



Technology Gaps Identified

IPNDV Working Group 6

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In Phase II of the International Partnership for Nuclear Disarmament Verification (IPNDV), the Working Group on Technologies for Verification (Working Group 6, WG6) focused on identifying and evaluating key verification technologies across the IPNDV's 14-step dismantlement framework. WG6 reviewed requirements for information barriers to protect proliferation-sensitive information when using some verification technologies and evaluated key verification technologies based on the findings from Phase I, where gaps were identified in the ability to detect and monitor a nuclear explosive device and its key components.

Based on its previously determined technology requirements, the Working Group identified several areas for which technologies either need to be developed or re-engineered to possibly be used during the 14-step dismantlement process. The technologies and methodologies that do not currently exist and need to be developed are:

- Detection of explosives in a closed container using a method that is not a technology based on swipe samples or is destructive to the container or its contents;
- Quantification of the threshold mass of explosives in a closed container that may contain additional contents;
- Methods for detecting nuclear weapons in a specific location within a large facility or within a building on a site with many buildings while walking or driving near the location;
- Passive measurement of uranium isotopics and threshold mass in a closed container;
- Sweeping and absence measurements for HEU, particularly during Step 8.

The technologies and methodologies that currently exist but need additional development or engineering are: Methods for detecting explosives in a room from a distance;

- Development of additional nuclear weapons template methods beyond the radiation-based ones that currently exist;
- Development of information barrier methods that can be used with a variety of monitoring methods; and
- Evaluation of potential nuclear weapon intrinsic signatures before and after dismantlement.

Most of these items were previously identified during Phase I of IPNDV. Over the course of Phase II, the state of technologies within these areas have not advanced significantly to remove anything from the Phase I list.

This is a product of the IPNDV Working Group 6: Technologies for Verification. For more information on the IPNDV Working Groups, please see www.ipndv.org/working-groups.

About the IPNDV:

The IPNDV is an ongoing initiative that includes more than 25 countries with and without nuclear weapons. Together, the Partners are identifying challenges associated with nuclear disarmament verification and developing potential procedures and technologies to address those challenges.

The IPNDV is working to identify critical gaps and technical challenges associated with monitoring and verifying nuclear disarmament. To do this, the Partnership assesses monitoring and verification issues across the nuclear weapon lifecycle.

The IPNDV is also building and diversifying international capacity and expertise on nuclear disarmament monitoring and verification. Through the Partnership, more countries understand the process, as well as the significant technical and procedural challenges that must be overcome. At the same time, the Partnership is highlighting the importance of verification in future reductions of nuclear weapons.