

*Exceptional service in the national interest*



## International Nuclear Threat Reduction Department- Overview

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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. Programmatic Review 5326579.



INTERNATIONAL  
**NUCLEAR**  
Threat Reduction  
*Innovative solutions for countering nuclear threats globally*

## Mission

The International Nuclear Threat Reduction (INTR) program enhances United States and international security by reducing nuclear threats through global engagement.

Using technical and analytical tools, the program addresses challenges posed by nuclear materials, facilities, and expertise, as well as underlying security motivations for weapons of mass destruction proliferation.

## TECHNICAL CAPACITY BUILDING



Strengthen capacities for technical engagement on nuclear safety, security, and safeguards (Gulf Nuclear Energy Infrastructure Institute (GNEI), Abu Dhabi, UAE).



Train foreign officials on commodities identification in support of global export control efforts (Beirut, Lebanon).



Promote the responsible use of nuclear material, technology, and expertise (training on safe and secure operation of nuclear research reactors, Rabat, Morocco).



Engage scientists through the Global Initiative for Proliferation Prevention (GIPP), (Food Safety Training, Iraq).

# TECHNOLOGY-BASED POLICY ANALYSIS



Collaborate with foreign research scholars and develop concepts for cooperative monitoring to reduce regional tensions. In addition, conduct Sandia research and analyses in support of program missions.



Develop creative, technically informed policy solutions that address nuclear threats and the underlying motivations for proliferation (India-Pakistan missile dismantlement transparency exercise, Sofia, Bulgaria).

## SYSTEMS DESIGN, TEST, AND EVALUATION



Demonstrate technologies and systems to address global security issues (Cooperative Monitoring Center, Albuquerque, New Mexico).



Evaluate commercial as well as prototype monitoring technologies and systems (Outdoor Test Facility, Sandia National Laboratories, New Mexico).

# Gulf Nuclear Energy Infrastructure Institute (GNEII)

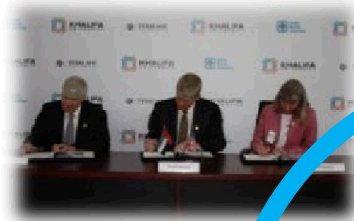
*GNEII is a Strategic Partnership between Sandia, Texas A&M and Khalifa University in the United Arab Emirates which serves as the host for GNEII.*

- Regionally based
  - Institution to develop human resource capability
  - Future nuclear program decision makers
- An Education & Development Institute
  - Nuclear energy infrastructure plus integrated safeguards, safety, and security (3S)
  - Regional context
- A Strategic effort
  - Integrated 3S culture for a responsible national nuclear energy program
  - Educate mid-level managers and regulators on the basics of nuclear power

Effort jointly funded by NNSA and Department of State.



# GNEII History



- Initial Discussions
- International Consultations
- Regional Scoping Trip

2009

2010 -2011

- Letter of Intent
- Memorandum of Understanding
- GNEII Pilot Course
- International Conferences

- Fundamentals Course
- International Conferences
- GNEII Symposium

2012 -2013



# International Nonproliferation Export Control Program (INECP)



Inspection training in Lebanon



Indian workshop in US jointly with US Customs and Border Protection

- Dual Use Commodity Identification Training (CIT)
- Outreach to international customs and border officials
- Strategic trade regulations and controls with government and industry.
- Sandia leadership for efforts in India, Pakistan, Sri Lanka, Lebanon and Oman.
- NNSA and State EXBS funded



CIT workshop in Vietnam



Strategic trade meeting in Chennai, India

# Egypt Center Of Excellence on Radioactive Waste Management



Sandia partners with the Egyptian Atomic Energy Authority (EAEA) to establish an Egyptian Training Center for Low-Level Radioactive and Nuclear Waste Management.

- Goal to establish regional training center emphasizing safety, security and nonproliferation norms
- Funded by State Department Partnership for Nuclear Security
- Activities conducted at Inshas, Egypt and Sandia.



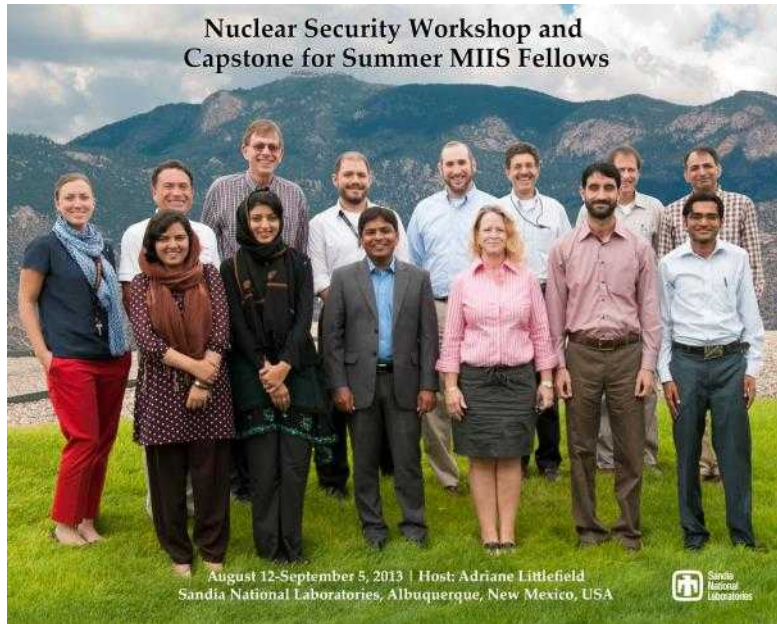
Safety, security and QA Course at Sandia  
January 2013



EAEA Mosaic Mural

# Monterrey Nuclear Security Fellows

## Workshops



August-September 2013

Up to month-long training and capstone projects at Sandia for Pakistani academic, government and military scholars as an adjunct to semester studies in Nonproliferation at the Monterrey Institute for International Studies.



May-June 2013



December 2012

# Other Recent Visits and Training Programs



**Jordan Atomic Energy Commission**  
Radiation Protection Study Tour  
June 24-28, 2013



**Indian Radiation Physics Graduate Students from Pandit Deedayal Petroleum University**  
Nuclear Security Summer Technical Training and Tour  
August 1-6, 2013



**Feroz Khan**  
Seminar on his Book "Eating Grass- Making the Pakistani Bomb"  
April 30, 2013

# Radiation Measurements Cross Calibration (RMCC) Project

- Improve nuclear measurement and monitoring capabilities among countries in the MENA region.
- Establish regional network of recognized and capable nuclear measurement laboratories.
- Build confidence by sharing data and best practices and evaluating results of sample analyses by program participants.
- Sponsored by NNSA and Dept. of State, with involvement of IAEA and CTBTO and DOE's Mixed Analyte Proficiency Evaluation Program (MAPEP).



2008 RMCC Meeting Bahrain



Eighth RMCC Meeting  
Amman, Jordan June 2013

# Cooperative R&D on Environmental Radiation Detection Stations (ERDS)



Radiation Monitoring Station  
Freiberg, Germany



ERDS Team at SNL Rad Lab

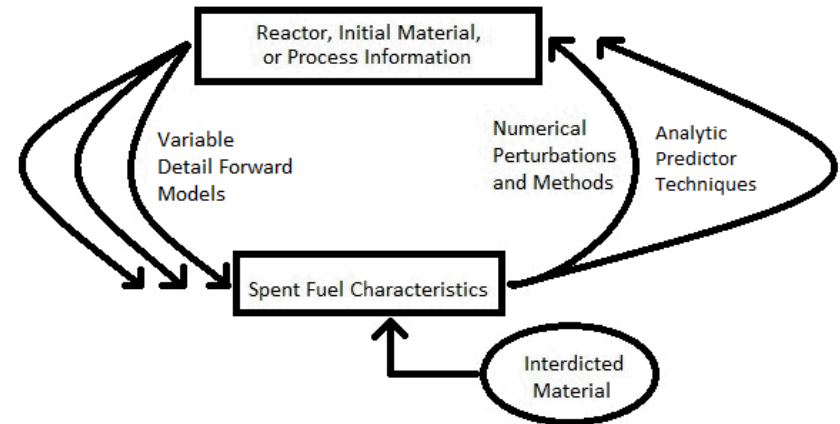
- Develop concept for Middle East and North Africa (MENA) region radiation monitoring network
- Exercise data sharing among regional countries.



2012 ERDS Core Working Group  
Morocco, Qatar, Jordan

# Nuclear Forensics Research

- Early career LDRD on "High Fidelity Forward Model Development for Nuclear Reactor Spent Fuel Technical Nuclear Forensics"
- Subject matter expertise provided to international nuclear forensics meetings
  - Beijing, China (June & August, 2012)
  - Taipei, Taiwan (August 2012)
  - Bangkok, Thailand (Sept. 2013)



Inverse Forensic Analysis Model



Sandia Radio-Analytical Capabilities

# Recent Visiting Scholars



Saher Haider- Pakistan  
June-July 2013

Masters candidate in Law and Diplomacy, Fletcher school, Tufts University. Former research analyst at Institute of Regional Studies (Islamabad)

“Pakistan’s Energy Crisis and Policy”

Tughral Yamin- Pakistan  
June-Sept. 2013

Associate Dean for the Center of International Peace and Stability (CIPS), National University of Sciences and Technology (NUST), Islamabad, Pakistan.

“Developing Confidence Building Measures (CBMs) in Information Space between India and Pakistan: Prospects and Proposals”



# Track II Engagements

- Contributing ideas and technical expertise to informal international dialogues on arms control, nonproliferation and regional security

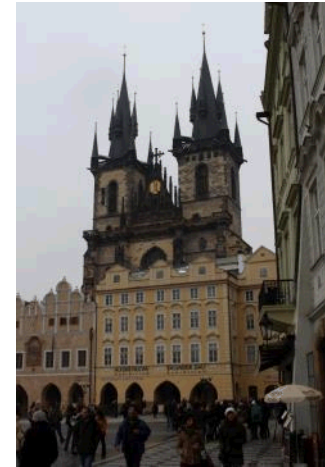
- Produce white papers and journal articles
- Convene special working groups
- Provide subject matter expertise
- Explore new approaches to further security

- Academic, NGO and Government sponsors

- Middle East
- South Asia
- East Asia



**The Nonproliferation  
Review  
IMPLEMENTING A  
WMD-FREE ZONE IN  
THE MIDDLE EAST**  
26 Feb 2013.



UCLA Regional Security in the Middle East Meeting  
Prague, Czech Republic



Strategic Studies Network Meeting  
Bangkok, Thailand  
November, 2012

# Example Facilities and Testing



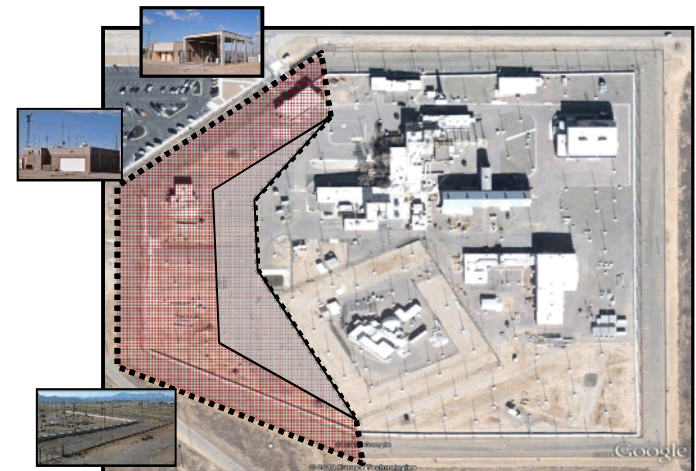
International Programs Building  
Cooperative Monitoring Center (CMC)



Outdoor Test Facility



Technology Training and  
Demonstration Area



Nuclear Security Center of  
Excellence

# Middle East Scientific Institute for Security (MESIS)



- Established by Sandia at the Royal Scientific Society of Jordan in Amman
  - Originally CMC @ Amman



## **Borders:**

Policy and Control  
Monitoring and Detection  
Technology



## **Energy:**

Renewable energy  
Nuclear non-proliferation



## **Environment:**

Sustainability (such as water stress and emissions)  
Safety (such as infectious diseases and hazardous materials)



معهد الشرق الأوسط العلمي للأمن  
Middle East Scientific Institute for Security

# Summary/Conclusion

- The INTR department supports the NNSA, State Department and other federal agencies in promoting regional security and nonproliferation objectives.
- The extensive knowledge of both the technical tools and political challenges associated with these issues enable us to contribute to new approaches and solutions to many of the world's most challenging problems.
- The longer term nature of many of these efforts presents challenges in developing metrics and sustaining resources needed to continue addressing these challenges.