SAND2011-6359C

September 2011

Sandia National Laboratories

Global Security Program and International Nuclear Threat Reduction

Kent Biringer

Manager, International Nuclear Threat Reduction Department

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.

Sandia's History

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 vital [illegible] atomic [illegible] national defense, and should have the best [illegible] technical direction [illegible].

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 National Laboratories

The Mission Has Evolved for Decades

1950s	1960s	1970s	1980s	1990s	2000s
Production engineering & manufacturing engineering	Development engineering	Multiprogram laboratory	Research, development and production	Post-Cold War transition	Broader national security challenges

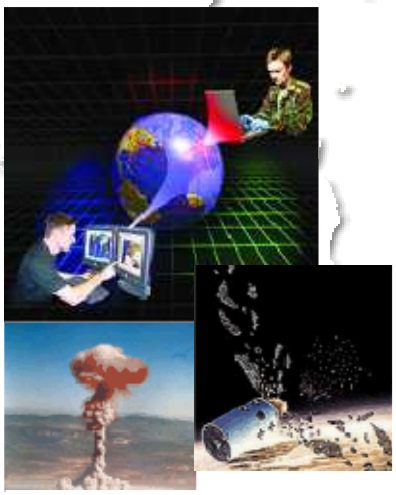
Sandia National Laboratories

Addressing Our Evolving National Security Environment is of the Greatest Importance

Traditional strategic nuclear threats

Threats from other nation states

Threats from non nation states



Threats of tech surprise

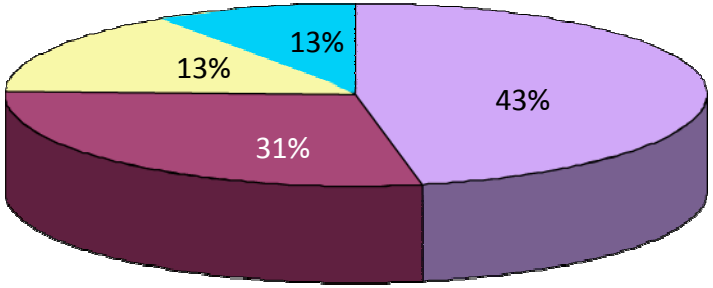
Other threats: natural disasters, climate change, energy supply

Sandia National Laboratories

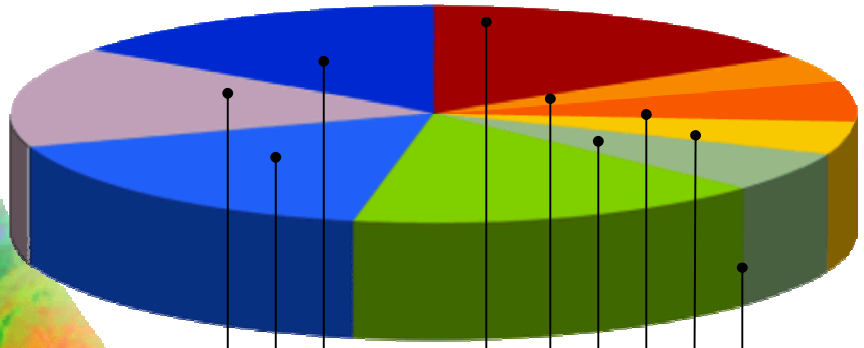
People and Budget
(As of October 15, 2010)

- On-site workforce: 11,677
- Regular employees: 8,607
- Gross payroll: ~$898.7 million

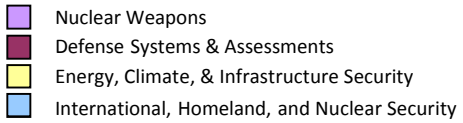
FY10 operating revenue
$2.3 billion

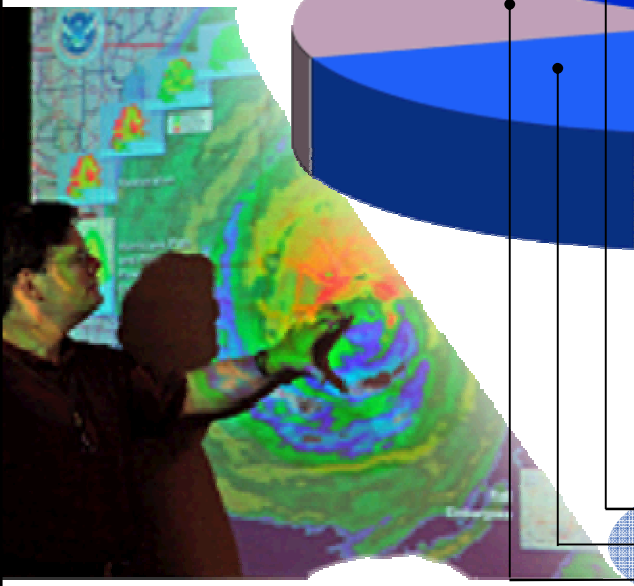


Technical staff (4,277) by discipline:



(Operating Budget)





Computing 16%
Math 2%
Chemistry 6%
Physics 6%
Other science 6%
Other fields 12%

Electrical engineering 21%
Mechanical engineering 16%
Other engineering 15%

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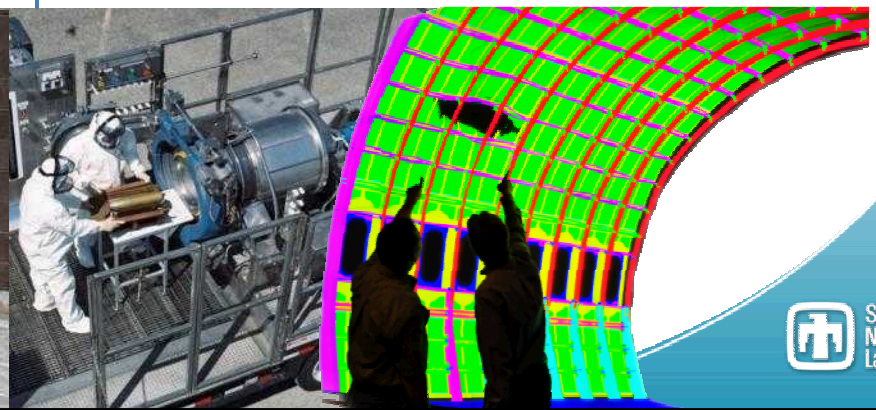
International, Homeland, and Nuclear Security

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

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Global Security Program

We apply a systems approach where S&T intersect, and both inform and implement policy

National Non-Proliferation Systems

International Treaties and Negotiated Agreements

Global Cooperative Threat Reduction

National Nuclear Security Administration

Sandia National Laboratories

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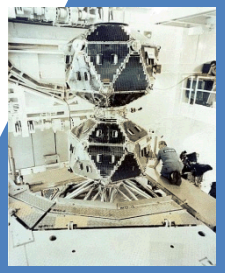
Global Security Program
A 40-plus year history

1960s-70s

Nonproliferation Treaty
Nuclear Nonproliferation Act
Proliferation Detection Technologies



- Satellite Verification
- Safeguards Technology
- Ground-based Sensors
- IAEA Physical Protection Missions

1980s

INF Treaty
Conv. on the Physical Protection of Nuclear Materials

- Verification strategy (Treaty On-Site Inspection)
- Arms Control Technology Options
- IAEA unattended monitoring technologies

1990s

START I and II
Nunn-Lugar Cooperative Threat Reduction
Warhead Safety and Security Exchange

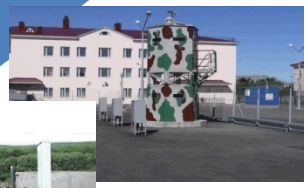
- Russian MPC&A Program
- FSU Threat Reduction

- Fissile Material Monitoring

- Cooperative Monitoring Center
- Regional Security
- Visiting Scholars

2000s

Multilateral cooperation on interdiction (PSI)
UNSCR 1540, GICNT
DPRK Denuclearization



- MPC&A Transition
- Second Line of Defense
- Megaports
- Warhead Monitoring
- Bilateral Transparency

- Radiological Threat Reduction
- IAEA Support
- Next Generation Safeguards
- WMD Detection

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Global Security Program
Our mission is focused on a broad threat

Mission: ***Reducing proliferation and terrorism threats to U.S. national security through global technical engagement***

Multi-Threat Risk Reduction

- **Limit the spread of sensitive materials and technologies by:**
  - **Reducing motivation to acquire/use WMD**
  - **Impeding access by proliferators to WMD expertise**
  - **Securing borders and ports**
  - **Securing critical materials and facilities**

Nuclear and Radiological Risks

- **Reduce the threat from malevolent use of nuclear and radiological materials by:**
  - **Enabling global reductions in NW arms and supporting infrastructure**
  - **Reducing fissile material inventories**
  - **Securing weapons and material**
  - **Strengthening international safeguards and nonproliferation regimes**
  - **Detecting / interdicting nuclear smuggling**

Biological and Chemical Risks

- **Reduce the risk from the malevolent use of biological and chemical materials by:**
  - **Enhancing the safety and security of high-risk pathogens, chemicals, and facilities**
  - **Strengthening capacities to detect and control dangerous infectious diseases**

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Cooperative Monitoring Center

Enabling International Technical Cooperation on Critical Security Issues

Technology integration, testing, demonstration, and operation

System analysis, modeling, and simulation for design and evaluation

Technology training courses and workshops

The CMC averages 100 tours per year with visitors from over 120 countries

Technical collaborations and experiments

Visiting scholars program, research, and analysis

Procurement, export control, foreign travel/visits

International business infrastructure

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Middle East Engagement

- **Gulf Nuclear Energy Infrastructure Institute (GNEII):**
  - A strategic effort to develop a nuclear energy safety and security culture in future program decision-makers in the Gulf region
- **Middle East Scientific Institute for Security (MESIS):**
  - An institute established by Sandia in Amman, Jordan in 2002 campus of the Royal Scientific Society (RSS) to focus on technical aspects of regional security cooperation in the Middle East
- **Other:**
  - Safe, secure, safeguarded research reactors
  - Radiation Measurements Cross Calibration (RMCC) project
  - Regional Training Center for Low Level Radioactive Waste Repository
  - Middle East Radionuclide Early Warning System
  - Depleted Uranium environmental issues
  - Border Security training and demonstrations
  - Middle East Track II engagements

GNEII Pilot Course,
Abu Dhabi
Spring 2011

MESIS

معهد الشرق الأوسط العلمي للأمن

Middle East Scientific Institute for Security

Tour of research reactor, Rabat, Morocco

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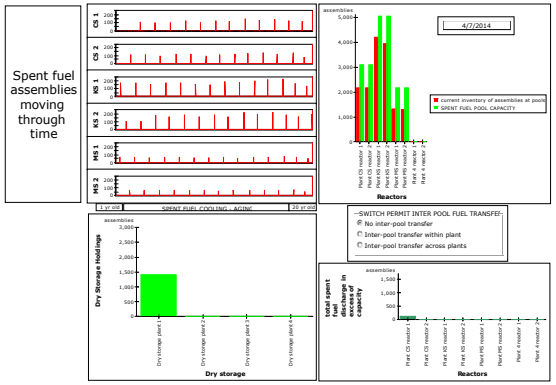
South Asia Engagement

- **South Asia Strategic Review**
  - Meeting of senior political, military, academic and media figures from India and Pakistan who have served as visiting scholars at Sandia
  - Set agenda for future security priorities in the region and potential for collaborative research
- **Missile Transparency**
  - Potential missile dismantlement transparency in the subcontinent
- **Crisis Management**
  - Engagement with Pakistanis on crisis management and media impacts.
- **Regional security dialogue**
  - National Defense University Near East-South Asia Regional Network of Strategic Study Centers (RNSSC) Track II process

East Asia Engagement

- **Engage nations of East and Southeast Asia in exploring linkages between nuclear energy and nonproliferation (NEN) in the region**
  - Annual NEN workshop
- **Support Track II regional security dialogues**
  - Council on Security Cooperation in the Asia Pacific (CSCAP)
- **Develop nuclear energy tools in support of Taiwan**
  - Spent fuel management tool
  - Participate in US-Taiwan Joint Standing Committee on Civil Nuclear Cooperation (JSCCNC)



Example: Powersim Fuel Cycle Model Output

CSCAP

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Other Examples of Cross-Regional Engagement

- **International Nuclear Export Control Program:**
  - **Prevent proliferation of WMD by working with governments worldwide to develop effective national export control systems**
  - **Sandia events this year have included:**
    - *Italy, Indonesia, Pakistan, Malaysia, Oman, Jordan, Mexico, Lebanon, Sri Lanka, India, various US venues*
- **Global Initiative for Proliferation Prevention (GIPP)**
  - **Program to engage former WMD scientists in peaceful commercial and scientific endeavors**
  - **Sandia programs in:**
    - *Russia, Iraq, Libya*

June 2011 Commodity Identification Training (CIT) Workshop, Beirut, Lebanon

Iraqi Food Safety Training

Libyan Water Desalination Project

Technology Training and Display (TTD) Area

- **Hands on technology displays**
  - Workshops
  - Training classes
  - Visiting scholars
- **Primarily internally funded**
  - Maintain current displays and training facilities
  - Expand to reflect new technologies and programs

Global Security Program: Summary

As proliferation and terrorism threats continue to increase and evolve, Sandia's Global Security Program will anticipate US needs and develop systems solutions to the challenges presented in a dynamic and complex international environment:

- Building on Sandia's science and technology foundations that are strengthened by strong relationships with the nation's top universities
- Building on more than 40 years of experience in domestic and international security
- Building on strong relationships with the nation's industrial base
- Building on relationships with and experiences in more than 120 countries

Meeting the global security challenges today and in the future

BACKUP SLIDES

Sandia's Sites

Albuquerque,
New Mexico

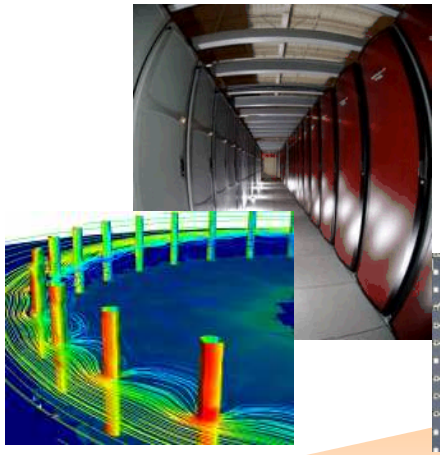
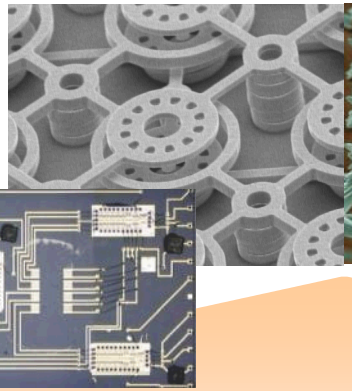
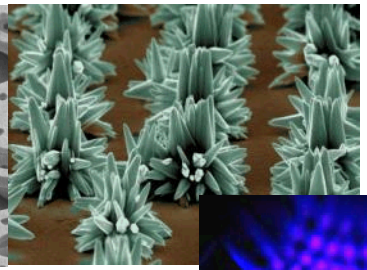
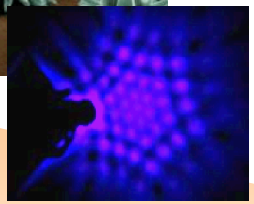
Livermore,
California

Tonopah, Nevada

Waste Isolation Pilot Plant,
Carlsbad, New Mexico

Pantex, Texas

Research Disciplines Drive Capabilities

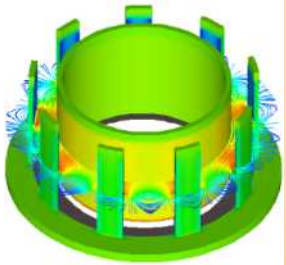





High Performance Computing

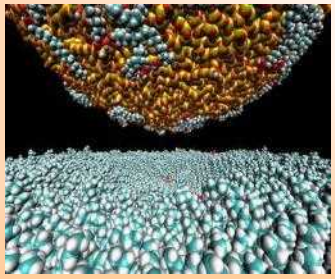
Nanotechnologies & Microsystems

Extreme Environments

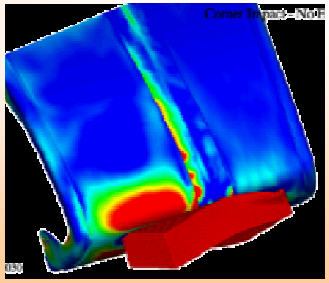
Computer Science



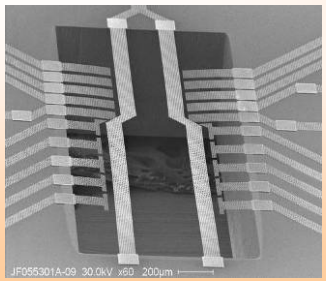
Materials



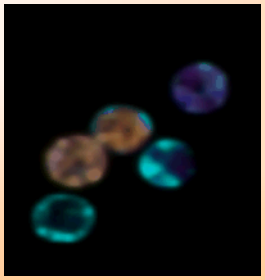
Engineering Sciences



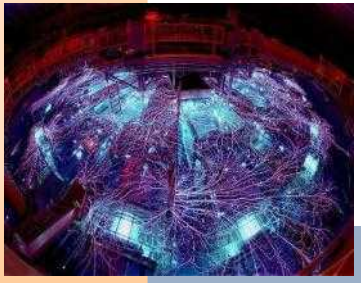
Micro Electronics



Bioscience



Pulsed Power



Research Disciplines