



# Summary Report of the IPNDV Joint Working Group Meeting - Stockholm, Sweden

March 26-28, 2018



The International Partnership for Nuclear Disarmament Verification (IPNDV - “the Partnership”) held the first Joint Working Group meeting under its Phase II in Stockholm, Sweden, March 26-28, 2018. More than 90 experts from 21 countries and the European Union participated. This was the first meeting for the new working groups constituted under Phase II and afforded the first opportunity for the groups, under the leadership of their respective co-chairs, to begin to scope their work plans for the next year.

The Stockholm meeting also saw the participation of three new countries in the Partnership: Hungary, Nigeria, and Pakistan<sup>1</sup>. As members of the newly-formed Group of Governmental Experts to Consider the Role of Verification in Advancing Nuclear Disarmament (“the GGE”), these countries were invited to participate in order to gain an understanding of the work of the IPNDV as it relates to the GGE, and to determine their interest in joining the Partnership. The IPNDV includes other longtime participants who are also members of the GGE.

Finally, the Partnership began discussions about a set of potential exercises/demonstrations that could 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**

**Co-Chairs: The United Kingdom (David Chambers) and Poland (Marek Sobótko)**

Working Group 4 (WG4) opened its session with a review of planned milestones for the group, detailing the topics to be covered over the course of Phase II. The group discussed eight papers prepared by Partners in advance of the meeting. Initial discussions focused on the role of declarations in nuclear disarmament, to give context for more detailed discussions on warhead baseline declarations on which the group will focus their efforts. The group then looked at papers on previous regimes, to see what applicable elements and lessons could be learned including from the Conventional Armed Forces in Europe (CFE) Treaty, the START family of treaties and the Chemical weapons convention (CWC). WG4 agreed to develop short follow-on papers on these existing verification regimes, focused more narrowly on key elements of declarations and their verification that could be relevant for future nuclear warhead baseline declarations.

WG4 then reviewed papers on types, descriptors, and other terms relating to nuclear weapons to see which would add value in baseline declarations. This included terms related to the physical operation of the weapons (fission and fusion), operational aspects such as delivery vehicles, and doctrinal descriptions, such as operational, strategic, or reserve. While it was clear some of these may add transparency or confidence building aspects, there was limited value for

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<sup>1</sup> Pakistan participated as an observer.

verification purposes, as little would be able to be confirmed by inspectors. The group also looked at the types of sites where inspectors would likely be required to verify such declarations, using overhead imagery of historical sites to understand the facilities and challenges that inspectors might face.

Finally, WG4 took an initial look at what baseline declarations may consist of and how the disarmament scenarios under which they may take place would affect them. WG4 also identified several new topics to explore which will result in papers on IAEA site declarations, the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) Arrangements, exploring “Nuclear Cultural Anthropology,” and the implementation of unique identifiers. The latter paper will be cross-coordinated with Working Group 6. The co-chairs will also be leading the effort to develop possible tabletop exercise options and scenarios and a Phase II concept paper to guide the work of WG4 throughout Phase II.

### **Working Group 5 - Verification of Reductions**

**Co-chairs: The Netherlands (Piet de Klerk) and Australia (Rob Floyd)**

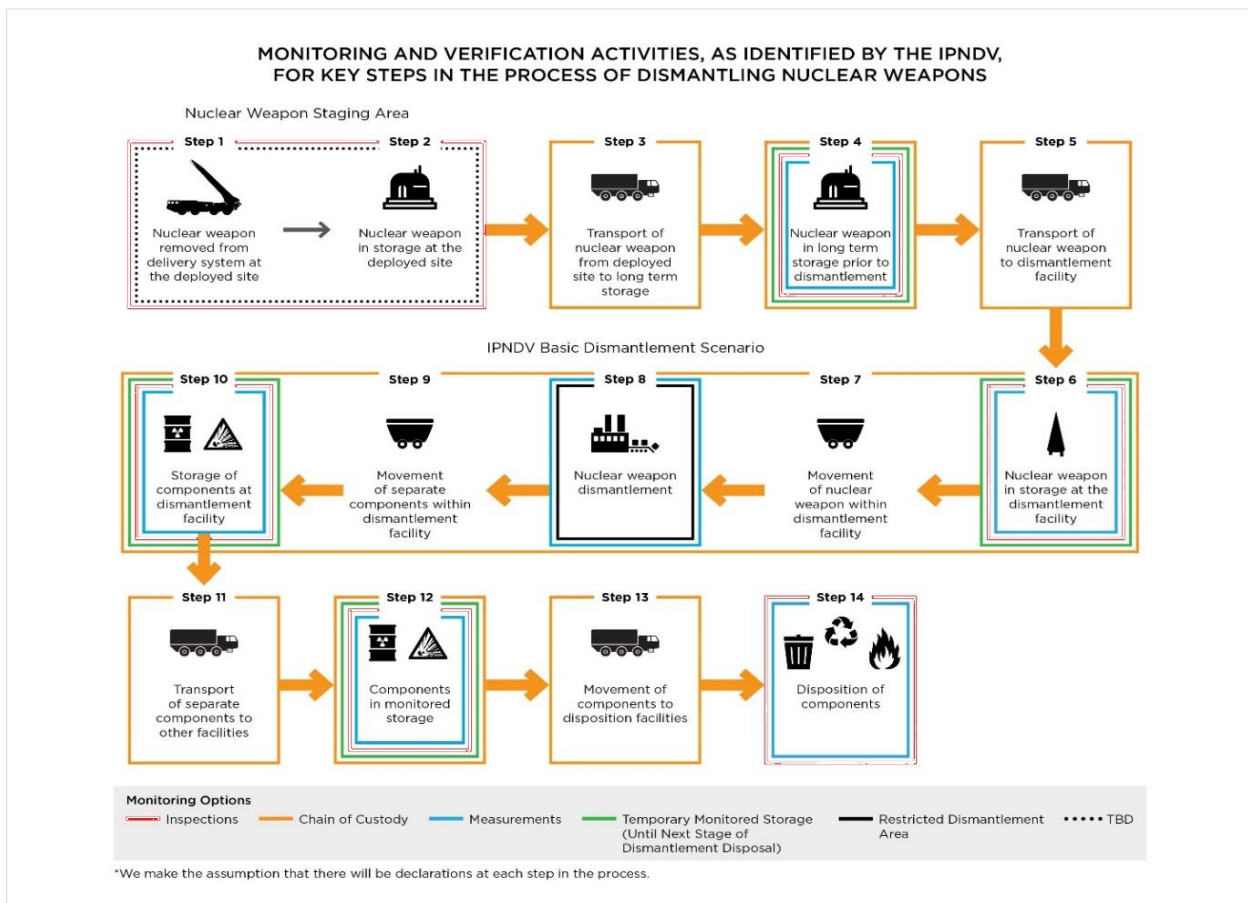
Working Group 5 (WG5) initially reviewed papers prepared by Partners in advance of the meeting on how to develop mapping of verification requirements across the 14-step dismantlement process (Figure 1). The members agreed to base their broader work in Phase II on a framing template and set of questions. Despite analyzing the 14 steps individually, members noted the need to consider all 14 steps holistically when assessing confidence gained, as the results from one step of verification should carry over into subsequent steps. The members also discussed how they should focus on each of the 14 steps, which range from the removal of nuclear weapons from deployed delivery systems to the disposition of dismantled components. Although all wanted the group to have the most complete focus possible, several members noted that initial reductions would be likely to occur beginning with weapons in storage, rather than deployed weapon systems, and therefore steps 1 through 3 may not be applicable in all cases.

Sample analyses for step 5 by Australia and for step 8 by the United States and Canada based on a draft framing template, identified the key objectives, verification requirements, tasks, risks, and potential pathways for diversion within each of those steps. WG5 subsequently grouped each of the 14 steps into five buckets dealing with: transportation, storage, dismantlement, removal from delivery vehicles, and disposition. It subsequently tasked write-ups for what would be necessary at each step to members, with the goal of having an initial analysis of the requirements across the entire 14-step process, broken out by step, at the next Joint Working Group meeting in July.

WG5 also considered whether it should consider the 14 steps in the context of the dismantlement of a single nuclear weapon, or multiple weapons. The group observed that although there are different potential disarmament scenarios, practical reality suggests that dismantlements may occur serially. The United Kingdom proposed utilizing the context provided within the Quad Initiative to help guide WG5’s work by developing a similar case study. This will help focus the group’s assumptions and facilitate its analysis of the verification requirements within the 14 steps.

WG5 also received several presentations that examined various initiatives which may have applicability to the group’s work. These included: a presentation by Pavel Podvig of UNIDIR about his proposal on “deferred verification;” a presentation by the United States on its experience with the HEU Purchase Agreement; a presentation by the United Kingdom on the Quad Initiative, and the related “Letterpress” exercise; and a presentation by Japan on fissile material disposition options. In light of these presentations, WG5 began a discussion of how it should address verification requirements for post-dismantlement disposition of nuclear material.

**Figure 1: 14 Steps in the Nuclear Weapons Dismantlement Lifecycle**



## **Working Group 6 - Technologies for Verification**

**Co-chairs: Sweden (Jens Wirstam) and the United States (Michele Smith)**

Working Group 6 (WG6) continued its detailed technical discussions focused on developing a toolbox of potentially applicable technologies that could support future verification of nuclear weapon dismantlement. The group discussed technology gaps identified in Phase I and considered ways to make progress on work in Phase II, including plans for a potential technology demonstration. Members heard five presentations that detailed new detection technologies and lessons learned from the Quad Initiative's "Letterpress" exercise.

Throughout Phase II, WG6 will consider potentially applicable technologies at steps 1-5 of the 14-step process, when the nuclear warhead is removed from deployed delivery systems and placed into interim long-term storage before dismantlement, and at steps 11-14, when the fissile material and the high explosives are separated after dismantlement and are disposed of. The group is considering how different classes of technologies – those supporting chain of custody and radiation detection specifically – could be used in combination across the steps in order to strengthen the confidence in the dismantlement process. To this end, the group spent considerable time identifying specific chain of custody-related technologies that could be used in steps 1-5 and populating a comprehensive technology matrix which details aspects of more than 15 surveillance, containment, and identification technologies.

As next steps, working group members will prepare a paper on initialization options at step 1 or step 4 and a presentation on safety and security aspects in relation to steps 1 and 2 for the next meeting. WG6 members will also continue to consider technology applications throughout steps 1-5 and 11-14 and populate technology matrices for chain of custody and other technology monitoring options of warheads and their components. WG6 members hope to incorporate input from other working groups at the next Joint Working Group meeting in July.

### **Exercise/Demonstration Planning Group**

The Exercise/Demonstration Planning Group met twice during the Stockholm meeting. The Group is coordinating the planning of several exercise/demonstration activities focused on the 14 steps of the nuclear dismantlement process. The capstone exercise activity will be a tabletop walkthrough exercise similar to the one conducted in Phase I (<https://www.ipndv.org/reports-analysis/walkthrough-exercise-summary-report/>) that addresses all 14 steps. In addition, Germany is planning a "deep dive" activity focused on step 8 to be conducted in the spring of 2019. Finally, a proposal was made to conduct a "deep dive" activity on step 14.



The group discussed possible objectives of the walkthrough exercise and how to connect deep dive activities to that larger effort. The group also discussed the timetable for exercise planning and conduct, aimed at completing the exercise/demonstration activities ahead of the 2019 Plenary. The group agreed to conduct the walkthrough exercise at the Joint Working Group meeting to be held in June/July 2019. Following completion of the walkthrough exercise a report will be issued and briefed at the 2019 Plenary meeting. The group agreed to conduct the Step 8 deep dive in the March-April 2019 timeframe, associated with the Joint Working Group meeting planned for that time. The results of this deep dive will be included with the overall walkthrough exercise report.

The proposal for a deep dive activity related to step 14 involved how to either convert fissile material with classified characteristics into an unclassified form, or to dispose of the classified material in a way in which detailed measurements of the material are not required. During Phase I, the IPNDV had not addressed the classification issue and so have not addressed potential solutions to this sensitive and important problem. As a result, the Partners could conduct a deep dive into the issue in order to better understand what the classification issues are and how to potentially address them.

This proposal would review and better understand how classified characteristics of plutonium have been dealt with previously, and address whether the same methods could be employed in the Partnership's Phase II work. If not, then the Partners could look at the blending process that could result in unclassified outputs (such a process would have fewer verification challenges), or look at disposition methods in which all declared material was disposed, but the details of that material remain classified. This work would also consider how U.S.-Russian materials down-blending agreements have worked previously.

## **Summary**

The meeting in Stockholm served as a productive beginning for the work of Phase II. While there remains a great deal to be done, the Working Groups took strong, positive steps towards further refining their work plans. At the 2018 Plenary, the working groups will review their progress from the first half of Phase II and will finalize specific tasks and products to be developed by the end of the phase in December 2019.