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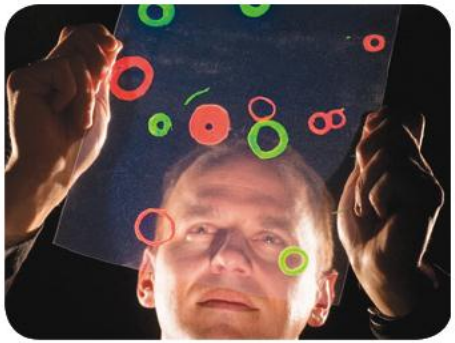
Exceptional service in the national interest

Sandia National Laboratories



Overview

Evaristo J (Tito) Bonano, Ph.D.
Senior Manager
Advanced Nuclear Energy Programs Group

U.S. DEPARTMENT OF ENERGY

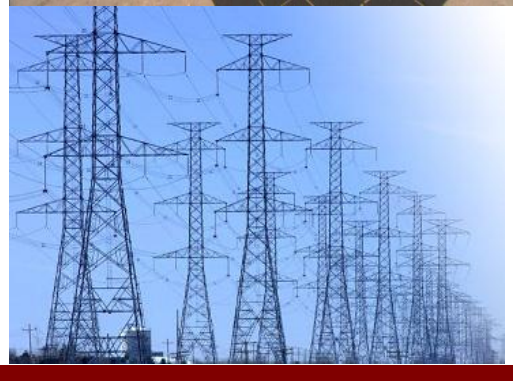
National Nuclear Security Administration

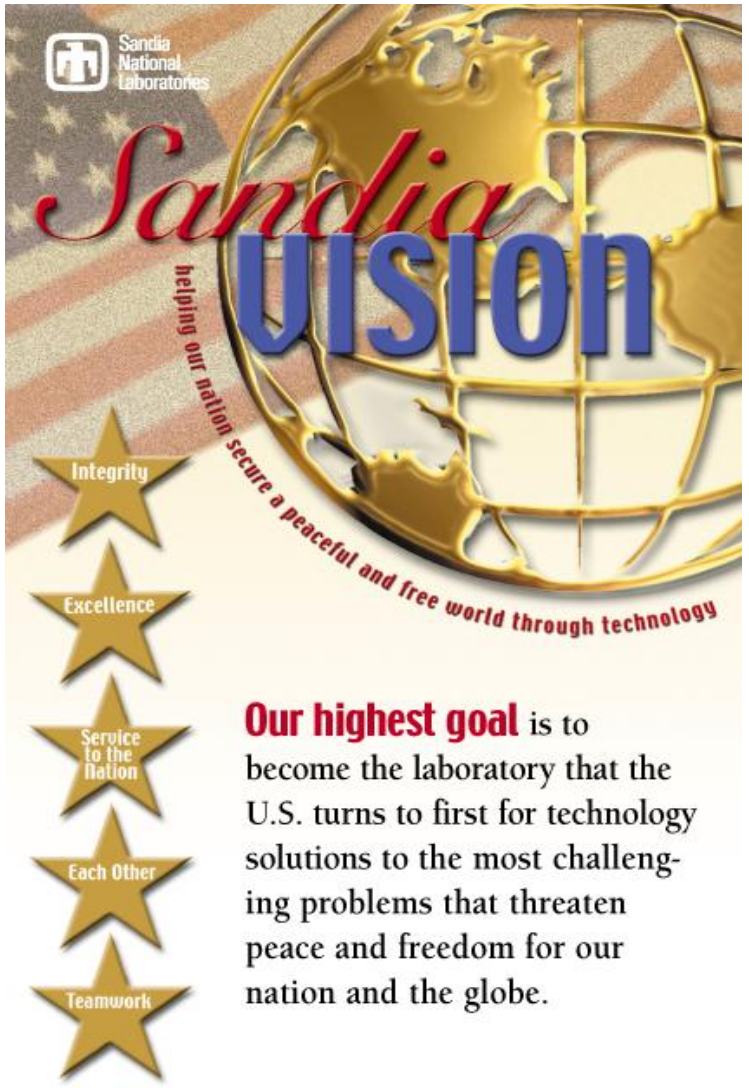
Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND2011-0439P

Sandia National Laboratories

"Exceptional Service in the National Interest"

- National Security Laboratory
- Broad mission in developing science and technology applications to meet our rapidly changing, complex national security challenges
- Safety, security and reliability of high-consequence systems, facilities, and infrastructure





Sandia's History

Sandia National Laboratories

AMERICAN TELEPHONE & TELEGRAPH CO. BELL SYSTEM AND ASSOCIATED COMPANIES

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 [illegible] at Albuquerque, New Mexico. This operation, which is a [illegible] atomic [illegible] national defense, and should have the [illegible] national 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. C. E. Buckley.

Very sincerely yours,

Harry Truman

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

exceptional service in the national interest.

Sandia's Governance Structure

Sandia Corporation

- **AT&T: 1949–1993**
- **Martin Marietta: 1993–1995**
- **Lockheed Martin: 1995–present**
- **Existing contract expires Sept. 30, 2013**

Government owned, contractor operated

Federally funded research and development center

Sandia's Sites

Sandia National Laboratories

Albuquerque, New Mexico

Livermore, California

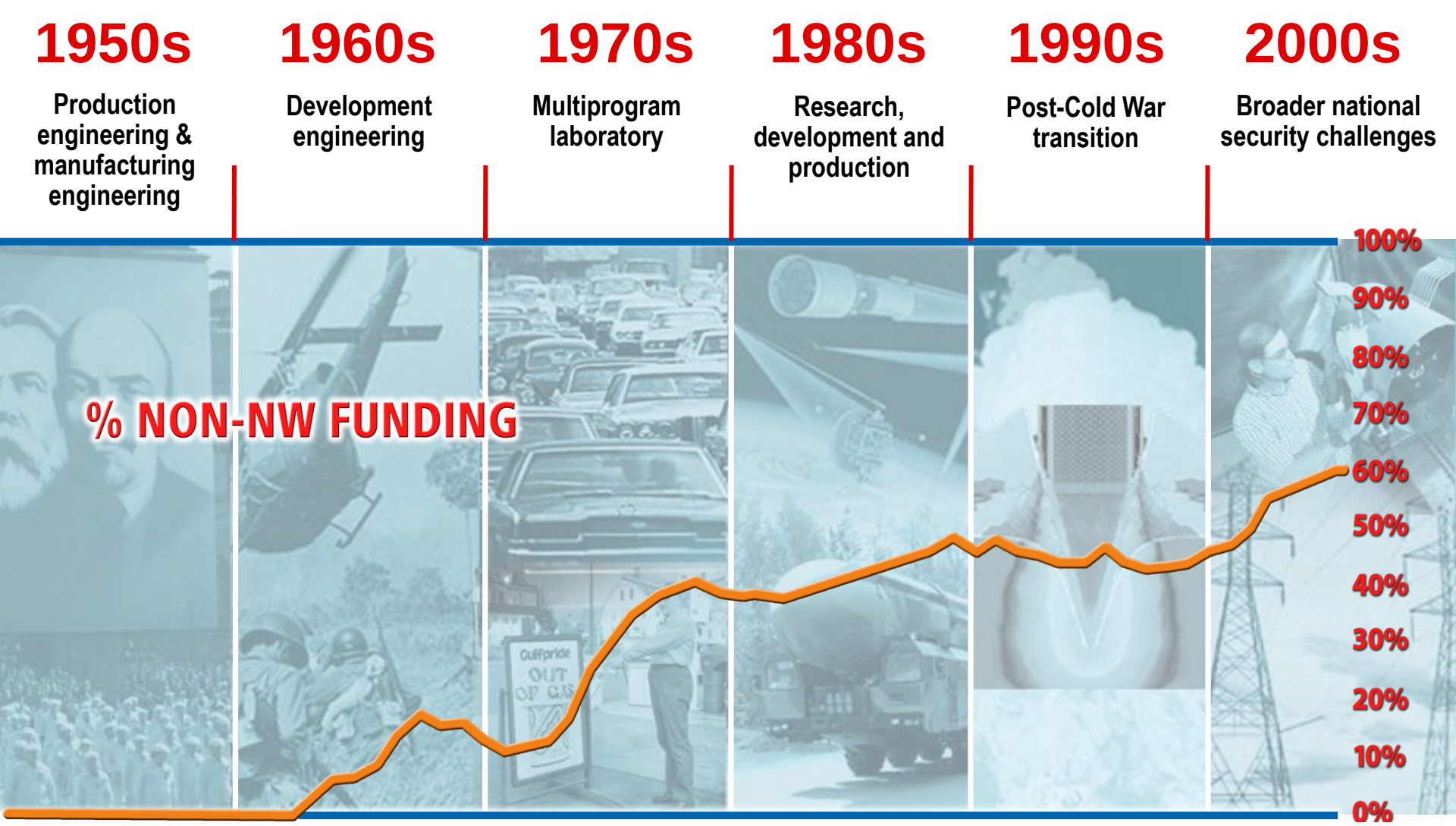
Tonopah, Nevada

Waste Isolation Pilot Plant, Carlsbad, New Mexico

Pantex, Texas

Evolution of Sandia's Mission

Sandia National Laboratories

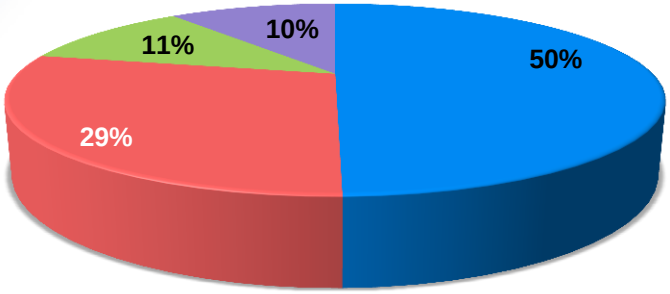


Our People and Budget

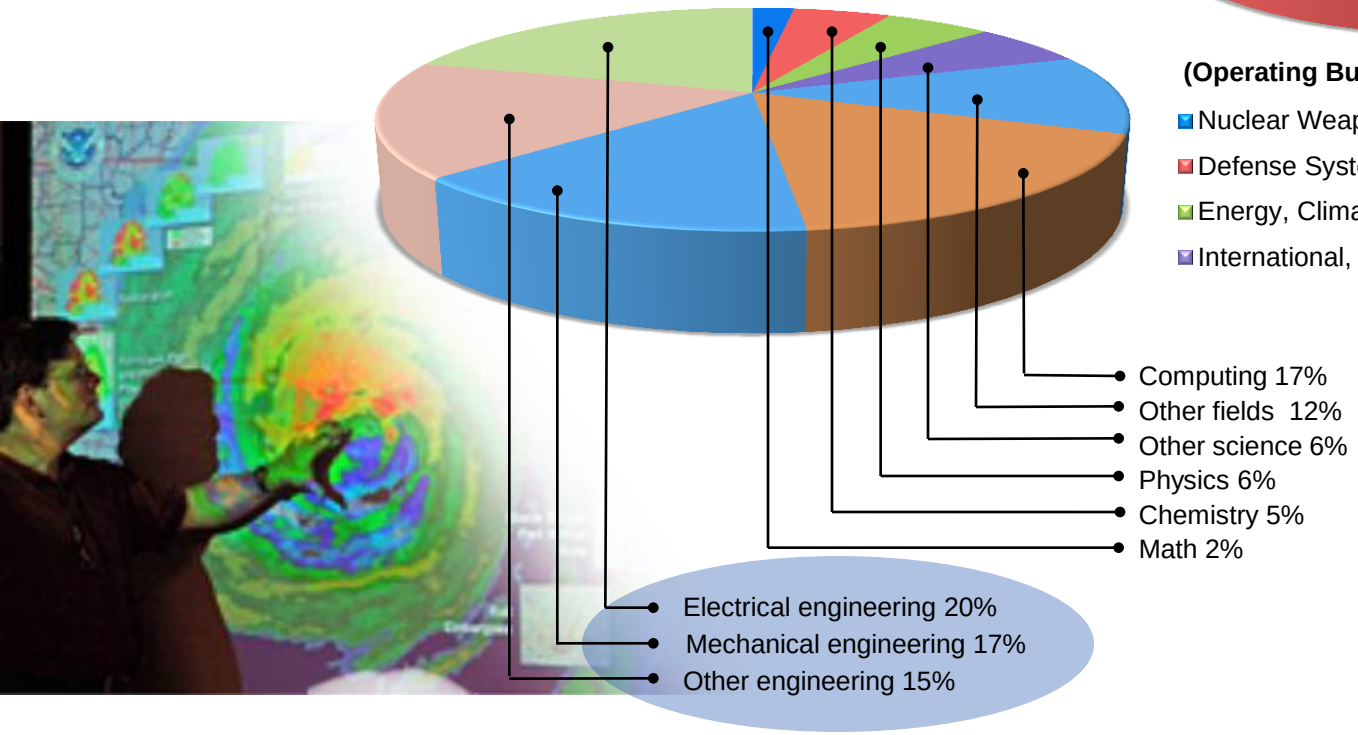
(As of October 11, 2011)

- On-site workforce: 11,876
- Regular employees: 9,122
- On-site contractors: 2,754
- Gross payroll: ~$943 million

FY11 Operating Revenue
$2.4 billion



Technical staff (4,557) by discipline



Sandia is Organized into Four Strategic Management Units and Two Programs

Sandia National Laboratories

National Security Technologies & Systems
Three Management Units

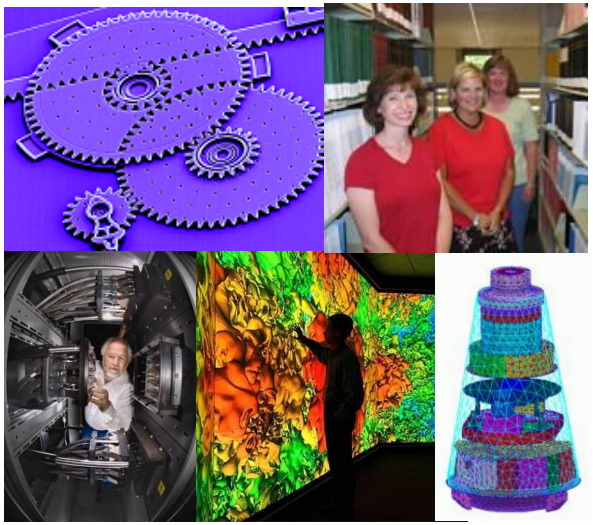
- ***Energy, Resources, and Nonproliferation***
- ***Homeland Security and Defense***
- ***Defense Systems and Assessments***

Nuclear Weapons
One Management Unit

- ***Nuclear Weapons***

Programs

- ***Chief Technology Officer***
- ***Integrated Mission Support***



Nuclear Weapons

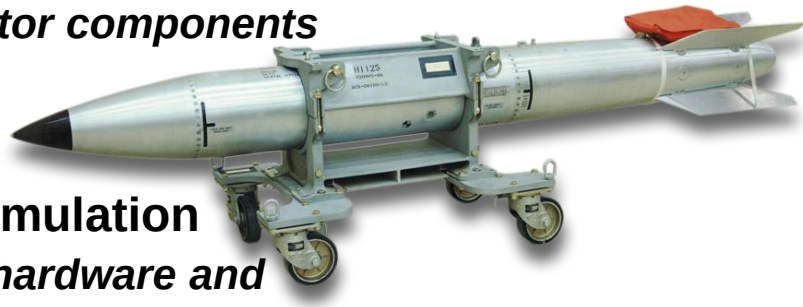
High reliability, high consequence of failure, challenging environments, and technology solutions

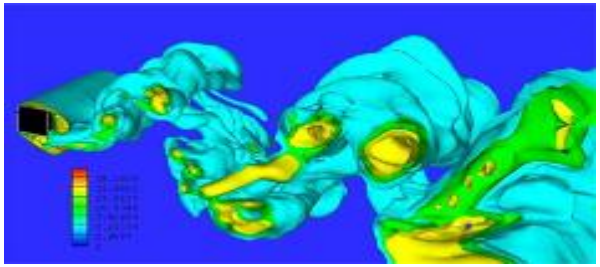
Sandia National Laboratories

Facilities and Capabilities

Microelectronics and microsystems

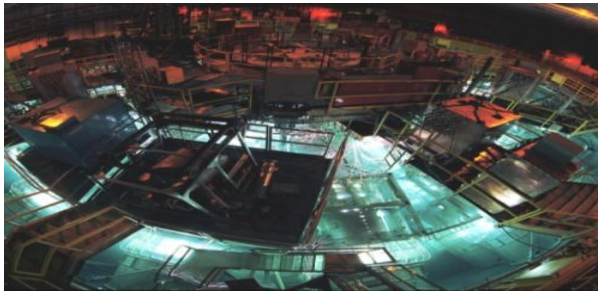
Design, fabricate, package, and test trusted semiconductor components





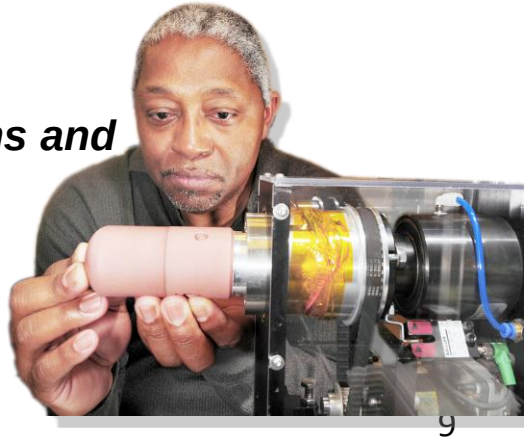
Computational simulation

High-performance hardware and software tools to enable solutions requiring massively parallel computers



Environmental testing

Simulate environmental conditions and collect relevant data for systems, subassemblies, and components



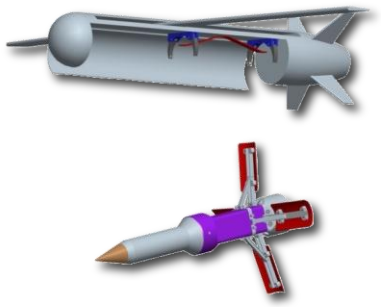
Defense Systems and Assessments

Program Areas

- Information Operations
- Integrated Military Systems
- Proliferation Assessment
- Remote Sensing & Verification
- Space Mission
- Surveillance & Reconnaissance

Areas of Expertise

- Nuclear Detonation Detection System
- Nonproliferation
- Cyber Security
- Synthetic Aperture Radar
- Space Situational Awareness
- Data Processing and Exploitation



Energy, Climate, and Infrastructure Security

Sandia National Laboratories

Program Areas

- Infrastructure Security
- Energy Security
- Climate Security
- Enabling Capabilities

Areas of Expertise

- Modeling & Analysis, Cyber, Electricity Distribution, and Energy Assurance
- Renewables, Energy Efficiency, Energy for Transportation, and Nuclear Energy Systems
- Sensing & Monitoring, Carbon Capture, Sequestration, Modeling and Analysis, and Water
- Discovery Science & Engineering, Systems Analysis, and Regulatory & Policy

International, Homeland, and Nuclear Security

Sandia National Laboratories

Program Areas

- Critical Asset Protection
- Global Security
- Homeland Defense and Force Protection
- Homeland Security

Areas of Expertise

- Countering Bioterrorism
- Nuclear, Radiological, and Chemical Risk Reduction
- Nonproliferation and Arms Control
- Physical Security
- Emergency Response
- Systems Analysis and Engineering
- Border Security
- Aviation and Airworthiness Security

Partnerships and Collaboration Accelerate Innovation

Sandia National Laboratories

Nuclear Energy Programs at Sandia

"Renew U.S. Leadership in 'Nuclear Energy' . . ."

National Technical and Policy Leadership

- Safety and Security
- Proliferation Assessment
- Storage
- Transportation
- Repository Science

Key System Demonstrations

- Advanced Energy Conversion Systems
- Small Modular Reactor Development
- Long-Term Interim Storage

Nuclear Fuel Cycle Science

- Sustainable LWR Nuclear Energy
- Advanced Fuel Cycle Technologies
- Advanced Modeling and Simulation
- Small Modular Reactors
- Confirmatory Nuclear Experiments

DIVISION 6000 ENERGY, NON-PROLIFERATION, and HIGH-CONSEQUENCE SECURITY

JILL HRUBY

6200 NUCLEAR ENERGY AND FUEL CYCLE PROGRAMS

Andrew Orrell

6210 DEFENSE WASTE MANAGEMENT PROGRAMS — Paul Shoemaker	**6220** ADVANCED NUCLEAR ENERGY — Tito Bonano	**6230** NUCLEAR ENERGY SAFETY TECHNOLOGIES — Susan Pickering
6211 PERFORMANCE ASSESSMENT AND DETECTION ANALYSIS — Moo Lee	6221 ADVANCED NUCLEAR CONCEPTS — Gary Rochau	6231 RISK AND RELIABILITY ANALYSIS — Shawn Burns
6212 REPOSITORY PERFORMANCE — Christi Leigh	6222 RADIOLOGICAL CONSEQUENCE MANAGEMENT & RESPONSE — Kevin McMahon	6232 SEVERE ACCIDENT ANALYSIS — Randy Gauntt
6213 EXPERIMENTAL PROJECTS COORDINATION — TBD	6223 ADVANCED NUCLEAR FUEL CYCLE TECHNOLOGIES — Ken Sorenson	6233 STRUCTURAL AND THERMAL ANALYSIS — Imane Khalil
	6224 NUCLEAR FUEL CYCLE SYS ENGR. AND INTEGRATION — Bob MacKinnon	6234 ENVIRONMENTAL SAFETY AND TESTING — David Miller

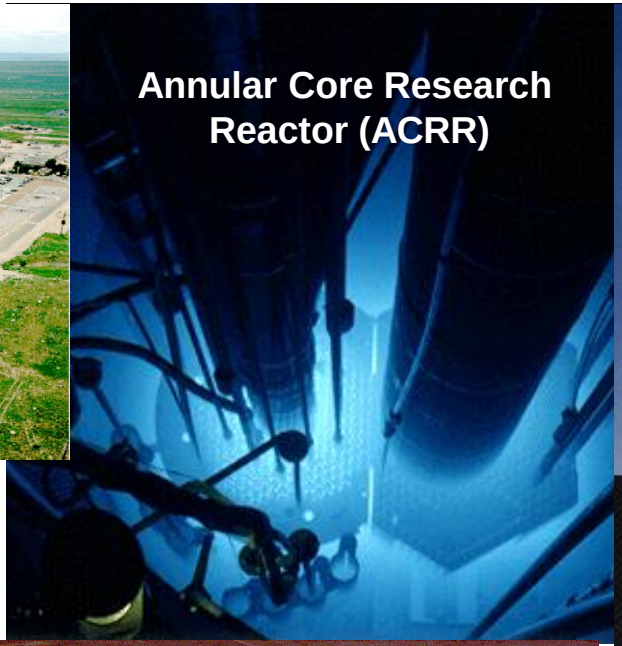
Nuclear Energy Programs at Sandia: Customers and Resources

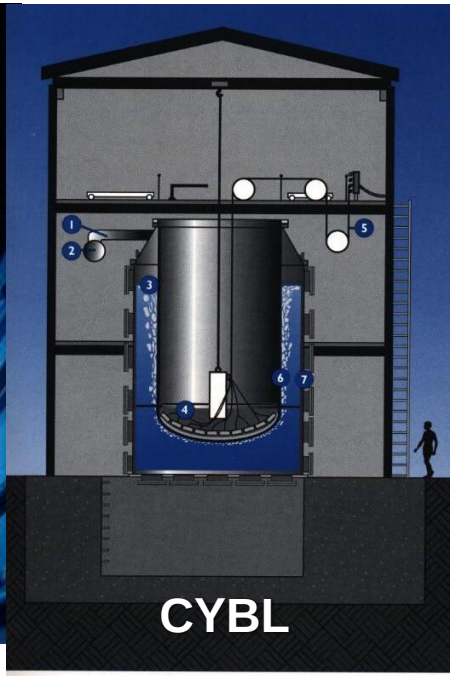
Sandia National Laboratories

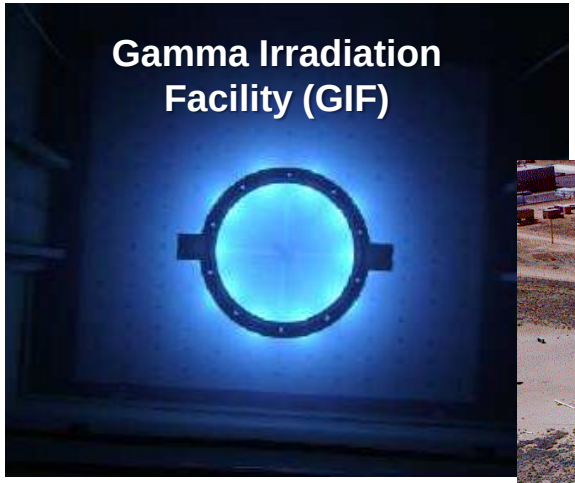
- **Primary Customers**
  - Department of Energy
    - Environmental Management (EM)
    - Nuclear Energy (NE)
    - Defense Nuclear Nonproliferation (NA)
  - Nuclear Regulatory Commission (NRC)
  - NASA
  - Non-federal entities (industry)
- **Investments and initiatives**
  - SNL LDRD Program
  - SNL Program Management Funds

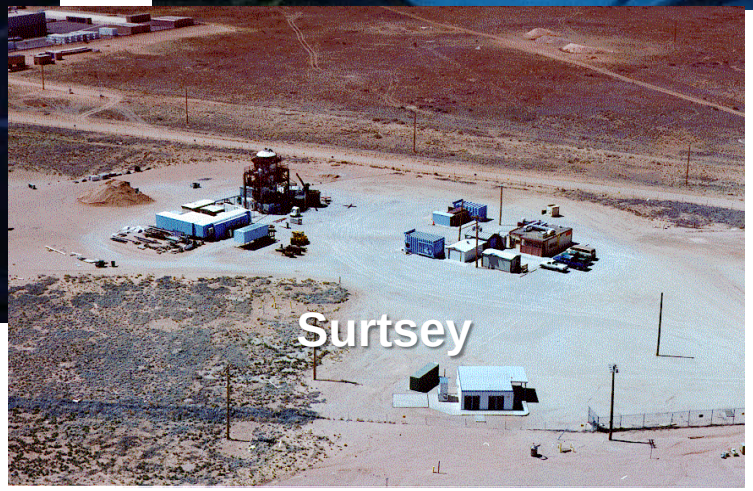
Nuclear Energy Experimental Facilities

Sandia National Laboratories







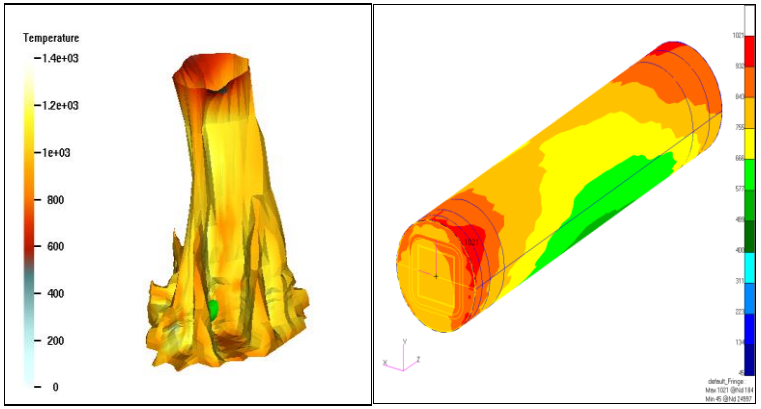


Nuclear Security and Safety Testing Facilities

Sandia National Laboratories

Impact Testing

Fire Testing and Modeling



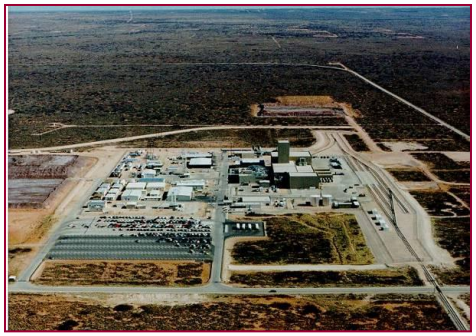
Water Slug Impact Test (NRC)

F4 Crash Test (Japan)

¼-Scale Prestressed Concrete Containment Vessel Test to Failure (Japan)

National Leadership in Nuclear Waste Management

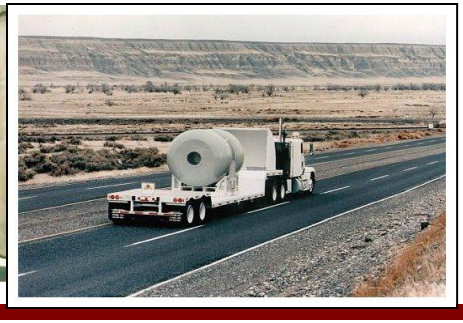
Sandia National Laboratories



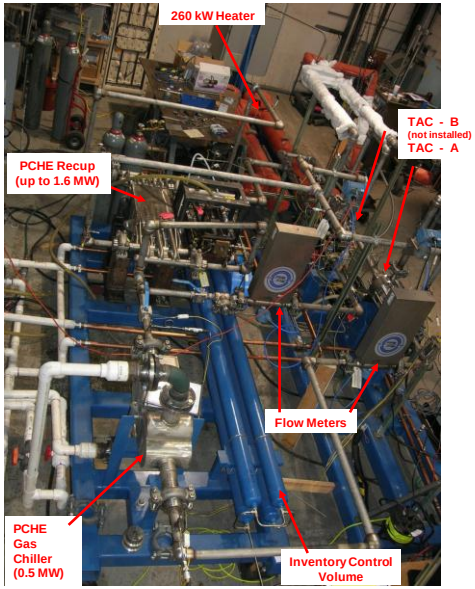
Science Advisor for Waste Isolation Pilot Plant

Lead Laboratory for Yucca Mountain Project

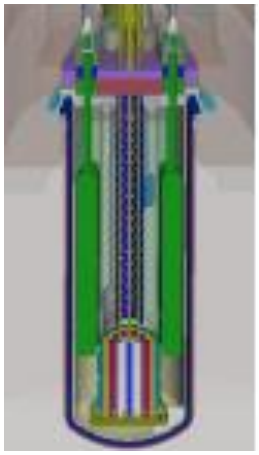
National Technical Director for Used Fuel Disposition Program



Advanced Nuclear Energy Programs

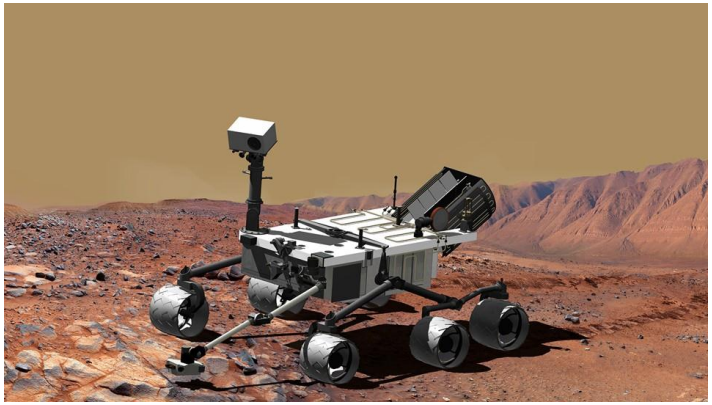


Advanced Energy Conversion – Supercritical CO_2 Brayton Cycle

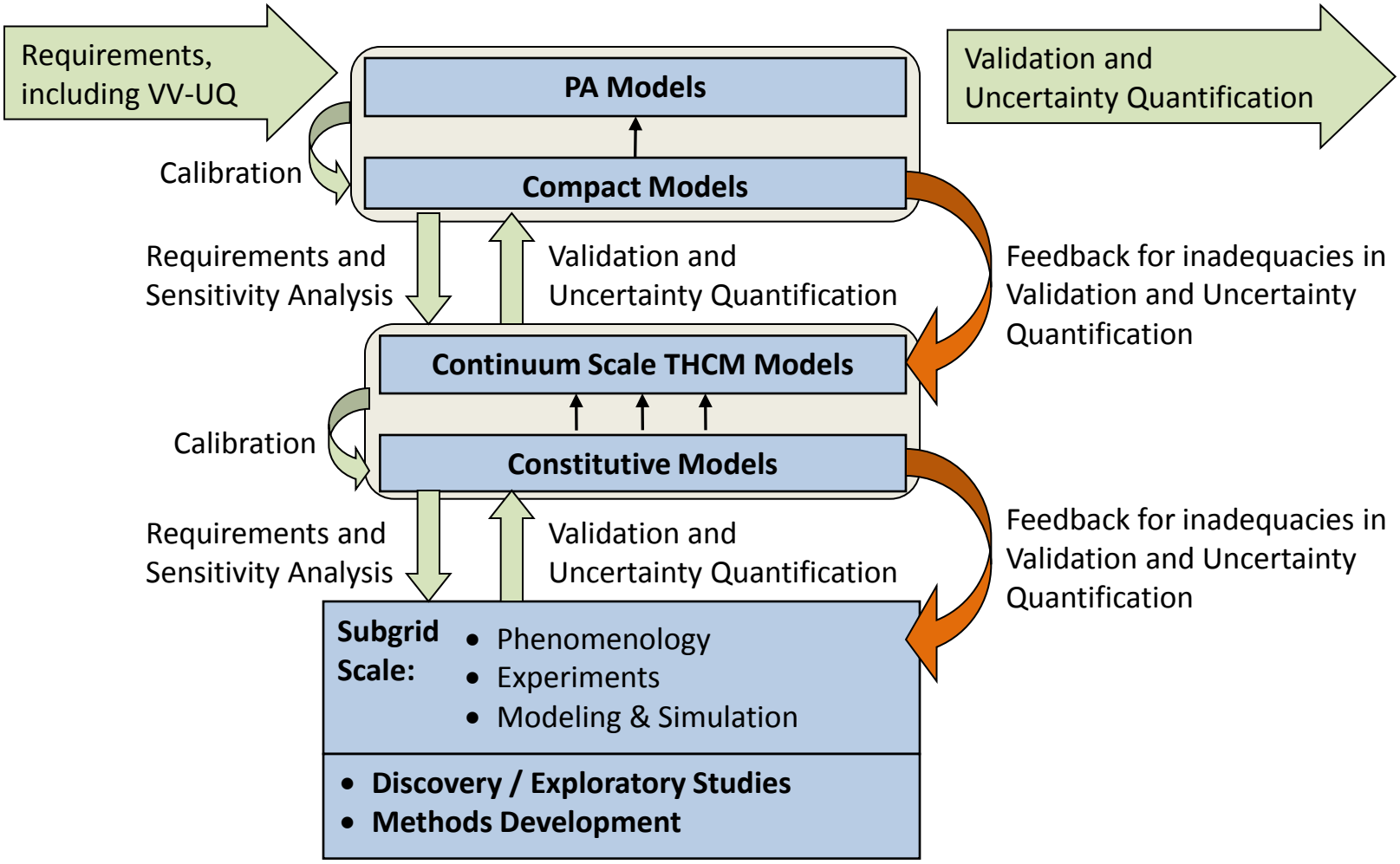


Small Modular Reactors

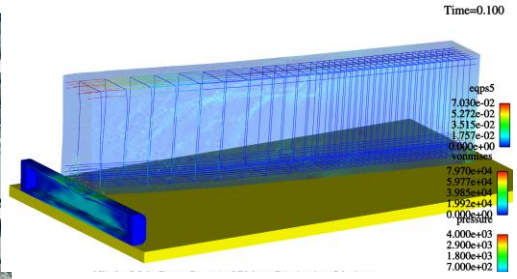
Space Nuclear Power Mars RTG Launch Safety Science Lab Rover



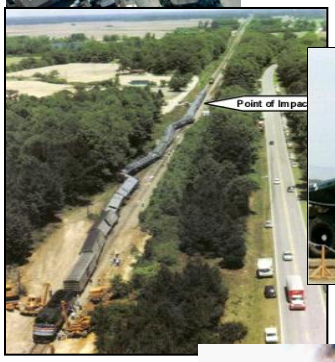
Advanced Modeling & Simulation

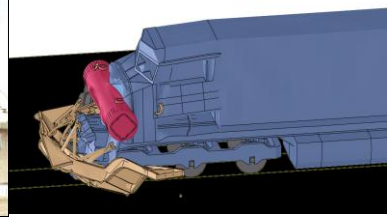


Nuclear Materials Transportation

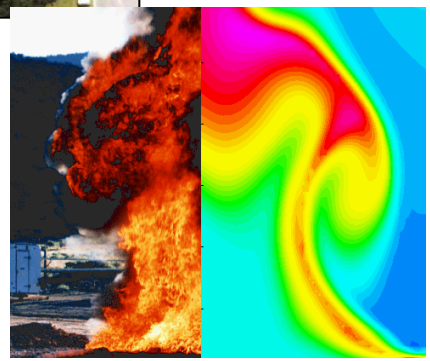


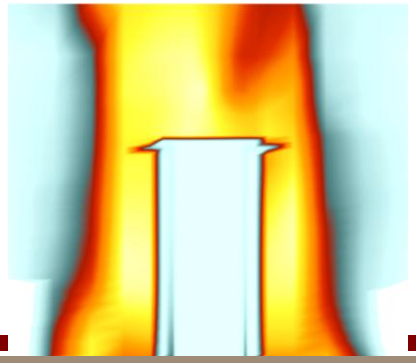
Nimitz Freeway collapse: simulated loading onto a truck spent fuel cask





Testing and analysis to simulate cask response to a locomotive impact event





Validating fire models allows for accurate cask response to severe thermal environments