Software Division

The Global Voice of Quality™

SAND2014-0364C

Quality at Sandia National Laboratories

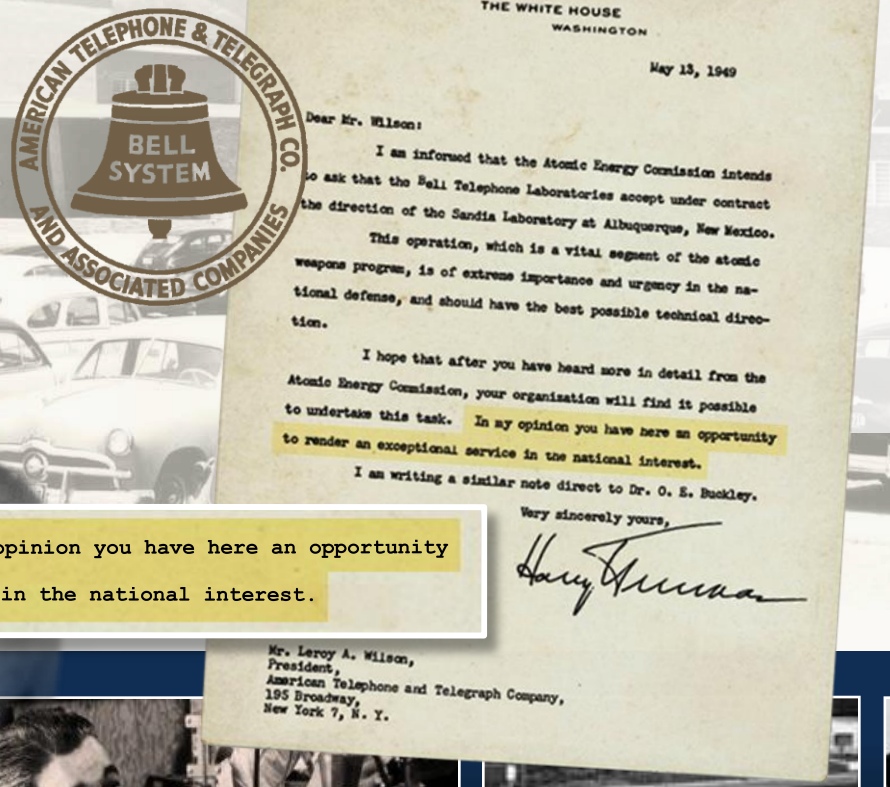
J. Stephen Rottler

Vice President, California Laboratory

Vice President, Energy and Climate Strategic Management Unit

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's mission work reflects 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 national security mission areas

Sandia National Laboratories

Sandia's discipline-based research foundations

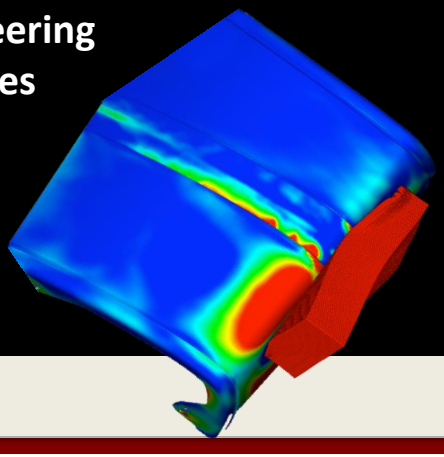
Sandia National Laboratories

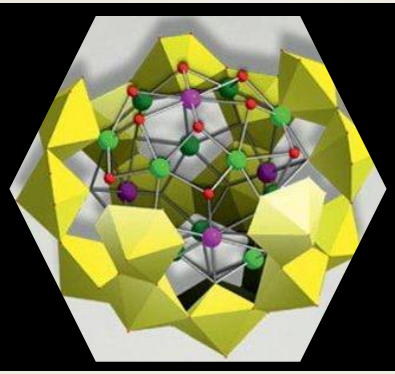
Computing Science

High Energy Density Physics

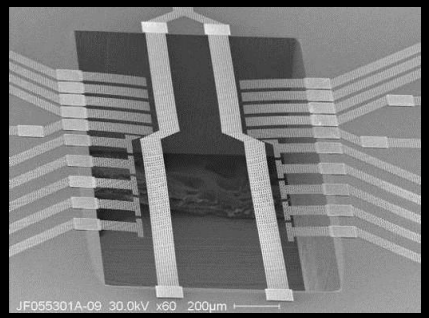
Materials

Engineering Sciences





Geoscience

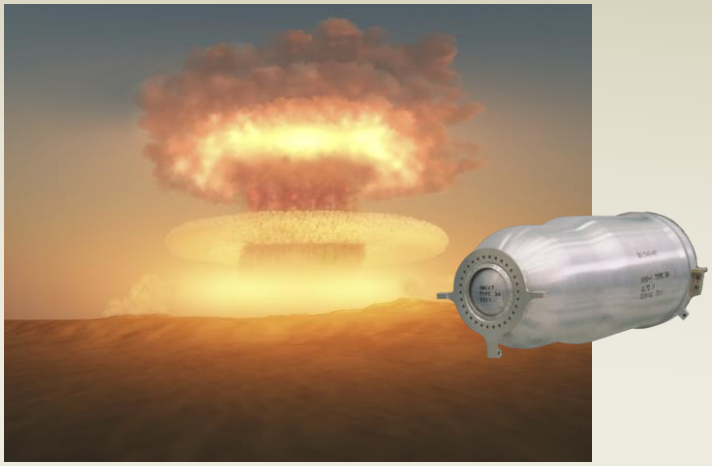


Microelectronics

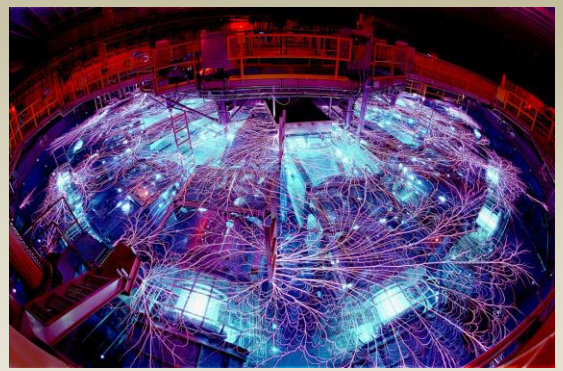
Bioscience

A mission failure can have unimaginable consequences

Sandia National Laboratories



Nuclear weapon safety and security



Operational safety

Chemical munitions destruction

Engineering, ethics, and quality

Sandia National Laboratories

- Engineering is a profession and ethics is a defining element of all professions
- We have an ethical obligation to take positive steps to prevent unwanted outcomes
- Defect or error prevention is the cornerstone of quality at Sandia
- Quality is:
  - Driven by a culture that values defect prevention …
  - Supported by an appropriate and reinforcing set of processes and tools

Sandia's quality framework

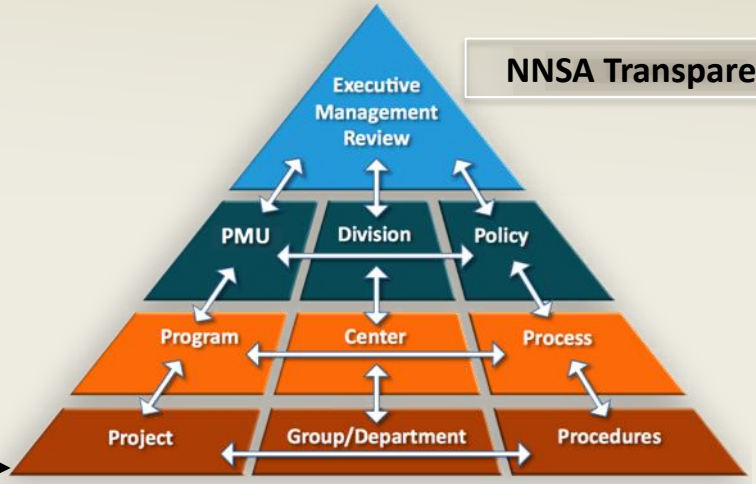
Sandia National Laboratories

Performance Assurance System (PAS)

External and internal audits independently validate performance

Management Reviews

NNSA Transparency

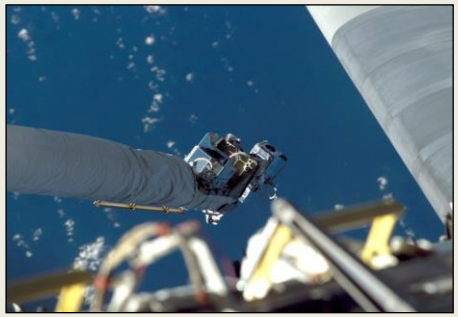


Quality is meeting customer and Sandia expectations consistently and predictably through flawless execution of personal and collective responsibilities

Quality at Sandia: Examples

Nuclear weapon safety and quality

Quality standards for research



Critical software applications

Operational safety

Summary

Sandia National Laboratories

- Sandia is driven by the need to prevent the **unimaginable** and **unacceptable consequences** of a failure in our mission
- We have evolved from emphasis on control and inspection to an emphasis on **defect prevention** as the **cornerstone** for our approach to quality
- Our culture is built on **values** and **principle-based behaviors and attitudes**
  - We align through our **vision and mission** and use **policies and standards** to enable **quality mission results**
  - We adopt or develop techniques and practices that enable a **disciplined approach** for the **engineering of products and services** with **assured quality**

Questions?

Sandia National Laboratories

"Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit."

Nichomachean Ethics, Aristotle (384-322 BC)