U.S. / Russia Nuclear Technical Cooperation
Past and Future

SAND2009-1424C

Presented at
The 2nd U.S. – Russian Nuclear Non-Proliferation Conference
Russian Academy of Sciences and Nuclear Threat Initiative
Moscow, March 18 - 20, 2009

Arian Pregenzer
Sandia National Laboratories

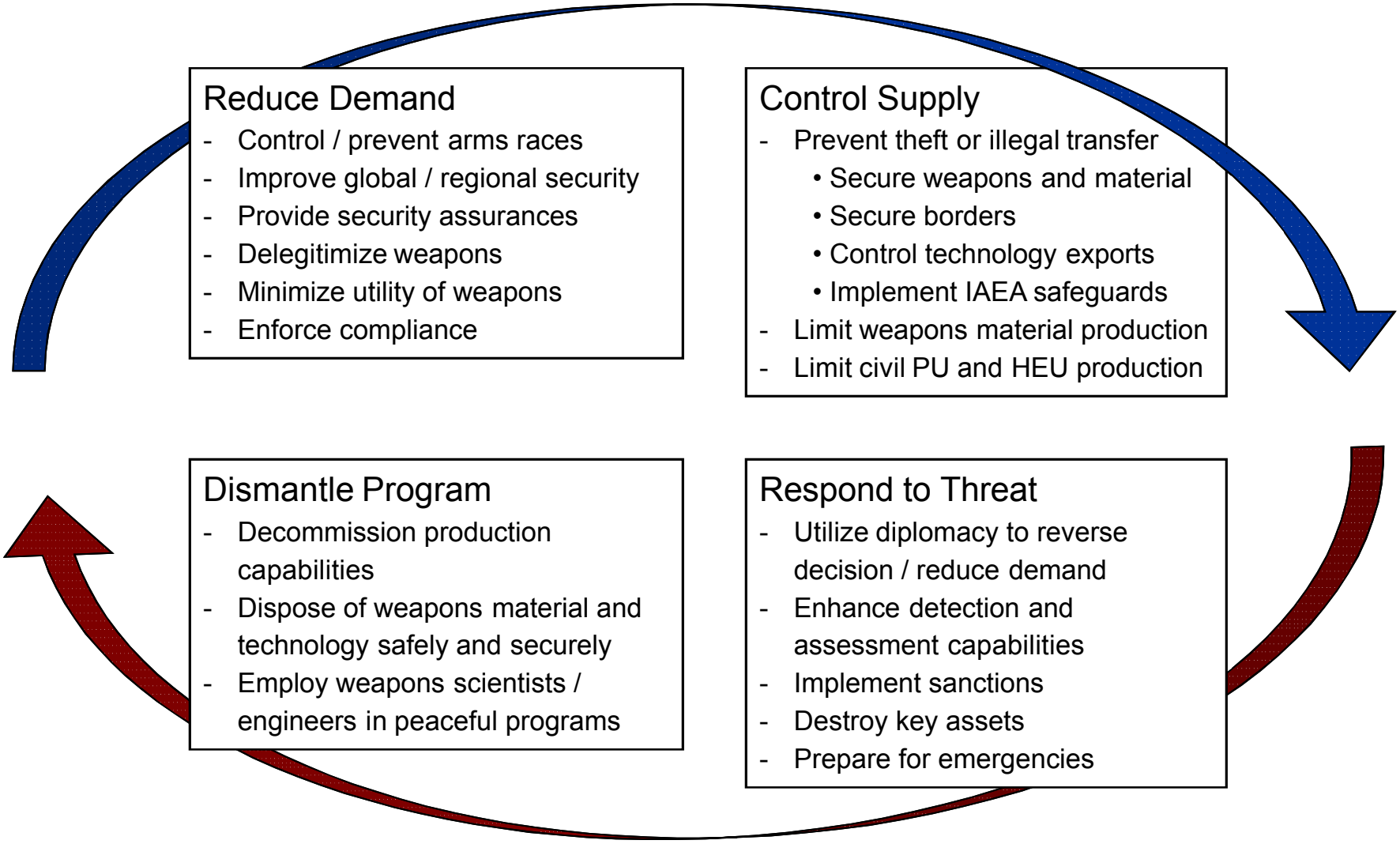
Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Introduction

- **US / Russian Federation (RF) technical cooperation is essential to achieving our security objectives with respect to reducing the nuclear / radiological threat**

- **Need to reconsider the form and topics for technical cooperation based on**
  - **Evolution of the US-RF relationship**
  - **Changes in leadership**
  - **Transition from assistance to partnership**

General Strategies for Dealing with the Threats of Nuclear Proliferation and Terrorism



Timeline for US / Russia Nuclear Technical Cooperation

Technical measures to verify arms control
- Test limitation treaties
- INF Treaty
- START

S&T
- Pulsed power
- Fusion

Technical options for future arms control
- Warhead storage monitoring
- Warhead dismantlement transparency
- Excess fissile material monitoring (tri-lat initiative)

Technical measures to verify US / RF treaties

Technical options for multilateral treaties

Technical US/RF Confidence Building Measures (CBMs)

Adversaries 1991 ***U.S. Assistance*** 2009 ***Partners?***

Nuclear weapons safety and security
- Transportation
- Sites / facilities

Nuclear material security
- Facilities
- Borders

Material production limitations
- Pu disposition
- HEU blend-down / transparency

Defense conversion
- S&T for NW personnel
- Nuclear institute / industry partnerships

Radiological source security

Sustainability of weapon and material security

Security measures for evolving threat

Global nuclear weapons safety and security

Global nuclear energy safety and security

Achievements under the Warhead Safety and Security Exchange (WSSX) : 1995 - 2008

- Warhead and fissile material monitoring
- Warhead safety in storage
- Warhead authentication
- Tamper-indicating devices
- Warhead dismantlement transparency
- Accident characterization and response
- High explosives aging study
- Combating terrorism technologies

Lessons Learned from Past Technical Cooperation

- Obtain commitment at the highest levels on both sides
- Focus on most important common problems
- Develop a clear legal framework for cooperation
- Insulate technical programs from political issues
- Maintain consistency of personnel: success depends on strong personal relationships that can take years to develop

Opportunities for Future Technical Cooperation - 1

Goal	Project Ideas
Reduce Demand	
Verified deeper reductions in strategic nuclear forces	• US/RF study on Post-Start verification measures with less complexity, intrusiveness and operational impact • US/RF studies to identify technology gaps and requirements for monitoring warhead dismantlement, nuclear production infrastructure, delivery systems, etc. followed by joint technology development.
Coordinated P-5 efforts on NPT Art. VI	• US/RF leadership of multilateral study on "Monitoring Nuclear Weapons….." • US/RF cooperation with UK to establish "Dismantlement Laboratory"
Reduce tensions over NATO, NMD	• US/RF study on technical confidence-building measures (CBMs) for missile defense installations in Europe
Verifiable FMCT	• Development, testing and demonstration of potential verification measures (classified material and naval fuel)
Ratification of CTBT	• US/RF study of nuclear test site transparency measures followed by test and evaluation.
Reduce motivation to develop E&R	• Joint study followed by demonstration of international spent fuel interim storage compatible with US-origin fuel.

Opportunities for Future Technical Cooperation - 2

Goal	Project Ideas
Control Supply	
Global nuclear weapons/ material security and accountability	• US/RF working group - evolving threat to nuclear weapons (NW). • US/RF demo of security technologies/ systems to address evolving threat. • US/RF development of principles and guidelines for NW security.
Detect nuclear smuggling and transfers	• Develop sustainable system concepts and technologies for border (crossings and open borders) and port management
Limit global spread of weapons delivery capabilities (missile technology)	• US/RF study on draft global treaty • US/RF development/ demonstration of advanced technologies for Global INF verification
Respond to Threat	
Effectively respond to nuclear / radiological events	• US/RF study of international nuclear weapons and/or material search and recovery capability • US/RF development of MOD Emergency Response Center

Questions for Discussion

- What are the major shared security challenges between the US and Russia?
- What are the highest priorities for addressing these challenges?
- Where could technical engagement or collaboration have the greatest impact?
- How might the current economic crisis affect future US/Russia nuclear security cooperation?