



Summary Report
of the IPNDV Joint Working Group
Meeting - Seoul, Republic of Korea
July 10-12, 2018



The International Partnership for Nuclear Disarmament Verification (IPNDV - “the Partnership”) held a Joint Working Group meeting under its Phase II in Seoul, Republic of Korea July 10-12, 2018. Nearly 90 experts from 21 countries and the European Union participated. This was the second meeting for the new working groups constituted under Phase II and saw continued progress by the three working groups in their respective work plans.

The Partnership continued discussions under its Phase II work program and began initial planning related to a set of exercises and technology demonstrations planned to take place during Phase II. Summaries of the outcomes of each of the Working Groups and the Exercise/Demonstration Planning Group follow below.

Working Group 4: Verification of Nuclear Weapon Declarations

As agreed upon during the previous meeting in Stockholm, Working Group 4 updated three papers that further fleshed out the role of declarations in nuclear disarmament, how declarations fit into different disarmament categories, and possible types/options of declarations of nuclear weapons. The conclusions from the discussion on these updated papers will be combined to serve as the introductory section of the group’s final deliverable document for Phase II. A first draft of that document is planned to be presented at the December plenary meeting. Working Group 4 also continued its deep dive examinations of declarations arrangements of existing treaties (specifically, the Chemical Weapons Convention (CWC), Conventional Armed Forces in Europe (CFE), and Strategic Arms Reduction Treaty (START) family of treaties), further drawing out applicable elements from their respective verification regimes that could be of use in a future nuclear disarmament agreement.

In addition to revisiting these updated papers, Working Group 4 prepared seven new papers in advance of the meeting, including papers on declarations arrangements within IAEA safeguards and the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC), the concept of “nuclear cultural anthropology”, the utilization of unique identifiers under the New START Treaty, and UK collaborative exercises.

At the December plenary, Working Group 4 will conduct a table top exercise that would utilize ideas and concepts from the existing CFE verification regime and test them against a pre-determined scenario. In addition, the group will hold discussions on four new papers, extending previous work on transparency, and covering weapon, and site-specific and state-wide issues to address verifying correctness and completeness of declarations on nuclear weapon numbers.

Working Group 5: Verification of Reductions

Working Group 5 made good progress in identifying the inspection concepts, requirements and tasks for verifying reductions in nuclear warheads based on the [14-step process](#). While Phase I focused on steps 6-10 of that process (examined in detail in the [Geneva walk-through](#)), Phase II breaks new ground on inspection measures to observe the removal of warheads from their

associated delivery vehicles as well as on verification of transportation and storage of warheads and their dismantled components. A theme in discussions was the need to conduct inspection tasks based on a systematic approach to verification. Such an approach could be designed around a logical model for the 14 steps (similar in principle to the IAEA's physical model for safeguards). The group had an initial discussion of the timing and frequency of verification activities to confirm that the attributes of each item subject to verification (containerized warheads or components) is consistent with its declared identity. The Working Group also explored whether there could be some "economies in implementation" of given inspection activities.

Working Group 5 considered how best to integrate its products with those of Working Group 6. A productive discussion was held with Working Group 6 on disposition (Step 14). An important question for discussion is where in the process might nuclear material first be in a form that could be placed under IAEA safeguards. Verification at step 14 should give assurance that the nuclear material is no longer available for use in weapons. However, Working Group 5 noted that a future verification agreement would need to include explicit commitments on irreversibility with all 14 steps in mind.

Questions were posed on how verification should apply to high explosives and other weapons components from a dismantled warhead. Further discussion is required; however, the working group considered that arrangements to monitor the long-term storage of high explosive material would not be needed.

The United States and Australia will draft a narrative for the 14 Steps that connects and integrates the work done by Working Group 5 to date with the results of Phase I regarding steps 6-10. This product would also provide a basis for the conduct of the 14-step walkthrough exercise planned for the end of phase II.

Working Group 6: Technologies for Verification

Working Group 6 continued its detailed technical discussions further building a "toolkit" of potential technologies that could be applied to the procedures at each of the 14 steps in the nuclear weapons dismantlement process. In order to do this, the group discussed several critical scenario assumptions at each of these steps, particularly on obtaining baseline data during steps 1-4 that a treaty limited item is a nuclear explosive device. Working Group 6 examined mapping documents prepared by Working Group 5 with a view to better integrating the two groups' work. Additionally, Working Group 6 continued populating a comprehensive technology matrix with more than 15 surveillance, containment, and identification technologies that can be applied across each of the 14 steps.

There were several presentations from experts to share work that is being done internationally and identify critical information that could be applied to the Partnership's technology investigations. These included:

- A presentation from the United Kingdom about its nuclear weapons enterprise and where steps 1 and 2 take place in the UK;
- A presentation from Germany about radiowave spectrometer technology and its potential applications in the dismantlement process;
- A presentation from Hungary about Hungarian capabilities and multiplicity spectrometer technology;
- A presentation from Japan on a computer simulated verification technology using a hypothetical nuclear explosive device;
- A presentation from the United States on the U.S.-Russian HEU Agreement and lessons learned that can be applied to the Partnership's work; and
- A presentation from Finland on improved confidence to address Phase I technology gaps by providing design options for dismantlement room verification measurements.

Two potential technology demonstrations are being planned by members of Working Group 6. One technology demonstration, hosted by Belgium, would use actual nuclear material to demonstrate technologies for the detection of the presence and absence of plutonium. A second technology demonstration, hosted by Canada, would focus on muon tomography. The Working Group 6 planners agreed to provide updates on technology demonstration planning at the upcoming plenary meeting at the end of 2018.

Joint Working Group Sessions

Working Group 5 and 6 held two combined sessions. The first combined session considered a proposed deep dive exercise of step 14 (disposition), coordinated by the Japanese, and the exercise of procedures at step 8 (dismantlement), coordinated jointly by France and Germany. The second session took a more detailed look into step 14 than had been done by the group before. Working Group 5 also provided a list of questions to Working Group 6 that will help inform both groups' work regarding identification of technologies for use in verification activities. More combined sessions are planned for future meetings, as well as work to address questions about overlapping work between the working groups.

Exercise/Demonstration Planning Group

The Exercise/Demonstration Planning Group continued its work coordinating several proposed exercises and technology demonstrations planned for Phase II. The group met twice in Seoul and heard from the hosts of the Franco-German Step 8 Deep Dive exercise planned for next year. Germany host this exercise at the Forschungszentrum Jülich. Further discussions were also held regarding the conduct of the comprehensive Step 1-14 Walkthrough exercise which will tentatively take place in June or July 2019. Finally, the group reviewed proposals by Belgium and Canada to conduct separate technology demonstrations as highlighted above in the WG6 summary. During the intersessional period, the group will continue its coordination efforts, in particular working with experts to identify participants needed for the various exercise and demonstration activities planned.

Summary

The meeting in Seoul continued the productive work of the working groups in Phase II. With substantial intersessional work planned, the working groups will be well positioned for the mid-phase stock-taking planned for the end of year plenary, and will finalize specific tasks and products to be developed by the end of the phase in December 2019.

