2010s
NW production engineering & manufacturing engineering	Development engineering	Multiprogram laboratory	Missile defense work	Post–Cold War transition	Expanded national security role post 9/11	LEPs Cyber, Biosecurity Proliferation
	Vietnam conflict	Energy crisis	Cold War	Stockpile stewardship		Evolving national security challenges



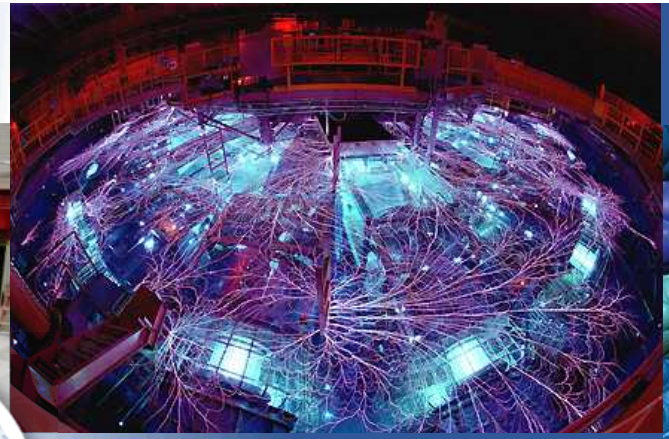
Sandia's Research Foundations

Long-term, discipline-based research efforts to support mission execution

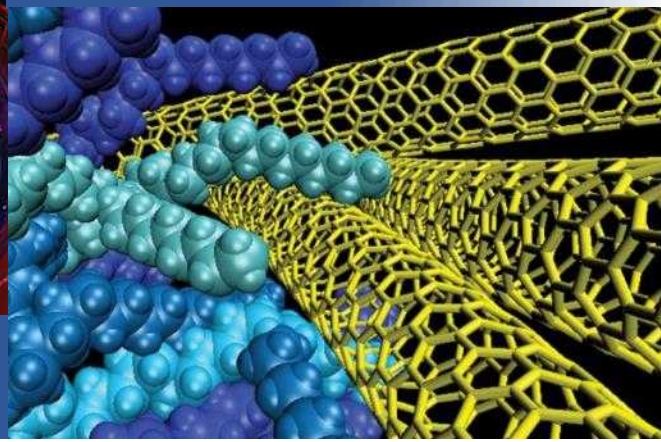
Sandia National Laboratories

Computing & Information Sciences

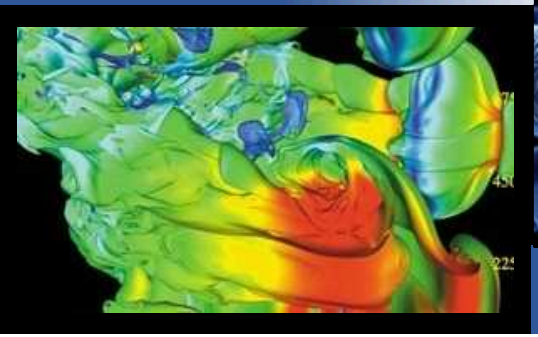
Radiation Effects & High Energy Density Science



Materials Sciences



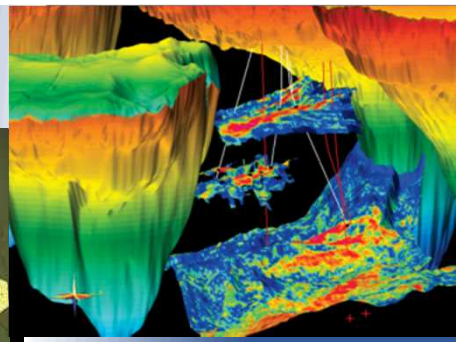
Engineering Sciences



Bioscience

Nanodevices & Microsystems

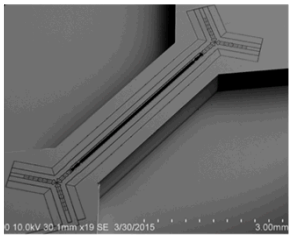
Geoscience



Sandia's Research Challenges

Multidisciplinary research campaigns that complement Research Foundations

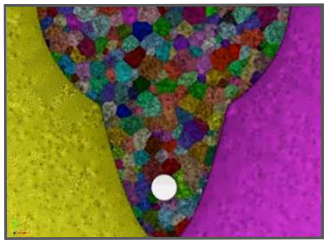
Power on Demand



Science & Engineering of Quantum Information Systems

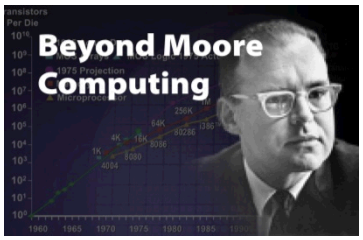
Trusted Systems & Communication

Detection at the Limit

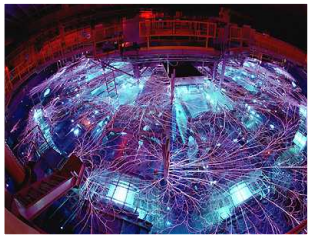


Engineering of Materials Reliability

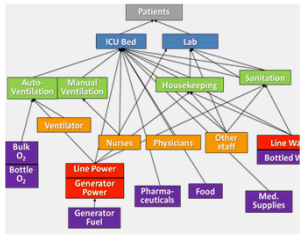
Data Science



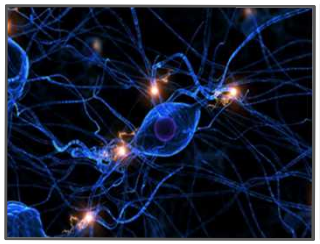
Beyond Moore Computing



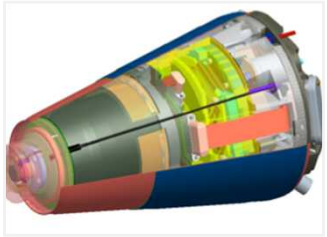
Pulsed Power Opportunities for Weapons & Effects Research



Resiliency in Complex Systems



Engineering Abiotic-Biotic Living Systems



Revolutionary Approaches to the Stockpile

Engage expertise from fundamental science to technology application

Pursue decade-scale "moon shot" goals guided by roadmaps

Create transformational capabilities that address mission-critical problems

Drivers for a lab-university alliance

- Evolving makeup of the national (and global) research landscape
- Complex nature of the problems that are important to the nation
- Challenge of developing a sufficient base of qualified researchers
- Availability of mechanisms for funding to address these problems
- Expected benefits of collaboratively developing new ideas and technology

Alliance objectives

- **Establish a strategic FFRDC-university partnership model to maximize collective S&T value to the nation**
  - Envision and advance future of engineering and science for the nation
  - Provide thought leadership on critical S&T issues
- **Provide opportunities for university partners to expand their engagement in national security R&D**
  - Alliance partners share a common interest and commitment to national service
- **Enrich our mutual capabilities and expand our impact**
  - Solve significant problems we could not address alone
  - Sustain and enrich our talent pipeline
  - Accelerate the commercialization and adoption of new technologies

Possible guiding principles for our Alliance

- Our alliance will present a national model with respect to its purpose
- We will act collectively to effect systemic change to achieve this common purpose
- We will concur on any alliance action that commits all member institutions
- Other bilateral or multilateral relationships between us may continue or develop
- Membership in the alliance may evolve with time

Topics for discussion

- Does this partnership model resonate with you?
- What value do you believe a multi-lateral alliance can bring to your institution?
- Where would you suggest we focus the Alliance's efforts?
  - Key issues?
  - Specific technical areas?

Sandia National Laboratories

Dialogue

Sandia today

Vision: On behalf of our nation, we anticipate and solve the most challenging problems that threaten security in the 21st century.

Mission: Our unique mission responsibilities in the nuclear weapons program create a foundation from which we leverage capabilities enabling us to solve complex national security problems.

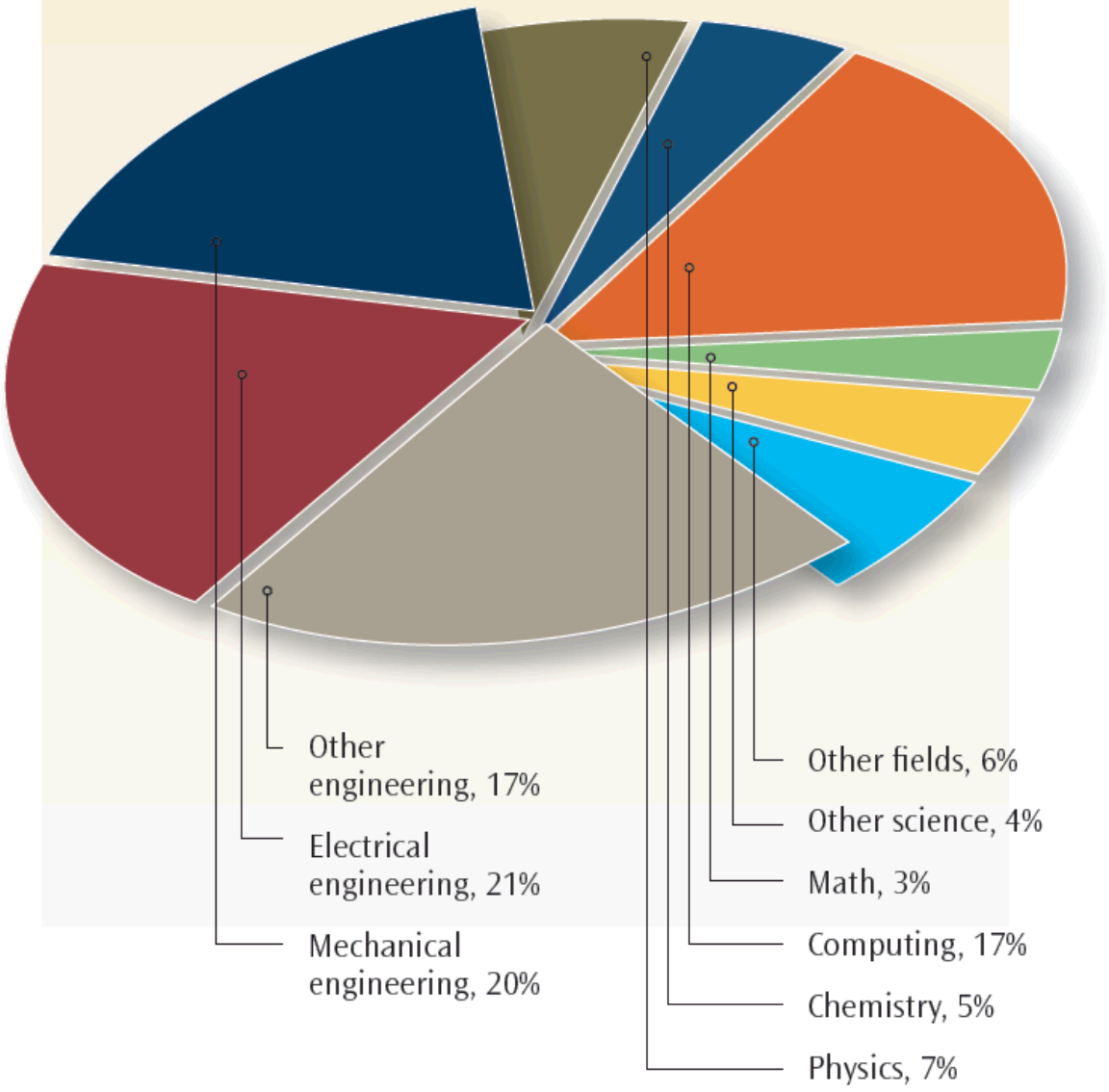
Fundamental Characteristics

- Engineering to high standards
- Engineering that integrates science
- Engineering that enables scientific discovery
- Engineering and science to assure mission
- Lasting retention of talent with depth and breadth
- Anticipating emerging national security threats

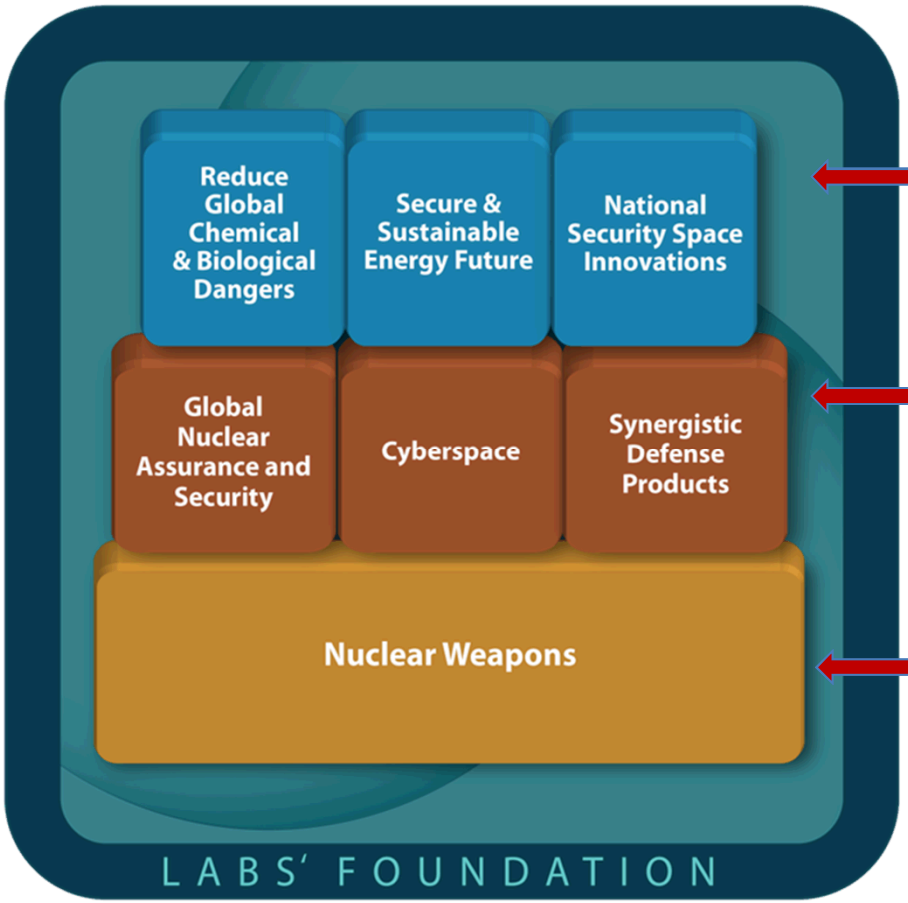
Underpinned by our values and a culture of safety, security, ethics, and quality.

Sandia National Laboratories

Technical staff by discipline



Sandia's National Security Mission Areas



- Top row: Critical to national security and synergistic with the Labs' foundation
- Middle row: Strongly interdependent with the nuclear weapons mission and provide value to the nation
- Bottom row: Our core mission, nuclear weapons, is enabled by a strong scientific and engineering foundation.

Laboratories' Foundation and Capabilities

- High-reliability engineering
- Sensors and sensing systems
- Cyber technology
- Reverse engineering
- Micro/nano devices and systems
- Modeling, simulation, and experiment
- Natural and engineered materials
- Pathfinders
- Safety, risk, and vulnerability analysis

Sandia sites

Sandia National Laboratories

Albuquerque, New Mexico

Livermore, California

Kauai, Hawaii

Waste Isolation Pilot Plant, Carlsbad, New Mexico

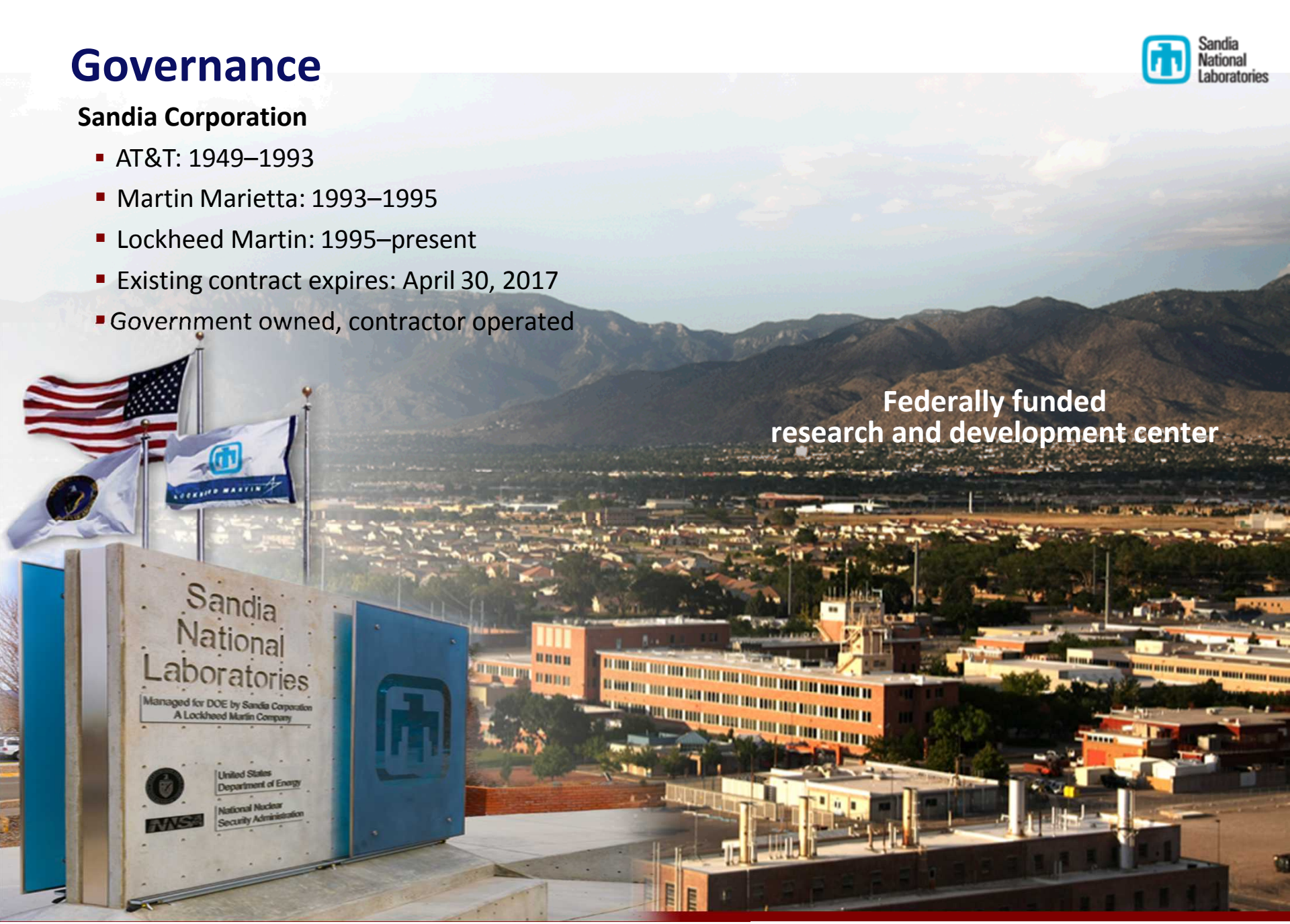
Pantex Plant, Amarillo, Texas

Tonopah, Nevada

Governance

Sandia Corporation

- AT&T: 1949–1993
- Martin Marietta: 1993–1995
- Lockheed Martin: 1995–present
- Existing contract expires: April 30, 2017
- Government owned, contractor operated



Federally funded research and development center

Sandia is a Federally Funded Research and Development Center (FFRDC): Key FFRDC attributes*

- Long-term relationships with the government afford the continuity that will *attract high-quality personnel* to the FFRDC and encourage the FFRDC to *maintain currency in its field(s)* of expertise.
- Meets *special long-term research or development needs*.
- Operates in the public interest with *objectivity and independence*, is *free from organizational conflicts of interest*, and fully discloses its affairs to the sponsoring agency.
- Is operated, *managed*, and/or administered as an *autonomous organization* or as an identifiable separate operating unit of a parent organization.
- *Does not* use privileged information to *compete with the private sector* but may work for other than the sponsoring agency when the work is not available from the private sector.

* *Abridged definition from the Federal Acquisition Regulation*