



# The Next Generation's Arms Control Agenda for 2050

The **Arms Control** Working Group

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Recent years have seen a slow but steady erosion of the existing global arms control architecture along with a continuous degradation of trust and stability in the international security environment. Indicative of these developments is the U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty in 2019, which effectively terminated a historically important pillar of the bilateral arms control framework between the U.S. and Russia. Similarly, U.S. withdrawal from the Open Skies Treaty underlines the downward trajectory of transparency and mutual trust—a trend furthered by the UK's recent decision to raise the limit to its nuclear stockpile. While a complete dissolution of the arms control framework has ultimately been averted by the full and unconditional extension of the New Strategic Arms Reduction Treaty (New START) for another five years, recurring noncompliance with treaty obligations, complex regional dynamics and the emergence of new technologies will require creative and flexible solutions to strengthen arms control and reduce the risks posed by nuclear weapons.

The goal of this paper is to establish an arms control agenda for the coming decades, looking to 2050. It draws from the perspectives of next-generation leaders in nuclear policy who seek increased international

cooperation targeted at reducing nuclear risks. Its time horizon was established with the understanding that realistic nuclear arms control measures require a significant investment of time and political capital. For the scope of this paper, arms control refers to measures taken by states to “minimis[e] the costs and risks of arms competition, curtail the scope and violence of war in the event it occurs,”<sup>1</sup> and limit destabilising military options. This paper focuses on long-term regional dynamics between the U.S., Russia, and China, and addresses the complications posed by emerging technologies on strategic stability and nuclear dynamics. It outlines ambitious and creative objectives for future arms control agreements.

### **The impact of regional dynamics on arms control**

As opposed to the bipolar structure of the Cold War period, relations between nuclear-weapons possessor states (NWS) have become increasingly complex and multipolar. Today, the US-Russia dyad is interconnected with several regional and global dynamics. China’s growing influence on the global security architecture now affects relations between the US and Russia, and adds complexity to achieving diplomatic progress with the Democratic People’s Republic of Korea (DPRK). Driven by distinct threat perceptions, the shift towards multipolarity has been accompanied by heightened tensions; strategic relations between NWS that were characterised by cooperative tendencies in the post-Cold War period have degenerated to more competitive and confrontational modalities. In recent years, NWS have accelerated modernisation efforts while arms control treaties between US-Russia have almost all fallen apart. This further leads to a lack of transparency. Increasingly ambiguous nuclear doctrines and capabilities have only added to the strategic environment’s volatility and increased the risk of accidental nuclear conflict.

Arms control efforts in East Asia have been hampered by imbalance. While traditional bilateral arms control efforts have been targeted at ensuring parity of nuclear arsenals through reciprocal reductions, there are drastic differences in the size of China’s nuclear arsenal in comparison to that of the US and Russia. As such, there is little appetite to engage in negotiations aimed at establishing limits on arsenal size. The changing global security landscape therefore necessitates a flexible and asymmetric arms control architecture that values but is not limited to achieving parity and is responsive to the multi-polar reality of present-day nuclear threats.

While engaging China in capability management remains a challenging goal, strategic risk reduction presents a readily accessible opportunity for cooperation. The risks created by nuclear possession and use are persistent, and all NWS share incentives to minimise them. A structured effort to establish dialogue on risk reduction would help narrow the perception gap on each other’s nuclear postures. For example, specialized working groups could be established in the P5 context—or bilaterally between different NWS—to thoroughly examine possible escalation dynamics and propose mitigation strategies. Working groups should address the need to increase transparency on nuclear arsenals and discuss individual nuclear doctrines and force postures. Additional discussion could centre on de-alerting as well as the implications of new disruptive technologies. That way, risk reduction measures can serve as a tool in the medium term to enhance transparency and mutual trust and can facilitate creation of a favourable environment for long term arms control engagement with China and other NWS.

The extension of New START is a welcome development that sets the stage for movement towards a more resilient arms control architecture. A follow-on multilateral arms control agreement among NWS states would be a useful mechanism for the cooperative mitigation of emerging threats. Rapidly advancing military capabilities of certain P5 states, currently unbound by bilateral agreements, have raised concerns that technological innovation may be leveraged for destabilising purposes. A multilateral treaty among the P5,

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1 Thomas C. Schelling and Morton H. Halperin, *Strategy and Arms Control* (New York: The Twentieth Century Fund, 1961), 2.

initiated by the U.S. and Russia – with the United Kingdom, France and China taking part in discussions – is an ambitious but worthwhile goal. In formulating such a treaty, these states should pursue a mix of concrete reductions and legally-binding confidence- and transparency-building measures, which would be useful in demonstrating a commitment to restraint and balance.

### **The intersection of space, cyber, and nuclear domains and implications for nuclear risk and arms control**

The international approach to non-proliferation and arms control cannot remain static in a dynamic environment characterised by new actors and emerging technologies. It will be crucial to integrate military and government operations in space into the global arms control architecture, given that space is an increasingly competitive and contested domain that lacks sufficient regulatory structures for the purpose of arms control. Exploring opportunities to expand arms control measures to space is especially important given the impact of emerging technologies on nuclear command, control and communications (NC3).

Space is married to nuclear weapons through satellite operations, and creative approaches to nuclear arms control could provide solutions for increased contestation and risk in this domain. Military and government systems reliant on space infrastructure are increasingly vulnerable to anti-satellite weapons (ASAT), and it is cheaper to attack than to defend a satellite. Military and government satellite operations could impact or threaten nuclear escalation when NC3, missile detection, and tracking accuracy are unreliable. While reliance on space assets will only increase as launch costs and other barriers to development are driven down, the number of assets in orbit will produce increasing risk for government and military operations if their use remains unregulated in a congested and competitive environment. Assessments of intent and the ambiguities of anti-satellite weapon attribution will continue to puzzle the security policymakers as satellite spoofing, jamming and ASATs only increase presence.<sup>2</sup> A failure of the nuclear policy interlocutors to include space operations in approaches to non-proliferation and arms control would therefore have grave consequences.

Similarly, artificial intelligence (AI) has begun to influence deterrence relationships between NWS and will have long-term implications for arms control.<sup>3</sup> As AI is introduced in NC3 and becomes vulnerable to errors and hacking, it can lead to accidental nuclear escalation. The integration of AI into military platforms exacerbates concerns about its misuse and furnishes states with opportunities to mitigate relative regional imbalances or weaknesses in their capabilities. Such dynamics have been evident in terms of nuclear balancing, where asymmetry in power and conventional capabilities has led to more assertive strategic posture and even nuclear weapons acquisition. These dynamics are also expected to play a role in the development of AI algorithms that interact with conventional and nuclear platforms in the future.<sup>4</sup> On the other hand, AI-enabled systems, such as ISR (see footnote 2), can be used to verify treaties and monitor compliance with nuclear forces, increasing transparency among nuclear-armed states. For this purpose, the information obtained would need to be shared among the nuclear powers which must consensually release data on their nuclear forces.<sup>5</sup> The realisation of such an approach would be more feasible when

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2 Satellite jamming, whether co-orbital crosslink, uplink, or downlink, can degrade, disrupt, or destroy a satellite without making physical contact by interfering with the satellite signal; this activity is classified as a non-kinetic weapon. Satellite spoofing causes the receiver to lie with a false signal sent to the ground station; for example, ships can be lured off-course with spoofing.

3 The four types of nuclear force-related applications of AI are: (a) nuclear weapons, (b) increased intelligence on enemy nuclear forces, surveillance and reconnaissance (ISR), (c) nuclear command, control and communication (NC3) and (d) conventional weapon systems relevant to nuclear forces.

4 SIPRI. *The Impact of Artificial Intelligence on Strategic Stability and Nuclear Risk*. Volume II ed., Lora Saalman, 2019, pp. 3-4.

5 Geist, Edward, Lohn, Andrew, J. *How Might Artificial Intelligence Affect the Risk of Nuclear War?*. (Santa Monica: RAND Corporation), p. 6

accompanied by traditional confidence-building measures (CBMs) that would shore up the credibility of affected states.

Emerging technologies have further expanded the potential applications for the monitoring and verification of arms control agreements. Civil society actors increasingly use publicly and commercially available sources of information such as remote sensing to scrutinise weapons of mass destruction agreement compliance. The inclusion of societal verification measures in future arms control agreements, including feedback mechanisms for open-source verification, may help states achieve a more detailed picture of treaty compliance in a transparent, democratised way. While open-source tools will not replace national technical means (NTM) and other traditional verification measures, they will play a valuable supporting role.

### **Establishing an Arms Control Agenda for 2050**

Arms control has long been centred on the principles of parity and reciprocity. While these principles remain important, focusing efforts purely in this space might not prove effective in building an arms control framework that adequately addresses contemporary and future challenges to strategic stability. Deemed by some as a relic of the Cold War period, the arms control architecture needs to evolve and can no longer be limited to quantitative reductions to nuclear warheads and delivery systems. Instead, future diplomatic efforts and negotiations will have to adopt a comprehensive approach that includes both quantitative and qualitative targets. The latter will become particularly important in light of changing and emerging technologies that are expected to challenge the contemporary notion of strategic stability and blur the line between the nuclear and conventional realms. Expanding future arms control efforts to include nuclear armed states – beyond the P5 members – as well as opening ways for non-nuclear weapon states (NNWS) to actively feed into P5 discussions will be equally important to rebuild confidence and achieve progress reductions in nuclear risk.

Realizing our vision of a **multilateral, flexible, and asymmetric arms control architecture** will not be possible without **political commitment** and buy-in from NWS and other relevant stakeholders. To make progress towards establishing a more inclusive framework, finding new ways of engagement and participation for all nuclear armed states, NNWS, and representatives from civil society will be crucial. The following recommendations ensure a “soft and phased” approach towards arms control which builds on initial dialogue among NWS and NNWS and can further be shaped into legal commitments, tangible reductions, and improved international security.

To address the deterioration of trust in arms control and lack of dialogue among NWS and between NWS and NNWS:

- **Nuclear weapon states should establish a formal, sustained, and transparent dialogue to discuss nuclear capabilities, doctrines and confidence-building measures** to reduce strategic reliance on nuclear weapons and mitigate nuclear risk. The P5 should lead this dialogue, and discussions should follow a concrete work plan and a commitment to regular reporting on progress must be made. As part of this dialogue, all participants should reaffirm the Reagan-Gorbachev formulation that “a nuclear war cannot be won and must never be fought”, recognizing their unique responsibility to ensure nuclear weapons are never used again.
- **The P5 must establish concrete, sustainable, and regular engagements with NNWS and civil society representatives** to expand and strengthen strategic stability discussions. To prevent recurring noncompliance with future treaty obligations and joint commitments, states could further establish a dispute resolution mechanism through which affected regional groups and individual countries could serve as mediators between conflicting parties.
- **States must lead the immediate creation of collaborative approaches to verification that can be used for future arms control treaties.** These verification methods should build on the cooperation between

NWS and NNWS while ensuring conformity with Article I and Article II obligations under the NPT, such that NNWS would not gain access to information that would allow them to develop nuclear weapons themselves. Additionally, increasingly sophisticated commercial technology makes open-source verification a promising new avenue for verification. States should therefore engage in early cross-sectoral discussions on how to address some of the challenges related to crowd-sourcing methods in the realm of arms control, such as how to effectively validate data and protect the identities of participants.

The “one size fits all” approach is no longer relevant for future arms control agreements, which is why:

- We support the **pursuit of asymmetric arms control measures that adopt common goals but differentiated approaches**. Developing tailored paths to establish a more flexible global arms control framework would allow for the inclusion of both quantitative and qualitative targets. Setting concrete proportionality targets will bring other NWS on board while elevating the issue of the disproportionate arsenal sizes of Russia and the United States.
- We recommend **the creation of “gift baskets”** similar to those successfully used during the Nuclear Security Summits to achieve progress in arms control. Such an approach would entail voluntary commitments - made outside of the formal arms control architecture - to strengthen arms control. These could take the form of a high-level commitment by the P5 to the pursuit of arms control, regional discussions towards confidence and security building measures among NWS, individual or joint affirmations to exercise restraint in rhetoric and military postures, the establishment of pathways for crisis communication, and other measures.
- To address the changing strategic environment, we propose to **establish working groups among NWS and NNWS** based on regional dynamics, thematic areas (such as emerging technologies or crisis management measures), verification and other specialized interests.

The impact of emerging technologies on strategic stability is expected to be significant and deserves particular attention.

- **Large space powers should spearhead an agreement banning operations that could undermine or damage NC3**. Discussions could centre on technology regulation and the correlation between unregulated technology, misperception and escalation.

## Conclusion

Arms control, at its core, rests on the recognition of shared humanity as a means to balance national interests and political divisions with the need for diplomacy and de-escalation. While the security environment is now different to that of the Cold War, the fundamental goals remain the same: to avoid an arms race and to reduce the risk of using nuclear weapons. This policy paper recognises the need for flexibility in achieving the enduring relevance of the arms control architecture as diverse actors enter an ever-shifting landscape. It proposes a set of modest confidence-building and risk reduction steps while maintaining an ambitious long-term strategic vision for a flexible, inclusive, and forward-looking multilateral arms control framework.