APLN
Asia Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament

CNND
Centre for Nuclear Non-Proliferation and Disarmament

Policy Brief No. 42 **July 2017**

The Nuclear Weapons Prohibition Treaty: Aim, Scope and Limitations

John Carlson

Summary

The Nuclear Weapons Prohibition Treaty is politically and historically important but poorly executed, especially on the vital issue of safeguards standards. It is to be hoped the General Assembly will act to correct this and other drafting problems. The approach taken in the treaty means no nuclear-armed state is likely to join it in the near term. The treaty also appears to exclude non-nuclear-weapon states with extended nuclear deterrence arrangements (a "nuclear umbrella"). The implications for other states in alliance with nuclear-armed states are not clear. In addition there may be implications for states in nuclear weapon-free zones. An issue to be managed in the future is the interaction of review processes under this treaty and the NPT.

1. On 7 July 2017 a negotiating conference established by the United Nations General Assembly adopted a draft treaty prohibiting nuclear weapons.[1] The draft treaty is to be submitted to the General Assembly, and it is proposed that it will be open for signature on 20 September 2017. The treaty will enter into force after it has 50 ratifications. The treaty will be legally binding, but only for those states that join it.

2. The number of states participating in the negotiating conference varied, but was around 130, that is, around two-thirds of states parties to the Nuclear Non-Proliferation Treaty (NPT). The treaty was adopted by 122 votes, with one vote against and one abstention.

3. The negotiations were boycotted by all nine nuclear-armed states (the NPT nuclear-weapon states – the US, Russia, UK, France and China – together with India, Pakistan, Israel and North Korea) and most of their allies, some 30 states in all. These states consider that a ban treaty is unrealistic when for the foreseeable future nuclear weapons will remain essential to their national security. They maintain that nuclear reductions are possible only through a step-by-step approach, and the pace cannot be forced by a ban treaty.

Key Treaty Provisions

4. **Prohibitions**. The treaty prohibits the following actions with respect to nuclear weapons (Article 1):

- Development, production, manufacture, acquisition, possession, stockpiling;
- Transfer, having control;
- Using or threatening to use;

[1] http://www.undocs.org/en/a/conf.229/2017/L.3/Rev.1

- Assisting, encouraging or inducing anyone to engage in any activity prohibited under the treaty;
- Stationing or deployment;
- Testing.

5. **Parties**. The treaty provides for three groups of parties:

a. Parties that had nuclear weapons after 7 July 2017 but eliminate them before joining the treaty (informally described as *destroy and join* states)(Article 4.1);
b. Parties that have nuclear weapons but will eliminate them upon joining the treaty (informally described as *join and destroy* states)(Article 4.2). These states are required to remove their nuclear weapons from operational status immediately, and to destroy them in accordance with a time-bound plan, described further in paragraphs 8 and 9 below;
c. Other parties (essentially, non-nuclear-weapon states).

6. **Safeguards**. The treaty sets out two different safeguards standards:

a. The highest standard – a safeguards agreement with the International Atomic Energy Agency (IAEA) *sufficient to provide credible assurance of the non-diversion of declared nuclear material from peaceful nuclear activities and of the absence of undeclared nuclear material or activities in that State Party as a whole* – applies to parties that had nuclear weapons after 7 July 2017 but eliminated them before joining the treaty (Article 4.1).

   This formulation corresponds to the combination of a comprehensive safeguards agreement and an additional protocol, the most effective form of safeguards currently applied by the IAEA. Further information on the additional protocol is in the Technical Background at the end of this brief.

   This standard also applies to parties that have nuclear weapons upon joining the treaty, but only after they have eliminated their nuclear weapons and weapon program (Article 4.3). The treaty sets out no safeguards requirement for parties while an elimination plan is being implemented, which could be a period of years. As discussed below, this is a serious defect in the treaty.

b. A lower standard – a comprehensive safeguards agreement without an additional protocol – applies to a party that does not have a safeguards agreement (Article 3.2). As discussed below, a comprehensive safeguards agreement without an additional protocol is a less effective form of safeguards.

   This lower standard also applies to parties that do not have an additional protocol in place when the ban treaty enters into force. This is because the treaty requires parties that did not have nuclear weapons to maintain the IAEA safeguards obligations they have when the ban treaty enters into force (Article 3.1). Some parties will have a comprehensive safeguards agreement and additional protocol in place, thus meeting the highest safeguards standard. Other parties will have only a comprehensive safeguards agreement.

7. Rigorous verification is absolutely essential for a treaty banning nuclear weapons. The treaty should require the highest level of safeguards for *all* parties, without discrimination. This is discussed further in paragraphs 18–27 below.

8. **Elimination plans**. Parties that join the treaty while still having nuclear weapons are required to have a legally binding time-bound

plan for the destruction of their nuclear weapons within a deadline to be set by the first Meeting of States Parties under the treaty (Article 4.2). It is unclear whether this deadline is intended to be a generic time period (like "10 years") or a specific date (like "2025"). If the latter, then the possibility of joining the treaty via Article 4.2 will be time-limited.

9. The elimination plan is to provide for verifiable and irreversible elimination of the party's nuclear weapon program and elimination or conversion of all nuclear-weapon-related facilities. The plan is to be negotiated with a *competent international authority* designated by the States Parties and is to be approved by the next meeting of States Parties or treaty review conference. Further provisions on the competent international authority (or authorities) are in Article 4.6.

10. A party that has any nuclear weapons on its territory owned or controlled by another state is required to declare them (Article 2.1(c)) and ensure their prompt removal (Article 4.4).

11. **Relationship with other agreements**. The treaty provides that its implementation *shall not prejudice obligations undertaken by States Parties with regard to existing international agreements … where those obligations are consistent with the Treaty* (Article 18). As will be discussed, it is uncertain how this provision would apply in practice.

12. **Meetings and review conferences**. The first meeting of States Parties is to be convened within one year of the treaty's entry into force. Further meetings are to be biennial (Article 8.2), unless otherwise agreed. A review conference is to be held five years after entry into force, and thereafter every six years unless otherwise agreed (Article 8.4). Extraordinary meetings may be convened at the request of one-third of the parties (Article 8.3).

13. **Amendments**. After the treaty's entry into force, amendments may be agreed by a majority of two-thirds of the parties (Article 10).

14. **Reservations**. The treaty excludes any reservations (Article 16).

Application to Asia–Pacific States

15. As pointed out in a previous Policy Brief,[2] all global nuclear risks and threats are present in the Asia–Pacific and in some cases are even more acute in this region. The Asia–Pacific region has representatives of each kind of state to which the treaty provisions relate: nuclear-armed states; states in alliance with nuclear-armed states (including beneficiaries of extended nuclear deterrence); parties to nuclear weapon-free zone treaties; as well as other states, that is, non-nuclear-weapon states in general.

Comments

16. The nuclear weapon ban is a landmark treaty, of great political and historical importance. The treaty is an important contribution towards the establishment of an international norm against nuclear weapons, building on the 1996 Advisory Opinion[3] of the International Court of Justice which found that the use of nuclear weapons would generally be contrary to international law, in particular humanitarian law, and on the various nuclear weapon-free zone treaties. Accordingly, this treaty *should* rank with the 1968 NPT which, despite some criticism about the lack of specificity on disarmament, still remains a remarkable achievement almost 50 years later. The NPT was drafted with great effort and farsightedness. Unfortunately, this has not been the case with the ban treaty, the text of which is marred by serious problems.

17. These problems reflect the fact that negotiations took only four weeks, an unprecedented pace for a treaty of such importance. There was no need for the negotiating conference to conclude a text so quickly. The remit from the General Assembly[4] called for the conference to report on its progress to the General Assembly's seventy-second session (commencing in September 2017), to enable the General

---

[2] Ramesh Thakur, "Asia–Pacific and Global Nuclear Orders in the Second Nuclear Age," APLN/CNND *Policy Brief* No. 21 (Canberra/Seoul, July 2016), http://www.a-pln.org/briefings/briefings/

[3] http://www.icj-cij.org/docket/files/95/7495.pdf

[4] UNGA Resolution 71/258, 23 December 2016.

Assembly to assess progress and decide the way forward. It would have been far better for the conference to have taken the time to resolve the problems and achieve consensus, if necessary holding a further session after the General Assembly had considered the conference's report. The high vote for the treaty in the conference masks serious differences on the text. The Netherlands voted against the treaty, and Singapore abstained, but these were by no means the only participants to have concerns. More may be heard on this in coming months.

Safeguards Problems

18. As noted above, the main problems with the ban treaty relate to safeguards. Rigorous safeguards against further proliferation of nuclear weapons are absolutely essential to achieving nuclear disarmament. The treaty should require the highest standard of safeguards for *all parties*. This must include verification of the absence of undeclared nuclear material or activities in all parties, which is currently based on the IAEA's additional protocol. The need for a single, high, safeguards standard was recognized by NPT parties, including the states that participated in the treaty negotiations, through their declaration that *comprehensive safeguards and additional protocols should be universally applied once the complete elimination of nuclear weapons has been achieved*.[5]

19. States with nuclear weapons will not disarm when other states seen as potential proliferators have not committed to the strongest form of safeguards, which currently includes the additional protocol. A treaty that does not require this standard universally will fail to provide confidence that nuclear weapons are eliminated for all time.

20. The NPT requires non-nuclear-weapon states to conclude safeguards agreements in accordance with the IAEA's Statute and the Agency's safeguards system (NPT Article III.1). The NPT is not prescriptive, the meaning of *the Agency's safeguards system* is something that evolves over time. Currently the principal documents setting out the Agency's safeguards system are the comprehensive safeguards agreement (IAEA document INFCIRC/153 of 1972) and the additional protocol (INFCIRC/540 of 1997).

21. The additional protocol was developed to overcome shortcomings in the comprehensive safeguards agreement. The IAEA has made it clear that the most effective standard of safeguards is the combination of the comprehensive safeguards agreement and the additional protocol:

> It is only in countries with both a comprehensive safeguards agreement and an additional protocol in force that the IAEA has sufficient information and access to provide credible assurances to the international community of both the non-diversion of nuclear material and the absence of undeclared nuclear material and activities.[6]

22. Despite the additional protocol now being implemented or at least signed by 148 states (including 55 out of the 62 non-nuclear-weapon states that have significant nuclear activities), a number of states are opposed to recognizing the additional protocol as the IAEA safeguards standard. This has been an ongoing argument in IAEA and NPT fora. Any state that refuses to accept the most effective safeguards standard is not serious about achieving disarmament. Disturbingly, this could indicate that some of the states concerned want to keep open a nuclear weapon option – all the more reason why a treaty banning nuclear weapons should take a strong stand on this issue!

23. In the ban treaty negotiations, opponents to the additional protocol rejected any reference to the additional protocol as a requirement for non-nuclear-weapon states in this treaty. The curious thing is that among the states voting on the treaty, those with an additional protocol in place or signed outnumbered those without an additional protocol by 87 to 37 – so how the protocol opponents prevailed on this point is a

[5] Action 30 of the Final Document from the 2010 NPT Review Conference.

[6] https://www.iaea.org/newscenter/news/nuclear-safeguards-conclusions-presented-in-2016-safeguards-implementation-report

mystery. It certainly suggests there were problems in the conduct of the negotiating process.

24. Those drafting the ban treaty may have thought the appropriate forum to resolve this argument should be in the NPT or the IAEA, but in that case they should have sidestepped the issue rather than siding with the additional protocol opponents. The result is a conflict in safeguards standards:

a. The NPT requires a safeguards agreement in accordance with the IAEA Statute (which encompasses decisions by the IAEA's Board of Governors) and the Agency's safeguards system. The additional protocol has been accepted by a substantial majority of states and is firmly established as an important part of the safeguards system;

b. For parties that do not have an additional protocol the ban treaty does not require one, thereby conflicting with efforts to have the additional protocol recognized as the NPT safeguards standard.

   Currently there are 32 states that do not have an additional protocol, including Algeria, Argentina, Brazil, Egypt, Saudi Arabia, Syria and Venezuela. Iran is applying an additional protocol provisionally and has undertaken to conclude one subject to approval of its parliament;

c. For parties that have no safeguards agreement the ban treaty requires a safeguards agreement based only on INFCIRC/153. This is narrower in scope than the NPT's requirement so is in direct conflict with it.

   Currently there are 11 NPT parties that have not concluded safeguards agreements.

25. The ban treaty could have a detrimental effect on safeguards under the NPT. Article 18 of the ban treaty provides that the treaty shall not prejudice obligations undertaken by parties under existing agreements where those obligations are consistent with the treaty. The problem is, it is far from clear how *consistent with* may be interpreted in practice. Where a later treaty has a specific provision, for example requiring an agreement based on INFCIRC/153, this would usually prevail over a less-specific requirement in the earlier treaty. In other words, the provision which was presumably intended to protect existing agreements may not be adequate to do so. The danger is that NPT parties without an additional protocol will attempt to use the ban treaty to justify not concluding an additional protocol. It is totally unsatisfactory that the ban treaty could have a detrimental effect on the NPT and IAEA safeguards. This needs to be resolved when the draft treaty is considered by the General Assembly.

26. A surprising provision in the ban treaty is that the treaty's safeguards requirements do not apply to a party with nuclear weapons until *after* the state's nuclear weapon program has been eliminated (Article 4.3). This is a major weakness, surely it was not intended? Elimination of a state's nuclear weapon program could take many years, during which time effective safeguards are needed to ensure the state is not producing new weapons to replace those it is eliminating.

27. There is at least one other situation where the treaty appears to conflict with the NPT, fortunately less serious than the safeguards standard. This relates to the period within which states are required to conclude safeguards agreements pursuant to the NPT. The ban treaty could have the effect of extending this period, effectively starting the clock again for states that have not concluded an agreement before they join the treaty.

Other Aspects

28. As discussed above, the treaty's provision on the relationship with other agreements (Article 18) is not as clear as it should have been. There is some uncertainty how the treaty will impact on the NPT, the CTBT (Comprehensive Nuclear-Test-Ban Treaty) and the nuclear weapon-free zone treaties.

29. The treaty provides for the designation of a *competent international authority* or authorities to verify that a state has eliminated its nuclear weapon program before joining the treaty (Article 4.1) or is eliminating its program after joining in accordance with an approved plan (Article 4.2). It is not clear which entity might be so designated – the IAEA or a new entity? Also the implication of *international* is not clear – does this exclude a bilateral entity, or a regional entity? There is no reason why the IAEA could not undertake the Article 4.1 verification function. This task is similar to verifying an initial safeguards inventory, such as occurred when South Africa eliminated its nuclear weapon program and joined the NPT. There could be complications in Article 4.2 situations, where the state is eliminating nuclear weapons and its nuclear weapon program. Where highly sensitive information is involved it could be preferable to have a specialist verification group comprising specially cleared personnel. On the other hand, once nuclear material is no longer in sensitive form or composition it could be verified by the IAEA. The treaty leaves all this for future decisions.

30. As regards nuclear weapon-free zones, broadly speaking the ban treaty extends the principles of these zones to all treaty parties. The prohibition on stationing and deployment of nuclear weapons echoes provisions in the nuclear weapon-free zone treaties. In addition to the prohibitions on stationing and deployment, the ban treaty requires any party that has any nuclear weapons in its territory or in any place under its jurisdiction or control that are owned, possessed or controlled by another state to ensure the prompt removal of such weapons (Article 4.4). It is understood some participants in the ban negotiations were concerned whether this provision has implications for transit and visits by foreign ships and aircraft. This issue is not limited to nuclear weapon-free zones but potentially is relevant to any state. However, international law is clear: foreign military ships and aircraft have sovereign immunity. This means they are not under the jurisdiction or control of another state, so Article 4.4 does not apply. In addition, as a general practice nuclear-armed states do not reveal whether particular ships or aircraft are carrying nuclear weapons.

31. The treaty has major implications for states in arrangements involving extended nuclear deterrence, though the extent of this impact is uncertain. The prohibition on stationing of nuclear weapons is clear enough. The meaning of *deployment* is less clear. These prohibitions do not exclude extended nuclear deterrence as such, only these specific actions. Less certain is the operation of the prohibition on *assisting*, *encouraging or inducing anyone, in any way, to engage in any activity prohibited under the treaty* (Article 1.1(e)). Presumably this is intended to exclude from the ban treaty states that accept extended nuclear deterrence, as this could be considered encouraging or inducing another state to possess and use nuclear weapons.

32. The prohibition on *assisting and encouraging* could also exclude a state from inviting foreign ships and aircraft into its territory or jurisdiction where it knows these are nuclear-armed (this is different to the sovereign immunity point just discussed – here the issue is assistance or encouragement rather than jurisdiction). The scope of the prohibition on *assisting* is uncertain, this could also apply to states hosting facilities that contribute to preparations for using nuclear weapons, such as surveillance and targeting functions.

33. When the treaty concept was being developed different approaches were discussed for involving nuclear-armed states in the treaty. The treaty would have been much more powerful if it was more inclusive; for example, if there was a mechanism under which nuclear-armed states could associate themselves with key elements of the treaty. One could envisage a treaty where nuclear-armed states could accept principles such as no first use, and undertake phased nuclear weapon reductions as defined milestones are met. The treaty may have been able to provide a negotiating forum for a step-by-step approach, taking the place of the defunct Conference on Disarmament. However the majority of negotiation participants decided they did not want a process with an uncertain end date, as this would fail to tie down the nuclear-armed states to specific disarmament commitments, the criticism made of the NPT.

34. By insisting on a time-bound process, an approach rejected as unrealistic by all the nuclear-armed states, the ban proponents have deliberately taken a position that excludes the nuclear-armed states, at least in the near term. The first draft included a mechanism by which *additional protocols*,[7] setting out elimination agreements reached by states (by implication non-parties), could have been annexed to the treaty, but this has all but disappeared from the final text (there is a brief reference to additional protocols in Article 8.1(b)). The approach taken continues the divisiveness that has come to characterize NPT review conferences. Maybe this was inevitable, but it is unfortunate that greater effort was not made to find some common ground with the nuclear-armed states and their allies.

35. The treaty provides for a regular schedule of meetings. Unless otherwise decided by the parties there are to be biennial meetings with a review conference every six years. It is assumed, though the treaty does not say, that the review conferences would be combined with every third biennial conference. As the business of these meetings will overlap to some extent with NPT review conferences and preparatory committee meetings, it is to be hoped the parties will be able to avoid duplication and coordinate actions under this treaty and the NPT.

Conclusions

36. In view of the importance of this treaty it is most regrettable that more time and effort was not devoted to improving the text. The problems in the text might also have been avoided if the states that boycotted the negotiations had participated, though no doubt they would say that consensus was never going to be possible and their concerns would have been ignored. The problems in the text, especially the conflict with the NPT, are sufficiently serious for the General Assembly to ask for the text to be reopened to fix the drafting. This may be unlikely given that the states supporting the text have a majority in the General Assembly, but it is to be hoped that capitals will examine the issues discussed in this brief and give appropriate instructions to their delegations in the General Assembly. It is important that states that did not participate in the treaty negotiations do not remain disengaged in the General Assembly but intervene on the issues impacting on IAEA safeguards and the NPT.

37. Looking ahead – and considering that the impetus for the ban treaty is the widely shared concern at the lack of any current action on nuclear arms reductions and disarmament – it is essential for the nuclear-armed states and their allies to heed the majority's concerns and take constructive actions to restart the agenda on nuclear reductions and disarmament. It is not enough, as the boycotting states have done, to talk about a "step-by-step" approach. This approach lacks credibility when there are no such steps under way, or even being contemplated. The agenda needs to be restarted and to be expanded from bilateral actions by the US and Russia to a multiparty process involving the other nuclear-armed states.

38. The NPT makes it clear that nuclear arms reductions and disarmament are a shared responsibility of both the nuclear-armed states and the non-nuclear weapon states. The non-nuclear-weapon states that are allies of nuclear-armed states have a special responsibility to help these states see the urgency of acting to reduce nuclear risks. The non-nuclear-weapon states can also make a major contribution by putting aside the damaging arguments about the additional protocol and securing its recognition as an essential part of the IAEA's safeguards system.

39. As the Australia/Japan International Commission on Nuclear Non-Proliferation and Disarmament pointed out in its 2009 report,[8] there are many steps that can and should be taken in the near term, that will not compromise any state's national security. These are outlined in the Technical Background below. Some risk reduction steps, such as taking nuclear weapons off high alert, could be taken immediately. It would be possible to progress

[7] This should not be confused with the safeguards additional protocol.

[8] http://icnnd.org/reference/reports/ent/pdf/ICNND_Report-EliminatingNuclearThreats.pdf

to a *minimization point*, a global total of around 2,000 nuclear weapons (compared with the current 15,000), within 10-15 years. The steps taken towards this goal would significantly reduce the risks of nuclear war compared with today.

40. After this minimization point there would be a more challenging process of moving to lower numbers and eventual elimination of nuclear weapons. This could take an extended period and will depend on high levels of trust as well as robust verification. The experience of cooperating to reach the minimization point will help to build the confidence and trust needed to proceed further. The ban treaty is one important step along the way, contributing to an international norm against nuclear weapons. Now that we are at the point of having a ban treaty it is time to put the arguments aside and make the step-by-step approach a reality.

Technical Background

Additional Protocol

The additional protocol is an agreement concluded between a state and the IAEA, complementary to the state's safeguards agreement with the IAEA, broadening the information to be reported to the IAEA and the access to be given to safeguards inspectors. The model additional protocol (INFCIRC/540) was agreed by the IAEA's Board of Governors in 1997. Currently 146 states have signed, and 129 of these have ratified, an additional protocol. Of the 62 non-nuclear-weapon states that have significant nuclear activities, 50 have ratified and 5 more have signed an additional protocol.[9]

The additional protocol arose from efforts commencing in the 1990s to strengthen the IAEA safeguards system in response to the discovery of Iraq's nuclear weapon program following the first Gulf War. The primary focus of the "traditional" safeguards system, first developed for the NPT in the early 1970s, was verifying *declared* nuclear material and activities. It was assumed that development of fuel cycle capabilities independent of declared facilities would be beyond the resources of most states, and in any event would be readily detectable, so that proliferation attempts were likely to involve diversion of nuclear material from declared facilities. Events in Iraq demonstrated that this assumption was wrong. This led to a program by the IAEA and member states to strengthen IAEA safeguards. The additional protocol was an important result from this program.

The program to strengthen safeguards has focused particularly on establishing the technical capabilities and legal authority necessary for detection of *undeclared* nuclear material and activities. Central to these efforts is the effective use of *information* – involving collection and analysis of information that can enhance the IAEA's knowledge and understanding of nuclear programs – and providing more extensive rights of *access* for IAEA inspectors to nuclear and nuclear-related locations, including for the resolution of questions arising from information analysis.

The IAEA has made it clear that without the additional protocol its ability to detect undeclared nuclear activities is limited.

Stepwise Approach to Nuclear Arms Reductions and Disarmament

It is likely that extending the scope of arms control, and progress towards the eventual elimination of nuclear weapons, will proceed in a stepwise manner, involving negotiation of a number of agreements and the establishment of supporting verification arrangements together with transparency and confidence-building measures. At this stage the exact steps and sequence are speculative, but they are expected to be along the following lines (not necessarily in this order):

a. De-alerting (removing nuclear weapons from immediate launch readiness);
b. Agreed limits on deployed strategic weapons – extension of New START by the US and Russia, and negotiations on START IV;
c. Establishment of a multilateral negotiating process including the other NPT nuclear-weapon states (France, UK and China), and the non-NPT nuclear-armed states (India, Pakistan and Israel – North Korea is likely to be addressed as a special case);
d. No first use/sole purpose declarations – nuclear-armed states affirm that the sole purpose of nuclear weapons is to deter nuclear attack. The aim should be to move from declarations to treaties – negotiation of a *no first use* treaty, or better still a *no use* treaty;
e. Entry into force of the CTBT (Comprehensive Nuclear-Test-Ban Treaty);
f. Negotiation of a fissile material cut-off treaty (FMCT) – prohibiting production of fissile material for nuclear weapons;
g. A series of arms reductions (unilateral, bilateral and multilateral), covering tactical as well as strategic nuclear

[9] www.iaea.org/topics/additional-protocol/status

weapons, with arrangements for verification and for irreversible transfer of fissile material from weapon programs to peaceful use or disposal;

h. Nuclear archaeology to account for historical fissile material production;
i. A range of monitoring, transparency and confidence-building measures.

A detailed discussion of these and other likely steps can be found in the 2009 report of the International Commission on Nuclear Non-Proliferation and Disarmament.[10] The Commission set out a two-phase process, focusing in the short and medium terms on reaching a "minimization point," characterized by substantial nuclear weapon reductions, agreed no first use doctrine, and force deployments and alert status reflecting that doctrine, followed by a process leading to elimination.

An essential aspect of this process will have to be development of much stronger political arrangements than exist today for maintaining international peace and security, especially a strong commitment to collective action to deter and deal with violations of arms control and disarmament treaties.

Verification of Nuclear Arms Reductions and Disarmament

The verification missions required can be outlined as follows:

a. *Nuclear weapon limitations/reductions* – as agreements are reached on specific reductions, verification will be required that deployed weapon numbers are within agreed limits. There is considerable US/Russian experience to draw on.
b. *Nuclear weapon dismantlement* – in line with agreed nuclear weapon reductions, verification will be required that these weapons are dismantled.

The dismantling state will be concerned to protect sensitive information. The verifying entity will be concerned that the object being dismantled matches the state's declaration and that the recovered nuclear material is not diverted. This will require novel techniques involving verification of attributes or comparison against templates, and chain of custody/continuity of knowledge arrangements. There has been substantial research by the US/Russia/IAEA (Trilateral Initiative) and by the UK and Norway.

Because of the sensitivity of this process/material, the verifying entity could be a *competent international authority* as provided for in the ban treaty, or a bilateral or regional arrangement established by the states concerned. The details of the arrangements, and the extent of IAEA involvement, have yet to be developed and negotiated.

c. *Fissile material disposition* – for nuclear material resulting from nuclear weapon dismantlement, and from declaration of excess military stocks.

Monitoring arrangements will be required for nuclear material awaiting disposition. For nuclear materials with non-sensitive forms and composition, verification methods similar to those of IAEA safeguards could apply.

Verification will be required for progressive, irreversible transfer of nuclear material to peaceful use, or to non-proscribed use (such as naval propulsion), or to disposal. This verification would be similar to IAEA safeguards, so presumably would be implemented by the IAEA.

d. *Fissile material cut-off* – prohibiting production of nuclear material for nuclear weapons, with verification to confirm that all production of nuclear material after entry-into-force is for peaceful or non-proscribed purposes.

[10] *Eliminating Nuclear Threats*, icnnd.org/reference/reports/ent/pdf/icnnd_report-eliminatingnuclearthreats.pdf

This verification would be implemented by the IAEA.

e. *Nuclear material in non-peaceful non-proscribed use* (non-explosive purposes, such as naval propulsion). The design of naval fuel has always been considered highly sensitive information, excluding verification measures similar to safeguards. As the nuclear-armed states proceed with substantial nuclear arms reductions, monitoring or transparency arrangements will have to be developed to provide credible assurance that naval programs are not a route for diverting nuclear material to nuclear weapons.

f. *Declaration of historical production of nuclear material for military programs* – this will be required as part of the process for providing assurance that no nuclear material is being held back from the disarmament process. Verifying this information will require application of *nuclear archaeology* techniques to help validate declarations of current nuclear material inventories, to establish whether there may be nuclear material that remains undeclared.

g. *Declaration of all nuclear material remaining in weapon programs* – because of the sensitive nature of this material it will not be possible to verify it, but a declaration of overall quantities will be required as part of the process of matching historical production with current declared inventories (peaceful, non-peaceful non-proscribed, and weapons).

h. *IAEA safeguards for all nuclear material in peaceful use* – this is required to verify that nuclear material is not being diverted from peaceful programs to nuclear weapons.

i. *Safeguards activities to provide assurance that there is no undeclared nuclear material* – nuclear archaeology aims to provide assurance that all nuclear material produced in the past has been declared. Safeguards measures will be required to provide credible assurance against undeclared production of further nuclear material.

A detailed discussion of nuclear disarmament verification issues can be found in NTI's (Nuclear Threat Initiative) report, "Innovating Verification: Verifying Baseline Declarations of Nuclear Warheads and Materials," July 2014, http://www.nti.org/analysis/reports/innovating-verification-verifying-baseline-declarations-nuclear-warheads-and-materials/. An international collaborative program, the International Partnership for Nuclear Disarmament Verification, has been launched to develop the verification measures required for nuclear disarmament – see http://www.nti.org/about/projects/international-partnership-nuclear-disarmament-verification/

The Author

JOHN CARLSON AM is Counselor to the Nuclear Threat Initiative, Washington, and Nonresident Fellow at the Lowy Institute, Sydney. He was previously Director General of the Australian Safeguards and Non-Proliferation Office (1989–2010), Chairman of the IAEA's Standing Advisory Group on Safeguards Implementation (2001–06), and founding Chair of the Asia–Pacific Safeguards Network (2009–12).

APLN/CNND Policy Briefs

These express the views of the authors, and do not necessarily reflect the views of APLN members or the CNND, or other organizations with which the authors may be associated. They are published to encourage debate on topics of policy interest and relevance regarding the existence and role of nuclear weapons.

APLN and CNND

The **Centre for Nuclear Non-Proliferation and Disarmament (CNND)** contributes to worldwide efforts to minimize the risk of nuclear-weapons use, stop their spread and ultimately achieve their complete elimination. The director of the Centre is Professor Ramesh Thakur. See further http://cnnd.anu.edu.au.

The **Asia Pacific Leadership Network (APLN)** comprises around ninety former senior political, diplomatic, military and other opinion leaders from fifteen countries around the region, including nuclear-weapons possessing states China, India and Pakistan. The objective of the group, founded by former Australian Foreign Minister and President Emeritus of the International Crisis Group Gareth Evans, is to inform and energize public opinion, and especially high level policy-makers, to take seriously the very real threats posed by nuclear weapons, and do everything possible to achieve a world in which they are contained, diminished and ultimately eliminated. The co-Convenors are Professors Chung-in Moon and Ramesh Thakur. The Secretariat is located at the East Asia Foundation in Seoul, Republic of Korea. See further www.a-pln.org.

Funding Support

APLN gratefully acknowledges the generous support of the Nuclear Threat Initiative, Washington DC.

Contact Us

APLN, East Asia Foundation
4F, 116 Pirundae-ro
Jongno-gu, Seoul 03535
Republic of Korea
Email: apln@keaf.org
Tel: +82 2 325 2604-6