

Exceptional service in the national interest



Technically-Based Regional Nuclear Cooperation Programs

**CSCAP Nuclear Energy Experts Group Meeting
Bangkok, Thailand
29-30 October 2014**

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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 SAND XXXX



TECHNICAL CAPACITY BUILDING



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



Train foreign officials on commodities identification in support of global export control efforts



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



Engage scientists through the Radiation Monitoring Cross Calibration Project to improve radiation measurement and monitoring capabilities throughout the MENA region.



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).

Example Training Programs and Workshops

- Academic Interactions
 - Monterey Nuclear Security Fellows Workshops
 - Training and capstone projects for international academic, government and military scholars
 - South Asia Graduate Students
 - Radiation Physics Graduate Students
 - Nuclear Security Summer Training and Tour
- Jordan Atomic Energy Commission
 - Radiation Protection Study Tour
- Other Recent Workshops
 - Root Cause Analysis
 - Personnel Security Programs



Indigenous Adoption Project Examples

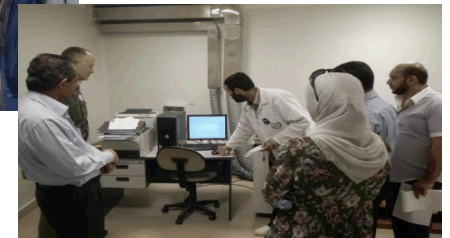
- Gulf Nuclear Energy Infrastructure Institute (GNEII)
 - Partnership of Sandia, Texas A&M and Khalifa University in Abu Dhabi, UAE
 - Institute for training and research on nuclear security culture, safety and safeguards
 - Government regulator, power company and security organization stakeholders
- Egypt Center of Excellence on Radioactive Waste Management
 - Collaboration with Egyptian Atomic Energy Authority (EAEA)
- Radiation Monitoring Cross Calibration (RMCC)
 - Improve nuclear measurement and monitoring capabilities among countries in the MENA region.



GNEII Fundamentals Course



Safety, Security and
QA Course for EAEA
Staff



8th RMCC Meeting 6
Amman, Jordan

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.



CIT workshop in Vietnam



Strategic trade meeting
in Chennai, India

Radiation Measurement Cross Calibration (RMCC)

- 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.
- In cooperation with IAEA, 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.

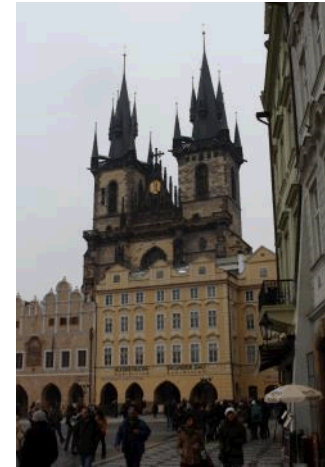


ERDS Core Working Group
Morocco, Qatar, Jordan

- 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.

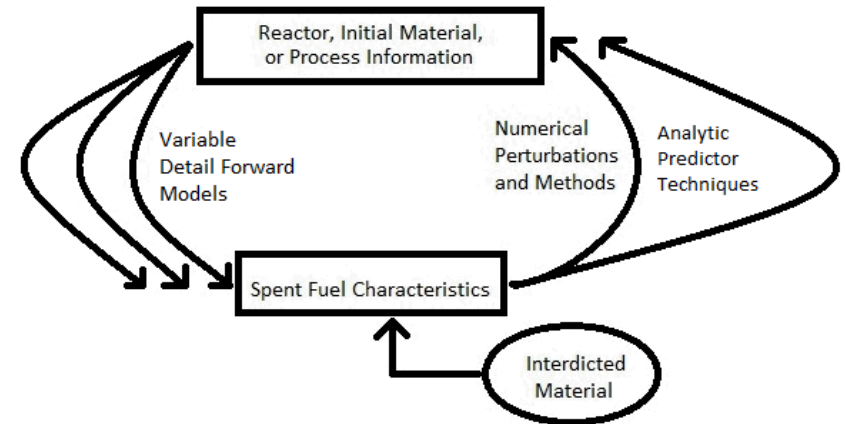


UCLA Regional Security in the Middle
East Meeting
Prague, Czech Republic



Strategic Studies Network Meeting
Bangkok, Thailand
November, 2012

- 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

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)

MESIS 
معهد الشرق الأوسط العلمي للأمن
Middle East Scientific Institute for Security

Example Facilities and Testing



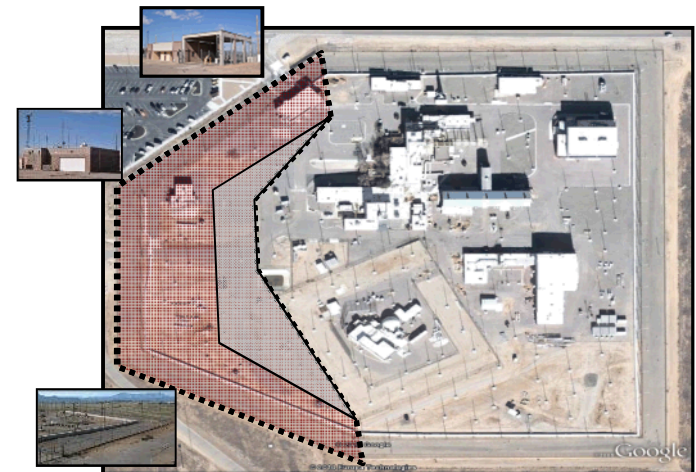
International Programs Building
Cooperative Monitoring Center (CMC)



Outdoor Test Facility



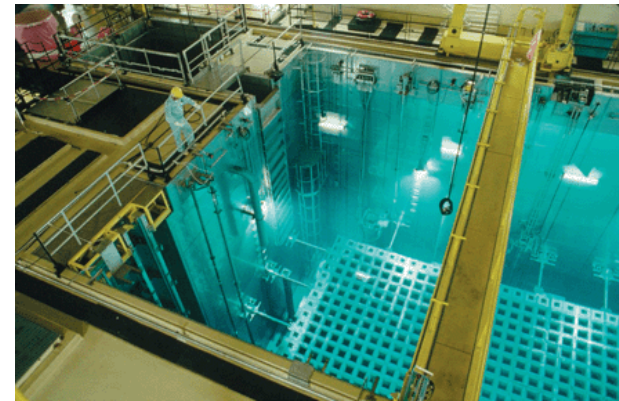
Technology Training and
Demonstration Area



Nuclear Security Center of
Excellence

Other Example Areas for Potential Education and/or Cooperation

- Nuclear waste repository
 - Design
 - Licensing
 - Safeguards
- Nuclear reactor safety and security
 - Physical security
 - Nuclear security culture
 - Reactor accident modeling
 - Systems modelling
 - Safety, Security and Safeguards relationships
 - Fuel and power cycle research
 - Nuclear transportation



- What elements of nuclear capacity building are most needed in the Asia-Pacific?
- What areas of international collaborative research or analysis would be most beneficial?
- What education and training needs of greatest importance to the Asia-Pacific countries?
- Where are there opportunities to conduct multi-lateral projects?

Backup Slides

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



Egypt Center of Excellence (COE) on Radioactive Waste Management



Sandia partners with the Egyptian Atomic Energy Authority (EAEE) 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
- Activities conducted at Inshas, Egypt and Sandia.



Safety, security and QA Course at Sandia
January 2013



EAEA Headquarters

Recent Visiting Scholars

- Dr. Sitakanta Mishra, India's Center for Air Power Studies and Dr. Mansoor Ahmed, Quaid-i-Azam University in Pakistan
 - Conducted joint study on cooperative measures to support the 2007 Agreement between India and Pakistan on Nuclear Accidents.
 - Results enumerated unilateral, bilateral, and trilateral activities which would enhance cooperation in South Asia.



- Tugral Yamin- Pakistan, June-Sept. 2013
 - "Developing Confidence Building Measures (CBMs) in Information Space between India and Pakistan: Prospects and Proposals"
- Saher Haider- Pakistan, June-July 2013
 - "Pakistan's Energy Crisis and Policy"

