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Conference report

WMD Verification: global capacity challenges

Monday 9 – Wednesday 11 June 2014 | WP1256

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Do we have the qualitative and quantitative capacity to implement global verification? That is to say, the means to achieve the end? What will be the future paths for verifying WMD agreements? What opportunities does technology offer and how can they be seized? Is it possible for the verification enterprise to be 'crowdsourced', and the public, community groups, and interested individuals to become part of monitoring and verification? How can and should the IAEA evolve, and be prepared for handling a disarmed world? What are the challenges posed by warhead dismantlement and fissile material disposition? What is the future of nuclear safeguards? How can verification techniques be applied in a cross-disciplinary context such as the Middle East WMD-Free Zone? What are the verification implications of the Syrian case?

Key points

- New verification approaches will likely fail if they aim at bringing about rapid change in a challenge environment. The US-UK initiative shows that cooperative step-by-step approaches and thinking ahead are more favourable to long-term progress.
- In the nuclear field it is crucial for global capacity building to bring non-nuclear weapon states on board and to promote multilateralism.
- There is no single approach to verification. Only complementary tools can constitute an effective verification system. Societal verification can apply in areas that are difficult for conventional mechanisms to cover.
- Regional cross-sector verification under a single overarching agreement requires full endorsement of all existing verification regimes, preliminary confidence-building measures in order to eliminate the obstacle of national security.
- The future role of the International Atomic Energy Agency (IAEA) will extend beyond the verification of peaceful nuclear activities. There can be a role for it in nuclear disarmament verification.
- The Syrian civil war has tested the CWC and brought flexibility to it. Further, the Organisation for the Prohibition of Chemical Weapons (OPCW) needs to be strengthened and provisions for attribution made.

"The verification community often finds itself unprepared for new solutions and hence slow to take advantage of them"

Introduction

Developing innovative solutions in the field of WMD verification can be more challenging than it might seem. While new opportunities emerge and more sophisticated technologies become available, the verification community often finds itself unprepared for new solutions and hence slow to take advantage of them. There is however no shortage of ideas. New models such as the inclusion of open-source data and social media into the verification process and the establishment of a cross-sector verification regime in the Middle East show

great potential. However, a lack of political will tends to hinder their implementation. Still, steps can be taken to help build global capacity, form alliances and challenge old assumptions to facilitate the identification of common denominators on how to deal with outstanding challenges.

"Collaborative work on warhead verification should start now so that we are prepared if political change comes suddenly."

Verification in the nuclear field: past experiences and the future role of the IAEA

Warhead Verification

1. In the absence of a specific treaty on warhead dismantlement, the US and the UK initiated the Joint Work on Warhead Verification programme in October 2000. Although the Nuclear Non-Proliferation Treaty (NPT) served as a basis for this initiative, its objective was to design an independent verification regime specifically for warhead dismantlement. In its early stages the initiative explored the feasibility of allowing other nuclear weapon states (NWS) access to nuclear facilities without divulging domestic security sensitivities. Initially, the idea of granting foreign inspectors access to national facilities was met with concern. The questions of what needed to remain secret, what could be shown and how staff could be trained to interact with inspectors remained open. Yet managed access, a concept borrowed from the challenge inspection model of the CWC, paved the way for technology and chain of custody development.
2. The realisation that it is very difficult to provide proof of effective dismantlement without giving away sensitive information was very important for the refinement of verification technology and methodology. Furthermore, dangerous military information could be exposed, such as designs which others could use to respond. Ironically, the classification guide itself is classified ('there is a red line in explaining what is a red line').
3. The US-UK initiative showed that while facilities and nuclear weapons can be similar in NWS, nuclear programmes can be very different in operational terms, something which requires a mutual learning process. It is significant to note that political issues were not addressed during the first ten years of the exercise. However, verification exercises were later conducted in real nuclear facilities as opposed to mock-up ones which allowed a better understanding of respective national standards.
4. The UK is in a unique position as it has collaborated with both a NWS (US) and a NNWS (Norway) in verification efforts. The information barrier with a NWS is smaller, which facilitates initial discussions, and makes it easier to investigate technologies and conduct exercises. In contrast, with Norway there was an enormous learning curve, because capacity building started from a much lower point.
5. The two-year Verification Pilot Project of the Nuclear Threat Initiative resulted in three reports, the third one calling for global capacity building. Verification is a field in which all states can contribute, and while not all have equal roles, equal access to information or equal interest in participation, all have something to gain. Involving NNWS in the process is the way to move forward, but the UK-US project showed that sharing information even between NWS is fraught with difficulties.
6. Why do these initiatives stop at dismantlement? The US-UK separated out fissile material but did not proceed to its destruction. There is a potential to expand the scope of the initiative by bringing NPT member states on board. This would allow the application of IAEA safeguards to the storing and monitoring processes once the weapons have been successfully dismantled. US-UK try to use them where they can but there are always going to be challenges in doing so.
7. There is no single approach to verification; only the sum of complementary tools can constitute an effective verification system. As the numbers of warheads decline, the consequences of uncertainty grow more profound. Collaborative work on warhead verification should start now so that we are prepared if political change comes suddenly. A new framework is needed for sensitive information. Each country should

be able to re-evaluate what information is sensitive and should be protected. Capacity building does not just imply ad hoc technical training; it needs to be a dedicated long-term process. Lessons learned and knowledge accumulated from twelve years of experience of UNSCOM and UNMOVIC can serve as a foundation.

"A great opportunity was lost through the demise of the TI"

The Trilateral Initiative: IAEA verification of classified forms of weapon-origin fissile material

8. The Trilateral Initiative (TI) between the US, Russia and the IAEA was born during the 1996 IAEA General Conference and came to an end in 2002. Its principal objective was nuclear disarmament, rather than non-proliferation, and verification under the TI consisted of the monitoring of storage, transfer and conversion of weapons-origin fissile materials which after declassification were verified under normal IAEA safeguards.

9. The NPT provided the legal framework of the TI.The Agency is authorised to apply safeguards at the request of States parties under Art. III A5 of its statute and possesses a mandate to further the establishment of safeguarded worldwide disarmament under Art. III B1.The two States Parties voluntarily submitted fissile materials to the Agency and could not withdraw them until termination of the verification process. The obligation of the IAEA consisted of the non-discretionary application of safeguards to the submitted materials. This process was intended to promote confidence that fissile materials remained irreversibly removed from NW and other military uses.

10. The TI began as a feasibility study. However, as progress was made, steps were taken towards its implementation. Point 8 of the 13 points adopted at the 2000 NPT Review Conference called for the completion and implementation of the T'. Negotiations on a model agreement began and press releases at the IAEA General Conference increasingly pointed to completion and implementation. The IAEA Press Release 2001/1 sounded like a promise of the parties to discuss and oversee the implementation of the TI, but in the event no such discussions took place. A year later, at the IAEA General Conference the decision was made to revert to the original feasibility study format, which led to the demise of the TI.

11. A great opportunity was lost through the demise of the TI. Nevertheless, the TI not only brought technological advances but also a basis of a legal framework. Even if it has stagnated it is in a position to inspire other NWS. It could be taken up by two to three other friendly states to help the TI regain prestige. Possibly recent discussions would be different in the current context.

12. What is the value of trilateral as opposed to bilateral agreements? Important issues were avoided in an attempt to reach consensus. The US and Russia were not ready to accept irreversible commitments on a matter that was not symmetrical. The Plutonium Management and Disposition Agreement (PMDA) was signed in 2000 and entered into force, yet nothing has happened since then. There are still bilateral agreements between the US and Russia and respective initiatives with the IAEA, but these efforts remain on a technical level. On the political level, both countries continue to lie and break promises.

13. Can the trilateral agreement work without completeness? It was never about completeness. It never aimed at challenging a state to provide full information. The model verification agreement was never made public. It is more of a confidence-building agreement. There is a divergence in what countries are willing to provide. For this reason, separate agreements of Russia and the US with the IAEA instead of a trilateral agreement would make it easier to find the lowest common denominator.

The Future of the IAEA and Nuclear Safeguards

14. Past experiences of the IAEA such as in Iraq, South Africa and Libya have demonstrated its ability to respond immediately to verification tasks, to effectively collaborate with other organisations like UNMOVIC and to constitute a forum for verification experiments. The fundamental role of the Agency is to match technical

expertise with political experience and to make declarations on the compatibility of nuclear activities with IAEA safeguards.

15. Since its mission in Iraq the philosophy of the Agency has changed and its rights have expanded. A role for the IAEA can be seen in the organisation of international verification initiatives. With the support of the Agency 'red lines' can be pushed back and classified sensitivities identified.

16. There is also a strong debate on the necessity of expanding the Agency's mandate in order to give it a role in nuclear disarmament. Strong opponents of such an expansion argue that the Agency only has a role that is strictly limited to safeguarding activities in the area of peaceful nuclear energy activities and should not get involved in the verification of nuclear disarmament.

17. According to others, the absence of discretion on peaceful or military use of nuclear materials in the Statute of the IAEA implies a role for the IAEA in disarmament. If this task is given to the Agency, it will be complementary to the activities it already carries out. If it is given to another organisation, there will be a competition. The true obstacle in the way of a clear role is not the mandate but a lack of political will. NWS want to avoid non-proliferation and disarmament mirroring each other; they will therefore suggest a separate format for disarmament.

18. In such a case, the State-Level Concept (SLC) which considers a state as a whole as opposed to individual facilities could have a small window of opportunity. Application of the SLC would offer the possibility to increase the understanding of the IAEA's work. The underlying problem of the SLC is that IAEA member states have different ideas of what it covers. However, according to the Agency's Director General, SLCs will have to apply to all states in the long run; NWS as well as NNWS. If that is the case, the SLC can be a small but important contribution to verification.

19. Other potential roles of the IAEA can be identified. In view of a stalemate in the negotiations of a nuclear disarmament convention the Agency will have to play a managerial role. Further, the IAEA can play an advisory role in assessing the impact of nuclear weapons on the humanitarian dimension.

"In the light of the events in Syria, the OPCW should be strengthened"

Syria: a crisis of confidence for the CWC?

20. The war in Syria has challenged the CWC and put the OPCW under a lot of pressure. The CWC is not prepared for conflicts like Syria: it does not provide any guidelines on how to conduct verification in hostile contexts. Syria is the first time that the OPCW has to verify in an on-going war while not having access to all parts of the territory.

21. The CWC does not contain any provisions for attribution. It is designed to prevent public knowledge, which explains why the openness of UNSCOM cannot be found in the OPCW. No official attribution of responsibility for the use of chemical weapons was made in Syria but many voices in the international community alluded to it. While monitoring is a technical process, attribution is a political process and an emotional decision. For these reasons there needs to be another forum for attribution than the population. The International Criminal Court (ICC) could provide an environment in which it may become possible.

22. The seriousness of the Syrian case brought flexibility to the CWC regime. Accelerated destruction, taking the destruction process out of Syria and prevention of 'cherry picking' inspectors have limited the extent to which the verification process can be delayed. Still, further flexibility is needed and the CWC regime needs to be kept technically abreast of events. After the discovery of the Iraqi WMD programmes in 1991, the Additional Protocol to the NPT was adopted to strengthen the role of the IAEA. In the light of the events in Syria, the OPCW should be strengthened in a similar way. Today it still needs to rely on the old methods of the Secretary-General approach with a number of restrictions.

23. Possible strengthening factors include the creation of an Additional Protocol to the

CWC, an example set by the US and Russia by destroying their own chemical weapons stockpiles, agreement of technical issues such as the level of intrusiveness of inspections, full support of the international community and the chemical industry, going beyond producing facts and aiming at attribution or an update of the Secretary-General's mechanism.

24. The CWC does not mention a chain of custody. During investigations in Syria a lot of conflicting information was collected through the Secretary-General Mechanism, Syrian declarations and the ICC investigation. Evidence from different countries pointing in different directions is not useful. In contexts where evidence is rare or conflicting it could play an important role. Can a system be created to make it possible to have a chain of custody even in the absence of inspectors?

New approaches to verification

Verification in an information age: challenges and opportunities of societal verification

25. The images of the chemical attacks in Syria were first shown on YouTube and were thus influential in triggering a quick and strong reaction on the part of the international community. Whistle-blowers are capable of revealing highly classified information about WMD and other activities of governments. The combination of freely available information from satellite images, press statements, defector accounts and even photos uploaded on Facebook can help to recreate an event that has happened. The emerging concept of societal verification suggests that enormous amounts of open-source data, if processed efficiently and in a focused manner, can constitute a valuable tool for verification processes.

"The emerging concept of societal verification suggests that enormous amounts of open-source data, if processed efficiently and in a focused manner, can constitute a valuable tool for verification processes"

26. The social networking and microblogging service Twitter shows great potential for providing existing verification regimes with an additional layer of information. It allows the targeted detection and characterisation of events on which information exists. More importantly, the interpretation of so-called 'clustered bursts' of certain terms can facilitate the prediction or reconstruction of events on which no prior knowledge exists. In addition to the identification of hard events that are actually occurring, soft events such as attitudinal shifts can be revealed; a tool that has been used in the political field in the past to better understand electors. 500 million tweets per day including very detailed profiles of users are freely available at no cost. While the example of Twitter shows that social media deserves the attention of the verification community, the strong debate surrounding the credibility and risks of reliance on social media in the field of arms control illustrates the scepticism about its utility as a verification tool.

27. Unconstrained events are not very well reported. Therefore, not all events can be detected and where this is possible, their nature often remains unclear. Furthermore, the generational character of social media excludes not only a large number of data samples from non-users but also draws a line between users in responsible positions and those who are not ('serious men don't tweet'). It can be argued that effective civil monitoring is only possible in democratic states. Societal verification lacks a framework of its own which determines the collection and use of data. These issues lead to the questioning of the validity of information collected through social media.

28. A possible methodological reaction to the problem of the authentication of this kind of information is the overlay of multiple sources; the synergy of sources which on their own would be insignificant. These findings must be considered complementary to those of existing regimes, not a duplication of efforts. Civil society has an important role in areas which are difficult for established verification organisations to cover. The exact value of societal data and its incorporation into existing verification mechanisms, however, remains unclear.

29. A large amount of data does not necessarily mean a large amount of knowledge. In order to determine an important element in a torrent of data we can transfer the analytical burden onto a computer, filter out irrelevant information and turn the flood into

a more manageable amount.

30. Countries are averse to the idea that their internal activities are monitored. Thus, it is to be expected that in a quickly evolving field like information technology, societal monitoring will soon be met with counter-measures. The growing incorporation of open-source information into the verification process will likely be seen as a provocation for states to make licit activities, infrastructures and facilities appear illicit. Data poisoning and large-scale tampering with information will render the authentication process even more difficult. The Soviet case of disinformation shows the need for independent streams of matching information. Finally, the risk of intelligence gained through false whistle-blowing must not be underestimated.

31. Lag time of reactions to cheating of up to several weeks due to lengthy data analysis processes can be dramatically reduced through the growing interaction of conventional and new verification methods. Societal verification does not encounter political obstacles or require permissions to get access to a state's territory. For instance, research and processing of Twitter data could run continuously. It would write an instant history and bring a new element to verification. Disarmament will no longer take place on a 'lessons learned' basis, but will make instantaneous intervention possible.

32. An important policy problem that remains is 'after detection – what?' In cases like Syria, can people using social media be educated to make their data usable in the case of prosecution? Some argue that societal verification is not verification; it only points out things that are not as they should be. It is not preventing anything but rather draws attention to critical things which can have an influence on decision makers. What does this enable the verification community to do which intelligence agencies could not have done? How is this transformative? Not only users but also governments need to be convinced of its value in order to increase its effect as a deterrent.

33. While assessing the benefits and challenges surrounding this new type of research we must bear in mind that it is very young and very weak. It has no memory and is allocated very little resources and attention. Still, it can be directed in ways that can be used for WMD verification. Technological experts must be educated in the field of non-proliferation and the non-proliferation community needs to build a bridge to data experts. The way forward requires the building of new alliances and the combination of skill sets. Societal verification isn't mature yet. It cannot constitute an independent means of verification. But it deserves attention and its potential for arms control must be explored.

Cross-sector verification: the Middle East WMD-Free Zone (WMDFZ)

34. A new approach to verification of WMD is currently being explored on a regional level in the Middle East. Convergence between goals and common elements of all three WMD verification regimes raises the question whether is it possible to verify all three sectors in one single overarching regional agreement, an idea first proposed by former Egyptian President Mubarak in 1990 and endorsed by NPT States parties at the 1995 NPT Review Conference.

35. Examples of comparable activities of verification bodies are: declarations of sites and activities, routine inspections in IAEA and OPCW to declared sites, possibility of 'special inspections' and 'challenge inspections', hosting remote sensing capabilities on national territories and the use of inspection equipment on site, none of which are comprehensive.

36. There is a common understanding that at this point in time all three WMD agreements cannot be verified under such an agreement. The Middle East WMDFZ (the Zone) is only an ideal concept which is not operational yet. What are we talking about when we discuss the Zone? Its scope and implications are ill-defined which leads to a series of open questions.

37. The Zone would need an appropriate and equipped body to verify. There are already four separate instruments (IAEA, OPCW, CTBTO and the Secretary-General

Mechanism) whose authority would be difficult to replicate. Reinventing the wheel would be a waste of time and resources. Every sector has relevant verification mechanisms which work more or less efficiently. However, they are insufficient for a watertight and overarching verification regime covering all three.

38. Four countries in the region have not signed the CTBT. Even when it enters into force the non-signatory is simply excluded. So it will have a limited impact in the ME. It is an important part of the verification architecture, which needs to be ratified as soon as possible by remaining states. Only if existing arrangements are supported and developed can there be an opportunity for an overarching agreement.

39. The fundamental question of national security is an important complicating factor. The lack of trust in the region leaves its countries dissatisfied with only challenge inspections. Still, they have almost become a taboo because of the fear of not finding anything. A country that challenges another's compliance has to be absolutely certain that it will find something due to the political implications of such inspections. Conducting them on a routine basis could possibly eliminate this fear as this would show that 'challenge' does not imply that an inspection is 'out of the ordinary' or an accusation.

40. If countries in the Middle East wish to include enrichment as a right, it will need to be limited. A Zone with enrichment capacities would be counterproductive. Moreover, delivery systems are often forgotten. What is a delivery system free zone? We have a clear definition of nuclear chemical and biological weapons but not of their delivery systems. The problem is that countries agree that NCBW will be used in defence if deterrence fails. Although missiles are offensive and not defensive weapons, the means of delivery will not disappear anytime soon.

41. International organisations and countries in the region are very suspicious of each other. What can be done to create an environment that allows the implementation of such a zone? The most important element the region needs is political will and leadership to contain the political climate of distrust. A lot of the technical work on an expert level can start to build confidence, such as ballistic missile inspections, inspections of dual-use facilities and the construction of an IMF station. Sensitive technical issues can and need to be addressed now. Through preparatory work and exercises, shared assumptions, behaviours and common understanding will emerge which will help transform the region's regulatory environment into a culture of security.

42. There are currently cooperative efforts in the Middle East. The Integrated Field Exercise 2014 (IFE14) in Jordan is the first large-scale cooperative multilateral arms control verification exercise in the ME. It underscores the value of cooperation at a technical level. Since 2010, a task force explores technical measures for verification in the Zone. So far it has identified 15 projects where countries are willing to cooperate, but lacks the necessary resources to implement them. Similarly, the Code of Conduct of the OPCW, despite its important contribution to a culture of security, lacks funding necessary for its implementation.

43. Can the regional model be expected to become the model of the future? A combination of efforts of regional and international organisations will be able to fulfil the verification task efficiently. The problem isn't the lack of ideas, but the lack of funding which leads to the stagnation of the Zone.

44. A less optimistic point of view suggests that negotiating and implementing comprehensive verification package for all three WMD can not only be complicated by turf wars but could also end up weakening current minimum standards in the Additional Protocol, the CWC verification annex and the CTBT protocols. Even if there was a political agreement on the Zone, it would not be practically possible to implement it given the lack of a strong enough interest in the Zone. There has been an attempt to include BW in United Nations Security Council (UNSC) resolution 2118 which provided the framework for eliminating Syrian CW which failed. We should not address cross-cutting technological challenges in the ME, but rather make current technical and

procedural capabilities in the individual regimes more effective.

Conclusion: open questions

Several questions have been part of debates surrounding verification for a long time and in the absence of clear answers, continue to do so today.

What is the purpose of verification? During the cold war the purpose of verification was to build confidence and trust between East and West. As trust and knowledge grew, this purpose faded. Today a variety of conceptions exist.

Its general purpose is to verify treaty compliance. In the case of Syria where weapons have already been used, is the purpose only to discover that someone is cheating or also to stop these weapons being used? Another conception goes further and sees a role for verification in the reduction of armaments. It can also serve a humanitarian purpose, as rapid detection can prevent further harm. Finally, verification can serve as a strong deterrent. However, is it meant to deter the cheater, to deter in order to protect people or to deter military significance of cheating?

A recurring question immediately linked to the purpose of verification is whether it matters. Is verification well enough implemented to have an impact? Are there similar means outside the verification community which can achieve the same goals? The answer is: verification does matter, but not always. Even if its efficiency and impact tend to be restricted, states need it to protect themselves. A single cheater can represent a considerable security risk. States need it to make informed decisions. Knowing little is better than knowing nothing.

However, it should not be assumed that all states care about verification and are willing to implement it. Often it is not very high up on the list of their priorities and seen as unnecessary. It is clear a lack of political will can considerably reduce the authority of verification regimes undermine verification mandates. The question of what can be done to enhance the political will in the field is often avoided.

Another important issue regards the application of verification mechanisms to non-state actors. Missiles and other delivery systems that can carry WMD can be acquired by non-state actors but this problem was not taken into consideration during the negotiation of verification agreements. UNSC resolution 1540 is the deals with the non-proliferation of WMD to non-state networks, but no international agreement has been signed on this issue. The question of how non-state groups are to be held accountable for their crimes further complicates the situation.

Finally, a problem that is often mentioned but the verification community is reluctant to address in a serious manner, is the verification of biological weapons. Since the failure of the additional protocol this is a sensitive issue; besides the idea of extending the Secretary-General mechanism to biological weapons, little initiative is shown to work on it. Given that the industry, science and development change new opportunities emerge which need to be seized.

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