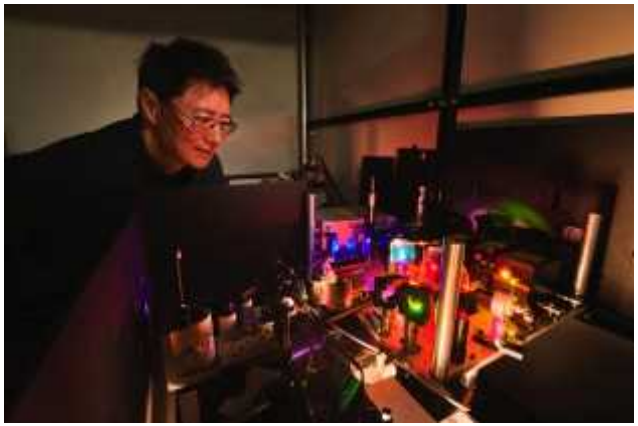
SAND2015-3941PE

Exceptional service in the national interest

Sandia National Laboratories



Sandia National Laboratories and Safeguards:

An Overview

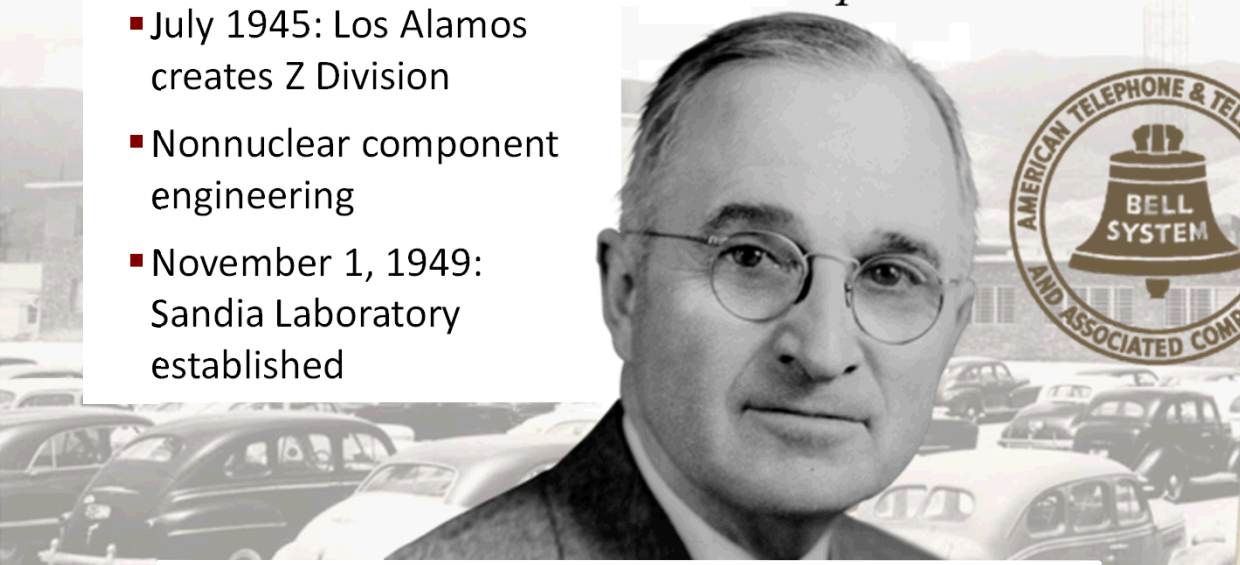
U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

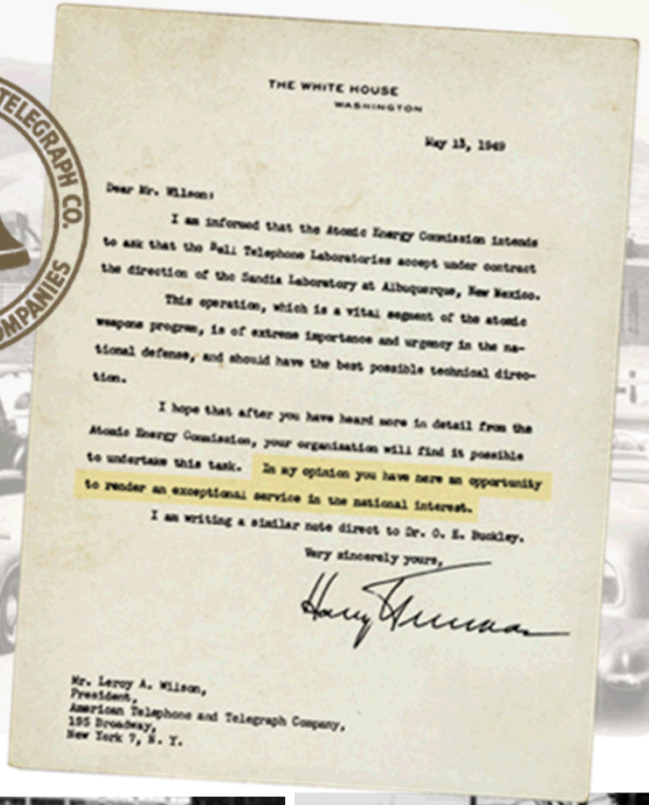
Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND2015-XXXX

Sandia's History

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

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.

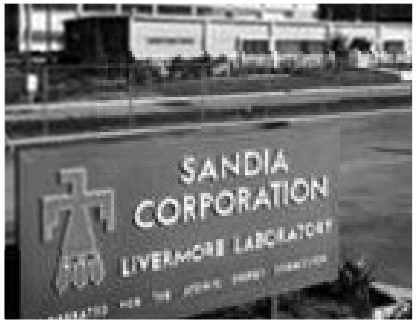
I am writing a similar note direct to Dr. O. E. Buckley.

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.



Sandia Addresses U.S. National Security Challenges

Sandia National Laboratories

1950s	1960s	1970s	1980s	1990s	2000s	2010s
Nuclear weapons	Development engineering	Multiprogram laboratory	Missile defense work	Post–Cold War transition	START Post 9/11	LEPs Cyber, biosecurity proliferation
Production and manufacturing engineering	Vietnam conflict	Energy crisis	Cold War	Stockpile stewardship	National security	Evolving national security challenges

Sandia: Governance / Workforce / Budget

Sandia Corporation

- AT&T: 1949–1993
- Martin Marietta: 1993–1995
- Lockheed Martin: 1995–present
- Existing contract expires: April 30, 2016, with a one-year contract extension option
- Government owned, contractor operated

- Total Sandia workforce: 12,123
- Regular employees: 10,177
- Advanced degrees: 6,097 (59%)

(as of February 27, 2015)

Federally funded research and development center

Total Laboratory Expenditures (FY2014) $2,686,329,000

Sandia Sites

Sandia National Laboratories

Albuquerque, New Mexico

Livermore, California

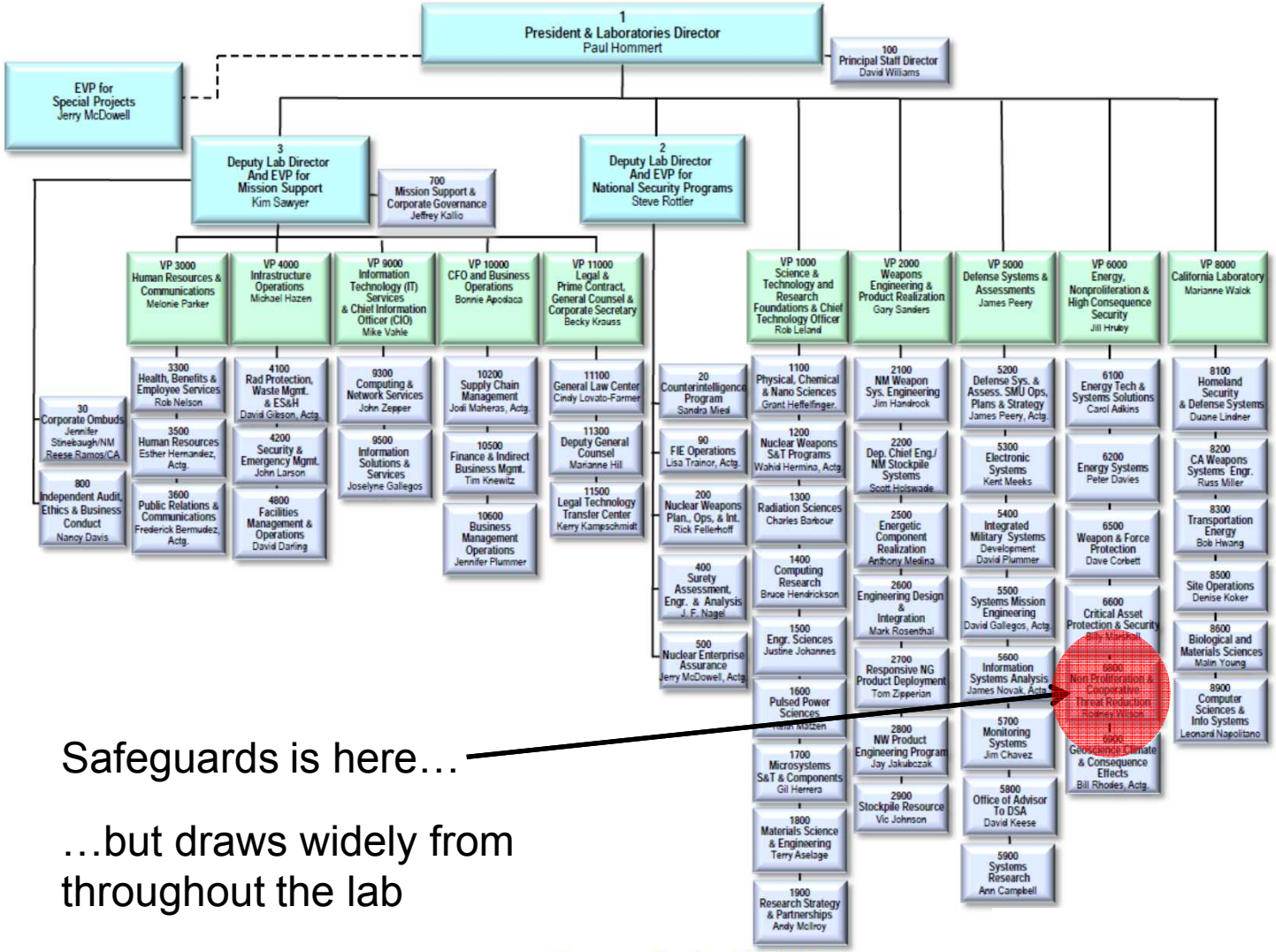
Kauai, Hawaii

Waste Isolation Pilot Plant, Carlsbad, New Mexico

Pantex Plant, Amarillo, Texas

Tonopah, Nevada

Sandia is organized by Divisions



Safeguards is here…

…but draws widely from throughout the lab

Org Charts 4/2/2015:cg

Changes effective 4/2/2015

International, Homeland, & Nuclear Security

Sandia National Laboratories

Global Security

WMD Counterterrorism and Response

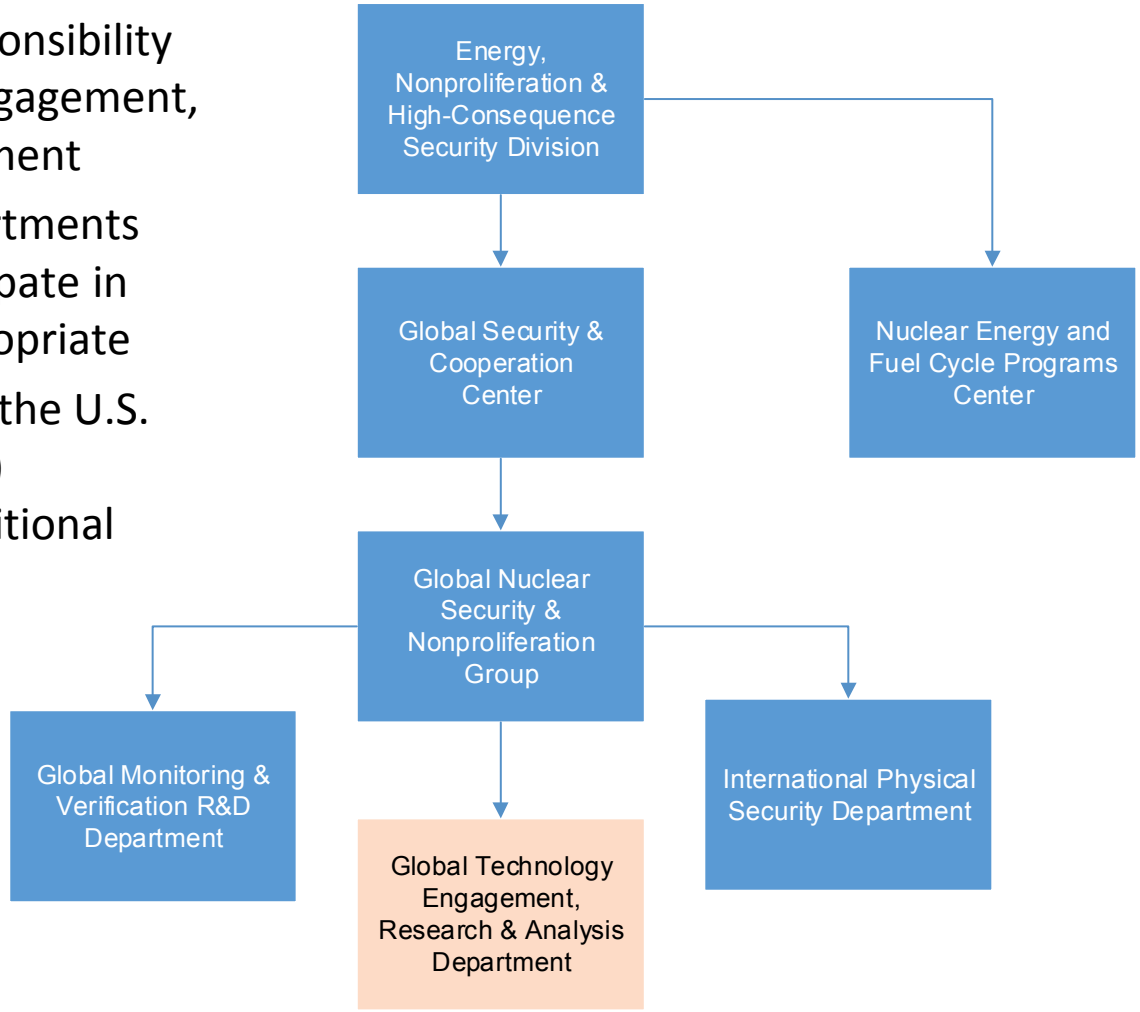
Homeland Security Programs

Homeland Defense and Force Protection

Cyber and Infrastructure Security

International Nuclear Safeguards at Sandia: Organization

- Sandia's work on International Nuclear Safeguards is the major responsibility of the Global Technology Engagement, Research & Analysis Department
- Staff from many other departments within the laboratory participate in safeguards projects, as appropriate
- Separately, Sandia supports the U.S. Safeguards (Voluntary Offer) Agreement with annual Additional Protocol reporting to DOE



International Nuclear Safeguards at Sandia: Sponsors and Partners

- National Nuclear Security Administration
  - A semi-autonomous agency within the U.S. Department of Energy
  - The Office of Defense Nuclear Nonproliferation (DNN) is our primary sponsor
  - NA-22 Office of Nonproliferation Research & Development
    - Sponsors advanced R&D concepts
  - NA-24 Office of Nonproliferation and Arms Control (NPAC)
    - Sponsors safeguards engagement, implementation, outreach
  - Next Generation Safeguards Initiative (NGSI)
    - not an organizational entity, but a strategic theme that began in 2008
    - Five "Pillars": Policy and Outreach, Concepts and Approaches, Technology Development, Human Resources, International Engagement (INSEP)
- Also
  - Program of Technical Assistance to IAEA Safeguards (POTAS)
  - Laboratory Directed Research & Development
  - Other sponsors
- Partners
  - DOE National Laboratories: ANL, BNL, LANL, LLNL, NBL, ORNL, PNNL, SRNL
  - Universities and Industry

International Nuclear Safeguards at Sandia: What We Do

- Our mission focus is ensuring the *surety** of safeguards information
- Core Technical Areas:
  - Information Management and Security
  - Containment and Surveillance
  - Unattended and Remote Monitoring
  - Geological Repository Safeguards

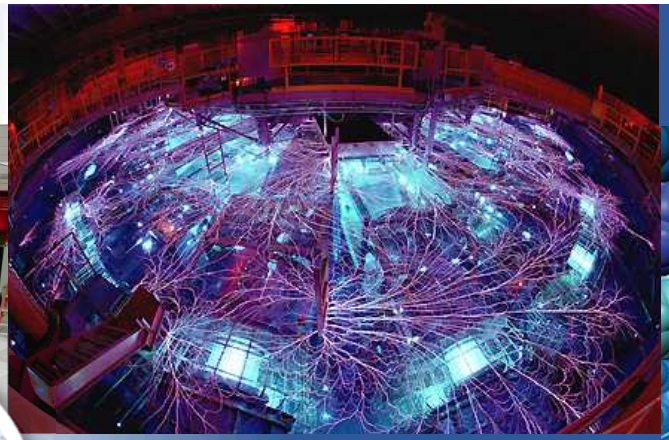
- Infrastructure Development is a complementary mission to strengthen nuclear safeguards worldwide
  - Applying systems engineering to promote 3S
  - Cooperative technical engagement to build capacity

*(information) surety: *a measure of the degree to which information can be trusted*
Baldwin and Tolk, 31st ESARDA Annual Meeting, SYMPOSIUM ON SAFEGUARDS AND NUCLEAR MATERIAL MANAGEMENT, 28 May 2009, Vilnius, Lithuania

Our Research Framework

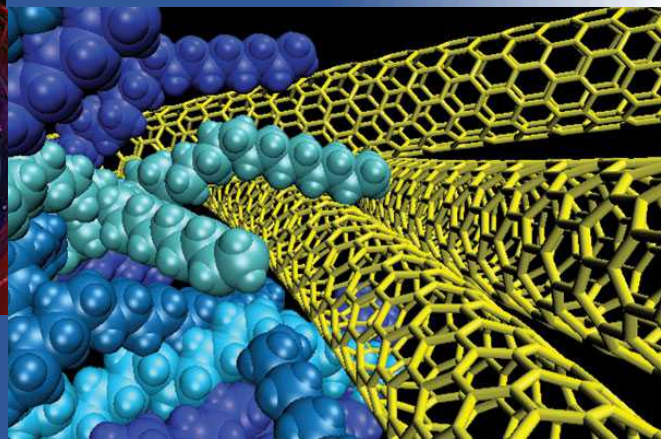
Strong research foundations play a differentiating role in our mission delivery

Computing & Information Sciences

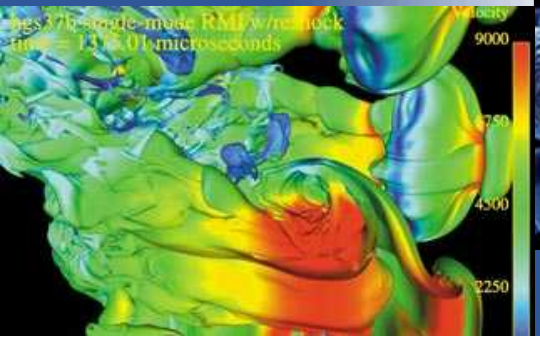


Radiation Effects & High Energy Density Science

Materials Sciences

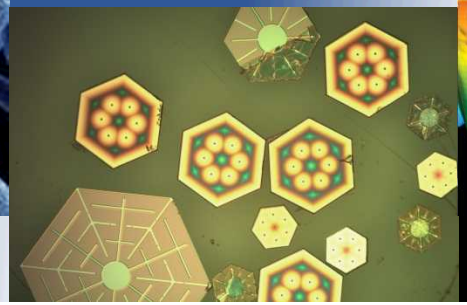


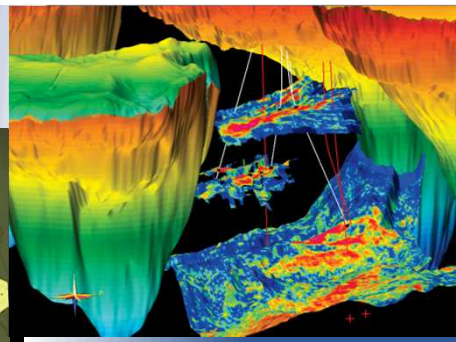
Engineering Sciences



Bioscience

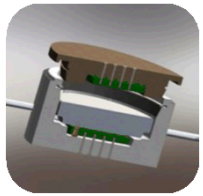
Nanodevices & Microsystems





Geoscience

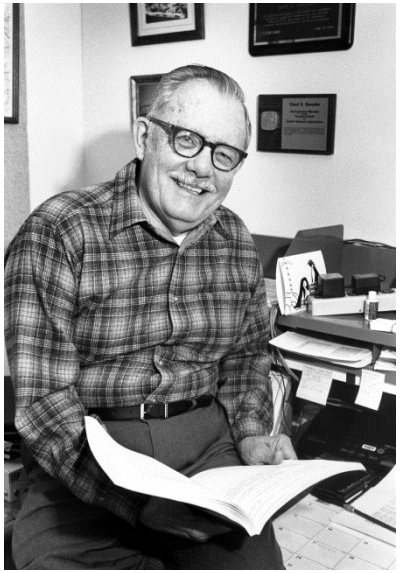
International Nuclear Safeguards at Sandia: Current Activities



- Remotely Monitored Sealing Array (RMSA)
- Next Generation Ceramic Seal
- Magnetic Smart Tag
- Geological Repository Safeguards studies
- INSEP Bilateral Safeguards Collaborations
  - Euratom: Enhanced Data Authentication System (EDAS)
  - INSEP Regional Lead for France/Germany
  - ROK: Safeguards qualification of waste streams for repositories
  - ABACC: Inspector C/S Training
- Participation in the multi-laboratory NGSI Spent Fuel Nondestructive Assay Project

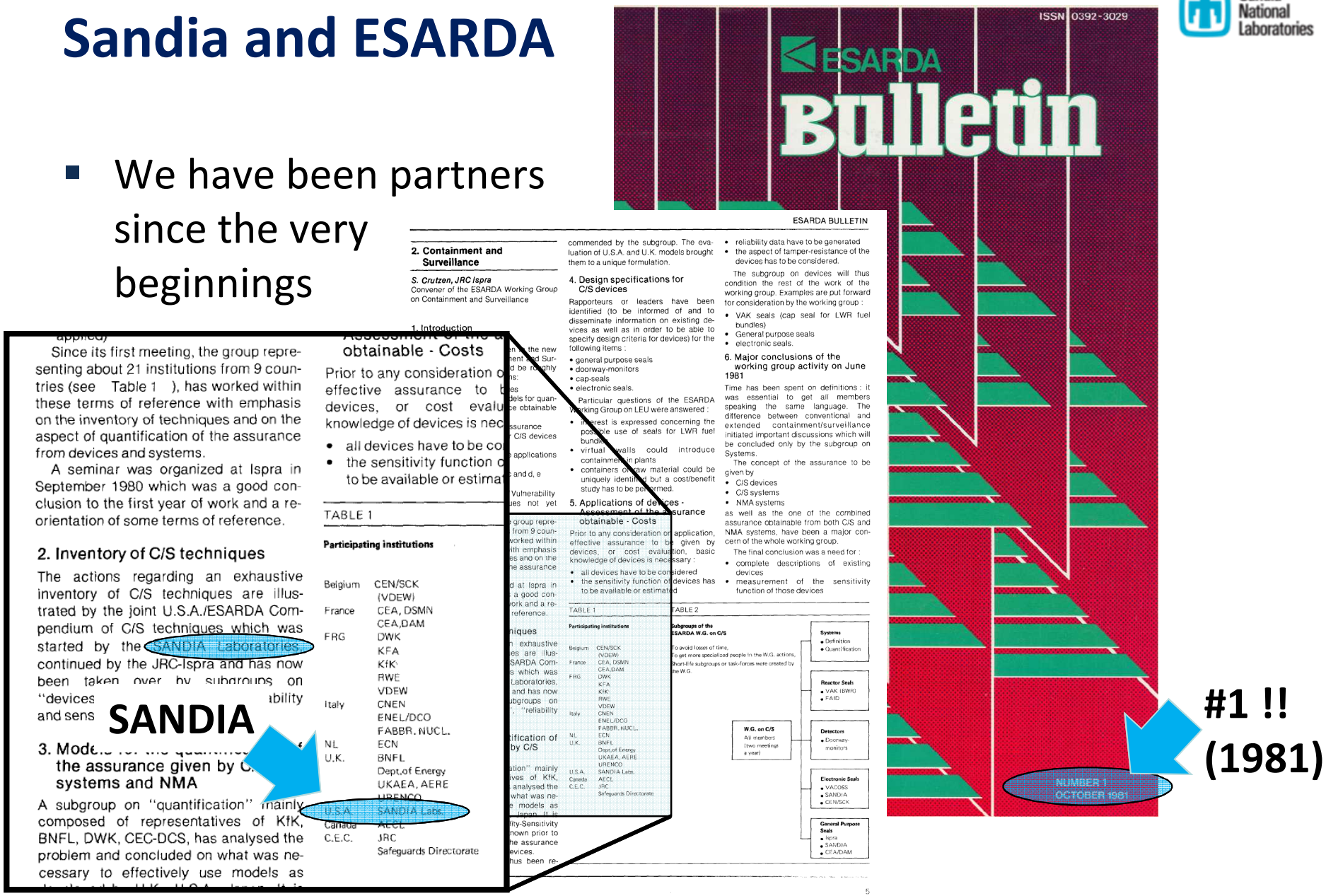
International Nuclear Safeguards at Sandia: Historical

- Individuals
  - Cecil Sonnier, Steve Dupree, Denny Mangan, John Matter, Don Glidewell
- International Assignment
  - IAEA: Balsley, Baldwin, Tolk, Damico, Mascarenhas, Pastercyk, Gastelum
  - Japan: Betsill, Olsen, Lucero, Furaus, Damico
- Systems and Technologies
  - Modular Integrated Video Surveillance (MIVS)
  - Cobra seal
  - Spent Fuel Plutonium Measurement study
  - Secure Video Surveillance System (SVSS)
  - Vulnerability Assessments
- Training
  - ABACC Containment and Surveillance Training (ongoing)
  - IAEA Unattended and Remote Monitoring (2002, 2003)
- Professional organizations
  - INMM: International Safeguards Technical Division
  - ESARDA Working Groups
    - Containment and Surveillance
    - Implementation of Safeguards
    - Verification Technologies and Methodologies
  - ASTOR



Sandia and ESARDA

- We have been partners since the very beginnings



#1 !! (1981)

Conclusions

- Sandia National Laboratories has an enduring commitment to supporting international nuclear safeguards
- Sandia has already been an active participant in the ESARDA safeguards community for many years
- Sandia joining as an Associate Member of the ESARDA would formally recognize our mutually beneficial relationship