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Citation for published version (APA):

Burford, L., Cameron, J., Elbahtimy, H., Everett, M., Hobbs, C., Kienzle, B., ... Muhammad, A. (2019, Jan 19). Evidence submitted to Inquiry on Nuclear Non-Proliferation Treaty and Nuclear Disarmament. *House of Lords, UK Parliament*.

Citing this paper

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Dr Lyndon Burford, Dr James Cameron, Dr Hassan Elbahtimy, Mr Martin Everett, Dr Christopher Hobbs, Dr Ben Kienzle, Dr Nicola Leveringhaus, Dr Adil Sultan Muhammad, Dr Sarah Tzinieris, Centre for Science and Security Studies, King's College London – Written evidence (NPT0032)

Preface

This is a collective submission of evidence by scholars from the Centre for Science and Security Studies. It draws on the diverse technical and regional expertise at the Centre to examine various facets of global nuclear diplomacy and how they relate to the United Kingdom.

The submission is divided into separate essays each addressing a specific topic and written by a single author. The views presented in each essay belong solely to the author, and do not necessarily represent the views of the Centre for Science and Security Studies or the other contributors in this collective submission. When citing ideas in this work, please include the name of the essay's author .

The essays are clustered into two parts. The first part reflects on broad themes and trends influencing global nuclear diplomacy and highlights opportunities for UK action and leadership. Essays in the second part situate the UK within a specific regional or international nuclear context. Essays in that part examine developments in US-Russian arms control, China, the Middle East and South Asia as well as exploring UK's role in nuclear diplomacy post-Brexit.

Hassan Elbahtimy
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London, 18 January 2019

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About the Centre for Science and Security Studies King's College London

The Centre for Science and Security Studies (CSSS) is a multi-disciplinary research and teaching group that brings together scientific experts with specialists in politics, international relations and history. CSSS forms part of the School of Security Studies at King's and draws on experts from the Department of War Studies and the Department of Defence Studies. Members of the Centre conduct scholarly and policy-relevant research on weapons proliferation, non-proliferation, verification and disarmament, nuclear security, space security and mass effect terrorism including the CBRN (chemical, biological, radiological and nuclear) dimension. In addition to academic staff, CSSS host masters and postgraduate research students, as well as visiting fellows and associates drawn from the academic, government and business sectors.

Three Masters Programmes are run within CSSS, an MA in Science and Security (launched 2005), an MA in Non-Proliferation and International Security. (launched 2012) and an MA in Arms Control and International Security (launched 2016). A significant emphasis is also placed on engagement with industry, government and international organisations, and the wider dissemination of research findings through interaction with the media. These activities include executive education and specialised professional development courses for practitioners with a focus on supporting the implementation of nuclear security measures and efforts to counter proliferation-related trade.

The Centre organises conferences and hosts a regular seminar series where internal and external speakers address issues related to science and security. For forthcoming events check the War Studies and CSSS events web pages.

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Dr Christopher Hobbs

Dr Hobbs is a Reader in Science and Security within the War Studies Department at King's College London and Co-Director of the Centre for Science and Security Studies (CSSS). He is a member of the Steering Committee for the Fissile Material Working Group (FMWG), a former Chair of the International Nuclear Security Education Network (INSEN) and Technical Implementing Lead for the UK's Nuclear Security Culture Programme. He has published widely on nuclear

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Dr Sarah Tzinieris

Dr Tzinieris is a Research Fellow in the Centre for Science and Security Studies (CSSS), part of the War Studies Department, King's College London. Dr Tzinieris' current research focuses on nuclear disarmament, non-proliferation, nuclear security and CBRN terrorism. She also helps manage the Nuclear Security Culture Programme, funded by the UK government's Department for Business, Energy and Industrial Strategy (BEIS). Dr Tzinieris has co-edited a briefing book on the NPT Treaty which was provided to state parties at the 2018 NPT PrepCom. Her other publications have focused on insider threats, the EU accession process, UK foreign policy, and mining and oil gas projects.

PART I

Current Challenges Facing Global Nuclear Diplomacy

Dr Sarah Tzinieris

1. Despite progress on disarmament at the end of the Cold War, great power competition is resuming on the world stage. In recent years, a number of nuclear weapon states (US¹, UK², France³ and Russia⁴) have included statements in their security doctrines about strengthening their nuclear arsenals. New nuclear programmes take decades to become operational, indicating that the nuclear weapon states are committed to maintaining the status quo.
2. We have moved away significantly from the policy dialogues of the Cold War period – especially the 1960s and 1970s – where nuclear weapons were a persistent issue generating a great deal of fear. Yet, in reality the salience of nuclear weapons has never been greater in view of technological advances in weapons and the volatile state of global politics. In practical terms, international diplomacy and trade negotiations between states almost always ignore the issue of nuclear weapons. Whilst this is a more conducive approach to achieving results, the absence of discussion on disarmament within international forums reduces pressures on central government over their nuclear arsenals and delivery systems. In most cases, discussions about nuclear weapons are siloed into the defence ministry and do not feature in broader international dialogues.
3. Over the past decade, great power rivalries between the US and Russia and between the US and China have intensified and led to a series of hostile encounters and geopolitical flashpoints, especially in the Korean peninsula, South China Sea, Ukraine and Syria. The relentless modernisation by these states of nuclear capabilities and their delivery systems is exacerbating tensions on the international stage. John F Kennedy's adage that we live under a sword of Damocles which is capable of being cut at any moment by accident, miscalculation or madness⁵ is more salient today than it ever has been since the Cold War ended.⁶
4. Following the optimism heralded at the end of the Cold War, the subsequent impasses on disarmament have led to dismay amongst various non-nuclear weapon states and civil society groups. Many believe that provisions in the NPT on 'good faith' obligations⁷ have not been sufficient to commit nuclear weapon states to disarmament.
5. The more that advances are made in the modernisation of nuclear arsenals, the more that questions are being asked in other parts of the world about the commitment of nuclear weapon states to disarmament. The NPT was premised on a 'grand bargain' that non-nuclear weapon states would forego nuclear weapons forever, whilst the select few already possessing nuclear

1 US Government, US Nuclear Posture Review (January 2018).

2 UK Government, UK National Security Strategy and Strategic Defence and Security Review (November 2015).

3 République Française, Defence and National Security Strategic Review 2017 (October 2017).

4 Russian Federation, The Military Doctrine of the Russian Federation 2014 (29 June 2016); also see statements by President Vladimir Putin on 1 March 2018 (www.bbc.co.uk/news/world-europe-43239331).

5 John F Kennedy, address before the UN General Assembly, New York (25 September 1961).

6 For a list of incidents of near nuclear use and their implications, see Patricia Lewis, Benoit Pelopidas, Heather Williams and Sasan Aghlani, *Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy*, Brookings Institute Press (2015)

7 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), UN Office for Disarmament Affairs (1 July 1968).

weapons would commit to eliminating theirs. However, lack of progress over disarmament – with modernisation programmes simultaneously underway – appears to be consolidating the status quo, where a select few ‘nuclear haves’ indefinitely retain their arsenals. The grand bargain, built on trust and good faith, is increasingly perceived as a fragile construction.

6. Modernisation confers some important benefits such as risk-reduction and improvements in the safety of nuclear weapons, making them less prone to accident or malfunction. However, these benefits are rarely the principal motivation for modernisation programmes; rather, it is the belief by nuclear weapon states that they must develop and maintain an arsenal to assure their national security. Non-nuclear weapon states and civil society groups are becoming increasingly wary of attempts to frame modernisation programmes in disingenuous ways.⁸
7. Profound differences in perceptions about arms control are continuing to complicate diplomatic efforts on nuclear disarmament. At the heart of the problem, policy makers in nuclear weapon states (especially the US and Russia) tend to take an approach to arms control that focuses on narrow, technical constraints on military capabilities. Such arms control theories rely on implicit assumptions about how deterrence works, which unavoidably extends to making assumptions about the intentions of other nuclear weapon states. Policy makers meanwhile assume that other states are reasoning from the same ‘first principles’, when in fact there might be crucial domestic issues or other constraints that mean such threat perceptions are misaligned. As well as inhibiting diplomatic progress, there is a risk of nuclear escalation.
8. The entanglement of nuclear weapons with non-nuclear weapons, as well as their equivalent C3I capabilities⁹, heightens the risk of an inadvertent global nuclear war – even where a conflict may have been initiated over local or regional issues. The dangers in entanglement are increasingly recognised in the West, but less so in Russia and China due to entrenched assumptions that any escalation is calculated rather than inadvertent. The risk of entanglement is heightened with the growing capability of non-nuclear weapons to threaten dual-use C3I assets, such as US early-warning satellites.
9. The increasing propensity of states to penetrate the cyber systems of other states heightens the risk of a nuclear attack where hacking and cyber attacks extend to nuclear arsenals and C3I assets. The problem is extensive and all nuclear weapon states are tied up in these practices – and therefore must take responsibility for the creation of these new ‘norms’. Whilst such assets are usually equipped with ‘air gaps’, an adversary intent on entering a system may be able to exploit it (as demonstrated by the Stuxnet attack).¹⁰ Given the high stakes, governments should acknowledge accountability and accord the issue urgency within global nuclear diplomacy.

8 See for example, Reaching Critical Will, ‘NPT News in Review’, Vol. 15, No. 6 (6 May 2018); Women’s International League for Peace and Freedom, ‘Assuring Destruction Forever: 2018 Edition’ (April 2018).

9 For more on this subject, see James M. Acton, ‘Escalation through Entanglement: How the Vulnerability of Command-and-Control Systems Raises the Risks of an Inadvertent Nuclear War’, *International Security*, Vol. 43, Issue 1 (summer 2018).

10 For more on this subject, see Andrew Futter, *Hacking the Bomb: Cyber Threats and Nuclear Weapons*, Georgetown University Press (10 April 2018).

The Relevance of the NPT for Global Nuclear Diplomacy

Dr Sarah Tzinieris

1. Above all, the NPT has near-universal acceptance and adherence within the international community. Negotiated 50 years ago last year, the NPT has the highest number of state parties of any nuclear treaty and represents the main forum for negotiations on disarmament and non-proliferation. Equally important, it is the only treaty containing the obligation to disarm to which five of the world's nuclear-weapon states – crucially, including the US and Russia – have acceded. As such, the NPT continues to be recognised as the cornerstone of global nuclear governance.
2. Yet operating as, arguably, a 'lowest common denominator' has its drawbacks. The NPT has failed to deliver on aspirations of a nuclear-free world and instead instituted a two-tier hierarchy of leverage – with the nuclear-weapon states inherently privileged over the non-nuclear weapon states owing to their hegemony over disarmament. The NPT has also been unable to manage nuclear relations effectively in some key regional theatres, leading to nuclear proliferation in the Middle East, East Asia and South Asia. Nevertheless, the NPT continues to have a unique appeal. It represents the triumph of multilateralism and global collective action to mitigate transnational risks arising from nuclear weapons.
3. Many states argue that the NPT requires a re-balancing of the relative value assigned to the three pillars. The P5 have long prioritised the non-proliferation pillar but, since the initial momentum at the end of the Cold War, progress has ceased on the disarmament pillar. For this reason, some observers argue that the NPT confers legitimacy for nuclear weapon possession;¹¹ certainly, the NPT has served to preserve the status quo with regard to the privileged status of the P5. The continuing lack of leverage for non-nuclear weapon states has created widespread disillusionment, although this has not yet reached a level that would see any serious abandonment of the NPT process by signatories.
4. The NPT's sanctioning of a two-tier hierarchy works through the international community more broadly, most evidently reflected in the structure of the UN Security Council and the corresponding veto powers of the P5. Notwithstanding the politics around the nuclear weapons themselves, the NPT retains a crucial role within international affairs – and indeed mirrors and reinforces the existing structures of global governance.
5. The implicit hierarchy between the nuclear weapon states and non-nuclear weapon states encapsulated within the NPT renders the treaty incapable of unconditionally delegitimising nuclear weapons. This does not necessarily result in lack of relevance for the NPT – and few states would argue this – but it does create an absence in multilateral treaty provisions on the issue of delegitimacy. This gap is something that the new ban treaty, for all its controversy, categorically serves to fill.

11 For example, Nick Ritchie, 'Legitimizing and Delegitimising Nuclear Weapons', in John Borrie and Tim Caughley (eds.) *Viewing Nuclear Weapons Through a Humanitarian Lens*, UN Institute for Disarmament Research (2013).

6. In addition to lack of multilateral leverage over disarmament, other critical factors create structural inequalities in global nuclear diplomacy: only five out of nine nuclear weapon states are signatories, limiting the NPT's impact on global disarmament negotiations; Article VI, which concerns disarmament, is lacking in legal strength and its meaning is open to interpretation; and the indefinite 1995 extension of the NPT was premised on a package of initiatives, which included the convening of a Middle East WMD-Free Zone Conference and progress being made on the Comprehensive Test-Ban Treaty (CTBT) and Fissile Materials Cut-Off Treaty, yet, of these, only the CTBT has been implemented and six nuclear weapon states have not yet ratified it.
7. The perception of a two-tiered hierarchy within the NPT creates a sense of futility on the part of the non-nuclear weapon states over reaching any meaningful progress, particularly with regard to their key demand for disarmament. This leads to more confrontational and obstructive behaviours than would otherwise be the case in a more balanced negotiating framework. For instance, one of the tools available to all states is to block consensus on a final document at NPT Review Conferences. Without more progress on disarmament, this dynamic may ultimately undermine the NPT framework as a forum for constructive debate.
8. The past NPT Review Conference in 2015 failed to produce a consensus agreement on a final declaration document. There is therefore added pressure to achieve a final declaration document at the 2020 conference in order to avoid a weakening of trust in the NPT process, which over the longer term could potentially result in some states seeking alternatives. Leading up to 2020, there are high expectations for achieving momentum, with the 75th anniversary of Hiroshima to be marked the same year. Reaching a consensus agreement will require strong leadership as well as compromise by state parties.
9. The NPT Review Conference in 2025 is the key event that arouses most attention since, by then, the new Treaty on the Prohibition of Nuclear Weapons is expected to have entered into force. Yet, as most NPT signatories would agree, a legally-binding nuclear ban will not make the NPT architecture redundant, precisely for the reasons behind the 1995 decision to extend it indefinitely – namely to prevent new states acquiring nuclear weapons and stem other proliferation activities. Moreover, nuclear weapon states are highly unlikely to disarm unilaterally; even step-by-step disarmament has historically required a sea change in security conditions.

Recalibrating the UK's Role in International Nuclear Diplomacy

Dr Sarah Tzinieris

1. It cannot be overstated that the UK government is legally committed to pursue negotiations in 'good faith' on nuclear disarmament¹², and has been so since 1968 when it signed and ratified the NPT. Whilst official government statements recognise the UK's responsibilities as a nuclear weapon state within the NPT framework, there appears to be greater ambiguity about the implications of these responsibilities within government discourses and even inside the civil service and military.
2. The UK has a real opportunity to take a leadership role in the 2020 NPT Review Conference, especially by providing a bridge for communication between the P5 and other state signatories. The 2020 RevCon is regarded as a litmus test for progress since failure to produce a consensus final document would mark the first time that two consecutive RevCons ended without this agreement. Such a failure would lead to further loss of confidence in the NPT process.
3. Ahead of 2020 RevCon, the UK can engage constructively by enhancing cooperation between disparate states involved in the NPT process, particularly between the nuclear weapon states and groupings of non-nuclear weapon states that have traditionally been influential such as the Non-Aligned Movement (NAM), New Agenda Coalition (NAC) and Nonproliferation and Disarmament Initiative (NPDI). The UK's bridging role also needs to focus on closing gaps in perceptions between proponents and detractors of the ban treaty. In particular, the UK might look to communicate the threat perceptions warranting possession of nuclear weapons to those states not party to a nuclear umbrella guarantee, since security conditions are often the sticking point in negotiations.
4. The UK is uniquely placed to act as a bridge or pivot between disparate groups in the NPT by virtue of its membership in the P5, whilst at the same time possessing a low number of nuclear warheads (in relative terms) and a single delivery platform. The UK has a long history of successfully utilising multilateral fora to contribute to international peace and development. Nevertheless, the UK will need to ensure that this approach is not perceived as a self-interested strategy to maximise strategic influence, or worse, as a smokescreen to mask lack of progress on disarmament.
5. If the UK is serious about pursuing a leadership role ahead of the 2020 RevCon, the government must recognise that its credibility will hinge on being able to follow through with concerted efforts and actions. Ultimately, lack of progress within the NPT process was what motivated states to pursue a ban treaty. Non-nuclear weapon states are growing increasingly disillusioned by empty rhetoric on disarmament which has characterised decades of NPT meetings, and they can be expected to push for tangible outcomes.
6. Building coalitions between disparate groups within the NPT would denote constructive diplomatic efforts by the UK, especially if this were to ease

¹² Treaty on the Non-Proliferation of Nuclear Weapons (NPT), UN Office for Disarmament Affairs (1 July 1968).

tensions between ban treaty proponents and detractors. Nonetheless, playing an active role in global nuclear diplomacy is not equivalent to taking concrete steps on disarmament. Still, it is difficult to see how a further cut in the number of the UK's missiles, warheads or delivery platforms would be sufficient to maintain a posture of minimum credible deterrence.

7. Short of the presently unthinkable – although not unachievable – abandonment of its continuous at-sea deterrent, the UK's options for making progress on disarmament are limited to declaratory policy. One obvious way to do this is take more concerted efforts to engage with other nuclear weapon states, and this must necessarily include China and Russia – the latter even in the face of ongoing major political strains. Such engagement should also include the non-NPT state signatories: Israel, India, Pakistan and the DPRK – although the UK would need to work in concert with the US, China and Russia to facilitate the participation of the non-NPT states, which can be expected to be highly distrustful of any multilateral initiative.
8. In the past decade, the P5 framework for negotiations over the NPT has not produced any meaningful progress with regard to disarmament. Whilst breaking the impasse between the US and Russia over the issues will remain critical, the UK might promote the P3 framework (US, France and UK) as a means to achieve tangible outcomes.
9. Within the framework of engagement with nuclear weapon states, the UK might seek to publicise its technical work on verification and arms control in order to create alternative pathways. As highlighted by the Comprehensive Test Ban Treaty, building an effective verification regime can build the necessary trust required to make political progress over disarmament.
10. The UK has taken a leading role in a variety of non-proliferation fora, including the Proliferation Security Initiative, International Partnership for Disarmament Verification, the UK-Norway Initiative and the Quad Verification Partnership. The UK has also made important long-standing contributions within the NPT to the non-proliferation pillar (through its technical work on export controls) and the peaceful use of nuclear energy pillar (through its capacity support for nuclear safety, nuclear security and reactor design for new civil nuclear programmes). Much of this work takes place behind the scenes, so publicising it more effectively would build recognition of the UK's long-term commitment to global nuclear diplomacy. Such public relations efforts are worth instigating not just in the traditional NPT framework, but in the Global Britain agenda and various multilateral fora.
11. A more ambitious approach could be for the UK – possibly in tandem with France – to encourage other nuclear weapon states to adopt a minimum level of nuclear deterrence. Whilst this is unlikely to yield positive results in the short term, the UK could seek to develop a longer-term framework to return to this issue on a periodic basis.
12. Whilst achieving progress at 2020 is critical, progress over global nuclear diplomacy is about playing the long game and the UK will need to commit resources and attention beyond 2020. Disarmament in particular requires long lead-in times to enact change. Meanwhile, the 2025 RevCon will bring new pressures to bear on the NPT review process due to the likelihood that

the TPNW will be ratified by that date. The UK's commitment to playing a constructive role in disarmament efforts will require cross-party support to ensure that future British governments take up the baton.

13. In addition to ensuring a long-term commitment to global nuclear diplomacy, achieving cross-party support over non-proliferation and disarmament is in the public interest. There remain crucial differences between the two main British political parties over the UK's nuclear deterrent which creates ambiguities for long-term planning. The Brexit project has served to side line these debates over the past three years, but they will almost certainly re-emerge, particularly as key decisions are made over the transition to the Dreadnought series and associated decommissioning.
14. As a liberal democracy, maintaining public support for the UK's global nuclear diplomacy will be vital to make this project successful and, most importantly, sustainable. At present, public understanding of the UK's nuclear posture and the realities of the nuclear deterrent is limited. A simple action to increase public engagement would be to update the UK government website. The website is currently limited to information on the nuclear deterrent and does not include the UK's broader work on non-proliferation and verification, nor its long-standing commitment to the NPT process.
15. For the time being, the UK's political pressures amid Brexit uncertainty will make progress on global nuclear diplomacy a trying endeavour. There are also budgetary pressures across the civil service. Nonetheless, the 2020 RevCon presents a vital opportunity for the UK to contribute to progress and the risk of further impasse will make the world more dangerous.

UK Leadership for Constructive Dialogue on Nuclear Disarmament Responsibilities

Dr Lyndon Burford

Core recommendation

1. As nuclear weapons-related threats become more complex, numerous and interdependent, the need for concerted, multilateral action to address them is becoming more urgent. Meanwhile, the international community finds itself without a forum capable of sustaining constructive dialogue on how disarmament might help to address those threats. The United Kingdom (UK) should therefore support the recent US proposal to establish disarmament working groups under the Nuclear Non-Proliferation Treaty (NPT), and building on Britain's record of constructive disarmament leadership, should offer to co-chair a multilateral NPT working group on the theme "Responsibilities under Article VI."¹³ To maximise the strategic and political benefit of this initiative, the UK should invite a non-nuclear weapon state from the global South to co-chair the group, and welcome administrative and substantive contributions from international civil society.
2. This initiative would help to secure three core British interests. First, it would demonstrate Britain's good faith commitment under NPT Article VI to advance nuclear disarmament, thus helping strengthen the multilateral nuclear order based on the NPT, from which the UK derives significant strategic benefit; second, it would facilitate essential dialogue on how disarmament can assist in reducing nuclear threats such as the growing risk of nuclear war caused by a range of disruptive political and technological developments; and third, it would advance the Global Britain initiative at home and abroad via UK leadership on a vital international security issue.

Working group format and theme

3. NPT Article VI commits *all* States Parties to the Treaty "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," as well as to pursue general and complete disarmament. But many non-nuclear weapon states see the current NPT review process as failing to facilitate the fulfilment of these responsibilities or produce tangible progress in multilateral disarmament, while unhelpfully limiting the scope of expert support for the task by restricting the participation of international civil society.
4. As nuclear weapons-related threats become more numerous and complex (issues discussed in more detail below), both allied and independent/non-aligned non-nuclear weapon states are demanding greater attention be paid to identifying and addressing the evolving sources of nuclear risk. The format of the working group can be used to address these concerns and to maximise its positive political impact on NPT dynamics. In this regard, the UK should seek to co-chair the working group with a non-nuclear weapon state from the global South. It should welcome the

¹³ See Amb. Christopher Ford's remarks at Wilton Park, 10 December 2018: "The P5 Process and Approaches to Nuclear Disarmament: A New Structured Dialogue." <https://www.state.gov/t/isn/rls/rm/2018/288018.htm>

participation of all interested NPT Parties and civil society experts, and pursue grant funding to support the engagement of officials and nongovernmental experts from the global South. Finally, it should appoint a highly-qualified civil society partner to help coordinate funding support and civil society participation.

5. This format would ensure the consideration of a diversity of views on how disarmament action might help to reduce the risk of accidental, unauthorised, miscalculated or intentional nuclear war. In doing so, it would demonstrate Britain's commitment to pursuing and supporting good faith efforts to advance nuclear disarmament under NPT Article VI, which would help to ameliorate the antagonistic political dynamics surrounding the issue in the lead up to the 2020 NPT Review Conference. In the longer term, this would strengthen the NPT review process and help safeguard international commitment to the Treaty as a cornerstone of the disarmament and nonproliferation regime. Britain could further demonstrate leadership in this context by inviting the other NPT nuclear weapon states to co-chair parallel working groups in the same format.
6. In terms of thematic focus, a British-led working group should seek to emphasise the vital, common interest of the international community in preventing nuclear war, while exploring the evolving disarmament responsibilities of NPT members given the rapidly changing security environment—particularly with regard to the impact on deterrence practices of disruptive technologies. In political terms, it would be useful to frame this initiative as an NPT-based “nuclear disarmament working group,” setting aside the US label “Creating the Conditions for Nuclear Disarmament.” The latter is deeply unpopular even among allied countries, in part due to its perceived emphasis on barriers to, rather than means to advance, disarmament, and in part to its association with the nuclear weapon states' common insistence that no disarmament action is possible at present.
7. To address widespread concerns about evolving and expanding nuclear risks, and to facilitate constructive dialogue about how disarmament action can help to address those risks, topics for discussion in the working group should include:
 - a. **Pathways to nuclear war.** To prevent nuclear war in a rapidly evolving security environment, it is necessary first to establish agreement on potential pathways to war, then on collective action that might be taken to preclude them. As multiple political and technological factors disrupt the status quo, constructive dialogue on these issues is urgently needed.
 - b. **Technological disruption of nuclear deterrence.** Technologies such as cyber capabilities, AI, machine learning, remote sensing, computing networking, robotics and autonomous vehicles threaten to undermine confidence in nuclear command and control and early warning systems. If this threat is realised, it will increase the perceived ‘use it or lose it’ incentive for nuclear first strikes in a crisis.¹⁴ Nuclear weapon states and their allies in particular have a responsibility under NPT Article VI to acknowledge such threats and

¹⁴ Stanislav Abaimov and Paul Ingram, “Hacking UK Trident: A Growing Threat” (London: BASIC, 2017).
http://www.basicint.org/sites/default/files/HACKING_UK_TRIDENT.pdf.

show how they are responding to reduce the risk of deterrence failure.

- c. **The disarmament-deterrence conundrum.** Deterrence advocates often worry that disarmament action will reduce deterrence credibility, increasing adversaries' motivation for aggression and thus, also increasing the risk of conflict that may escalate to nuclear war. This conundrum must be addressed if disarmament is to progress.
- d. **International law and nuclear weapons.** Global awareness of the humanitarian consequences of nuclear weapons is increasing while the risk of nuclear use is arguably becoming more acute. In this context, examining how international law can constrain nuclear policy and practice may help to advance disarmament and lower the risk of war.
- e. **Disarmament and nonproliferation education.** Despite widespread agreement on the value of education, little concerted action has been taken in the NTP context to harvest this 'low-hanging fruit.' British leadership could produce useful results in the short term in this area, by facilitating multilateral cooperation on nuclear education in public and political constituencies.
- f. **Gender balance and perspectives in nuclear forums.** As is the case with education, widespread agreement on the value of gender diversity and gender perspectives in disarmament forums has yet to produce collective commitments or action. Existing initiatives such as Gender Champions in Nuclear Policy are further low-hanging fruit, offering tangible, immediate options to demonstrate good faith disarmament efforts and build new modes of cooperation.¹⁵

Rationale: reduce the risk of nuclear war, defend the multilateral order

8. The UK derives significant strategic benefit from the multilateral nuclear order built on the NPT, which has helped to slow the spread of nuclear weapons and reduce the risk of nuclear war. It is therefore strongly in the British national interest to take decisive action to address the political, social and technological disruptions which, collectively, are threatening the foundations of the nuclear order and increasing the risk of nuclear war.
9. In 2017, for example, former US Secretary of Defense William Perry warned that there was "greater danger of a nuclear catastrophe than we faced during the Cold War" and worse, that unlike during the Cold War, "hardly anybody understands that."¹⁶ Examples of dynamics that are increasing the complexity and scale of nuclear weapons-related risk include:
 - a. a return to great power competition combined with the demise of bilateral arms control
 - b. plans to produce high-accuracy, low-yield nuclear weapons that lower the perceived threshold for the use of nuclear weapons, thus increasing the risk of intentional nuclear war

¹⁵ See <https://www.gcuclearpolicy.org/>.

¹⁶ William J. Perry, "The Risk of Nuclear Catastrophe Is Greater Today Than During the Cold War," *Huffington Post*, 6 December 2017. https://www.huffingtonpost.com/william-jperry/nuclear-catastrophe-risk_b_9019558.html

- c. renewed nuclear arms-races in complex, multipolar contexts where Cold War-era threat reduction technologies, agreements and shared understandings are often absent
 - d. a growing 'entanglement' of nuclear and non-nuclear weapon systems, which increases the number and complexity of potential pathways to escalation from conventional to nuclear war
 - e. the splintering of international opinion on how to advance nuclear disarmament, with the Treaty on the Prohibition of Nuclear Weapons (TPNW) demonstrating a profound frustration among the majority of non-nuclear weapon states at the lack of progress on multilateral nuclear disarmament
 - f. lowered barriers to nuclear weapons acquisition by new states and non-state actors due to the rapid advance of disruptive technologies such as 3D printing, laser-based uranium enrichment and nanotechnologies
10. Without concerted preventive action, the likely result of these dynamics over time is an increased risk of accidental, unauthorised, miscalculated or intentional nuclear war. International debates about evolving nuclear threats suggest that British strategic and political interests would be served by acknowledging the emerging sources of nuclear risk and exploring further steps to mitigate them, including through disarmament action where appropriate. While helping to lower the risk of nuclear war, addressing these issues in a British-led, multilateral disarmament working group would also be welcomed as evidence that the UK continues to take its NPT responsibilities seriously.
11. Establishment of a new venue for sustained dialogue of this type would be valuable because, unlike the range of forums that currently exists to support international efforts for nuclear nonproliferation, safety and security, there is at present no international forum capable of facilitating constructive, multilateral dialogue on nuclear disarmament. The Conference on Disarmament is hobbled by the arbitrary application of its consensus rule to even administrative matters, such that the Conference has failed to agree on an agenda, let alone negotiate for disarmament, since 1996. The Disarmament Commission attached to the UN General Assembly—an advisory body only—has nevertheless also struggled, “unable to agree on any substantial outcome” from 2000 to 2017, when it endorsed recommendations for a set of confidence building measures related to conventional weapons.¹⁷
12. The NPT review process was strengthened as one of the conditions for its indefinite extension in 1995, with States Parties agreeing to hold a Preparatory Committee meeting in each of the three years leading up to the five-yearly Review Conference, and a fourth, if necessary, in the same year as the Review Conference. Regardless, the process rarely produces meaningful disarmament dialogue, with delegates often reading pre-prepared statements that talk past each other's concerns, further embedding a sense of division rather than shared interest. In 2005, for example, the conference was unable to agree on a programme of work for almost three weeks, leaving only 5 days to substantive discussions and debates, and ending in failure. The 2015 conference likewise failed to

¹⁷ UNODA, “United Nations Disarmament Commission.” <https://www.un.org/disarmament/institutions/disarmament-commission/>

reach consensus, and debates at the 2017 and 2018 Preparatory Committee meetings were more fractious and antagonistic than in 2015.

13. Faced with nuclear-weapons-related threats that are increasing in number, complexity and interdependence, and sharp international disagreements over the best means of advancing disarmament, the UK can help to advance global cooperation by engaging decisively at an early stage in the establishment of NPT disarmament working groups. This would allow the UK to help shape the format, composition and focus of the groups, use them to highlight common-ground issues around which new modes of cooperation can be built, and ensure that the initiative strengthens the NPT review process in the long-term.

British leadership and the shared global interest in preventing nuclear war

14. In the first paragraph of the NPT preamble, States Parties affirm “the devastation that would be visited upon all mankind by a nuclear war and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples.” This core objective unites proponents of the so-called ‘security-based’ and ‘humanitarian’ approaches to nuclear disarmament—the former being that favoured by the nuclear weapon states and their allies, and the latter, the approach favoured by the majority of non-nuclear weapon states, which became a motivating factor for negotiation of the TPNW.
15. Adoption of the TPNW in 2017 revealed sharp disagreements among NPT members on the strategic and moral value of nuclear weapons and the best means of achieving disarmament. But in the context of a growing set of risks that may lead to nuclear war, the shared global interest—indeed, humanity’s existential interest—in preventing such war constitutes an area of common ground that, with strong international leadership, might help to re-establish cooperation between proponents of the security-based and humanitarian approaches to disarmament on the path to the 2020 NPT Review Conference.
16. The UK is well placed to play such a leadership role. It has a strong record of disarmament leadership, including as a result of the UK-Norway Initiative—a pioneering effort to engage non-nuclear weapon states in the process of verifying nuclear warhead dismantlement without revealing proliferation-sensitive information.¹⁸ These technical efforts are essential and should continue. They help to demonstrate the feasibility of disarmament and to build trust between nuclear-armed and non-nuclear armed NPT members. A new technical area that deserves exploration in this regard is the potential for blockchain or ‘distributed ledger technology’—the foundation upon which crypto-currencies such as Bitcoin are built—to support future disarmament verification efforts.
17. But while such technical efforts are valuable, the current impasse in disarmament discussions revolves around much broader, security-political issues and it is these hard issues that NPT members must address if disarmament is to advance in a security-enhancing manner. By

¹⁸ See <https://ukni.info/>.

establishing a multilateral NPT disarmament working group under the theme “Responsibilities under Article VI”, the UK could demonstrate its commitment to supporting and advancing good faith disarmament efforts, help to lead international efforts to mitigate evolving nuclear-weapons related threats and the risk of nuclear war, and help to sustain political support for the NPT beyond 2020, irrespective of the Review Conference outcome.

18. Recent evidence suggests that experts and officials from European allies value British disarmament leadership and would welcome further UK initiatives in this field.¹⁹ Leadership on this vital international security issue also resonates strongly with the theme of Global Britain, and would help to advance that enterprise in both domestic and international institutions.

¹⁹ Cristina Varriale, “European Views on Leadership in the Nuclear Non-Proliferation Treaty and Recommendations for the UK,” (London: RUSI, November 2018).

The Impact of the Treaty on the Prohibition of Nuclear Weapons on Non-Proliferation and Disarmament

Dr Sarah Tzinieris

1. In the same way that provisions of international law have been effective in banning chemical and biological weapons, disarmament advocates believe a new legal framework is necessary to force change on nuclear weapons. At its heart, the TPNW is a comprehensive and categorical prohibition on all forms of activity involving nuclear weapons.²⁰ By association, nuclear weapons are put in the same legal category as other weapons of mass destruction (WMD). The TPNW is incompatible with theories of nuclear deterrence and does not have any provisions recognising the security concerns of nuclear weapon states. Security is defined only in terms of how it relates to humanity and collective survival.
2. The Humanitarian Initiative, the precursor to the TPNW, was a turning point for global nuclear diplomacy as it presented overwhelming fact-based evidence that even a 'limited' nuclear exchange would have worldwide effects on human development, with millions of deaths and injuries and the practical impossibility of immediate rescue missions. Evidence was also employed to show the long-standing impacts on the environment, climate and food security.²¹ This was a new way of framing the debates, which had historically been dominated by 'techno-strategic' discourses focused on deterrence theories.²² Notwithstanding the longer-term implications of the TPNW, debates within the international community are privileging more and more the humanitarian, human security and international development implications of nuclear weapons.
3. Despite the impact of the Humanitarian Initiative on international debates, the nuclear weapon states – including the UK – have been reluctant to engage with humanitarian issues in official policy statements regarding nuclear weapons. The responses of the P5 to the TPNW when it was negotiated in 2017 reflected a traditional security approach and overweening reliance on deterrence theories.²³
4. The TPNW was not designed to engender the immediate disarmament of nuclear weapon states – and this is the view taken by the majority of its state parties. Rather, the treaty's provisions are aimed at applying international humanitarian law against indiscriminate and disproportionate attacks on human populations and the natural environment. In the same way that the 1999 Anti-Personnel Mine Ban Convention and 2008 Convention on

20 Treaty on the Prohibition of Nuclear Weapons, UN Office for Disarmament Affairs (7 July 2017).

21 See for example, Lynn Eden, *Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation*, Ithaca, NY: Cornell University Press (2004); Richard P. Turco, Owen Brian Toon, Thomas P. Ackerman, James B. Pollack and Carl Sagan, 'Nuclear Winter: Global Consequences of Multiple Nuclear Explosions', *Science*, Vol. 222, No. 4630 (23 December 1983), pp. 1,283–92; Lou Maresca, 'The Catastrophic Humanitarian Consequences of Nuclear Weapons: the Key Issues and Perspective of the International Committee of the Red Cross', in Borrie and Caughley (eds.) *Viewing Nuclear Weapons through a Humanitarian Lens* (2013), pp. 134–35.

22 Carol Cohn, 'Sex and Death in the Rational World of Defense Intellectuals', *Signs*, Vol. 12, No. 4, Within and Without: Women, Gender, and Theory (Summer 1987), pp. 687–718.

23 See the following statements: Chinese Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference, 20 March 2017; Joint Press Statement from the Permanent Representatives to the United Nations of the United States, United Kingdom, and France Following the Adoption of a Treaty Banning Nuclear Weapons, 7 July 2017; North Atlantic Council Statement on the Treaty on the Prohibition of Nuclear Weapons, 20 September 2017; and Russian Mission's comments on the Treaty on the Prohibition of Nuclear Weapons, 27 September 2017.

Cluster Munitions both emerged after traditional forums failed, the TPNW is explicitly intended to reframe the normative context for nuclear weapons. The objective is to delegitimise nuclear weapons in such a way that the incentive structures will change for nuclear weapon states and others that rely on extended nuclear deterrence. As such, the TPNW is not expected to bring about outright disarmament or proliferation prevention – and any discernible impacts on these will be diffuse, not easily measurable, and in concert with other initiatives.

5. One of the main shortcomings of multilateral nuclear weapon treaties is the lack of enforcement mechanisms. For precisely this reason, states are increasingly focusing on the development of norms in international affairs – the rationale behind the new ban treaty. As such, the TPNW should be not be judged in terms of its mechanisms for coercion, but rather its ability to induce nuclear weapon states to undertake disarmament – and, at the same time, that it does not undermine other arms treaties.
6. The TPNW has created a new sense of urgency about nuclear weapons, particularly as this relates to humanitarian issues. It has also served as a catalyst for creating new momentum and commitment to pursue new disarmament approaches. One area where there has recently been some progress on disarmament is the Conference on Disarmament (CD). In March 2018, the 65-member forum took the decision to form subsidiary bodies on five agenda items related to nuclear weapons. Whilst it is impossible to calculate how much impact the TPNW had on inducing change, the development indicates that the ban treaty has not served to polarise states to the extent had been predicted. Meanwhile, there has been a small divestment in nuclear weapons manufacturers. According to the 'Don't Bank on the Bomb' report, produced by Dutch non-profit organisation PAX, at least 30 institutional investors have divested or refused to invest in such companies since the TPNW was signed, including the investors, GE Capital, Deutsche Bank and Vulcan Value Partners.²⁴ Yet, again, it is difficult to calculate the TPNW's impact on inducing this change.
7. The arrival of the TPNW has aggravated concerns about further polarisation within the international community over the dual challenges of nuclear disarmament and non-proliferation, two of the three main pillars of the NPT. Nuclear weapon states, including the UK, argue that the TPNW is not only ineffective but risks undermining the NPT at a time when a unified approach to proliferation is critical. Proponents of the TPNW counter that there have always existed differing views within the international community on nuclear disarmament; what has changed is the formalisation of this collective dissatisfaction through a legal instrument. Indeed, TPNW proponents do not necessarily view polarisation as a negative issue, since it is more likely to mean pressure is brought to bear on nuclear weapon states. Historically, progress has been made on arm treaties where stakes have been high.
8. According to ban detractors, the TPNW ignores the reality of the contemporary international security environment in which deterrence is necessary; any move towards disarmament require a step-by-step approach. There are also concerns that the TPNW could divert resources and focus away from the NPT and other established frameworks which facilitate negotiations

²⁴ Susi Snyder, '2018 Don't Bank on the Bomb', Pax for Peace (2 March 2018).

over disarmament. At various times, the P5 states have used language asserting that the TPNW would 'undermine', 'weaken' and 'damage' the NPT²⁵ (although arguably China has remained more circumspect in its public statements.²⁶

9. Some ban detractors have highlighted that the TPNW is only likely to have resonance in liberal democracies where democratically elected governments are more responsive to public opinion, protests and normative arguments. It is argued that the US, France and the UK are at a disadvantage versus states such as Russia and China.
10. The arrival of a new legal instrument presents a potential challenge to the NPT review cycles, not least because many perceive the TPNW as a tactic born out of frustration with lack of progress on disarmament within the NPT framework. Despite the possible contradictions, however, to date international debates over nuclear weapons have been less fraught than predicted. The evidence from the previous two NPT Preparatory Committees suggests that fears the TPNW would distract or undermine the NPT process appear to have been overplayed. Indeed, both the meetings in 2017 and 2018 attracted a higher level of participation by government representatives than the preceding review cycle.²⁷ Whilst the TPNW featured in a number of government pre-prepared statements and rights of reply in both Prepcoms, it is difficult to argue that the new ban treaty dominated debate or even disrupted the proceedings.
11. There are concerns with the legal implications of the TPNW, especially in terms of its alignment with the NPT. The TPNW's comprehensive set of prohibitions on partaking in any nuclear weapon activities – including undertakings not to develop, test, produce, acquire, possess, stockpile, use or threaten to use nuclear weapons – could potentially make the NPT subordinate to the TPNW, on account of the NPT's narrower objectives. TPNW proponents argue this claim is flawed as the TPNW's preamble specifically recognises the NPT as the cornerstone of the nuclear disarmament and non-proliferation regime. Yet, it cannot be denied that the TPNW seeks to go further in its prohibitions than the NPT meaning there is potential for interpretative conflicts, for instance over peaceful nuclear cooperation (the NPT's third pillar) with a nuclear weapon state.
12. Criticism of the TPNW has often focused on the issue of disarmament verification. The TPNW provides only an outline with the details to be dealt with by an unspecified 'competent national authority'. Such lack of detail reflects an implicit recognition by state parties during negotiations that disarmament was unlikely to take place immediately, not least because the non-nuclear weapon states were unlikely to join the TPNW. Indeed, this bolsters the argument that the TPNW was not intended, at least in the short term, as a treaty to be implemented in any practicable sense – but rather to

25 See the following statements on the TPNW: United Kingdom's Statement at the 2015 NPT Review Conference, Main Committee 1 (15 May 2015); France's Statement at the 71st UNGA First Committee (4 October 2016); United States' Statement at the 71st UNGA First Committee (14 October 2016); North Atlantic Council Statement on the Treaty on the Prohibition of Nuclear Weapons (20 September 2017).

26 See Chinese Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference (20 March 2017).

27 For instance, a comparison can be made at equivalent points of the 2010-2015 and 2015-2020 review cycles. At the first PrepCom, there were 632 registered diplomats from 109 states in 2012; these numbers increased to 742 diplomats from 114 states in 2017. At the second PrepCom, there were 580 diplomats from 106 states in 2013; these numbers increased to 612 diplomats from 112 states in 2018. Figures available in Gro Nystuen, Kjølvi Egeland and Torbjørn Graff Hugo 'The TPNW: Setting the Record Straight', Norwegian Academy of International Law (October 2018).

provide a nominal legal framework and, in so doing, create the normative conditions for nuclear disarmament.

13. Criticism of the TPNW has also focused on safeguards. The TPNW obligates every state party to either maintain or, if not already in place, to bring into force the Comprehensive Safeguards Agreement (INFCIRC/153 Corrected). By providing the caveat that this agreement is without prejudice to additional safeguard instruments, it ensures that states can upgrade their safeguard standards by adopting an Additional Protocol as well as accommodate any higher standards that might be available. Furthermore, the TPNW prohibits acceded states to withdraw from existing arrangements. This is why proponents argue the TPNW goes further than the NPT, which only obligates state parties to 'accept safeguards' in an unspecified agreement with the IAEA and does not enforce the Additional Protocol.
14. Whilst state and civil society proponents of the TPNW remain resolute that the treaty will achieve its normative objectives, there has not been a discernible uptake in accession figures. As of January 2019, only 19 state parties have gone on to ratify the TPNW out of the 122 states that voted in favour in July 2017.²⁸ Nonetheless, the pace of ratification has preceded faster than some comparable treaties, such as the Chemical Weapons Convention and the Comprehensive Test-Ban Treaty.
15. The relatively slow pace of ratification appears partly contributable to issues being raised about the treaty text itself. At the time, there was considerable time pressure to enact the TPNW to capitalise on the current political momentum, even potentially at the expense of clarity and legal misinterpretation. Underscoring the accelerated timescale, the treaty text was finalised after only four weeks of formal negotiations between the state parties. Partly for this reason, various governments are now conducting legal assessments of the risks and costs of the treaty, which could potentially lead to some states never ratifying the treaty. Indeed, the Swiss government opened an inquiry and announced in August 2018 it would not sign the TPNW at the current time (although the Swiss parliament is seeking to overrule this decision). Nevertheless, other treaty proponents argue that the text is deliberately encompassing to provide for a strong condemnation of all forms of nuclear weapon activities.
16. Whilst few would argue that the TPNW is set to enter into customary international law in the immediate term, the differences in interpretation of the treaty, as well as a lack of clarity in some aspects of the text, make it difficult for TPNW proponents to argue that both general state practice and *opinio juris* are sufficiently aligned with treaty principles. As such, the TPNW cannot be expected to be legally binding on those states that do not accept the provisions of the treaty. TPNW proponents would argue that this issue is immaterial, at least in the short term, since the treaty is primarily designed to generate normative pressure rather than establish customary law.
17. No concrete evidence has yet arisen that the TPNW is undermining the NPT, or the disarmament and non-proliferation regimes more broadly. Rather, the TPNW is more likely to have an impact on its primary goals of strengthening norms on the delegitimisation of nuclear weapons and applying pressure on

²⁸ For the latest on the TPNW's ratification, see the UN Treaties Collection site

nuclear weapon states to disarm. However, any tangible impacts are unlikely to be realised years from now and more than likely within a less febrile international security environment.

18. Another area where the TPNW is seeking to apply normative pressure is the development of new WMD-free zones, most pertinently a WMD-free zone in the Middle East which has been put on hold for years. Awareness of the TPNW is likely to grow in the coming years – as well as of the humanitarian issues that the treaty highlights – which may potentially lead to regions deciding that a WMD-free zone is the most effective way to enhance their security.
19. In the future, the TPNW may apply normative pressure on non-nuclear weapon states that host nuclear weapons on their territory or are in other extended deterrence arrangements. In contrast to the TPNW, the NPT does not contain prohibitions on non-nuclear weapon states hosting nuclear weapons – ultimately blurring the lines of the grand bargain. Notably, Australia has a long-standing security alliance with the US yet the opposition Labor party has committed to signing and ratifying the TPNW in government.²⁹ Other states in security alliances with nuclear weapon states – including Kazakhstan, the Philippines and Thailand – have already signed the TPNW. Still, the only one of these states to have ratified the TPNW – Thailand – has a somewhat disengaged relationship with its security guarantor.³⁰
20. The impact of the potential development of new WMD-free zones and even abandonment of extended nuclear deterrence will be to further delegitimise nuclear proliferation. In this sense, the TPNW could potentially go beyond its central goal of disarmament to progress international efforts on non-proliferation, which in turn serves to reinforce the first pillar of the NPT.
21. Value-laden comparisons between the NPT and TPNW are not helpful when evaluating the impact of these treaties on disarmament (and non-proliferation). When progress is achieved over an issue that relates to multiple touch points in international diplomacy, it is almost impossible to distinguish whether one particular treaty was instrumental in inducing the change. Whilst it is true to say that not one nuclear warhead has been dismantled as a result of direct negotiations within the NPT – and neither, the TPNW – the existence of both these treaties strengthens the international security architecture, with an international legal framework serving to buttress bilateral negotiations.

²⁹ The Guardian, 'Labor set for nuclear showdown as Gareth Evans warns of risk to US alliance' (17 December 2018).

³⁰ See for instance, Brian Harding, 'Moving the U.S.-Thailand Alliance Forward', Center for Strategic and International Studies' (7 August 2018).

Assessing Global and UK Efforts to Counter the Threat of Nuclear Terrorism

Dr Christopher Hobbs

Introduction

1. This section explores non-state actor threats to nuclear weapons, civil nuclear materials and facilities, examining the international regime that governs these materials and national-level responses. UK government and industry have played an active role in mitigating this risk through strengthening nuclear security systems domestically and globally. The UK is working bi- and multi-laterally with other states and supporting the work of the International Atomic Energy Agency (IAEA) in this area.
2. In political discourses, the importance of nuclear security is typically framed in terms of countering the threat of nuclear terrorism. It is this key risk that is explored in detail in this section, however, it should be emphasised that terrorist groups do not represent the only threat in this area. Organised crime and individuals can and have been motivated by financial gain, disgruntlement and other reasons to steal and illicitly traffic nuclear materials and sabotage facilities. Here, 'insiders' – employees or others that misuses their legitimate access (physical or electronic) to commit a malicious act – represent arguably the greatest threat.³¹
3. There are a very broad range of policy measures that can be enacted against the terrorist threat, from counter-radicalisation to intelligence and policing. Given the nuclear focus of the inquiry, discussion here is limited to activities that reduce the vulnerability of nuclear materials, facilities and sensitive information, which would fall under the Protect Strand of the UK's Counter Terrorism Strategy, and within the UK's National Security Strategy and Counter-Proliferation Strategy.³²

Nuclear Terrorism – Concept, Threat Perceptions and Assessing Risk

4. Nuclear terrorism is an issue which defies simple formulation, with international treaties, political and public discourse capturing a spectrum of adversary activities.³³ Conceptually, nuclear terrorism can be thought of as encompassing four broad scenarios, which vary widely in terms of barriers to success and potential impact:³⁴
 - a. Acquisition of a nuclear weapon from a state arsenal and its detonation;
 - b. Theft or purchase of nuclear material, construction and detonation of an 'Improvised Nuclear Device';
 - c. Sabotage of a nuclear facility or transport, releasing radioactivity;

31 Christopher Hobbs and Matthew Moran, 'Insider Threats: An Educational Handbook of Nuclear & Non-Nuclear Case Studies', King's College London, 14th August 2015. <https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/csss/pubs/insider-threats-an-educational-handbook-of-nuclear-non-nuclear-case-studies-2017.pdf>

32 'CONTEST: The United Kingdom's Strategy for Countering Terrorism', Gov.UK, p. 27 (June 2018); National Security Strategy and Strategic Defence and Security Review 2015, Gov.UK, p. 26 (23 November 2015) National Counter-Proliferation Strategy to 2020, Gov.UK, p. 3 (24 March 2016).

33 For example, see Article 2 of the 'International Convention for the Suppression of Acts of Nuclear Terrorism', UN, 2005 <https://treaties.un.org/doc/db/terrorism/english-18-15.pdf>

34 Charles D. Ferguson and William C. Potter, *The Four Faces of Nuclear Terrorism* (Monterey, CA: Center for Nonproliferation Studies, Monterey Institute of International Studies, 2004), p. 3.

- d. Theft or purchase of non-nuclear radioactive materials and use in a radiological weapon.
5. Nuclear terrorism has been near the forefront of UK and Western security debates for more than a decade and was described in 2009 by President Obama as the “most immediate and extreme threat to global security.”³⁵ However, this viewpoint is not shared by all states, particularly those that lack nuclear weapons, a civil nuclear sector or direct experience with terrorism. Diverging international threat perceptions in this area have served to complicate the global response, with states disagreeing on the extent to which nuclear security should be prioritised.
6. In any formal sense, assessing the risk of nuclear terrorism is an extremely challenging task due to the diversity of scenarios, multitude of pathways to success and the limited historical record that can be drawn upon when making predictions. Consequently, the use of risk assessment frameworks should be focused on discrete components of nuclear terrorism and carefully caveated.³⁶ Nevertheless, the salience of nuclear terrorism has motivated the development of a number of unifying models, which attempt to quantify the likelihood of a nuclear terrorist attack. These have resulted in predictions that range from a near certainty to a virtual impossibility. Despite this extreme variance these estimates serve to influence political and public debates.

Nuclear Security – Scope and Primacy of the Nation State

7. The widely accepted IAEA definition of nuclear security is ‘*the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities*’.³⁷ This encompasses a broad spectrum of activities from the physical protection of nuclear materials, sensitive information and facilities to the detection, recovery and identification of lost or stolen materials to emergency planning and post-incident response.
8. Nuclear security is a distinct concept to ‘nuclear safeguards’ which refers to technical measures applied by the IAEA to verify that states’ nuclear materials and technology are used only for peaceful purposes.
9. Individual states are responsible for establishing, implementing and assessing their national nuclear security regimes. In contrast to IAEA safeguards, there is no international system that provides oversight or verification that effective nuclear security measures are being employed. Instead IAEA developed guidance has served to generate a common baseline for implementing nuclear security, with IAEA peer review and support missions available to states upon request.

³⁵ ‘Obama promotes nuclear-free world’, BBC News, <http://news.bbc.co.uk/1/hi/7983963.stm> (5 April 2009)

³⁶ Robert J. Downes and Christopher Hobbs, ‘Nuclear Terrorism and Virtual Risk: Implication for Prediction and the Utility of Models’, *European Journal of International Security*, Vol. 2, Issue 2, p. 203-222 (July 2017)

³⁷ Nuclear Security Series Glossary Version 1.3, Division of Nuclear Security, IAEA <https://www-ns.iaea.org/downloads/security/nuclear-security-series-glossary-v1-3.pdf> (November 2015)

International Nuclear Security Regime – Evolution, Complexity and Solidification

10. The international regime for nuclear security has evolved gradually over the past 40 years in response to the globalisation of the nuclear industry, increasing threat perceptions and perceived policy gaps.³⁸ It is currently a patchwork of legally binding conventions, informal initiatives and international guidance. These elements cover different aspects of nuclear security and have varying memberships.³⁹
11. The UK has in the past argued for greater international nuclear security oversight and enforcement, advocating in 2009 that it be promoted to a 'fourth pillar of the international framework', alongside non-proliferation, disarmament and peaceful use.⁴⁰ However, the introduction of a new unifying and verifiable nuclear security instrument, akin to the NPT, is complicated by its complexity, differences in international threat perceptions, and broader nuclear politics. Here, in lieu of greater progress towards nuclear disarmament, developing states are likely to remain reluctant to take on additional formal obligations in this area.
12. Given that a dramatic reform of the international nuclear security regime is currently unfeasible, efforts have focused on galvanising existing approaches through increasing high-level political buy-in. Here the most notable initiative in recent years was the US-led Nuclear Security Summit (NSS) process. From 2010 to 2016, world leaders and their representatives participated in four summits, resulting in hundreds of new national commitments and a number of high-profile tangible nuclear security improvements. The UK played an active role in this process, participating in each summit and launching new initiatives on cyber and maritime security.⁴¹
13. The impact of the NSS and other efforts to raise international awareness of nuclear security is clearly evidenced by the entry into force in 2016 of the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM), following its ratification by two-thirds of state parties. As the only legally binding instrument with specific provisions for physical protection of civil nuclear material, this is a cornerstone of the international regime. The Amendment extends its mandate from international transport to domestic use and storage, demonstrating a solidification of nuclear security norms.
14. Despite a lack of formal authority, the IAEA plays a crucial role in supporting states to develop provisions on nuclear security – providing international guidance, training and support services upon request – including physical protection upgrades, the removal of high-risk materials and the strengthening of security culture. The IAEA also has an important communication and coordination role within different initiatives. For

38 Wyn Q. Bowen, Matthew Cottee and Christopher Hobbs, *International Affairs*, 88: 2 (2012) p. 349–368.

39 'Nuclear Security Briefing Book: 2016 Edition', King's College London, <https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/csss/pubs/nuclear-security-briefing-book-2016-edition/2016nsbb---final-version.pdf> (2016)

40 'The Road to 2010', UK Cabinet Office, Gov.UK, p. 7 (July 2009).

41 Nuclear Security Summit 2016, FCO Policy Paper, <https://www.gov.uk/government/publications/nuclear-security-summit-2016/nuclear-security-summit-2016> (1st April 2016)

example, the IAEA is responsible for organising the first review conference for CPPNM in 2021 and will host an International Conference on Nuclear Security in February 2020, including ministerial and technical sessions.

15. The UK is one of the major contributors to the IAEA's nuclear security activities, both through the provision of expertise and a direct financial contribution, providing over forty millions pounds to the IAEA's Nuclear Security Fund since 2010. Given the centrality of the IAEA in this area, there is a strong argument for other states to increase this support, as long as new resources can be effectively utilised by the Agency.

Nuclear Security Implementation – International Cooperation and Domestic Transparency

16. The UK has worked with states to strengthen their nuclear security systems for many years, both bilaterally and through multilateral working-level partnerships such as the Global Initiative to Combat Nuclear Terrorism (GICNT). Through its Global Threat Reduction Programme (GTRP), the UK has delivered a wide range of projects aimed at securing or removing civil nuclear and radioactive materials, as well as promoting permanent threat reduction through the adoption of alternative.⁴² This important and broad spectrum of activities must be maintained in order to ensure that the high-level political interest generated by the NSS is translated into practical security improvements.
17. As one of the first adopters of civil nuclear technology, UK government and industry has decades of experience implementing nuclear security, with world leading expertise across many areas, including decommissioning, transport, regulation, nuclear forensics, cyber, physical protection and culture. These are shared through the aforementioned programmes and relevant IAEA forums although there is scope for this to be further expanded.
18. Domestically, the UK has been relatively transparent when it comes to releasing information on how it regulates nuclear security, with the UK's Office for Nuclear Regulation (ONR) publishing a detailed annual report which summaries security improvements, compliance by industry and incidences. In 2017, the UK started transitioning to a regulatory framework based on Security Assessment Principles (SyAPs). This enabling approach to regulation is aimed at providing further clarity for industry and encouraging the development of new innovative security solutions. The UK has also sought advice on how to improve the effectiveness of its nuclear security systems from the IAEA, hosting two International Physical Protection Advisory Service (IPPAS) missions in 2011 and 2016.⁴³ Other countries are considerably more opaque when it comes to sharing information on their domestic nuclear security systems and can be unwilling to meaningfully engage with international initiatives

⁴² UK International Chemical, Biological, Radiological and Nuclear Security Assistance Programmes, GOV.UK, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/472421/20151030_UC_CBRN_Security_Report.pdf (2015)

⁴³ How the United Kingdom Seeks to Enhance Nuclear Security with the Help of IPPAS, IAEA, <https://www.iaea.org/newscenter/news/how-the-united-kingdom-seeks-to-enhance-nuclear-security-with-the-help-of-ippas> (27 February 2017)

in this area. The UK has and should continue to promote the benefits of a transparent and accountable approach to nuclear security and the importance of sharing good practice.

Nuclear Security – Areas for Further Improvement

19. Despite considerable progress over the past decade, nuclear security this is an area that will require continual global investment and attention. Particularly given the recent launch of new or expanded nuclear energy programmes by a number of states.
20. The political momentum generated by the NSS, has understandably slowed since its completion. However, continued interest at this level remains vital for ensuring the implementation of commitments made at the Summits, further solidifying the international nuclear security regime, identifying and addressing gaps and effectively coordinating available international assistance. The Nuclear Security Contact Group (NSCG) was established to this end, and benefits from a broad membership of states with both developed and developing nuclear programmes. However, despite the significant potential of this group to advance global discourse and practice its impact to date has arguably been limited. The UK could play a leading role in re-energising this initiative and ensuring its goals are translated into concrete actions.
21. Although far more prevalent than nuclear materials, the international regime and national-level systems that govern the security of radioactive sources remains relatively weak. With these materials falling outside of key conventions and being assigned a lower priority within international threat reduction programmes. Although the negotiation of a new international legal instrument in this area would likely be a significant challenge, the UK and others should increase their support for activities that strength global radiological source security practice.
22. Military nuclear materials exist considerably further outside of the global nuclear security system. Information-sharing arrangements on military material security do exist between certain states, although there is considerable scope for further confidence building measures.

The Challenge of Hypersonic Missile Vehicles

Martin Everett

Introduction

1. Hypersonic weapons are increasing in number and their inherent characteristics risk further destabilising an already disrupted rules-based international order, especially in terms of arms control agreements. The UK can reinforce and support existing agreements such as the Missile Technology Control Regime, as well as mitigate against the deployment of increased numbers of hypersonic defences which may encourage development of further nuclear hypersonic weapons. It can also develop and support improved space-based early warning systems which will reduce some of the destabilising aspects of hypersonic weapons. It must bear all these factors in mind if, in the future, there is a possibility of deploying hypersonic glide vehicles on its nuclear deterrent.
2. Hypersonic weapons travel at speeds of over Mach 5 and are also capable of aerodynamic flight. This is in contrast to long-range ballistic missiles, which although travelling at similar speeds, follows a much better-defined, predictable trajectory.
3. Broadly speaking, there are two categories of hypersonic weapons – hypersonic cruise missiles, which use supersonic combustion ramjet (scramjet) engines to accelerate to speeds of over Mach 5; and hypersonic glide vehicles (HGVs), which ride on a ballistic missile into the atmosphere before being released. As they re-enter the atmosphere, they level out and glide, using the velocity picked up to manoeuvre at high speed.
4. The ultimate concern for this inquiry is that hypersonic systems are a potential platform for delivery of nuclear weapons, though like existing ballistic and cruise missiles, they may be dual-capable – that is, they can be used to deliver conventional payloads as well. However, their speed and manoeuvrability raise a number of additional concerns for their targets.
5. The first concern is that an extremely fast, manoeuvrable, low-flying nuclear weapon shortens the target's response time considerably, because it is coming over the horizon at speed. The second is that the manoeuvrability creates an element of ambiguity in what the missile may be targeting – is it heading to its target, or is it taking evasive action? Finally, these two problems are exacerbated by the problem of warhead ambiguity – hypersonic platforms may be dual-capable, carrying either conventional or nuclear payloads.
6. Other nuclear states pursuing hypersonic weapons are the United States (US), the People's Republic of China, the Russian Federation (Russia) and India.

Role of the Missile Technology Control Regime:

7. One aspect of the rules-based international order are mechanisms which inhibit the proliferation of delivery platforms for nuclear weapons. One such mechanism is the Missile Technology Control Regime (MTCR), a non-legally-binding export control regime of 35 states (of which the UK has been a member since 1987) where signatories agree not to export 'all delivery systems (other than manned aircraft) capable of delivering weapons of mass

destruction, and of equipment and technology relevant to missiles whose performance in terms of payload and range exceeds stated parameters.⁴⁴ These parameters, as of the last revision of the regime documentation, are a payload weight of at least 500 kg deliverable over a range of at least 300km.⁴⁵

8. At face value, these restrictions should limit the export of some dual-capable (i.e. could carry nuclear or conventional payloads) hypersonic weapons to other states, assuming they fell within the MTCR range and payload weight parameters. However, it should be noted that if a hypersonic weapon is sufficiently fast, then the kinetic impact alone would start to become equivalent to a high explosive payload, *even if it is carrying no explosive payload*.⁴⁶
9. There are catchall provisions in the MTCR that should restrict the export of any dual-capable platform. However, greater awareness of the destructive potential of a hypersonic weapon from mere impact alone and how this may be a possible confounding factor for enforcement of export control is something that the UK, as an MTCR member, should encourage.
10. As a useful supplement, an export control list of materials used in components of hypersonic weapons was proposed by the RAND Corporation, a US think tank, in 2017.⁴⁷ This list would serve as a useful starting point for explicitly restricting the movement of the ingredients of a hypersonic weapon. Any amendments to MTCR guidelines would require the building of consensus among partners, which the UK can take the lead in facilitating.

The rise of hypersonic defence:

11. Much of the press coverage surrounding hypersonic weapons resorts to the term “unstoppable” - however the drive to develop *hypersonic defences* (that is, defences against hypersonic weapons) has been going on for some time. For example, the US’s Terminal High Altitude Area Defence Extended Range (THAAD-ER) program provides the interceptor missile with a second boost stage in order to push it towards hypersonic speeds. The Russian 40N6E missile, developed for their S-400 and S-500 missile defence systems, is claimed by their domestic press outlets to be able to shoot down hypersonic weapons.⁴⁸
12. The true concern here is not that these weapons are unstoppable - it is the belief that they can be stopped. The proliferation of hypersonic defences as well as hypersonic weapons risks a return to a manner of arms racing observed between the US and USSR during the Cold War, which was ultimately capped with both limitations on offensive weapons, but on defensive weapons as well, in the form of the Anti-Ballistic Missile Treaty (ABMT). Not only may there be a race for greater and greater numbers of offensive weapons, but there may also be a race for greater and greater numbers of defensive weapons, with states

44 “Guidelines for Sensitive Missile-Relevant Transfers”. *Missile Technology Control Regime*, §1. Accessed January 14, 2019. <[Link](#)>

45 “Missile Technology Control Regime (MTCR): Annex Handbook 2017”. *Missile Technology Control Regime*. Accessed January 14, 2019. <[Link](#)>

46 Using the simplest expression for kinetic energy, ($E = \frac{1}{2}mv^2$), a object would only need to have a mass of approximately 90 kilograms travelling at Mach 20 to produce an impact equivalent to 500 kg of TNT - if those flight speeds have indeed been attained, and maintained to the point of impact.

47 Speier, Richard H., George Nacouzi, Carrie Lee, and Richard M. Moore, *Hypersonic Missile Nonproliferation: Hindering the Spread of a New Class of Weapons*. Santa Monica, CA: RAND Corporation, 2017. <[Link](#)>

48 E.g. “Specs of Russia’s new missile capable of hitting hyper-sonic targets ‘revealed’”, *Russia Today*, August 28, 2018. Accessed January 14, 2019. <[Link](#)>

attempting to avoid giving an advantage to their opponents in either defence or offence.

13. There are some permutations of two competing states' nuclear offensive and defensive capabilities which risk inducing further instability, in addition to the instabilities provoked by hypersonic offensive weapons. For example, one state may believe it is in their interests to engage in a first strike to take out a sufficient number of enemy nuclear weapons to make it easier to mop up a second strike with their defences, and "survive" a nuclear exchange in this manner. Alternatively, it may induce increasingly dangerous mutual arms racing of offensive nuclear weapons and defensive weapons in an attempt to blunt an opponent's perceived advantage.
14. Several different technologies are being pursued as possible alternatives to intercept hypersonic weapons. The first, directed energy weapons, use powerful laser beams to disable a missile. Numerous states are working on these systems, including the UK, US, China, Russia, and India. Current limiting factors are the power of the beam needed to penetrate the atmosphere and sufficiently damage the missile,⁴⁹ and tracking increasingly faster targets like hypersonic weapons in order to actually strike them with the beam.⁵⁰
15. The second technology is a reprise of space-based defensive layers. Michael D. Griffin, US Under Secretary of Defense for Research and Engineering, has spoken on several occasions in Congress to encourage the use of space-based missile defences.⁵¹ The 2019 Missile Defense Review recently published by the US Department of Defense states that a "new and near-term examination of the concepts and technology for space-based defenses" will take place, and that there may be an advantage in deploying such defences as they can destroy enemy missiles over their country of origin⁵² - however, this may well be perceived as an existential threat in countries such as Russia.⁵³
16. Problematic also is the historical context in which a proliferation of hypersonic defences would take place. For example, Russian President Vladimir Putin characterised the building of the Avangard hypersonic glide vehicle, and the Kinzhal hypersonic cruise missile, as a response to the 2002 US withdrawal from the ABMT.⁵⁴ A return to such a treaty, amended and updated for the post-Cold War era, that limits the deployment of both ballistic missile and hypersonic defences may break this cycle from being repeated.
17. However, should hypersonic weapons proliferate, an additional space-based early warning layer capable of tracking hypersonic weapons in flight may increase the size of the response window in the event of an attack. The space layer should not be neglected, as it is a means of protecting the UK and its allies. The importance of improved space-based sensing capability has also been acknowledged in the US 2019 Missile Defense Review.⁵⁵

49 Ward, Robert Hunter. "The Dawn of Anti-Personnel Directed Energy Weapons." *RealClearDefense*. July 24, 2018. Accessed January 15, 2019. [<Link>](#)

50 Fedasiuk, Ryan; & Reif, Kingston. "Reasons to Doubt Laser Missile Defense." *Arms Control Now*. May 14, 2018. Accessed January 15, 2019. [<Link>](#)

51 E.g. "Space-Based Missile Defense." *C-SPAN*. September 4, 2018. Accessed January 15, 2018. [<Link>](#)

52 "Missile Defense Review 2019." *US Department of Defence*, January 17, 2018: pp. 36-37. Accessed January 17, 2018.

53 Bartles, Charles K. "Russian Threat Perception and the Ballistic Missile Defense System." *The Journal of Slavic Military Studies*, Vol. 30, No. 2 (April 27, 2018): pp. 152-169.

54 Putin, Vladimir. "Presidential Address to the Federal Assembly." *Website of The President of Russia*. March 1, 2018. Accessed January 15, 2019. [<Link>](#)

18. Recommendations here are for the UK to facilitate dialogue which will mitigate potential arms racing between states developing hypersonic weapons, which may require the limitation of hypersonic defences as well by some kind of agreement similar to the ABMT. Early warning systems in space must be preserved and expanded, which could be incorporated under the UK's Defence Space Strategy.

The future of the UK nuclear deterrent

19. Finally, a future decision may have to be made as to whether the UK retains a "classic" ballistic warhead on its nuclear missiles, or whether the decision is taken to pursue a hypersonic glide vehicle.

20. It is possible that a US-designed candidate successor missile to the Trident D5 is better - or even exclusively - suited to being tipped with nuclear hypersonic glide vehicles. Should this decision arise, the UK must be conscious of the consequences of the adoption of such a system, and this context in which it takes place - issues this brief summary has endeavoured to highlight.

PART II

Brexit and 'Regime Complexity' In Global Nuclear Diplomacy

Dr Benjamin Kienzle

Introduction

1. After the 'golden age' of nuclear non-proliferation in the 1990s, the 'nuclear non-proliferation regime' – a complex set of different international agreements and institutions with the 1970 Nuclear Non-Proliferation Treaty (NPT) at its centre – has come under increasing pressure. At the same time, the United Kingdom, historically one of the staunchest defenders and promoters of the existing nuclear non-proliferation regime, faces in the wake of Brexit its most significant foreign policy realignment in a generation. This submission examines this *double challenge* in greater depth and outlines the United Kingdom's role in global nuclear diplomacy post-Brexit. It argues that the UK needs to double up its efforts to mitigate these challenges in both the short- and long-term and to maintain its leadership role in global nuclear diplomacy. At the same time, global nuclear diplomacy offers an opportunity to turn 'Global Britain' into reality after Brexit.

The Challenges to the Nuclear Non-Proliferation 'Regime Complex'

2. Over the last few decades, nation states have created a complex web of dozens of international institutions and agreements to prevent the spread of nuclear weapons, the so-called nuclear non-proliferation 'regime complex'. On the whole, this 'regime complex' has made a significant contribution to the mitigation of nuclear proliferation concerns in comparison with what was expected in the 1960s. Yet, in spite of its relative effectiveness, a number of challenges remain. The four most important ones are listed below.
3. *Proliferation concerns*: Although concrete proliferation concerns have somehow diminished during the last decade, countries such as North Korea remain as stark reminders that the norms and rules of the nuclear non-proliferation 'regime complex' are not universally followed.
4. *Inequality*: Unusually for international law, the NPT has created two separate categories of states: nuclear weapon states and non-nuclear weapon states, each with different rights and obligations. This inequality has created a latent conflict between the former and the latter category of states, which pervades the whole 'regime complex'. In recent years, the confrontation between (some) non-nuclear weapon states and the nuclear weapon states has intensified due to the perceived lack of progress regarding nuclear disarmament. This confrontation makes any kind of progress of the 'regime complex' more complicated.
5. *Decreasing belief in multilateralism*: In light of the unilateral US withdrawal from the Intermediate Nuclear Forces Treaty and the Joint Comprehensive Plan of Action with Iran as well as in light of the preference of earlier US administrations for 'coalitions of the willing' (e.g. in the form of the so-called Proliferation Security Initiative) instead of

formal treaties or organizations, has shed doubts on the continuing US belief in the existing institutions and agreements of the nuclear non-proliferation 'regime complex' and its unfettered commitment to upholding the norms and rules of the 'regime complex' in the future. While other nation states may also question the effectiveness of multilateralism in the fight against nuclear proliferation, the US role will be crucial. In the long-term, the stability of the whole 'regime complex' is at stake.

6. *Complexity*: The complexity of the 'regime complex' itself is a challenge. In other words, the 'regime complex' has not been based on a manageable number of clearly defined agreements and institutions as in the case of other weapon categories. It has rather grown into an intricate maze of international treaties, intergovernmental organisations, conventions, protocols and informal institutions with overlapping membership and mandates, in particular regarding the three basic principles of the regime, namely non-proliferation as such, peaceful use of nuclear energy and nuclear disarmament. This turns the coherent and comprehensive management of the 'regime complex' into a real challenge.⁵⁶

The Challenges of Brexit in the Context of the Nuclear Non-Proliferation 'Regime Complex'

7. Points 3 to 6 constitute formidable challenges to the UK's approach to global nuclear diplomacy, which will not be made easier by Brexit. Yet, on a more positive note, Brexit is not expected to form a major immediate challenge to the UK's nuclear diplomacy efforts: first, because the institutional integration between the UK and the EU in the field of non-proliferation is comparatively low, making the separation between the two easier; second, because there are no major differences between the UK and the EU consensus on non-proliferation in terms of interests and policy preferences, making post-Brexit conflict between the two unlikely; and thirdly, because the UK remains a full member of each and every institution and agreement of the nuclear non-proliferation 'regime complex' post-Brexit (with the exception of the European Atomic Energy Community (EURATOM); see point 10). None the less, Brexit may weaken the UK's nuclear diplomacy, especially in the mid- and long-term.
8. *Loss of allies*: EU member states are key allies of the UK in its nuclear non-proliferation efforts. The clearest example, in this regard, is the *E3 group* in the negotiations with Iran. In the wake of the revelations about clandestine nuclear activities in Iran, the UK established with fellow EU member states France and Germany this group in 2003. Ever since, the E3 have formed the core group of the international efforts to find a negotiated settlement of the Iranian nuclear issue. Through this group, the UK has been able to play a key role in the negotiations with Iran, which culminated in the 2015 Joint Comprehensive Plan of Action. Although the E3 format in itself is not an EU institution, the E3 is intimately linked to the EU. This raises the question in how far the E3 as a distinct group can survive Brexit. EU member states that do not form part of the E3 may question the legitimacy of E3 leadership in the EU, if one of its members ceases to be an EU member. For the same reasons, it will be

⁵⁶ See Benjamin Kienzle, 'Atoms untangled: Examining the implications of "regime complexity" in the fight against the proliferation of nuclear weapons', paper prepared for the 2017 International Studies Association Annual Convention, Baltimore (United States), 24 February 2017.

difficult to replicate the E3 model after Brexit, which might close one of the most effective options for the UK to work with like-minded allies in global nuclear diplomacy.⁵⁷

9. *Reputational costs:* Considering point 5 above, the UK's withdrawal from the EU can be seen by other nation states as setting a bad example. That is, other nation states might question the UK's unfettered commitment to international institutions and agreements. As a consequence, the UK's efforts to underpin the existing institutions and agreements of the nuclear non-proliferation 'regime complex' might suffer in the future. Although at present there is no evidence that this is the case in the field of non-proliferation, it is important to keep in mind that most agreements in this area have withdrawal clauses. This issue is most acute regarding Article X of the NPT, where the UK traditionally supports a stricter interpretation.

10. *Misperception of UK safeguards system:* A fundamental element of the nuclear non-proliferation 'regime complex' is the international safeguards system of the International Atomic Energy Agency (IAEA), which ensures that civilian nuclear material is not diverted for military purposes. Generally, non-nuclear weapon states are subject to a strict safeguards system covering all their nuclear facilities, while safeguards in nuclear weapon states cover only their civilian nuclear installations. In practical terms, nuclear safeguards are implemented domestically and verified by the independent international inspectorate of the IAEA. In EU member states, however, the domestic element is carried out at the European level, i.e. by EURATOM, which is formally an organization separate from the EU, but governed by the EU institutions. Since the UK government decided to withdraw from both the EU and EURATOM, the UK had to establish a domestic safeguards system to replace EURATOM's regional safeguards system. The Nuclear Safeguards Act 2018 empowered the Office of Nuclear Regulation to carry this out. Although the UK appears to make good progress in this regard, the danger is that the replacement of a regional safeguards system with a domestic one could create the impression that the UK lowers the standards of its safeguards. This is particularly problematic in the context of point 4 above. Given the inequality between non-nuclear weapon states and nuclear weapon states (not least regarding the extent of their respective safeguards system) such an impression could increase the perceived grievances of non-nuclear weapon states and increase their unhappiness with the 'regime complex' as a whole.⁵⁸

11. *Funding of international non-proliferation institutions:* Since the adoption of the EU Strategy against the proliferation of weapons of mass destruction in 2003, a cornerstone of EU activities in this field has been the (voluntary) funding of relevant international organizations, including the IAEA, the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization or the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. This has made an

57 See Aniseh Bassiri Tabrizi and Benjamin Kienzle, 'Legitimation Strategies of Informal Groups of States: The Case of the E3 in the Nuclear Negotiations with Iran', paper presented at the 12th Pan-European Conference on International Relations, Prague (Czech Republic), 15 September 2018.

58 See Robert J Downes, 'Safeguarding Britain's Nuclear Non-Proliferation Obligations After Brexit', *Commentary*, Royal United Service Institute, 5 February 2018, available at: <https://rusi.org/commentary/safeguarding-britain%E2%80%99s-nuclear-non-proliferation-obligations-after-brexit>

important contribution to the functioning of the nuclear non-proliferation 'regime complex', for example regarding nuclear security. As an EU member state, the UK is an integral part of these efforts to underpin the 'regime complex'. But after Brexit, the UK will not be associated with them anymore. Assuming that the UK wants to be seen as a key pillar of the 'regime complex' post-Brexit, the challenge will be how the UK can compensate this loss with own funding for international non-proliferation institutions and programmes.⁵⁹

Overcoming the Challenges: 'Global Britain' in Global Nuclear Diplomacy

12. Taken together, points 8 to 11 form a set of important challenges that the UK needs to overcome to retain its leading role in global nuclear diplomacy and to address effectively the global challenges in points 3 to 6. If done properly, global nuclear diplomacy offers an important opportunity to sharpen the UK's international profile post-Brexit and to shape what 'Global Britain' is in reality. To this end, this submission offers two sets of recommendations.

UK Role regarding the Nuclear Non-proliferation 'Regime Complex'

13. Any international leadership role requires **expertise and funding**. In the context of Brexit, it is important to make sure that the UK maintains its high level of expertise in the nuclear field and increases the funding for the actions outlined in point 14 to substitute EU funding with domestic funding (see point 11). It is also necessary to reinforce the cross-government approach to nuclear non-proliferation, including the Foreign & Commonwealth Office, the Ministry of Defence and the Atomic Weapons Establishment.

14. The UK should strengthen its image as a 'good nuclear citizen' through *concrete actions* that strengthen the different pillars of the 'nuclear non-proliferation regime', in particular non-proliferation and disarmament (see point 9). This could include voluntary contributions to relevant activities of international non-proliferation institutions (see point 9 and 11) or bilateral (disarmament) initiatives such as the UK-Norway Initiative on Nuclear Warhead Dismantlement Verification (see point 4).

15. *Working with allies* is key in global nuclear diplomacy, as the Iran case has shown (see point 8). Therefore, the UK needs to double up its efforts to establish a 'group of friends' (alongside the P5), on which it can rely in global nuclear diplomacy. It could follow the example of key allies such as Australia, Canada and Germany that established the Non-Proliferation and Disarmament Initiative in 2010. Likewise, the UK should make an extra effort to maintain the current working relationship with France and Germany.

16. *Managing complexity* (see point 6) could become a novel approach for the UK to sharpen its profile in global nuclear diplomacy. To this end, the UK could focus on strengthening the coordination work done by certain key institutions. For example, the 1540 Committee of the United Nations (UN)

⁵⁹ See Benjamin Kienzle, 'A European Contribution to Non-Proliferation? The EU WMD Strategy at Ten', *International Affairs* 89.5 (2013), pp. 1143-1159.

Security Council sits at the centre of many international efforts regarding nuclear security and has 'orchestrated' the work carried out by other institutions in this area. At present, however, the 1540 Committee is institutionally weak. Therefore, the UK could reinvigorate the idea to establish a formal 1540 Secretariat, which the UK proposed originally when the UN Security Council adopted Resolution 1540 in 2004. Such a 1540 Secretariat would be in an institutionally more powerful position to coordinate other nuclear security institutions and make complexity more manageable.

UK Role regarding the 2020 NPT Review Conference

17. Another area where the UK could sharpen its international profile in the short-term is the 2020 NPT Review Conference. As a matter of fact, due to its timing, the Review Conference will be an important 'test case' for the UK's nuclear diplomacy post-Brexit.
18. In this regard, the UK should adopt, first of all, an *active and cooperative role* in the Review Conference aimed at the successful outcome of the conference, ideally in the form of a substantive final declaration.
19. Furthermore, the UK should *coordinate* its approach with EU member states and other like-minded countries to maximize the effectiveness.
20. The UK needs to be prepared to offer good evidence to counter any allegations that the new domestic safeguards system post-Brexit does not lower the safeguards standards in the UK (see point 10). An *NPT Review Conference Working Paper* could be helpful in this regard.

The Future of U.S.-Russia Arms Control: The Intermediate Range Nuclear Forces (INF) and New START Treaties

Dr James Cameron

Summary

1. Together the Intermediate-Range Nuclear Forces (INF) Treaty and the New Strategic Arms Reduction Treaty (New START) constitute the basis of the U.S.-Russian arms control regime. Given the importance of these agreements and London's key interests in the continuity of the INF Treaty and New START, the United Kingdom should pursue a number of initiatives designed to preserve their benefits. If the U.S. suspends its obligations under the INF Treaty, the UK should push within the North Atlantic Treaty Organisation (NATO) for a dual-track policy, insisting that any deployments of U.S. intermediate-range systems to NATO Europe should be coupled with diplomatic efforts aimed at the elimination of these weapons from the continent. Secondly, in advance of a U.S. decision on New START extension, the United Kingdom should continue to underline the importance of the treaty to European security, both bilaterally in Washington and within NATO. Thirdly, the UK should continue to strengthen its already-significant capacity as a hub for non-governmental thinking and dialogue on the long-term future of nuclear arms control.

The INF Treaty and New START

2. Under the terms of the 1987 INF Treaty, both the U.S. and USSR committed to eliminate from their arsenals all conventional and nuclear ground-based cruise and ballistic missiles with ranges of between 500 and 5,500 km, dismantling hundreds of modern offensive systems. The treaty also banned the testing and production of new weapons of this type.⁶⁰
3. The INF Treaty enhanced strategic stability by banning missiles with relatively short flight times. Intermediate-range ballistic missile systems such as the SS-20 and Pershing II were reputed to take as little as six minutes to reach their targets in the USSR and NATO Europe, giving the enemy virtually no warning of a nuclear strike.⁶¹ Cruise missiles were hard to detect in flight, also decreasing warning times. By eliminating these systems, the INF Treaty reduced fears of a surprise nuclear attack on both sides.
4. Signed in April 2010, New START reduced both U.S. and Russian strategic forces to 1,550 deployed nuclear warheads and 800 deployed and non-deployed intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs) and long-range bomber aircraft. These limits represent a 30 per cent drop in deployed warheads and a 50 per cent reduction in launchers from those agreed in previous treaties. New START will expire in February 2021, with an option to extend its provisions by mutual agreement for an additional five years (i.e. to February 2026).⁶²

60 'Intermediate-Range Nuclear Forces Treaty at a Glance', *Arms Control Association* (<https://www.armscontrol.org/factsheets/INFtreaty>, accessed 8 January 2018); James Cameron, 'The Impending Demise of the INF Treaty: Britain Has a Job on Its Hands', 22 October 2018, *RUSI Commentary* (<https://rusi.org/commentary/impending-demise-inf-treaty-britain-has-job-its-hands>, accessed 8 January 2018).

61 Michael Getler, 'Pershing II Missile: Why It Alarms the Soviets', *Washington Post*, 17 March 1982 (<https://www.washingtonpost.com/archive/politics/1982/03/17/pershing-ii-missile-why-it-alarms-soviets/>, accessed 8 January 2018).

62 'New START at a Glance', *Arms Control Association* (<https://www.armscontrol.org/factsheets/NewSTART>, accessed 8 January 2018).

5. In addition to marking further steps in the reduction of the two nuclear superpowers' strategic arsenals, New START's limitations provide both Washington and Moscow with a measure of predictability in planning their nuclear forces. Through its wide-ranging verification mechanisms, including on-site inspections, exchanges of missile telemetry and other data, as well as allowances for unilateral monitoring of compliance by both parties, New START also provides a high level of transparency regarding the status and future development of both sides' strategic nuclear arsenals, thereby increasing mutual confidence.⁶³

UK Interests

6. Both the INF Treaty and New START benefit UK and European security by limiting the scope of U.S.-Russian arms competition. In addition to the general importance of measures designed to prevent nuclear miscalculation, the special place of Europe in both Washington and Moscow's foreign policy make arms control between the two particularly relevant to the continent's security. While a bolt-from-the-blue attack by one on the homeland of the other is almost unthinkable, more plausible scenarios in which nuclear weapons may be used by the United States or Russia involve escalation from a crisis involving NATO Europe, for example stemming from an incident in the Baltic region. Thus measures leading to the lowering of the risk of nuclear confrontation between the United States and Russia are of particular importance to the UK and Europe more broadly.
7. The demise of the INF Treaty would have a significant impact on UK security. The elimination of intermediate-range forces through the treaty removed a direct threat to the UK and NATO of Soviet nuclear systems that were specifically designed to wage nuclear war in Europe. Any future intermediate-range Russian systems would by their nature be aimed at targets in NATO Europe, most likely including the UK. However, any U.S. deployment of offsetting systems to Europe would be politically divisive, with NATO member states splitting over the security benefits of the new weapons versus the prospect of a new arms race in Europe and/or the domestic political controversy involved in hosting new U.S. weapons on their soil.
8. New START's specific benefits to the UK are twofold. Firstly, the treaty provides a baseline for assessing the U.S. nuclear deterrent guarantee to the United Kingdom and NATO. Were the treaty to lapse without a replacement and a new arms race to begin, it would become more difficult to assess the strategic balance between Washington and Moscow, thereby making estimation of the adequacy of the U.S. nuclear deterrent guarantee a more complex and potentially error-prone process. Secondly, the treaty provides the United Kingdom with predictability regarding the state of Russian strategic nuclear forces, facilitating its own nuclear force planning.
9. Finally, both the INF Treaty and New START help to uphold the UK's interest in the strengthening of the Non-Proliferation Treaty (NPT). Both treaties give substance to the nuclear powers' Article VI commitment under the NPT to work towards cessation of the arms race and nuclear disarmament. Without these two agreements, there would be very little left to substantiate this

⁶³ 'New START', United States Department of State (<https://www.state.gov/t/avc/newstart/>, accessed 8 January 2019).

commitment, thereby weakening the NPT as a cornerstone of the global non-proliferation regime.

Immediate Challenges

10. The most pressing challenge to the INF Treaty comes from alleged Russian noncompliance. The U.S. Department of State first declared Russia in violation of the treaty in 2014, claiming that it had tested a ground-launched cruise missile within the prohibited range.⁶⁴ Since then, the United States has named the missile as the 9M729 (NATO designation SSC-8) and NATO allies have broadly endorsed the U.S. position.⁶⁵ Moscow denies the charges levelled against it. In October 2018, President Trump declared his intention to withdraw from the treaty and in December Secretary of State Mike Pompeo announced that the U.S. would suspend its participation in 60 days if Russia did not come back into compliance with the treaty. If Russia fails to satisfy U.S. concerns by early February 2019 – a very remote prospect – the United States will in all likelihood suspend its obligations and give notice of its intention to withdraw from the treaty. It is highly probable, therefore, that the INF Treaty will cease to exist in 2019.

11. President Trump's INF announcement and the resulting ultimatum is part of a newly sceptical attitude from his administration towards nuclear arms control as a tool of statecraft. Notably, the Trump administration has made no commitment to extend New START for an additional five years beyond February 2021. When President Putin broached the option of renewal, President Trump reputedly criticised New START as a "bad deal" brokered by his predecessor.⁶⁶ This comes at the same time as President Trump has withdrawn the United States from the Joint Comprehensive Plan of Action (JCPOA) governing Iran's nuclear programme and published a new Nuclear Posture Review that places far more emphasis on the emergence of a new great-power nuclear competition at the expense of arms control. In short, Trump's animosity towards New START combined with the general attitude of the administration towards arms control indicates that the President Trump is likely to let New START expire in 2021 with no follow-on agreement.

Long-Term Issues

12. Even if New START were to be extended, differences between the Washington and Moscow on missile defence would place the long-term future of the U.S.-Russia arms control regime in doubt. Since its withdrawal from the Anti-Ballistic Missile Treaty in 2002, the United States has consistently resisted Russian attempts to include missile defence in arms-control agreements. Moscow, claiming that U.S. missile defence systems could endanger its nuclear deterrent, issued a unilateral statement at the time of New START's signature, saying that the treaty would be 'effective and viable

64 U.S. Department of State Bureau of Arms Control, Verification and Compliance, *Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments*, July 2014 (<https://www.state.gov/documents/organization/230108.pdf>, accessed 8 January 2019).

65 'Brussels Summit Declaration,' 11 July 2018 (https://www.nato.int/cps/en/natohq/official_texts_156624.htm, accessed 8 January 2019).

66 Jonatahn Landay and David Rohde, 'In call with Putin, Trump denounced Obama-era nuclear arms treaty – sources,' 9 February 2017 (<https://www.reuters.com/article/us-usa-trump-putin-idUSKBN1502A5>, accessed 10 January 2019).

only' if the U.S. did not build up its defensive systems.⁶⁷ Since then, Russia has prioritized the limitation of missile defences as part of any follow-on agreement to New START.⁶⁸ This standoff will need to be addressed for strategic arms control to move forward beyond 2026.

13. In addition to missile defence, there are a number of emerging technologies that are likely to challenge the nature of nuclear deterrence and hence arms control. Hypersonic weapons, able to fly at speeds of over 5,000km per hour, could shorten warning times in advance of an attack, increasing instability in ways similar to U.S. and Soviet intermediate-range systems in the past.⁶⁹ Cyber capabilities could challenge deterrence in a number of ways, allowing an attacker to disable an opponent's nuclear command and control system, or dramatically enhancing states' abilities to track and target the nuclear arsenals of their adversaries, thereby potentially making a first strike more feasible.⁷⁰
14. Finally the impact that the rise of China will have on arms control is still an open question. While factoring into both sides' considerations, Beijing has not been a party to U.S.-Russia arms control agreements. The United States and Russia still possess nuclear arsenals several times as large as China's, suggesting that the status quo could conceivably continue. At the same time, however, Chinese development of other capabilities, including a land-based intermediate-range ballistic missile force of the type banned under the INF Treaty, has been used by some in the United States as an argument for why the current arms-control regime is no longer fit for purpose. Moscow has also raised the prospect of including third countries in strategic arms reductions.⁷¹ As China grows in importance, these dilemmas will only become more significant.

Ways Forward

15. If the United States withdraws from the INF Treaty, the UK should press for a dual-track approach to any new U.S. missile deployments to NATO Europe. Based on the successful policy adopted by NATO in 1979, the position would state that any deployments of new intermediate-range missiles to NATO states should be accompanied by sustained diplomatic engagement with Moscow aimed at a new treaty to eliminate these systems from the European continent, be it through a U.S.-Russia treaty covering Europe only, or some form of global agreement covering Russia, the United States, and China. Such a policy would provide a point of compromise between those NATO states pushing for new U.S. systems and those fearful of a new arms race in Europe and/or domestic political controversy over new U.S. deployments.

67 'Statement of the Russian Federation Concerning Missile Defense', 7 April 2010 (<https://2009-2017.state.gov/t/avc/rls/140187.htm>, accessed 10 January 2018).

68 Amy F. Woolf, 'The New START Treaty: Central Limits and Key Provisions', September 27, 2018, 39 (<https://fas.org/sgp/crs/nuke/R41219.pdf>, accessed 14 January 2018).

69 Richard H. Speier, et al, *Hypersonic Missile Nonproliferation: Hindering the Spread of a New Class of Weapons* (RAND Corporation, 2017) (https://www.rand.org/pubs/research_reports/RR2137.html, accessed 10 January 2019).

70 Paul Bracken, 'The Cyber Threat to Nuclear Stability', *Orbis* Vol.60, No.2, 188-203 (<https://doi.org/10.1016/j.orbis.2016.02.002>, accessed 10 January 2019).

71 Woolf, 'New START,' 39.

16. In the case of New START, the UK should use its close contacts with the U.S. government to press the case for New START extension, underlining the importance the UK places on the treaty's provision of a more stable and predictable strategic environment. It should also coordinate with other NATO states to make the case for New START, stressing the importance of the treaty for maintaining strategic stability and hence a conducive environment for the continuation of the United States' nuclear-deterrent guarantee to the Alliance.

17. Regarding the long-term outlook, the UK should continue to develop its capacity for strategic thought in this field. This capability takes various forms, including home-grown expertise in the fields of nuclear security, arms control, missile defence, cyber warfare and emerging technologies at think tanks and universities, as well as the UK's considerable convening power for non-governmental, or semi-official (Track 2 and Track 1.5) international dialogues through venues such as the Royal United Services Institute (RUSI), the European Leadership Network, Chatham House, and Wilton Park. Only through a combination of deep research on in this field, as well as mutual understanding between countries of future challenges and ways to overcome them, will a way forward be found.

Global Nuclear Diplomacy and the Quest for a WMD Free Middle East

Dr Hassan Elbahtimy

1. Since 1995, this issue has played an important, and sometimes overbearing, role during the NPT review process. It is likely to be a key issue in the forthcoming 2020 NPT Review Conference. In NPT meetings, almost all state parties refer to the importance of the issue in their opening statements. The issue has also become weaved into the institutional fabric of the review process and dominates discussions in Subsidiary Body 2 in NPT Review Conferences. How a review conference handles the issue of the zone has become one of the factors that determines whether a conference is headed for success or failure.
2. The idea behind establishing a zone free of weapons of mass destruction in the Middle East commands wide international appeal as one way to deal with several inter-linked issues. Such a zone would extend the membership of the NPT, Chemical Weapons Convention (CWC) and Biological and Toxin Weapons Convention (BTWC) and bring these international instruments close to universality. It would address the sense of double standards that Arab states and Iran feel toward the way Israel's nuclear programme is handled. It could be the answer to tensions over Iran's nuclear and ballistic ambitions and fears of regional proliferation in reaction to it. Yet despite repeated calls for the establishment of a zone free of weapons of mass destruction in the region and the wide support the idea commands internationally, progress towards achieving that goal remains minimal.

The regional landscape

3. Israel is the only regional state that has nuclear weapons. According to the SIPRI 2018 Year Book, it has an inventory of 80 nuclear warheads; and refuses to join the NPT. While in South Asia both India and Pakistan are also outside the treaty, in the Middle East the Arab States and Iran are state parties. This imbalance creates a sense of deep frustration in the region. Israel's official policy is not to declare its possession of nuclear weapons. Experts have used the label 'nuclear opacity/ambiguity' to describe this policy where Israel never explicitly acknowledges or actively denies possession of nuclear weapons.
4. Several NPT state parties in the region have faced allegation of non-compliance and been accused of secretly building nuclear weapons. This list includes Iraq and Libya and recently Iran. None of these states are currently in possession of nuclear weapons and the Iraqi and Libyan nuclear programmes have been dismantled. The Joint Comprehensive Plan of Action currently applies verifiable constraints on Iran's nuclear programme. If freed from these constraints, Iran's nuclear programme has the potential to fuel a regional arms race that could further complicate efforts for the establishment of the zone.
5. While nuclear weapons have long been recognised as the key hurdle to the establishment of the zone, recent developments have shown how other weapon systems can also pose significant problems. The repeated

use of chemical weapons within the context of the Syrian Civil War has highlighted the regional gaps in membership of the Chemical Weapons Convention. Egypt, Israel and South Sudan are the only three regional states outside that international convention. Also, active missile programmes in Israel and Iran pose a challenge to a region-wide curtailment of missile capabilities. Additionally a number of regional states are yet to join the Biological and Toxin Weapons Convention, notably Egypt, Israel and Syria.

Diplomatic efforts

6. In 1974, Egypt (under Sadat) and Iran (under the Shah) made the first formal multilateral proposal for the establishment of a nuclear weapons free zone in the Middle East. This took the form of a resolution presented to the UN and then tabled regularly ever since. In 1980, Israel joined the international consensus in support of establishing a zone free of nuclear weapons in the region by voting for that resolution. Yet despite that vote, the proposal got no nearer to becoming a reality during the decade.
7. It was in the '90s that the issue acquired growing prominence both regionally and internationally. In 1990, Egypt presented an initiative broadening the scope of the proposed zone to include chemical and biological weapons in addition to nuclear weapons. The idea entailed a bargain where Israel would give up nuclear weapons while other regional states would formally abandon chemical and biological weapons. Since then, the concept of WMDFZ has gained prominence over a nuclear-only free zone.
8. The first regional discussion on the issue started with the Madrid Peace Process launched in 1991. This established a series of bilateral tracks between Israel and individual Arab states - a peace treaty with Jordan was signed in 1994. Parallel to these negotiations, a multilateral track was formed of five working groups dealing with region-wide issues. One of these groups dealt with 'arms control and regional security.' The group met in six plenaries from 1992-1994 with several intercessional events organised between the plenaries.
9. The Madrid Peace Process allowed direct discussions between Israel and other regional states on the issue but also enabled several track II events. However, it was not able to achieve any significant breakthroughs. First, the window for regional reconciliation soon closed with the derailment of the peace process. Second, the discussion highlighted the different visions that the Arab states and Israel held on the issue. Arab states argued that Israel was not serious about discussing denuclearisation while Israel argued that Arabs were not willing to entertain security confidence building measures. From that point on, these different views prevail.
10. It was in the 1995 NPT Review and Extension Conference that the relationship between the NPT and the WMDFZ proposal got intimately intertwined. During that conference, the NPT, which had originally had an intended lifespan of 25 years, was indefinitely extended through a package deal that included a resolution specifically endorsing the establishment of a WMDFZ in the Middle East. The resolution was adopted

after relentless campaigning by Arab states using the debate about treaty extension as leverage.

11. Since the 1995 conference, the lack of progress toward establishing the zone has come under the spotlight of subsequent NPT review conferences. The 2010 conference saw the emergence of an idea of convening a conference in 2012, to be attended by all states in the Middle East “on the establishment of a Middle East zone free of nuclear weapons and all other weapons of mass destruction, on the basis of arrangements freely arrived at by the states of the region, and with the full support and engagement of the nuclear-weapon states”. A Finnish facilitator was appointed and a series of meetings were organised and attended by some regional states but agreement on the agenda and modalities of the conference remained elusive.
12. The 2015 conference failed in part due to disagreements about how to address the lapsed 2012 conference on a Middle East WMD-Free Zone. An Arab proposal called for the UN Secretary General to step in to convene the conference within 180 days, and defined some of the main parameters for such a Conference. This was opposed by the US, UK and some other states on the grounds that the Arab group proposals were too prescriptive and unrealistic. Instead, these states advocated for the continuation of regional consultations to agree on the time frame and agenda of such a conference.
13. The issue is still deadlocked. In 2018, Arab states sponsored a resolution that asked the UN to convene a weeklong WMDFZ Conference in 2019. The resolution was supported by 103 countries, 71 abstained. Only the United States, Israel, and Micronesia voted against. Details about that conference are yet to be announced.

What can the UK do?

14. UK’s commitment to a rule-based global order and the viability of the treaty makes engagement with the issue unavoidable. Realistically, there is little prospect for progress on the issue without significant input and mediation from actors outside the region.
15. The UK’s position as one of three depository states of the NPT (alongside Russia and the US) lays some responsibilities and expectations on its shoulders. Because of this special role, the UK has been already been involved in some of the initiatives. For example, the UK co-sponsored for the 1995 Middle East resolution as part of the NPT indefinite extension package. In 2010, the NPT review conference named the UK as one of three state conveners for the 2012 conference on the zone.
16. In engaging with the issue, the UK needs to distance itself from taking sides in the polarised debate between regional actors and instead carve its role as principled and pragmatic champion of the NPT and the norms it embodies. Any watering down of such commitment would expose the treaty, and the regime it upholds, to accusations of double standards and undermines its authority in the region.

17. There is an opportunity for the UK to promote or sponsor a regional dialogue aimed at building consensus toward a vision for regional security that excludes reliance on weapons of mass destruction. This can be done through an approach that is inclusive of all regional actors. Between the depositories, the UK might be best placed to offer its good offices to facilitate such a dialogue.
18. The UK could also contribute to the building of regional capacities in arms control and verification. Unlike other regions, the Middle East's experience in arms control is limited. Building up these capacities will serve several functions. First, any effective regional agreement would entail a key role for verification. Second, capacity building could present a tangible contribution to the effort to create such a zone. Finally, it could contribute to a better-informed discussion about the actual challenges, solutions and opportunities in regional arms control.

China, the United Kingdom and Global Nuclear Diplomacy

Dr Nicola Leveringhaus

Summary

1. The UK and China share commonalities in their approach to nuclear diplomacy. At a time when global nuclear diplomacy is shifting away from multilateral institutions, and China-US relations are under strain, there are opportunities for further cooperation between the UK and China. These opportunities include a sustained dialogue on working practices regarding the management of a sea-based nuclear deterrent; and joint activities concerning verification. More generally, both countries can re-state their common commitment to multilateral nuclear diplomacy in the P5 process, of which both are members.

Background

2. Since the late 1980s, China has come to view the UK in an increasingly positive and independent light when it comes to nuclear weapons matters. During the Cold War, China considered the UK inseparable on nuclear matters from the United States, and accused the UK of colluding with the superpowers on arms control and non-proliferation to freeze the nuclear status quo to their advantage. Today, however, China acknowledges that the UK maintains an independent nuclear policy, and likens itself to the UK in the nuclear context based on a number of shared characteristics:
 - a. Preference for minimal forms of deterrence in nuclear strategy (though both countries differ in their definition of minimum deterrence);
 - b. Middle-sized nuclear arsenal (unlike the UK, China has not officially or unilaterally declared its nuclear arsenal size);
 - c. Limited set of nuclear weapons delivery platforms. China relies largely on a land based nuclear deterrent, the UK on a sea based deterrent.

That said, China also makes clear certain nuclear related differences from the UK:

- a. China is not part of an extended nuclear deterrent arrangement (the UK is in NATO);
 - b. China maintains a de-alerted nuclear force based on a declared pledge, since 1964, of No First Use (NFU), unlike the UK.
3. In the 2000s, the UK-China nuclear relationship has deepened, in large part because of UK efforts to engage the Chinese in bilateral dialogues (tracks 1-2) and the P5 process since 2008/9. The Chinese have been receptive to these efforts, for instance by hosting British officers at their National Defence University since 2011, and joining the P5 process despite early hesitation about the process.
4. Two main reasons can be offered to explain China's receptiveness. First, China has been making progress in developing, for the first time, a viable sea based nuclear deterrent and was likely keen to learn from Britain's longer experience of maintaining SSBNs. Second, the bilateral relationship improved more generally from 2012 to 2016, especially in relation to economic ties. This is reflected in Chinese investment in the Hinkley Point C nuclear power station. The ground was thus fertile for bilateral cooperation. Additional interests motivating China might have included the UK-Norway verification initiative (notably because this does not involve the United States), and more broadly, UK efforts to project itself internationally as acting responsibly in the management and reduction of its nuclear arsenal.

Chinese views of Non-proliferation and the Non Proliferation Treaty (NPT)

5. Unlike the UK, China is a latecomer to global nuclear diplomacy.⁷² China signed the NPT in 1992, some two decades after the treaty was established. Prior to this, Beijing loudly rejected the NPT in the 1960s and 1970s, and only began to change its position as the treaty expanded its global membership in the 1980s to non-nuclear countries in the developing world. China has always cared deeply about diplomacy with this part of the world, above and beyond its relations with more developed Western countries. It is notable, for instance, that the first international nuclear regime China signed and ratified was Protocol II of the Treaty of Tlatelolco in 1974, in large part because of Mexican pressure to do so.
6. China's relationship to the NPT and non-proliferation is complex and, in certain areas, unique. Upon joining the NPT, China was classified as a nuclear weapons state. This is because China first successfully tested a nuclear device on 16 October 1964, before the treaty cut-off date of 1 January 1967. This treaty recognition has become, intentionally or not, politically valuable for China in its nuclear relations with India, which tested a nuclear weapon in 1998 and can only join the NPT as a non-nuclear state.

72 China was not part of the early negotiations for the International Atomic Energy Agency, the Limited/Partial Test Ban Treaty or the Eighteen Nation Disarmament Committee during the Cold War. For more on this history, see Nicola Horsburgh, *China and Global Nuclear Order, from estrangement to active engagement* (OUP, 2015).

7. China has a different approach to the so-called 'three pillars' of the NPT: non-proliferation, peaceful use of nuclear energy, and a disarmament. Uniquely, China prioritises the right of equal access to and development of peaceful use of nuclear energy for member states *above* that of non-proliferation. More broadly, China sympathises with long-standing claims of injustice and inequality among non-nuclear member states that nuclear disarmament has been abandoned by nuclear member states. For example, of the five NPT nuclear states, China has wavered far more in its position regarding the Nuclear Ban Treaty and only reluctantly joined a recent P5 statement opposing the ban. Finally, China's suspected proliferation past⁷³ casts an enduring negative shadow over its non-proliferation credentials to a far greater degree than any of the other nuclear member states. That said, in the last two decades, China has sought to defend the norm of non-proliferation by bolstering its national export control system and curtailing the potential illicit proliferation of dual-use sensitive materials and technology through Chinese companies.⁷⁴ More symbolically, from 2003 to 2008, China hosted the Six Party Talks to resolve the North Korean nuclear crisis, a difficult role to which it was seriously committed.
8. Outside the NPT, China sees institutional value in the Comprehensive Test Ban Treaty (CTBT), which it joined in 1996. Compared to the NPT, this was a harder treaty to join given the technical constraints the CTBT imposed on countries with limited experience of nuclear weapons testing, which was the case for China. However, participation in CTBT negotiations between 1994 and 1996 was beneficial to China because it offered much needed experience in multilateral nuclear diplomacy at a time when it did not have a bureau for arms control and disarmament in the Foreign Ministry (this was established in 1997). China has not yet ratified the CTBT⁷⁵ but Beijing stresses that it demonstrates compliance through the certification of four International Monitoring Systems (IMS) stations on Chinese soil in 2017.⁷⁶ Elsewhere, China has invested in the US led nuclear security agenda. Under Xi Jinping, in 2015, China established a regional centre of excellence on nuclear security and nuclear security featured on the agenda of the first meeting of China's National Security Commission.
9. For China, the biggest challenge facing global nuclear diplomacy today is the United States' undoing or undermining of certain bilateral and multilateral nuclear treaties that together underpin a messy, though rules-based, nuclear order. China fears these developments heighten the prospect of an arms race with the United States, dilute the restraining effects of a nuclear taboo, and go against political attempts to secure strategic stability. These developments did not start with Trump. From

73 In the early 1990s, reports emerged that Chinese nuclear assistance to countries like Pakistan during the Cold War had extended to the transfer of dual-use technology, fissile material and weapons designs. The depth of these relationships remains unclear, though reports continued into the 2000s. For instance, in 2004, the International Atomic Energy Agency discovered a 1960s Chinese nuclear warhead design which had travelled via the Pakistani A.Q. Khan network to Libya.

74 See Wyn Bowen, Daniel Salisbury and Ian Stewart, 'Engaging China in proliferation prevention', *Bulletin of Atomic Scientists*, 29 October 2013, <https://thebulletin.org/2013/10/engaging-china-in-proliferation-prevention-2/>; and Daniel Salisbury and Lucy Jones, 'Exploring the Changing Role of Chinese Entities in WMD Proliferation', *The China Quarterly*, 2016, Vol. 225, March 2016, pp. 50-72

75 The reasons for this are mostly strategic, the non-ratification of the United States and the non-membership of India.

76 CTBTO, 'Remarkable progress: China and CTBTO', <https://www.ctbto.org/press-centre/highlights/2018/remarkable-progress-china-and-the-ctbto/>

Beijing's perspective, they reflect underlying hesitation in US nuclear diplomacy (as well as an uneasiness toward treaty commitments), reflected in Washington's abrogation of the Anti-Ballistic Missile Treaty in 2002/3, and the passing of the US-India civilian nuclear deal in 2008, bending Nuclear Supplier Group rules to do so. Under Trump, this trend has gained more momentum resulting in US withdrawal from the Joint Comprehensive Plan of Action over Iran, a blow to China because it considered itself an important broker in that deal; and the Intermediate Nuclear Forces Treaty (INF), partly explaining US withdrawal in the context of Chinese missile capabilities today.

10. The above signals to China that the dynamics of global nuclear diplomacy are shifting away from multilateralism to more tailored and bespoke platforms preferred by the United States. In the past, this has resulted in US initiatives like the Proliferation Security Initiative (PSI), which China refused to join on the grounds that it was a too-intrusive measure for non-proliferation. Today, this shift is evident in Trump's preference for bilateral summitry vis-à-vis North Korea. This preference has forced China to shift gear in its approach to the nuclear crisis on the Korean Peninsula, away from calling for a resumption of the Six Party Talks to engaging on a bilateral level with North Korea itself. Another area relates to verification, with US promotion of the International (though US led and funded) Partnership for Nuclear Disarmament Verification (IPNDV),⁷⁷ to which China and Russia are not party. The extent to which the IPNDV will complement or overshadow the P5 process, which China chairs at present, is not yet clear.

Chinese views of Multilateral Arms Control and Nuclear Disarmament⁷⁸

11. China publicly supports nuclear disarmament and in January 2017, Xi Jinping restated this commitment at the United Nations. China's dogged unilateral promotion of an international NFU treaty since 1971 can also be seen as a diplomatic effort towards nuclear disarmament, though a deeply unpopular one among other nuclear weapons states. In contrast to its support for nuclear disarmament, China has in the past challenged nuclear arms control as a global public good. During the Cold War, China considered arms control destabilising, as a way for the then superpowers to cement nuclear superiority relative to other states, including China.
12. China has consistently resisted participation in multilateral arms control while the United States and Russia maintain such large nuclear arsenals compared to other nuclear armed states. China first faced serious pressure in this regard following a Soviet proposal for multilateral arms control during the INF negotiations in 1983. Back then, China turned to the UK and France as a fellow 'middle sized nuclear power' in resisting the Soviet proposal. After this experience, China demanded substantial nuclear force reductions by the superpowers as a precondition to participation in any agreements.⁷⁹ The proposed size of reduction

⁷⁷ Dr. Christopher Ashley Ford, Assistant Secretary, Bureau of International Security and Nonproliferation Conference on "The Nuclear Nonproliferation Regime - Towards the 2020 NPT Review Conference"

Wilton Park, Wiston House, United Kingdom, 10 December 2018, <https://www.state.gov/t/isn/rls/rm/2018/288018.htm>

⁷⁸ A well-informed House of Lords debate on China and Multilateral Nuclear Disarmament took place in 2012,

<https://hansard.parliament.uk/lords/2012-11-22/debates/12112245000887/ChinaMultilateralNuclearDisarmament>

oscillated from 50% to at least 1,000 warheads each.⁸⁰ In 1988, China proposed the 'Three Halts/Cessation and One Reduction' idea to agree not to test, produce, or deploy nuclear weapons and to reduce nuclear arsenals to an unspecified number below levels being discussed by the superpowers.⁸¹

13. More recent Chinese conditions for multilateral arms control are not available. However, Chinese nuclear experts have offered helpful, though unofficial, conditions in recent years.⁸² These include: a unilateral guarantee to keep nuclear weapons off-alert; a unilateral declaration of an official moratorium on fissile material production; and a declared freeze on new nuclear weapons production, under the condition that the United States and Russia commit to deeper reductions. The extent to which these ideas inform and influence official nuclear weapons policymaking in China is unclear. To complicate matters, China's nuclear force modernisation, underway since the 1990s, is now starting to bear fruit under Xi Jinping,⁸³ a leader who is more confident in show-casing China's nuclear weapons capability, especially in a domestic context. That said, as noted earlier here, Xi Jinping is invested in global nuclear diplomacy, especially of the multilateral variety from nuclear security to the P5 process.

14. To conclude, four areas of future UK-China nuclear cooperation are proposed:

- a. Like the UK, China has a record of making *unilateral declarations* on nuclear matters (China's NFU is one example, the UK's declaration of its nuclear arsenal size another). The UK could encourage China to issue a unilateral declaration on its arsenal size;
- b. The UK has already engaged, successfully, with China in *the P5 process* and should continue to do so. China is especially engaged in this forum, having previously compiled a P5 glossary of nuclear terms,⁸⁴ and now as chair (rotating) of this process.
- c. The UK has a strong record on *verification*. Given that China is outside the IPNDV, the UK could engage China in a separate verification process, perhaps linked to the UK-Norway initiative, or its successors, with a view to understanding China's position on verification matters beyond its borders, specifically related to North Korea. China has displayed interest in verification yet seems to have limited experience of working on this issue in a multilateral forum beyond the P5 process (at present China has been working on verification through the China Academy for Engineering and Physics);
- d. Dialogue, at various levels, to further explore issues of safety, security and command and control in relation to a *sea-based nuclear deterrent*.

79 Liu Huaqiu, 'Analysis of Nuclear Arms Control Policy', *Military Today*, 11 November 1995.

80 Huang Hua reprinted in Ken Coates, *China and the Bomb*, (Nottingham: Humanities Press, 1986), pp.64-80.

81 *Beijing Review*, 'Qian Qichen's speech at the UN disarmament session', 13-19 June 1988, pp. 14-18.

82 For example, Li Bin, 'China's Potential to Contribute to Multilateral Nuclear Disarmament', *Arms Control Today*, March 2011, https://www.armscontrol.org/act/2011_03/LiBin

83 Nicola Leveringhaus, 'Developments in China's Nuclear Policy', IRSEM Research paper 31, 17 October 2016, https://www.defense.gouv.fr/content/download/486547/7786646/file/NR_n31_2016.pdf; and 'Nuclear Weapons Policy and Diplomacy under Xi Jinping', IRSEM Research Paper 46, 12 October 2017, p. 4

<https://www.defense.gouv.fr/content/download/514600/8663553/file/RP%20IRSEM%2046%20-%20China%20Five%20Years%20of%20Xi%20Jinping,%20Juliette%20Genevaz.pdf>

84 P5 Glossary of Terms, via US State Department, <https://2009-2017.state.gov/documents/organization/243293.pdf>

The Challenge of Universalizing Nonproliferation Norms

Dr Adil Sultan Muhammad

Introduction

1. The NPT based global nonproliferation regime that is supported by various formal and informal arrangements, has helped limit the number of nuclear weapons states, but is now under increasing stress due to several internal and external challenges. If left unaddressed for a prolonged period, it may unravel the global nonproliferation regime. To deal with this clear and present danger there is a need to universalize the existing NPT based nonproliferation regime and discourage the new trends of negotiating parallel arrangements that would only lead to further divisions amongst the international community and make it difficult to achieve the goals of nonproliferation and global nuclear disarmament.

Elements of the Global Nonproliferation Regime

2. The NPT is the central pillar of the global nonproliferation regime which is supported by various formal arrangements including the Comprehensive Test Ban Treaty (CTBT), UNSCR 1540, etc, and other informal arrangements including the Nuclear Suppliers Group (NSG) and the other export control regimes. Collectively, these help in strengthening the global nonproliferation norms. Efforts to undermine any of these arrangements, such as granting country-specific exemptions to non-NPT state like India from the NSG guidelines is likely to create further dissent amongst the NPT as well as other non-NPT states, and would adversely impact upon the credibility of the NPT.

Nuclear Risks

3. The risks of a nuclear exchange between major nuclear powers may have reduced but the chances of a nuclear use in a region like South Asia may have significantly increased due to the introduction of new war fighting doctrines and the ongoing nuclear modernization in both India and Pakistan. With a history of long outstanding disputes and mistrust a limited military conflict between India and Pakistan could lead to inadvertent escalation to a nuclear exchange with serious consequences for the international security.

The NPT

- 4.—The NPT is faced with several challenges including lack of progress by the NWS towards nuclear disarmament, Issues of internal non-compliance by NPT signatories (North Korea and Iran) and challenge by parallel and competing treaties (Treaty on Prohibition of Nuclear Weapons). One of the most important one is the non-universal nature of the NPT and the failure to integrate the three non-signatory states (India, Pakistan and Israel into mainstream nonproliferation regime.
5. The three non-NPT nuclear states that never signed the NPT are unlikely to agree to unilateral concessions and give up their nuclear weapons,

unless offered with a tangible quid pro quo. This may require negotiating a new 'bargain' that could give recognition to their nuclear status in return for legally binding nonproliferation and disarmament obligations.

Nuclear Arms Control in South Asia

6. The imminent demise of the INF Treaty that may also reduce the possibility of extension of the New Start Treaty, is a result mutual distrust and global leadership crisis. This could have adverse implications on other initiatives including the CTBT and the FMCT and developing an international consensus is likely to be more difficult.
7. In view of the fact that the entry into force of the CTBT is difficult in the near future, there may be a value in encouraging regional powers to engage in bilateral arrangements. Pakistan in the recent past (2016) had offered a bilateral test ban treaty to India, and if both states could be encouraged to convert their respective unilateral moratoria into a legally binding bilateral arrangement, this would help the global nonproliferation and disarmament efforts. Pakistan had also offered to keep the region free of Anti-Ballistic Missile (ABM) systems which was rejected by India. The recent purchase of S-400 system by India is likely to create further instability as Pakistan could take remedial measures to maintain the credibility of its deterrent.
8. As the nuclear capabilities in South Asia are growing the nuclear doctrines are becoming fuzzier. Recent statements by the former senior members of India's nuclear command authority indicate that India may be in the process of reviewing its nuclear doctrine and may have moved away from a posture of No First Use (NFU) and credible minimum deterrence' (CMD) to 'credible deterrence'. These developments are likely to force Pakistan to take countermeasures and lead to action-reaction phenomenon. India is in the process of operationalizing its nuclear triad which is likely to lead to a nuclear competition in the Indian Ocean.

Treaty on Prohibition of Nuclear Weapons (TPNWs) and the Non-NPT States

9. TPNWs is likely to undermine the NPT as it brings duplicate obligations upon the signatory states with no clear roadmap for verification and implementation. States adhering to the NPT have different sets of obligations for the NWS and the NNWS, but the TPNWs makes no such distinction, thus bringing it in conflict with the NPT. TPNWs failure to make progress towards nuclear disarmament could lead to further disillusionment amongst the international community thus making the task of disarmament more difficult.
10. TPNW offers no incentive for the non-NPT nuclear states to give up their nuclear weapons and join the new treaty. It is seen as another instrument to complicate the global nonproliferation regime. Unless the NPT outliers are made part of the global nonproliferation norms, it would be unrealistic to expect that any of these countries would agree to a binding commitment to work towards nuclear disarmament.

Role of UK

11. There is a global leadership crisis on arms control and disarmament related issues. Other major players, including the UK have the opportunity and responsibility to fill this void and help restore international confidence by enhancing their engagement with all the major stakeholders and building a conducive environment of trust.
12. The UK can also play more meaningful role in South Asia since it has better appreciation of India-Pakistan dispute due to its historic links with the region. The UK could encourage both regional nuclear powers to engage in bilateral arms control and confidence building measures while maintaining an objective and non-discriminatory approach, which is likely to improve regional security environment and reduce the incentive for both South Asian nuclear powers to remain engaged in an arms competition.
13. Recommendations
 - a. There is a need to open a formal dialogue with the non-NPT states to explore the possibility of integrating these states into mainstream nonproliferation regime without necessarily amending the NPT.
 - b. The relatively new trends of treating non-NPT states differently based on political and commercial interests is likely to create further disillusionment amongst the NPT as well as the non-NPT states and must not be encouraged.
 - c. The UK because of its historical linkage with India and Pakistan could help facilitate the resumption of a dialogue process, to help reduce the risk of another conflict between the two countries.

END of Submission

Received 19 January 2019