Historical Overview of Lab-to-Lab Interactions

Late 1991: DOE lab-to-lab exchanges urged by Admiral J. Watson

February 1992: Exchange visits, US/Russian nuclear weapon lab directors

Fall 1995: Clinton/Yeltsin agree on technical expert discussions

December 1995: US/RF recommend collaboration in Computations, Experiments, and Materials; Nuclear Warhead Safety and Security; and Test Ban Monitoring and Verification

March 1996:PDD signed [continued by current Administration]

> **"...goal of sustaining the scientific competence of individuals responsible for ensuring confidence in the US and Russian stockpiles."**

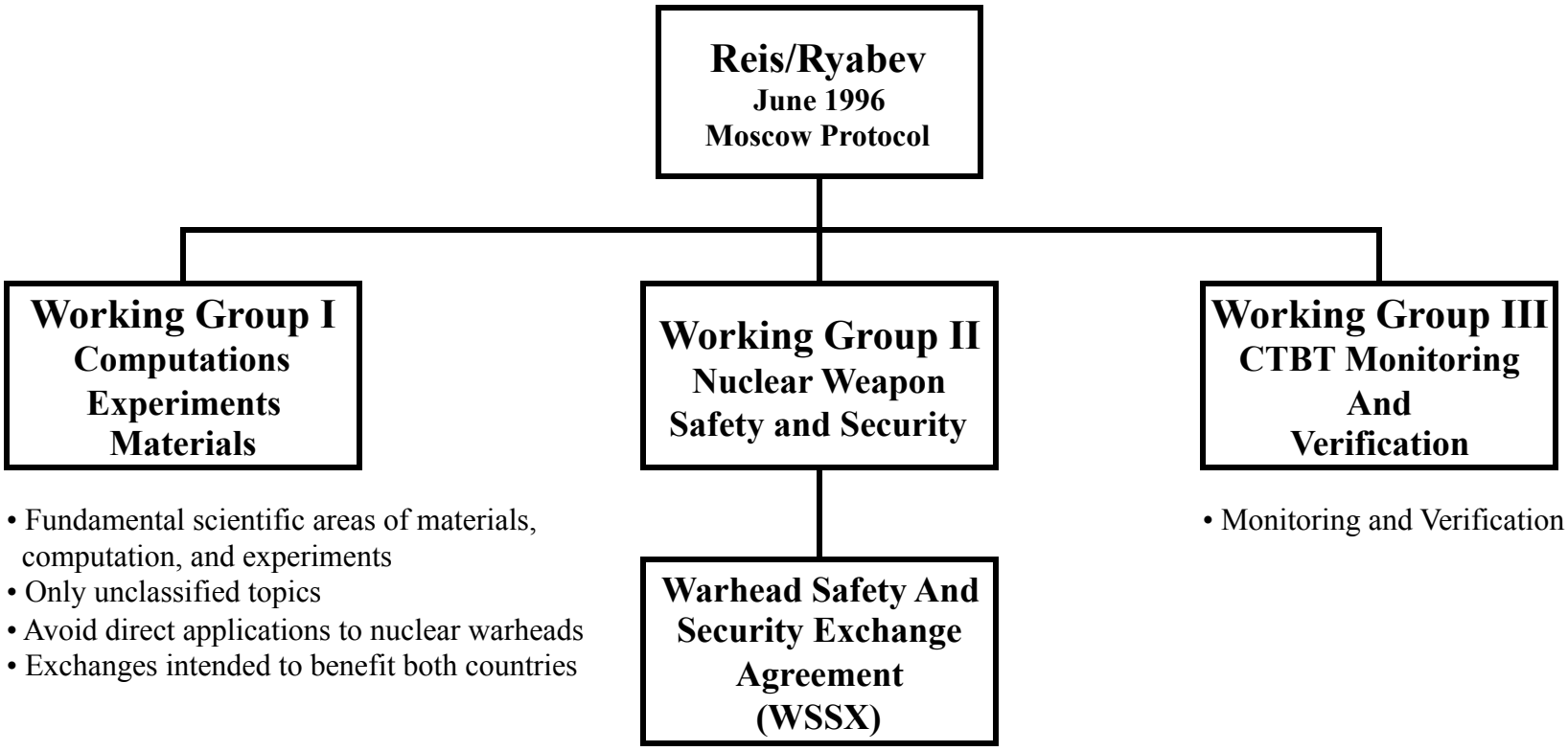
June 1996: Reis/Ryabev sign June 1996, Moscow Protocol for an enhanced program of mutually beneficial technical exchanges between the nuclear weapons laboratories of the two countries to ensure the safety and security of nuclear stockpiles

April 2000 Plenary Meeting: Moniz/Ryabev reported "both parties considered this area of scientific and technical cooperation to be a field that retains its importance for both countries, and intend to implement new projects in accordance with the Moscow Protocol signed in June 1996."

May 2002: Gordon letter to Ryabev suggests enhanced collaboration w/o reference to CTBT

August 2002: Ryabev responds and endorses collaboration between labs

Moscow Protocol Organizational Structure



- Fundamental scientific areas of materials, computation, and experiments
- Only unclassified topics
- Avoid direct applications to nuclear warheads
- Exchanges intended to benefit both countries

- Monitoring and Verification

- WG II includes WSSX
- WSSX is a formal agreement between US and the Russian Federation (RF)

Working Group I:Technical and Scientific Collaboration

1. Computer modeling

a. Models for material behavior (constitutive properties, strength, melt characteristics) under dynamic loading
b. Theoretical models of instability
c. Models of high explosives for safety assessments
d. Algorithms for solving mathematical problems using massively parallel computers

2. Recording technology for hydrodynamic experiments

3. Pulsed power generator technology and experiments

a. Pulsed power generator technology
b. Experiments on U. S. and Russian pulsed power facilities
c. Target fabrication for pulsed power experiments
d. Diagnostics for pulsed power experiments

4. Laser physics, technology and applications

a. Technology supporting advanced laser drivers
b. Experiments on U. S. and Russian laser facilities
c. Cryogenic targets
d. Diagnostics for laser plasma experiments

5. Properties of materials

a. Theoretical and experimental studies of equations of state, melt properties, strength and fracture of mutually agreed materials including possible diagnostics development
b. Material aging