



# Metis

## Study

### Nuclear arms control in crisis

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# Summary

**T**here is an urgent need to adapt nuclear arms control to technological and political changes, and to further develop and consolidate its bilateral and multilateral instruments. But instead, existing

agreements are under threat of erosion. This study outlines the deep crisis in which nuclear arms control finds itself. It concludes with a positive and a negative scenario and encourages further research.

## The twofold dilemma

In the early 1960s, atmospheric testing of nuclear weapons and the nightmarish experience of the Cuban Missile Crisis prompted the superpowers to impose arms control measures in order to contain the mutual threat of nuclear weapons. The aim was to prevent future crises between the US and the Soviet Union from escalating, to establish transparency and trust and to increase stability through arms limitation and a gradual reduction of weapons stockpiles.

Nuclear arms control became a major stabilising factor between the superpowers and for the international system as a whole. Bilateral nuclear arms control diplomacy provided the framework for the successful negotiation of elaborate counting rules for warheads and delivery systems and of clever verification regimes between Washington and Moscow so that compliance with the provisions of treaties could be mutually monitored. At the multilateral level, the Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT), which entered into force in 1970, was a crucial contribution to keeping the number of additional nuclear weapons states in the world at a low level.<sup>1</sup> After the end of the East-West

conflict, Russian and US arsenals shrank considerably in the 1990s, and the NPT was extended indefinitely in 1995.

Nuclear arms control is currently facing its greatest ever crisis. This is evident not just in the end of the Intermediate-Range Nuclear Forces Treaty (INF Treaty), which was a cornerstone of European security and a milestone in nuclear arms control between Russia and the US. Their negotiations for the extension of the New Strategic Arms Reduction Treaty (New START), which limits strategic nuclear weapons and carrier systems and expires in February 2021, have proven difficult as well. At the multilateral level, the withdrawal of the United States undermines the nuclear agreement with Iran, which had been the result of arduous negotiations in which Germany was also heavily involved. And the NPT, as the crucial element of multilateral nuclear arms control, was joined by the Treaty on the Prohibition of Nuclear Weapons (TPNW) in 2017 – with as yet unclear consequences. So far, the TPNW has been signed by 82 nations and needs only six more ratifications to enter into force.

At both the bilateral and the multilateral levels, the modernisation of existing nuclear arsenals, the development of new weapons and carrier systems and the emergence of new technological and political influencing factors would require existing instruments of arms control

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<sup>1</sup> According to the provisions of the NPT, only those nations which had already carried out a nuclear test by 1967 are entitled to own nuclear weapons, i.e. the five permanent members of the United Nations: the United States, France, China, the United Kingdom and the Soviet Union (now Russia). There are currently 191 signatories to the treaty. Only South Sudan, India, Israel and Pakistan never acceded to the treaty, with the latter three being nuclear weapons states

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themselves. North Korea, which also is a nuclear weapons state, announced its withdrawal from the treaty in 2003. Its status is controversial. To make up for the fact that the NPT cements the nuclear status quo, the treaty stipulates that the nuclear “haves” must support the nuclear “have-nots” in their civilian use of nuclear energy.



**Fig. 1** Estimated nuclear warheads on the part of the USA and the USSR/Russia, 1945–2014.  
(Data source: <https://ourworldindata.org/nuclear-weapons>)

to be further developed and expanded. Instead, previous achievements at both levels are now in danger of stagnation, erosion and dissolution.

This study outlines this two-fold dilemma of nuclear arms control on the basis of the most pertinent examples: the NPT, the TPNW and New START. It then goes on to highlight a number of new challenges in connection with all three examples before coming to a prospective conclusion.

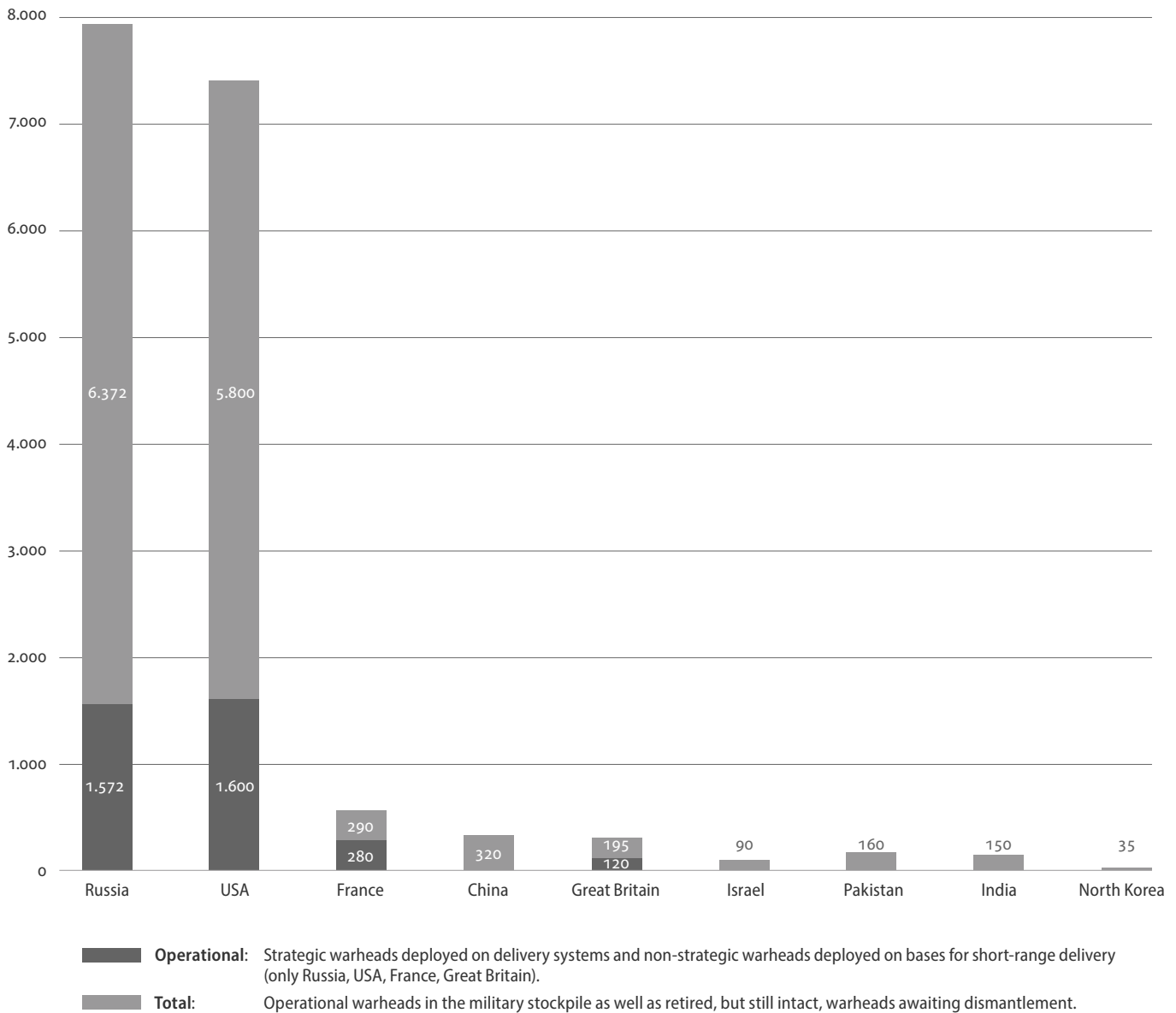
#### **Multilateral arithmetic: NPT + TPNW = ?**

Arms control and disarmament are frequently mentioned in the same breath. After all, the process of disarmament almost always forms part of arms control (provided the latter is aimed not only at preserving a status quo). But disarmament can also be the goal of a process of arms control. The INF Treaty, for example, eliminated an entire class of land-based ballistic missiles and cruise missiles. In its preamble and in Article VI, the NPT, too, obliges all

state parties to the treaty to work towards general and complete nuclear disarmament.

As paradigms, however, arms control and disarmament are fundamentally different. From the perspective of arms control, the weapons to be controlled are the symptom of a confrontational relationship between (state) actors. The often gradual process of arms control can result in a similarly gradual process of increasing transparency and trust, overcoming conflict and thus creating greater security, which – ultimately and ideally – will render weapons redundant. From a humanitarian perspective, however, weapons are not a mere symptom of conflict but a fundamental evil.

This differentiation is reflected in the difference between the Non-Proliferation Treaty and the Treaty on the Prohibition of Nuclear Weapons. The former is a traditional arms control treaty aimed at preventing proliferation and – long-term – at eventual global nuclear disarmament. The TPNW, however, is aimed directly at



**Fig. 2** Estimated worldwide strategic nuclear warhead arsenal, 2020.  
(Data source: Federation of American Scientists <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>)

this ultimate goal and thus at stigmatising the weapons themselves and banning them outright.<sup>2</sup>

These divergent worldviews are also reflected in

<sup>2</sup> The TPNW prohibits the development, testing, production, acquisition, stockpiling, transfer, direct or indirect control, stationing and use or threat of use of nuclear weapons as well as assistance in any of these prohibited activities.

the justifications of the two treaties, which are rooted in different concepts of security. The reasons put forth for the new TPNW barely rate a mention in the more traditional NPT, which dates back to an era when the concept of security was understood to apply only to inter-state relations. That is because the demand for an outright ban of nuclear weapons is based on the idea that they are a massive threat to human security. Because nuclear weapons cause extensive and indiscriminate destruction, their use poses an unacceptable risk for civilians and is



incompatible with international law of armed conflict and basic humanitarian values. Because the long-term consequences of their use, i.e. radioactive fallout or possibly even nuclear winter, would threaten the health or even survival of future generations, such weapons should be prohibited as a matter of principle, just like biological and chemical weapons. The new treaty thus does not consider nuclear weapons legitimate instruments of power in the international system. In the NPT, on the other hand, this legitimacy is not only unquestioningly assumed but also perpetuated in that the status quo of nuclear haves and have-nots is further cemented.

The growing frustration among the nuclear have-nots and large sections of global civil society is understandable, considering the lack of progress in terms of disarmament under the NPT,<sup>3</sup> especially since the treaty's indefinite extension in 1995 left the have-nots without leverage. They can now no longer threaten to just pull the plug on the whole thing at one of the review conferences that take place every five years.

There is no consensus on how the two treaties relate to and affect one another. Those in favour of the TPNW emphasise its complementarity with the NPT. They say that the TPNW explicitly recognises the non-proliferation regime as a cornerstone of international nuclear order and is based on the NPT's verification structures (safeguards agreement as per the Additional Protocol) and the role of the International Atomic Energy Agency as a watchdog for verifying disarmament. According to its proponents, the new treaty only spells out the intention to reduce nuclear arsenals – already agreed in Article VI of the NPT – as new provisions of international law. As a result, they say, the overall effect of the TPNW will be positive.

Sceptical observers believe the treaty to be meaningless at best and dangerously naive at worst. They believe that the nuclear weapons states (which oppose the treaty) will never accede to it, and that, in the medium term, the TPNW threatens to separate the disarmament issue from the non-proliferation regime and thus fragment the nuclear order. In the long term, the nuclear have-nots may even quit the NPT altogether in favour of the TPNW, which, overall, would have negative consequences. This sceptical view of the TPNW includes the charge that democratic societies with their more critical public mindset will be under pressure from civil society much more than autocracies such as Russia or China.

In short, the multilateral arms control architecture consisting of the NPT and the TPNW, which is soon to

enter into force, is subject to considerable tension and polarisation – and nobody knows where it may lead.

### **Bilateral tango: How about a third dancer?**

Nuclear arms control agreements with the Soviet Union and later with Russia were long met with bipartisan approval in the US. For decades, there was general agreement between Washington and Moscow that the risk reduction they promised was of mutual interest. All this is no longer the case. Even arms control has long become a highly politicised issue in the US, and the current bilateral negotiations to extend the New START treaty in Vienna were not only late to start but have also been slow to progress.

The US is insisting on including China and making New START trilateral, going as far as placing Chinese flags on empty negotiating tables in Vienna – an incident clearly designed to make headlines. China, with its weapons arsenal that is also undergoing modernisation but still much smaller in size, naturally rejects this proposal with the newly found level of confidence that the country has been known for lately.

Deciding on a one-time extension of New START for another five years, as laid down in Article XIV, para. 2, requires only an exchange of diplomatic notes. It could also be implemented quickly in the US since there is no need for Congress to ratify it. Observers of the Russian side, on the other hand, have pointed out that implementation there might require a legislative process involving the State Duma. If and to what extent this process could be sped up if absolutely necessary, however, is currently unclear. There is thus some debate about how urgently the Viennese decision on the extension of the treaty is actually needed. The only thing that is certain is that, even if China were ready to participate, the period until 5 February 2021 will not be enough time to include China as a third state – something which had never even been considered as an option for any previous iterations of the START treaties.

The Trump Administration is thus playing for time and trying in vain to use New START as leverage against China. Russia, on the other hand, claims to want to extend the treaty without delay, yet has been showing off provocative new developments such as hypersonic glide vehicles (*Avangard*), autonomous long-range torpedoes (*Poseidon*) and nuclear-powered cruise missiles (*Burevestnik*) in recent months.

The loss of New START would be cause for concern especially with regard to the verification regime, which creates transparency and trust. It uses tried-and-tested elements of previous START treaties (including on-site inspections, regular notifications, and exchanges of telemetric data for weapons tests) and, despite Trump's criticism of the "Obama-Biden deal", many experts say it has proven its worth since entering into force in 2011.

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<sup>3</sup> Not least because India, Pakistan and Israel going their own way had few if any consequences for these nations. Only North Korea faced ostracism and tough sanctions.



Negotiating more intensive verification measures would of course be possible, but for New START, right now the best would be the enemy of the good.

Should New START not be extended, there would no longer be any ceilings for US and Russian strategic warheads and carrier systems. The nuclear modernisation programmes pursued by both sides would continue without mutual monitoring. At least in terms of formal agreements, relations between the US and Russia would be set back to the 1960s – a time when bilateral nuclear arms control was just beginning to be established in response to a dangerous level of mutual distrust and lack of transparency.

### Entanglements and wormholes

Against the backdrop of the relatively straightforward bipolar constellation of superpowers during the Cold War, arms control was able to stabilise nuclear deterrence, which, even then, was more precarious and fraught with risk than is sometimes suggested in hindsight.<sup>4</sup> In the multipolar world of the 21st century – which now comprises nine nuclear weapons states – and under new technological and political framework conditions, nuclear risk reduction is more important yet more difficult than ever. Instead of the stagnation outlined in the previous two sections of this study, what is needed now are arms control reform and progress. Some of the new challenges are outlined below.

The arms race around hypersonic systems (glide vehicles and cruise missiles flying at speeds of over Mach 5), of which the previously mentioned *Avangard* is one example, necessitates that arms control measures be taken in response. Not because hypersonic speed is a new feature in nuclear weapons. When re-entering the atmosphere, the warheads of conventional ballistic missiles are just as fast, if not faster than the new systems currently discussed. Instead, the problem with the new carrier systems lies in the ambiguity of their warhead (nuclear or conventional?) and their target, which, without a ballistic flight path, is almost impossible to predict. This creates crisis instability between the US and Russia. With its combination of the DF-17 and the DF-ZF, China also has an operational hypersonic weapon system at its disposal already and should thus indeed be included in a trilateral approach.

Another issue that needs addressing is the increasing technological and doctrinal entanglement of nuclear and non-nuclear capabilities, a process that threatens to lower the threshold for using nuclear weapons. Both Russia and the US now include threats of nuclear retaliation for non-nuclear attacks in their nuclear doctrines because

they consider developments in conventional high technology – anti-satellite weapons, autonomy in weapons systems or cyber capabilities – a threat to their nuclear second-strike capability. As it stands, current instruments of arms control policy are insufficient when it comes to addressing the issues associated with hypersonic weapons and increasing entanglement.

Information technology in particular, which is more widespread and more socially and politically relevant than ever, is creating new challenges. In addition to the previously mentioned cyber operations, these challenges include the introduction of artificial intelligence technology into nuclear control and decision support systems as well as the risk of sudden “wormhole escalation” resulting from catastrophic misperceptions and miscalculations caused by distorted information, such as deepfakes. As far as these new challenges are concerned, nuclear arms control, whether between the US and Russia (and/or China) or at the multilateral level, is yet to arrive in the 21st century.

The implications of technological change and the inherent risks are the subject of research. But arms control has so far failed to come up with concrete solutions in practice. What is more, very little in the way of systematic research effort has gone into examining the issue from another angle entirely: that of using new technologies as additional leverage for the purposes of arms control. Only preliminary studies exist for distributed ledger technology (of which blockchain technology is the most commonly known example) to provide solutions for keeping a constant and secure record of data and agreements during negotiations and verification of treaties, or for automatic image recognition to facilitate nuclear export control.

### What if...?

China’s thirst for power, Russia’s hunger for status, and the short-sightedness of the US all serve to inhibit progress in nuclear arms control at the very worst moment: a time when, from a geopolitical and a military standpoint, such progress is needed more than ever to create transparency, trust and reliability. In addition, ongoing tensions between India and Pakistan are prone to escalation, North Korea has new weapons and carrier systems, and Iran, Saudi Arabia as well as Turkey could become nuclear weapons states.

How could a positive scenario, a return to effective bilateral and multilateral nuclear arms control, develop from this situation?

The election of Joe Biden as President of the United States in November 2020 could turn the tide. Biden has said that he will work on getting New START extended if that has not already happened by the time he assumes office. If they have to, the US side could actually pull this off after Biden’s inauguration in January and before the treaty expires in early February. Biden has also announced that he would once again reduce nuclear weapons to their role as a means of deterrence – and retaliation – for

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<sup>4</sup> See “Deterrence in the 21st Century”, Metis Study No. 16 (May 2020).



nuclear attacks alone. The Biden administration could also initiate bilateral negotiations on the further reduction of weapons stockpiles (either as part of the New START treaty's verification framework or through negotiating a new framework) as well as steps toward nuclear risk minimisation, such as reduced operational readiness of existing weapons. A trilateral US/Russian/Chinese moratorium on hypersonic weapons testing could even have a spillover effect that benefits arms control processes dealing with space, cyberspace and weapons autonomy. Finally, the return of the United States to the Iran deal, as promised by Biden, could be an invigorating signal for multilateral nuclear arms control. And, depending on the majority situation in Congress, even the ratification of the multilateral Comprehensive Nuclear Test-Ban Treaty could be on the cards. In such a hypothetical positive scenario, Germany could – and should – contribute to setting the relationship between the NPT and TPNW on a productive course. For reasons of Alliance politics, Germany has to be cautious in its approach to the TPNW. However, the treaty to ban nuclear weapons is a reality and both non-nuclear states and civil society will likely continue to be strongly in favour of it if things progress as outlined above. Thus, from the German point of view, not only would it make sense to participate in conferences of the parties to the TPNW, it would also be in line with Germany's reputation as a mediator and credible actor when it comes to nuclear arms control activities in numerous formats beyond the NPT.<sup>5</sup>

But even under President Biden, current geopolitical rivalries would remain acute and the nuclear order of the 21st century would become no less complex and uncertain. What would the corresponding negative scenario look like?

If the crisis continues on its current trajectory, the US and Russia will not uphold existing bilateral instruments or develop new ones. China, India and Pakistan for their part would not show any interest in nuclear arms control. On balance, the TPNW and the NPT would affect each

other negatively, the multilateral non-proliferation regime would be weakened and the likelihood of nuclear proliferation – for example, in the Middle East – would increase. In that case, it would be unclear if and how nuclear risks could be contained in the future. Against this backdrop, two individual aspects require more detailed prospective analysis.

- (1) What if proliferation prevention and export control by “coalitions of the willing” remained as the only available option? The Proliferation Security Initiative – an instrument for the prevention of proliferation initiated in 2003 at the suggestion of the US and with Germany as a founding member – could be a basis for further exploration of such emergency counter-proliferation initiatives in the event of a collapse of multilateral non-proliferation.
- (2) What if, for the first time since 1945, nuclear weapons were used again? There are a number of scenarios to be played through: an escalating crisis between India and Pakistan, a war on the Korean Peninsula involving the US or a crisis between NATO and Russia in the Baltic Region. How would these scenarios affect the nuclear order and its core norms of non-use and non-proliferation? Would they cast lasting doubt on nuclear deterrence, seeing as it would have failed in its role of a guarantor of non-use? Would the repercussions permanently damage the nuclear taboo – or would yet another use of nuclear weapons perhaps become even more unlikely (“never again”)? Would a ban on nuclear weapons become more likely or less?

So far, there has not been enough research and reflection in terms of security policy when it comes to these – admittedly uncomfortable – questions about the future. 🐝

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<sup>5</sup> Germany is already an active participant in the Non-Proliferation and Disarmament Initiative (NPDI) for more nuclear transparency, the International Partnership for Nuclear Disarmament Verification (IPNDV) for new verification methods, the Creating the Environment for Nuclear Disarmament (CEND) initiative for the promotion of nuclear disarmament, and the Stockholm Initiative for Nuclear Disarmament for strengthening the NPT.

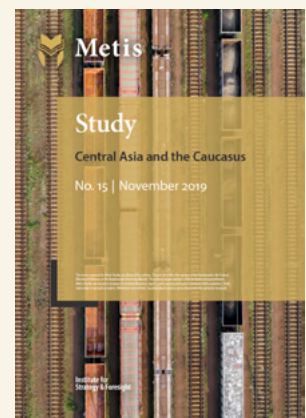






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