ABSTRACT
The Nuclear Non-Proliferation Treaty is the cornerstone of the global non-proliferation regime. However, the question is the NPT still relevant? may suggest that the importance of NPT has been forgotten. Indeed, lack of progress in nuclear disarmament has led some critics to question the value of the NPT. While frustration at the failure of the nuclear-weapon states to meet their NPT disarmament obligations is understandable, political attacks on the NPT itself are extremely short-sighted. Non-proliferation and nuclear disarmament are inextricably linked; there will be no disarmament if there is no confidence in non-proliferation, and weakening the non-proliferation regime is in no-one’s interest. The absence of disarmament efforts has prompted the negotiation of the Treaty on the Prohibition of Nuclear Weapons. This treaty has reinvigorated discussion on nuclear disarmament, but its impact is uncertain. Disarmament requires a collaborative approach between the nuclear-armed states and the non-nuclear-weapon states. A major diplomatic effort is needed on these issues: all states need to be more aware of the security benefits they derive from the NPT; and the nuclear-armed states must make a serious commitment to reducing the risks of nuclear weapons and pursuing disarmament, not only to meet NPT commitments but because disarmament is in their own interest.

Introduction
The Nuclear Non-Proliferation Treaty (NPT) has been the cornerstone of the global non-proliferation regime for almost 50 years. With 191 parties, it has become the most universal of all treaties. The NPT has been so effective with regard to the non-proliferation of nuclear weapons that it is now at risk of being taken for granted – as the question is the NPT still relevant? suggests. Many have forgotten that prior to the negotiation of the NPT there were predicted to be 25–30 nuclear-armed states by the 1990s.

In recent years there has been increasing focus on the disarmament aspects of the NPT, and questions on the continued relevance of the NPT reflect the intense frustration at the lack of progress in disarmament. The International Court of Justice (ICJ), in its 1996 advisory opinion on the legality of use or threat of use of nuclear weapons,
confirmed that the NPT places an obligation on the nuclear-weapon states to pursue disarmament. These states are clearly not meeting this obligation.

While frustration about this is understandable, it makes no sense to attack the NPT over the inactions of some treaty parties, especially since it was not possible to reach agreement on specific disarmament provisions when the NPT was concluded, and the treaty defers the details of disarmament to further negotiations. The problem is the failure of the parties to engage in these further negotiations, rather than any shortcoming in the NPT itself.

Non-proliferation and nuclear disarmament are inextricably linked. The objective of non-proliferation, stopping the spread of nuclear weapons to further states, is not only essential in itself but is intended to make an essential contribution to establishing the circumstances under which nuclear disarmament can proceed.

Nuclear disarmament requires a stable strategic environment where the nuclear-armed states have confidence, not only that the other nuclear-armed states will honour their treaty commitments, but that non-nuclear-weapon states will do likewise: in other words, that no new nuclear-armed states will emerge. For this reason, the NPT places the obligation to pursue nuclear disarmament not only on the nuclear-weapon states but on all the parties (that is, the non-nuclear-weapon states as well).

Political attacks on the NPT are extremely short-sighted because the treaty is vital to the security of every state (even the non-NPT states benefit from a stable non-proliferation environment). The NPT’s supporters must be more proactive in raising awareness of the treaty’s vital role in underpinning international peace and security. At the same time, the nuclear-weapon states must take their obligations seriously and start a process for reducing nuclear risks and reducing nuclear arsenals, resulting in concrete progress towards disarmament.

**Outline of the NPT**

The NPT is described as having three fundamental “pillars”:

1. **Non-proliferation**: non-nuclear-weapon states parties undertake not to seek or acquire nuclear weapons (Article II). They are required to conclude agreements with the International Atomic Energy Agency (IAEA) accepting safeguards on all their nuclear material to verify compliance with this commitment (Article III).
2. **Disarmament**: the nuclear-weapon states,\(^1\) and all other NPT parties, undertake to pursue negotiations in good faith on effective measures for cessation of the nuclear arms race and for nuclear disarmament, and also for general disarmament (Article VI).
3. **Peaceful uses**: parties have an “inalienable right” to use nuclear energy for peaceful purposes, and undertake to cooperate in the peaceful uses of nuclear energy (Article IV). For non-nuclear-weapon states, the use of nuclear energy is subject to IAEA safeguards.

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\(^1\)The NPT recognises five nuclear-weapon states: United States, Russia, United Kingdom, France and China.
A key element of the NPT is its provision for verification, through the IAEA’s safeguards system. Most non-nuclear-weapon states have a strongly held political commitment against acquiring nuclear weapons. Their observance of this commitment does not depend on the enforcement effect of IAEA safeguards. Nonetheless, it is an important maxim of international arms control to trust, but verify. The application of a credible verification mechanism is an essential confidence-building measure, providing assurance that all parties are honouring their non-proliferation commitments and thereby reinforcing these commitments.

Today there are only five states outside the NPT. Four of these are nuclear-armed: India, Israel and Pakistan, which never joined the NPT, and North Korea which was a party to the NPT but announced its withdrawal in 2003. In addition, there is the new state of South Sudan, which has yet to join the treaty but has no nuclear activities. In all, there are nine states with nuclear weapons: the five nuclear-weapon states recognised by the NPT and the four nuclear-armed states outside the treaty. Globally, all nuclear material and nuclear facilities outside these nine states are subject to peaceful use commitments under the NPT.

The NPT is commonly described as a two-way bargain, between the nuclear-weapon states that commit to nuclear disarmament and the non-nuclear-weapon states that undertake not to seek nuclear weapons. Some critics argue the nuclear-weapon states have not honoured their side of the bargain, so the non-nuclear-weapon states should consider they are no longer bound. This overlooks the deeper nature of the NPT as a three-way bargain: the NPT is not only a bargain between nuclear-weapon states and non-nuclear-weapon states, it is just as important as a bargain among the non-nuclear-weapon states themselves.

It is essential to the security of non-nuclear-weapon states that they do not find themselves facing nuclear threats from other non-nuclear-weapon states. This issue is especially relevant to developing countries: as indicated below, five of the six cases of safeguards non-compliance that have occurred under the NPT have involved developing countries—arguably nuclear proliferation presents a greater threat to developing countries than to the major powers.

**The Essential Value of the NPT**

The NPT, through the application of IAEA safeguards, provides confidence that nuclear programs covered by peaceful use commitments remain in exclusively peaceful use. This confidence reinforces peaceful use commitments. It also enables states to engage in international cooperation and trade in nuclear technologies and materials. Without confidence about peaceful use, states would be suspicious about the nuclear programs of others. Not only would this impact on willingness to cooperate and trade. More seriously, as happened in the pre-NPT era, many states would consider developing latent nuclear weapon capabilities “just in case”: this would be inherently destabilising to regional and global security.

**Non-Proliferation Challenges**

The non-proliferation regime has been remarkably successful. The NPT has helped to slow proliferation. Today there are nine nuclear-armed states: nine too many, but a far better situation than the 25–30 predicted before the NPT.
A number of factors have contributed to this overall success, including: the political commitment by most states to honour their non-proliferation obligations; verification of treaty observance through IAEA safeguards; and the limited availability for most states of fissile materials required for nuclear weapons and the means to produce these materials (namely, enrichment and reprocessing capabilities).

Today, however, there are major challenges to the non-proliferation regime, including:

(1) a series of major non-proliferation violations, where the IAEA has found several states in non-compliance with their safeguards agreements (namely, Iraq, Romania, North Korea, Libya, Iran and Syria);

(2) political ambivalence of many governments, or at least their diplomats, about the benefits of non-proliferation, too often presented as a North-South issue;

(3) the spread of proliferation-sensitive nuclear technologies (enrichment and reprocessing), and even nuclear weapon designs, particularly through an active black market. It is of particular concern that individuals and entities from more than 30 states, including several members of the Nuclear Suppliers Group, were involved in the proliferation efforts referred to in (1) above; and

(4) practical limits to the IAEA’s verification capability: detecting undeclared nuclear programs presents major challenges, particularly finding information that is sufficiently specific to be actionable.

**Greater Political Support Needed for Safeguards**

Regarding the IAEA’s ability to detect undeclared nuclear programs, the IAEA has emphasised on many occasions that the safeguards additional protocol is an essential part of the IAEA’s safeguards system. At the time of writing, 134 states have concluded an additional protocol, including 53 of the 62 non-nuclear-weapon states that have significant nuclear activities (that is, 85% of these states). Four other such states have signed an additional protocol but not yet ratified it, and five non-nuclear-weapon states with significant nuclear activities have not signed an additional protocol.

A handful of states, particularly Brazil and Egypt, maintain that the additional protocol is voluntary and say they will not conclude an additional protocol until the nuclear-weapon states meet their NPT disarmament obligations. However, it is misguided to present acceptance or refusal of the additional protocol as a political or legal issue. The purpose of safeguards is to provide confidence of a state’s commitment against acquiring nuclear weapons, and to ensure timely detection of diversion of nuclear material to nuclear weapons if this occurs. Universalising the additional protocol is essential to demonstrating and reinforcing non-proliferation commitments.

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2 Fissile materials comprise HEU (highly enriched uranium) and separated plutonium.
3 The status of the additional protocol is reported at www.iaea.org/topics/additional-protocol/status (accessed 6 March 2019).
4 Algeria, Belarus, Iran and Malaysia; Iran is implementing its additional protocol provisionally.
5 Argentina, Brazil, Egypt, Syria and Venezuela. Also of concern is Saudi Arabia, which plans significant nuclear activities, has discussed the possibility of pursuing nuclear weapons and does not have an additional protocol.
States that refuse to accept the additional protocol should reconsider their position, taking into account the national security advantage they derive from the additional protocol being so widely applied. The holdout states are also failing to recognise that the most effective safeguards are essential for the confidence needed for major nuclear weapon reductions, and eventual elimination, to proceed. There is no justification for a state to refuse the most effective form of safeguards, and where this happens it inevitably raises concerns whether that state is really committed to non-proliferation. States with additional protocols, which are today a substantial majority of the international community, should do all they can to persuade and assist the holdout states to conclude a protocol.

**Disarmament – Action (Or Inaction) Pursuant to the NPT**

On disarmament, Article VI of the NPT requires all parties

\[\ldots\text{to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.}\]

The drafters of the NPT recognised that nuclear disarmament would take many years and a series of agreements to achieve. They also recognised that imbalances in conventional forces can be a factor in national decisions on nuclear forces, so also should be addressed in disarmament negotiations (hence the reference in Article VI to general disarmament). In the 1960s when the NPT was negotiated there was no prospect of reaching agreement on all these complexities. Accordingly, the NPT left the details of arms reduction and disarmament measures to future negotiations.

Subsequently, the nuclear-weapon states have emphasised the NPT’s provisions on *horizontal proliferation*, that is, countering the spread of nuclear weapons to additional states, and have largely ignored disarmament. This unequal treatment does not reflect the provisions of the treaty, which requires all parties to work for nuclear arms reductions and disarmament. Clearly, the primary responsibility for progressing disarmament lies with the nuclear-weapon states since nuclear weapons are under their control. The division between nuclear-weapon states and non-nuclear-weapon states was never intended to be permanent: the NPT envisages that ultimately all the treaty parties will be non-nuclear-weapon states.

Some nuclear-weapon state representatives have claimed that the Article VI obligation to pursue disarmament negotiations is limited, requiring only that negotiations are held. However, in its 1996 advisory opinion on nuclear weapons, the ICJ concluded unanimously that Article VI is not only an obligation to pursue negotiations in good faith, but an obligation to bring these negotiations to an effective outcome, *leading to nuclear disarmament in all its aspects under strict and effective international control.* (ICJ 1996, paragraph 105.F).

**NPT Review Conference Decisions on Disarmament**

The final documents of successive NPT review conferences have emphasised the need to pursue the treaty’s nuclear disarmament objects. Key documents include:
The Principles and Objectives agreed by the 1995 NPT review and extension conference, which called for a program of action including:

(1) completion of negotiation of the Comprehensive Nuclear-Test-Ban Treaty (CTBT);
(2) negotiation of a fissile material cut-off treaty (FMCT); and
(3) determined pursuit by the nuclear-weapon states of systematic and progressive efforts to reduce nuclear weapons globally, with the ultimate goals of eliminating those weapons, and by all states of general and complete disarmament under strict and effective international control (NPT 1995).

The Thirteen Steps agreed in the Final Document of the 2000 NPT review conference, summarised as follows:

(1) achieving early entry into force of the CTBT;
(2) a moratorium on nuclear tests meanwhile;
(3) negotiation of an FMCT;
(4) establishing a subsidiary body of the Conference on Disarmament (CD) to deal with nuclear disarmament;
(5) the principle of irreversibility to apply to nuclear arms reductions;
(6) an unequivocal undertaking by the nuclear-weapon states to the total elimination of their nuclear arsenals;
(7) early entry into force of START II, adoption of START III, and strengthening the ABM Treaty;
(8) completion and implementation of the Trilateral Initiative between the US, Russia and the IAEA;
(9) steps by the nuclear-weapon states leading to nuclear disarmament in a way that promotes international stability:
   (a) further efforts to reduce nuclear arsenals unilaterally;
   (b) increased transparency regarding nuclear weapon capability and agreements pursuant to NPT Article VI;
   (c) further reduction of non-strategic nuclear weapons;
   (d) concrete agreed measures to further reduce the operational status of nuclear weapons;
   (e) a diminishing role for nuclear weapons;
   (f) engagement of all the nuclear-weapon states in the process leading to total elimination of nuclear weapons;
(10) disposition of excess fissile material;
(11) reaffirmation that the ultimate objective of all states in the disarmament process is general and complete disarmament under effective international control;
(12) regular reports by all states on the implementation of Article VI; and
(13) further development of the verification capabilities required to provide assurance of compliance with nuclear disarmament agreements (NPT 2000).
The 64-point Action Plan agreed by the 2010 NPT review conference. On disarmament, this Action Plan updates and elaborates on the actions set out in the Thirteen Steps (NPT 2010).

**The Record to Date**

There has been little progress on these various actions and steps. On the central issues – nuclear arsenal reductions, a diminishing role for nuclear weapons and commitment to the elimination of nuclear weapons – the following assessment from 2015 remains true today:

Nuclear-armed states pay at best lip-service to the ultimate elimination of nuclear weapons, and none has committed to any “minimization objective”, nor to any specific timetable for their major reduction – let alone abolition. On the evidence of the size of their weapons arsenals, fissile material stocks, force modernization plans, stated doctrine and known deployment practices, all nine nuclear-armed states foresee indefinite retention of nuclear weapons and a continuing role for them in their security policies. (Evans, Ogilvie-White, and Thakur 2015, xiii)

In many ways, the situation has deteriorated since this assessment. The principal arms control agreement between the United States and Russia, New START, is due to expire in 2021. The United States has not yet agreed to the extension of New START, and currently no negotiations are in prospect for a successor agreement. Worse still, nuclear arsenals are being upgraded, military planners are considering new uses for nuclear weapons, and political leaders are even threatening use of nuclear weapons. Scenarios for “limited” nuclear wars are being mooted.

The call for systematic and progressive efforts to reduce nuclear weapons globally, with the ultimate goal of eliminating those weapons, is clearly being ignored. Since the conclusion of the NPT there have been no multilateral negotiations on nuclear arms reductions, and no negotiations seriously addressing how to achieve nuclear disarmament.

At least there have been bilateral nuclear arms agreements between the United States and the Soviet Union/Russia, and substantial arms reductions by these two states. The number of nuclear weapons in the world has been reduced from a peak of over 70,000 to around 15,000 today: some 14,000 held by the United States and Russia, and over 1,000 held among the other seven nuclear-armed states (Kristensen and Norris 2018; Arms Control Association 2018). Despite these reductions, however, the number of nuclear weapons remaining is still enough to destroy the world several times over, and well in excess of the numbers required for credible deterrence (OTA 1979; Blair 2019). And it looks as if the world is entering a period where there will be no nuclear arms agreements in place.

As for other multilateral agreements contributing towards nuclear disarmament, although the CTBT was concluded in 1996 it has still not received the ratifications required for entry into force, and FMCT negotiations have not proceeded due to lack of consensus in the CD. The failure to bring the CTBT into force has added to criticisms over lack of action and political will on disarmament.

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6These bilateral agreements include the 1972 Strategic Arms Limitation Treaty (SALT I), SALT II in 1979, the 1987 Intermediate-Range Nuclear Forces Treaty (INF), the 1991 Strategic Arms Reduction Treaty (START I), START II in 1993, the 2002 Strategic Offensive Reductions Treaty (SORT), and New START in 2010.
One of the few positive developments is the establishment of nuclear-weapon-free zone treaties. There are now five regional treaties, with 102 states parties (or 103 states including Mongolia with its unilateral nuclear-weapon-free zone). Another development is the conclusion of the Treaty on the Prohibition of Nuclear Weapons (TPNW) in 2017. At the time of writing, the TPNW has yet to enter into force. As discussed later in this paper, the impact of this treaty remains to be seen.

To sum up, nuclear disarmament is an obligation under the NPT, but the NPT provides for this to be pursued through further agreements. The lack of negotiations and practical measures pursuant to Article VI is not a failure of the NPT itself but a failure of the parties to act in accordance with Article VI. The challenge for NPT supporters is how to persuade the nuclear-weapon states to engage in a serious process of nuclear risk reductions and arms reductions that will lead to the elimination of nuclear weapons.

Pursuing Action on Disarmament – Need to Commence a Negotiating Process

The NPT requires negotiations in good faith on cessation of the nuclear arms race and on nuclear disarmament. It is reprehensible that the nuclear-weapon states have largely ignored this obligation for almost 50 years. By not taking all practical steps to reduce the risk of nuclear war these states are behaving irresponsibly towards their own peoples as well as the world as a whole. It is imperative to commence negotiations on nuclear disarmament without further delay.

A negotiating process is needed, including a framework of activities in support of negotiations – such as bilateral dialogue and confidence-building measures, military-to-military contacts, and expert-level working groups and networks on verification and other details. At an NPT review conference preparatory committee in 2018, the United States presented a working paper on *Creating the Conditions for Nuclear Disarmament*, inviting dialogue on disarmament issues, particularly how to address the security concerns that have led states to produce and retain nuclear weapons (United States 2018). A dialogue of this kind could be valuable as a start to the negotiating process, provided it is not used as a pretext to avoid commitment to negotiations.

The NPT does not require negotiations to be multilateral – for example, bilateral arms control agreements between the United States and Russia have been very important and are still needed. However, as all nuclear-armed states will have to be involved sooner than later, it is preferable for the multilateral elements of the process to be established at the outset.

The negotiating process should also involve non-nuclear-weapon states, in order to maintain pressure on the nuclear-weapon states and ensure transparency on progress, and also because the nuclear-weapon states will want to address issues such as nuclear latency (potential nuclear weapon capabilities) in the non-nuclear-weapon states.

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7 The nuclear-weapon-free zone treaties are the 1967 Treaty of Tlatelolco (Latin America), 1985 Treaty of Rarotonga (South Pacific), 1995 Treaty of Bangkok (South East Asia), 1996 Treaty of Pelindaba (Africa), and 2006 Treaty of Semipalatinsk (Central Asia). In addition are the 1959 Antarctic Treaty, 1967 Outer Space Treaty and 1971 Seabed Arms Control Treaty.

8 http://undocs.org/A/CONF.229/2017/8.
Participation by non-nuclear-weapon states is consistent with the NPT which provides that disarmament negotiations are to involve all treaty parties.

A complication is that Article VI obligations do not apply to states outside the NPT. The NPT nuclear-weapon states will not commit to major arms reductions without the non-NPT states doing likewise. Accordingly, the process needs to be wider than the NPT membership.

In principle, a negotiating forum inclusive of non-NPT states could be provided by the Conference on Disarmament, and the Thirteen Steps envisage that nuclear disarmament would be assigned to a subsidiary body of the CD. However, the consensus rule for CD decisions is a major obstacle. Unless the CD can change its consensus rule it is obvious that a more effective negotiating forum is needed.

**Key Subjects for Negotiation**

In the absence of a negotiating process, there is as yet no agreement on the matters to be negotiated. Some ideas are set out in the 1995 Principles and Objectives, the 2000 Thirteen Steps and the 2010 Action Plan. Other sources include the international commissions that have studied what is required to progress nuclear disarmament, in particular the Canberra Commission which reported in 1996 (Canberra Commission on the Elimination of Nuclear Weapons 1996), the Weapons of Mass Destruction Commission which reported in 2006 (WMD Commission 2006), and the International Commission on Nuclear Non-Proliferation and Disarmament (ICNND) which reported in 2009 (ICNND 2009). In addition, The Elders (2019) have recently proposed a “minimisation agenda” that they believe offers a realistic long-term path to the total elimination of nuclear weapons.

These reports share many themes and proposals in common. The broad objective of the different reports is succinctly outlined in the report of the Weapons of Mass Destruction Commission:

A key challenge is to dispel the perception that outlawing nuclear weapons is a utopian goal. (Nuclear disarmament) is achievable and can be reached through careful, sensible and practical measures. Benchmarks should be set; definitions agreed; timetables drawn up and agreed upon; and transparency requirements agreed. Disarmament work should be set in motion. (The report) identifies many measures and initiatives that would move the world towards nuclear disarmament. It is time to move from the present stalemate and revive the discussion and negotiations about such steps. (WMD Commission 2006, 109)

The reports all reflect what has become known as the step-by-step approach. This envisages a range of specific steps: each step can be negotiated separately, but they contribute cumulatively to reducing risks, and building the confidence and trust necessary to support further steps, leading to eventual elimination. The Elders’ minimisation agenda sums up some of the major steps in four key principles:

- doctrine – every nuclear state should make an unequivocal No First Use declaration;
- de-alerting – almost all warheads should be taken off high alert status;
- substantial reduction in warhead deployments; and
- decreased numbers of warheads, and a dramatic increase in the numbers eliminated.
ICNND recommended a two-phased approach, with minimisation as the immediate goal and elimination as the ultimate goal. A series of specific steps would be required in each phase. The minimisation point, considered to be achievable within 15 years, would be characterised by low numbers of nuclear weapons – a global maximum of 2,000, with 500 each held by the United States and Russia, and no more than 1,000 in total held by the other nuclear-armed states – as well as agreement on No First Use (NFU), and force deployments and alert status reflecting a NFU posture.

An expanded outline of the steps would be something like the following. It can be seen that these are very similar in substance to the Thirteen Steps from the 2000 NPT review conference.

**Risk Reduction Steps**

*De-alerting*
Removing nuclear weapons from immediate readiness and launch-on-warning status. Currently, the United States and Russia maintain substantial numbers of nuclear weapons on high alert for immediate launching if it appears a pre-emptive strike has been launched. This is essentially a use it or lose it scenario which is inherently high risk. The obvious risk is the danger of false alarms; historically there have been several close calls, where either US or Soviet Union/Russian personnel believed an attack was in progress, and came close to launching strikes in response (Lewis 2012; Lewis et al. 2014).

Even without the danger of mistaken launch, maintaining nuclear forces on high alert is an obvious source of tension, as it implies the possibility that the state concerned could launch a nuclear attack with minimal warning. However, a state that has a secure second-strike capability thereby has an effective deterrent and has no need to maintain nuclear forces on high alert (Blair 2019).

*Strengthening checks on launch authority*
It is a terrifying thought that some political leaders have almost unchecked authority to initiate nuclear war. A consequence of maintaining a launch-on-warning posture, for instance, is that checks on launch authority are minimised to enable rapid response in the event of surprise attack. At best this situation presents serious risks, and there have been close calls, as just noted. At worst, the fate of the world depends on what an irrational leader might do in the dead of night. The issue of checks on presidential launch authority is now being addressed in the United States (Blair 2018); it is imperative for all nuclear-armed states to review their launch authorisation procedures and install appropriate checks and confidence-building measures.

*No First Use*
The basis of an NFU position is that the sole purpose of nuclear weapons is to deter the use of nuclear weapons by others.\(^9\) NFU is currently the declared policy of China and India.

Adoption of NFU would be a major step in changing mindsets with respect to nuclear weapons. Today actions are being taken which are inconsistent with the NPT's goal of the ultimate elimination of nuclear weapons, including: nuclear force

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\(^9\)Strictly speaking, the NFU and sole purpose concepts are slightly different but for practical purposes, they are virtually the same.
modernisation programs, which imply an ongoing utility for nuclear weapons and the likelihood of their use; and the development of new weapon types and scenarios to lower the threshold for nuclear use. Under an NFU policy, these actions would not be required and could no longer be justified (Blair 2019).

NFU would lead to negotiations on specific practical steps addressing issues such as ending the development of new weapons, and the inclusion of tactical nuclear weapons in arms reductions. NFU would also be an effective way of dealing with the problem of limiting presidential launch authority, discussed above. NFU would negate a launch-on-warning posture, enabling the elimination of an entire class of weapons (silo-based missiles) – enabling the nuclear triad to be reduced to a dyad (Zoellner 2010; Blair 2019).10

Some disarmament proponents object to NFU because it is based on nuclear deterrence, that is, NFU implies a preparedness to use nuclear weapons in response to a nuclear attack. While this is a valid concern, the reality is that nuclear deterrence will remain an essential aspect of national defence planning until nuclear weapons are eliminated. Adoption of NFU would help reduce international tensions and contribute to building the trust needed for taking further steps for substantial reductions and eventual elimination of nuclear weapons.

Progressive Reductions in Weapon Numbers

An obvious first step is for the United States and Russia to agree to extend New START and to initiate negotiations on a successor treaty.

Subsequent rounds of negotiations should address reduction of deployed nuclear weapons, and progressive dismantlement of excess nuclear weapons, in all the nuclear-armed states. Considering that current nuclear arsenals are well in excess of the numbers required for credible deterrence, it should be relatively easy to agree on major reductions if the parties can approach the negotiations reasonably. It should also be possible to agree to elimination of all tactical weapons, as these would not be required if NFU is adopted.

There would be a series of agreements on numbers and types of nuclear weapons in deployment, with excess weapons being progressively declared and dismantled. Recovered fissile materials would be declared as excess materials and transferred to civilian use or disposed of under irreversibility arrangements.

Other Steps

Progress in reducing nuclear risks and weapon numbers should be complemented by other treaty regimes, notably the CTBT and an FMCT. The CTBT was concluded in 1996 but is still not in force, because of an unduly demanding entry-into-force formula. This requires ratification by 44 specified states: eight of these have not yet ratified. Notable among these is the United States, which ironically was the first to sign the treaty. The CTBT is just as important as ever to phasing out and eliminating nuclear

10The nuclear triad comprises land-based missiles, submarine-based missiles and nuclear-armed aircraft. A dyad would comprise submarines and aircraft.
weapons, and to countering proliferation; it is essential to re-double efforts to bring the treaty into force.

Negotiations on an FMCT, to end production of fissile material for nuclear weapons, have been stalled for many years. This treaty would not only cap the material available for nuclear weapons, most importantly it would extend safeguards to all fissile material production facilities (enrichment and reprocessing) to ensure future production is not diverted to nuclear weapons. It is essential to find a way to progress these negotiations.

Another area for negotiation is the conclusion of further nuclear weapon-free zones. There is a long-standing proposal for a nuclear weapon-free (or weapons-of-mass-destruction-free) zone in the Middle East. Such a zone could also be considered for North Asia, as part of the denuclearisation of the Korean Peninsula.

A further area requiring ongoing work is the development of verification, transparency and other confidence-building measures in support of nuclear reductions and elimination. Once political leaders recognise that nuclear weapons must be eliminated as quickly as possible, it is essential that lack of technical and institutional means does not become an excuse for inaction. It is beyond the scope of this paper to discuss verification specifics, suffice to say that substantial verification capability and experience exist already and are being developed further (Carlson 2018a). These efforts should be given higher priority.

**Time Frame**

Critics of the step-by-step approach point to the lack of a time frame, and are concerned this approach is really an excuse for avoiding any commitment to meaningful action on disarmament. In fact, as discussed by the international commissions referenced in this paper, and reflected in the Thirteen Steps, a step-by-step approach is the only realistic way of achieving disarmament. The problem is not the step-wise approach as such, but the lack of any action on the necessary steps.

There is a need to initiate an action program and establish timelines where possible, and to instil a sense of commitment and urgency where specific times are not yet possible. On timelines, it would be possible, with sufficient political will, to reach agreement at the 2020 NPT review conference on establishing a negotiating process. Thereafter, the target proposed by ICNND of reaching a **minimisation point** within 15 years is certainly achievable, again, with sufficient political will. Within the 15-year period, there would be a number of specific actions with more immediate timelines, such as extension of New START (due by February 2021), commencement of negotiations on a replacement treaty (“START IV”), decisions on launch authority and decisions on de-alerting and NFU.

ICNND considered that a target date for getting to zero could not be credibly specified at the outset, but analysis and dialogue could commence immediately on the conditions necessary to move from the minimisation point to elimination. A better idea of a pathway and milestones to elimination should be possible by the time the minimisation point is reached.

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11See also the website of the International Partnership for Nuclear Disarmament Verification. [www.ipndv.org](http://www.ipndv.org).
Treaty on the Prohibition of Nuclear Weapons

The negotiation of the TPNW was prompted by frustration at the lack of action on nuclear disarmament. This led to the promotion of an alternative approach, outright prohibition as applies to other weapons of mass destruction. Encouraged by the achievement of ban treaties for chemical and biological weapons, a number of governments and civil society groups decided to seek a similar outcome for nuclear weapons.

The TPNW was negotiated under General Assembly auspices. The treaty text was adopted by 122 votes (63% of UN member states) and was opened for signature on 20 September 2017. The treaty will enter into force when it has been ratified by 50 states. At the time of writing, 23 states had ratified the treaty and 47 states had signed but not yet ratified.12

The TPNW prohibits parties, inter alia, producing, possessing, testing, deploying, stationing and using nuclear weapons (TPNW Article 1.1). States with nuclear weapons that join the treaty are required to remove them from operational status immediately, and to destroy them within a deadline to be set by the first Meeting of States Parties.13

The TPNW also prohibits parties from assisting, encouraging or inducing anyone to engage in any activity prohibited to a party under the treaty (Article 1.1(e)). This appears to prohibit parties from accepting extended nuclear deterrence from a nuclear-armed state. In other words, the treaty excludes so-called nuclear umbrella states from joining; they must first renounce alliance arrangements that involve nuclear weapons.

Unfortunately, the approach taken with the TPNW has polarised the international community. The treaty proponents are committed to immediate prohibition and in the negotiations were not prepared to seek common ground with the nuclear-armed states, such as a phased approach to disarmament. As a consequence, all nine nuclear-armed states and most of their allies, almost 40 states in all, considered it was futile to participate in the negotiations. For these states, an absolute prohibition is unrealistic when for the foreseeable future they consider nuclear weapons will remain essential to their national security. They maintain nuclear reductions are possible only through a step-by-step approach, and the pace cannot be forced by a treaty of this kind.

In addition to the fundamental issue of the treaty objective, the TPNW text contains some substantive problems and drafting uncertainties, including compromised safeguards provisions, uncertain impact on existing treaties, and uncertain implications for defence cooperation (Swedish Ministry for Foreign Affairs 2019; Norwegian Foreign Ministry 2018; Swiss Federal Department of Foreign Affairs 2018; Carlson 2017). These problems are not surprising considering that the text was negotiated so quickly. The negotiating sessions totalled just over four weeks, a very short time for such an important treaty, and far too short for resolving complex details.

On safeguards, under the TPNW a non-nuclear-weapon state that does not have an additional protocol when the treaty enters into force is not required to conclude one.14 This contradicts the unanimous conclusion of the 2010 NPT review conference that in

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12The status of the TPNW can be found at https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-9&chapter=26&clang=_en (accessed 13 April 2019).
13Article 4.2. It is not clear whether this deadline will be a generic time period (like “within 10 years”) or a specific date (like “by 2025”).
14TPNW Article 3.1. Under this provision, states including Iran, Brazil, Egypt and Saudi Arabia could maintain they are absolved from concluding an additional protocol.
a nuclear-free world the IAEA additional protocol should be in force for all states\textsuperscript{15} (Carlson 2018b). The universal application of the highest safeguards standard is essential, because the nuclear-armed states will not disarm if they believe new nuclear-armed states could emerge, and because stronger, not weaker, safeguards will be needed to maintain a nuclear-weapon-free world. TPNW supporters argue the treaty is without prejudice to any additional instruments a party may adopt in the future. But the point of a treaty is to establish obligations and standards – why have a treaty if its effectiveness depends on voluntary action?

Regarding existing treaties, the TPNW is expressed not to prejudice existing obligations where they are \textit{consistent with the treaty} (Article 18). It is not clear how this language might apply in practice. For example, Brazil has described the TPNW as the “new standard” for nuclear disarmament and non-proliferation, nuclear safety and security (Swedish report, page 3) – how does Brazil see this “new standard” affecting existing treaties on these matters?

On defence cooperation, the language of the TPNW may go much further than prohibiting extended nuclear deterrence. As has been pointed out (International Human Rights Clinic 2018), the treaty does not exclude a party from defence cooperation with a nuclear-armed state, provided this does not involve nuclear weapons. The problem is, the term \textit{assist} is imprecise, and there will be grey areas. One example is transits and visits by military ships and aircraft that \textit{could} be carrying nuclear weapons. Nuclear-weapon states usually neither confirm nor deny whether ships and aircraft are nuclear-armed, so the host state could simply rely on this, but other parties may consider this would not meet expected conduct under the treaty. Another example is cooperation in areas such as communications and surveillance, including through the hosting of joint facilities. Here too the host state may not know for sure whether there is some link to nuclear weapon planning and deployment. Will other treaty parties be content to let the host state rely on ignorance?

It is unrealistic to expect that nuclear-armed states will eliminate nuclear weapons by a date set by others, and that umbrella states will immediately renounce extended nuclear deterrence regardless of threats to their national security. The 2010 NPT review conference Action Plan called for progress on disarmament to be accelerated \textit{in a way that promotes international stability, peace and undiminished and increased security}.\textsuperscript{16} It is essential to find disarmament pathways that maintain strategic stability and avoid \textit{increasing} risks to national security.

What is needed is a practical step-by-step process to eliminate nuclear weapons in stages. Frustration that this is not happening does not mean this is not the right approach. Nuclear weapons should be reduced to a minimum deterrent level as quickly as possible, but they will not be eliminated below a minimum deterrent level until high levels of trust and confidence have been established.

\section*{Conclusions}

The NPT is not only still relevant, it will continue to be the essential cornerstone of the non-proliferation regime. Confidence in non-proliferation is essential for nuclear

\textsuperscript{15}2010 NPT Review Conference Conclusions, Action 30.
\textsuperscript{16}2010 NPT Review Conference Action Plan, Action 5.
disarmament to proceed. The non-proliferation regime is the end-state for disarmament – when nuclear weapons have been eliminated every state will be a non-nuclear-weapon state. Paradoxically, in a nuclear-weapon-free world, the temptation to acquire nuclear weapons may be greater (a small state could aspire to become a major power), so a rigorous non-proliferation regime, including the most effective form of safeguards, will be absolutely essential.

Against this background, it is a major concern that some states are attacking the NPT on political grounds, particularly for the failure of the nuclear-weapon states to fulfil their disarmament obligations. The perception of insufficient commitment to the NPT by the nuclear-weapon states makes for a difficult political atmosphere. There is a need for a major diplomatic effort on these issues, stressing two aspects: (1) states need to be more aware of the security benefits they derive from a strong non-proliferation regime; and most importantly (2) it is essential to press the nuclear-weapon states, as well as the non-NPT states, to make a serious commitment to reducing nuclear risks and pursuing disarmament.

This has to be a collaborative effort, as recognised in the NPT which calls for negotiations involving all parties. The TPNW has certainly reinvigorated discussion on the need for nuclear disarmament, and no doubt will help to stigmatise nuclear weapons, but a polarising approach is ultimately unhelpful. Nuclear disarmament cannot be imposed; states will not relinquish nuclear weapons until they see a pathway for doing this without endangering their security.

The TPNW is politically important as an expression of the world’s concern to see nuclear weapons issues addressed seriously and urgently. Those that reject the TPNW have a responsibility to produce something better. A step-by-step approach is the only realistic way of achieving disarmament, but this approach lacks credibility when there are no such steps underway or even being planned. The nuclear-weapon states and the non-NPT states must start taking concrete steps without further delay. The umbrella states must do everything they can to persuade and encourage the nuclear-weapon states in this effort. This paper has outlined a number of the steps required. Some of these are needed urgently and should be achievable fairly quickly. What is needed now is to instil a sense of common purpose and urgency to commence the process.

**Disclosure Statement**

No potential conflict of interest was reported by the author.

**Notes on Contributor**

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