International Partnership for Nuclear Disarmament Verification (IPNDV)

Working Group 3: Technical Challenges and Solutions
Terms of Reference

Finalized November 18, 2015

Specific technologies and methods will be needed to support future arms control and disarmament initiatives. Nuclear warhead verification and monitored dismantlement of nuclear weapons in particular will require extensive collaboration, technology development, and testing. While significant contributions have already been made, this work has largely been focused within a handful of states and many issues remain unresolved.

The Working Group on Technical Challenges and Solutions (WG 3) will work to develop solutions for key technical challenges for Nuclear Weapons States and Non-nuclear Weapons States related to nuclear disarmament verification, particularly issues focusing on nuclear warhead authentication, methods for establishing and maintaining chain of custody, and data and equipment authentication. The working group will coordinate its work with Working Groups 1 and 2. It will begin by surveying related research and initiatives undertaken to date. The Working Group acknowledges the complete nuclear warhead lifecycle, but our initial focus will be on the nuclear warhead dismantlement process and the monitored storage of nuclear materials resulting from dismantled nuclear warheads.

Key Questions and Assessments

Working Group 3 will examine and assess:

- How parties can confirm the presence or absence of nuclear warheads and relevant nuclear materials without revealing proliferation sensitive information;
- Effective methods and procedures for establishing and maintaining chain of custody for items at different stages in the nuclear weapons lifecycle; and
- Strategies and tools for software and hardware certification and authentication.

Expected Activities and Output

Working Group 3 expects to produce:

- A series of presentations, workshops or seminars on key activities and lessons learned from the U.S.-UK Technical Cooperation for Arms Control program, the UK-Norway Initiative, and other relevant activities;
- An assessment of existing approaches for warhead authentication, including the systems that support attribute measurements and templates, and an outline of other techniques that could increase confidence that something is in fact a nuclear warhead;
- The development of a chain of custody paper, presentation or demonstration involving unique identification and tamper-indicating devices in a specific environment, such as a mock warhead storage area; and
- A mapping of existing and potential technical capabilities necessary to enable monitoring and verification at different stages of a nuclear weapon dismantlement process, and the level of confidence the technology brings to monitoring the dismantlement process, with a list that identifies capability gaps and weaknesses to inform future research.

During the course of its work, WG 3, as it deems necessary, may expand on the tasks listed above.

Leadership

Sweden and the United States will serve as co-chairs of WG 3.

Timeline

The initial program of work will take place over the course of approximately 18 months. Completed work will be briefed to the IPNDV Plenary in late 2017.