



Global Security Program



# Global Security Program Overview

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Global Security Program

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,  
for the United States Department of Energy's National Nuclear Security Administration  
under contract DE-AC04-94AL85000.



# 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

### 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



### 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



# 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



# Global Security Program

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

## National Non-Proliferation Systems



## Global Cooperative Threat Reduction



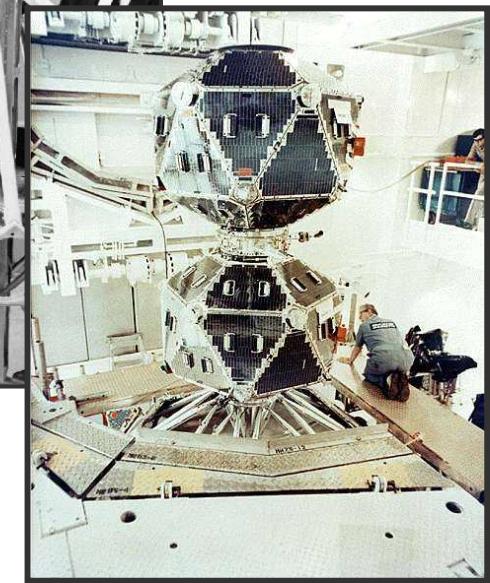
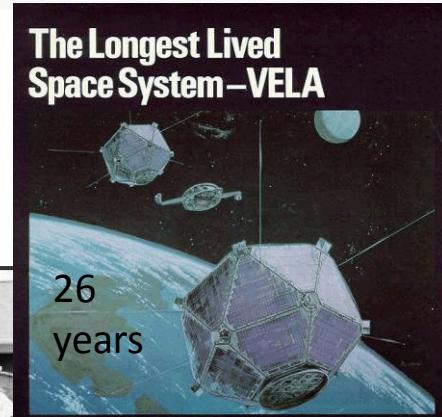
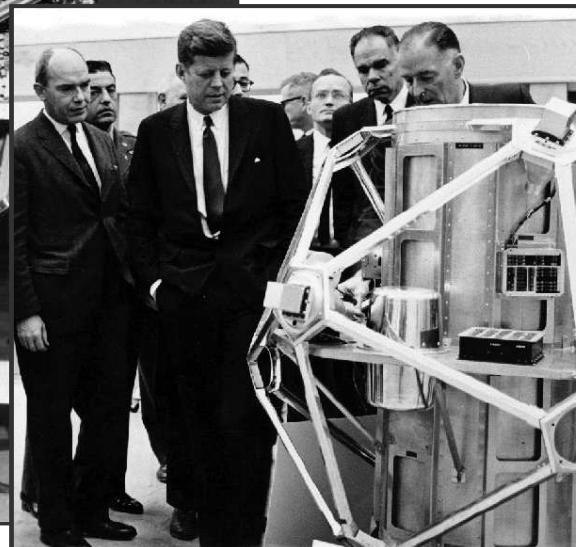
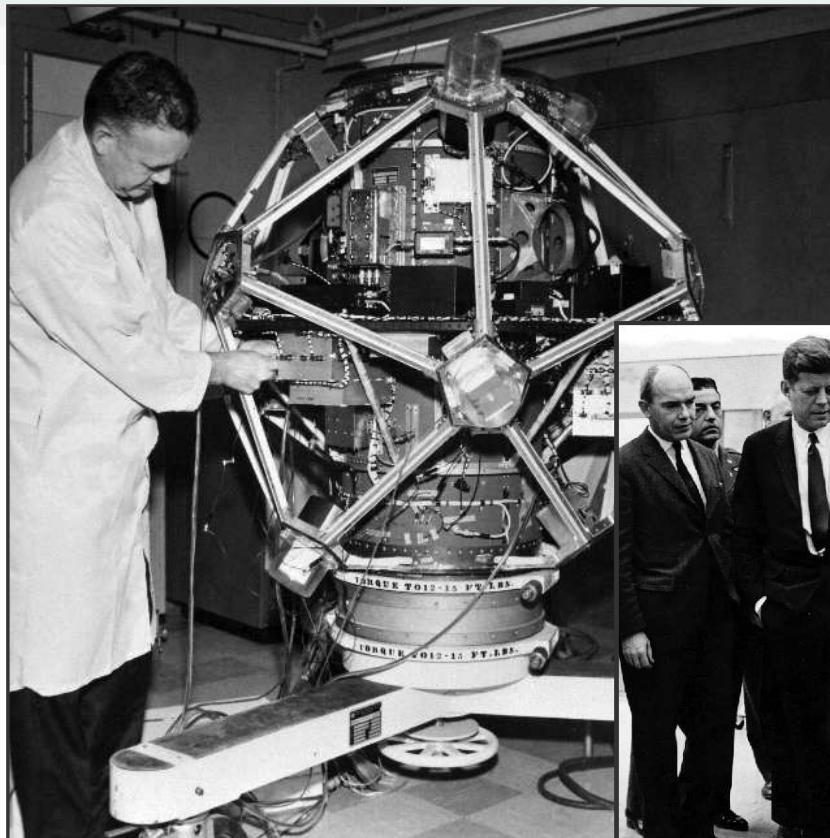
## International Treaties and Negotiated Agreements





# National Non-Proliferation Systems

## Example: VELA-Hotel



Mission: Nuclear Proliferation Monitoring

# *International Treaties and Negotiated Agreements*

## *Example: Considering a treaty involving nuclear warheads*



START Radiation Detection Equipment



Warhead Technology Monitoring Project



Radiation Detection Equipment



The TOBOS simulated storage facility in St. Petersburg, RU.

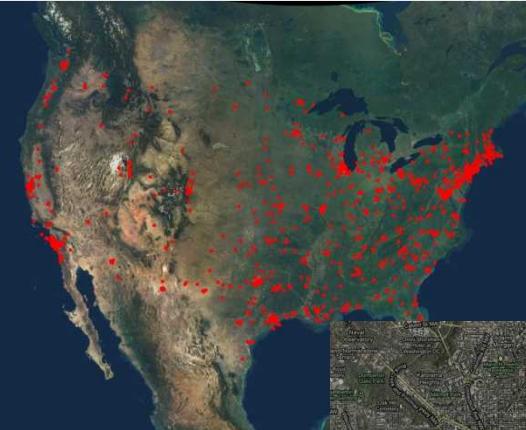


Storage Monitoring Collaboration Field Trials

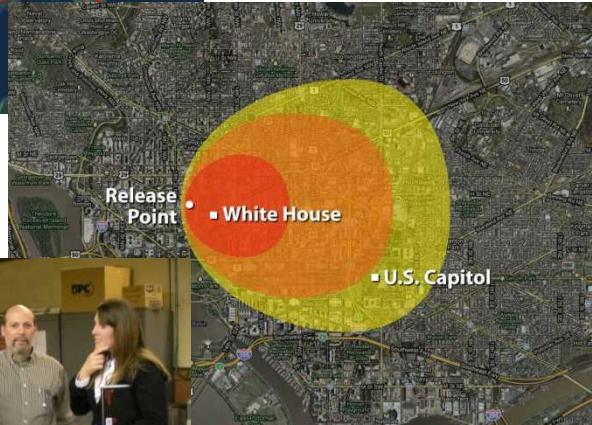


# Global Cooperative Threat Reduction

## Example: Global Threat Reduction Initiative



Threat



Consequence



Prevention



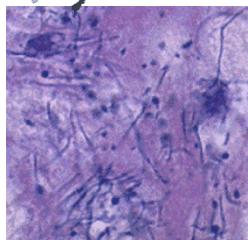
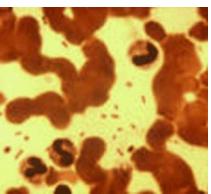
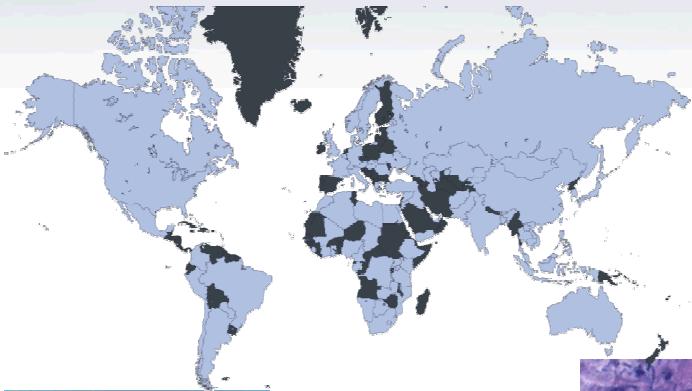
BN-350 60<sup>th</sup> at Baikal



BN-350 Casks on pad (November 15, 2010)

# Global Cooperative Threat Reduction

## Example: International Bio Threat Reduction



# Global Cooperative Threat Reduction

## Example: Gulf Nuclear Energy Infrastructure Institute (GNEII)



Regional Scoping Trip:  
November 2009



**Mission:** GNEII seeks to develop a responsible nuclear energy culture and institutionalize key safety, safeguards, security, and nonproliferation norms in the future decision-makers of Middle East region nuclear energy programs through professional development and training.

Pilot Course Begins: 20  
Feb. 2011



MOU Signed:  
20 Feb. 2011



LOI Signed:  
16 Mar. 2010

### Module 1: Fundamentals

**Week 1**  
Critical Thinking, the  
Scientific Method &  
Systems Thinking

**Week 2**  
Basic Nuclear &  
Reactor Physics

**Week 3**  
Nuclear Fuel Cycle: Front  
End, Production Cycle,  
Back End

**Week 4**  
Nuclear Material  
Control: History, Policy  
Issues, Technical Issues

**Week 5**  
Nuclear Power Plant  
Management and  
Operations

**Week 6**  
Radiological Materials  
Management

**Week 7**  
Nuclear Safety:  
Reactor Safety  
Systems

**Week 8**  
Nuclear Safety:  
Accident Modeling &  
Emergency  
Preparedness

**Week 9**  
Nuclear Safeguards:  
Terminology,  
Technology, Systems &  
Measurements

**Week 10**  
Nuclear Safeguards:  
Export Control, the  
Fuel Cycle & Sub-  
State Threats

**Week 11**  
Nuclear Security:  
Physical Protection System  
Design, Implementation &  
Evaluation

**Week 12**  
Nuclear Security:  
Vulnerability  
Assessments for  
Nuclear Facilities

### Module 2: Capstone

#### GN605

Independent  
student work to  
identify, structure,  
and conduct a  
research project  
analyzing a  
regional nuclear  
energy issue

Integrated “3S” Approach  
Curriculum Finalized:  
January 2011



# 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*