

NUCLEAR ENERGY & GLOBAL SECURITY



T E C H N O L O G I E S

Warhead Monitoring and Verification

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International Safeguards /

Nuclear Monitoring Science and Technology



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.





Outline

- **Confidence Building**
 - Transparency and Verification
 - Relationships and Collaborations
 - Technologies and Processes
- **Issue**
 - Balance of elements, including Confidence Level
 - How is Confidence measured, and who decides the target level?
- **Experiences**



Confidence Building A Matter of Degree

- **Face Value**
 - Acceptance of a declaration without confidence building measures. (e.g. Strategic Offensive Reductions Treaty/Moscow)
- **Transparency**
 - Largely voluntary measures to facilitate mutual understanding, easing tensions and reducing misperceptions.
- **Verification**
 - Measures with the purpose of establishing the degree of compliance with, or the violation of, the specific terms of an agreement.



Confidence Building Relationships and Collaborations

- **UK-US**

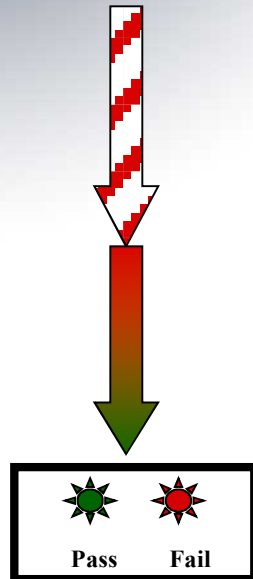
- **Mutual Defense Agreement of 1958, as amended**
- **EIVR-58 Authentication Workshop, 9-12 March 2009**
- **Tamper Indicating Devices Workshop, 13-17 March 2009**
- **Joint exercises**

- **Russia-US**

- **Warhead Safety and Security Exchange (WSSX) engagement**
- **Science and Technology collaborations**



Confidence Building Technologies



- **Sensing and Identification**
 - Warhead and material characteristics measurement
 - Radiation, explosives, weight, size, shape
 - Identification of materials or warhead
- **Information Barriers**
 - Protection of classified information
- **Authentication**
 - Hardware/Software methods and tools
 - Tamper Indicating Devices/Enclosures
 - Data Communications and Cryptography
 - Systems
- **Integrated processes**
 - Design through disposition
 - Certification, Authentication, Item Custody



Issue

Measuring Confidence

- **Measures taken will balance between**
 - confidence
 - financial resources
 - time
- **How is confidence defined?**
 - Political viewpoint
 - Technical viewpoint
 - Others?

There is a need for effective political – technical interpretation and feedback capabilities in preparation for and during negotiations.



Up Next

- **Verification of Disarmament**
 - Dr. Kevin Seager
- **Warhead Monitoring**
 - Robert (Dusty) Rhoades, Col USAF, Ret