

## Mapping The Emerging Strategic Stability And Arms Control Landscape

**Andrew Futter**

### Summary

- Our nuclear world is changing, and this will have significant impacts on strategic stability and arms control. This is being driven by a mixture of technological, geopolitical and normative forces.
- Technological change and innovation are facilitating new types of strategic weaponry and missions. These have the potential to challenge established notions of deterrence and create nuclear risks.
- The combination of an emerging system of nuclear great-power multipolarity at the same time as a growth in “nuclear nationalism” and a return of bellicose nuclear rhetoric and statecraft are challenging traditional power balances, arms control and nuclear stability based on restraint.
- This is all taking place within a bifurcating global nuclear environment characterised on one side by normative challenges to the established nuclear order and increasing demands for nuclear energy, and on the other with a resurgence in the political salience of nuclear weapons.
- Taken together, this suggests that we are arguably on the cusp of a new “nuclear age” where we will need to rethink the rules of the nuclear game and how we prevent nuclear use.

## Introduction: A Nuclear World Transformed

We are living in an era of transition and uncertainty in the global nuclear order where nuclear security and nuclear risks are changing and the ways, ends and means devised to manage the nuclear condition are under pressure. This is the result of a technological, geopolitical and normative change and transformation across the nuclear ecosystem. Taken together, these developments are calling into question the way that we manage nuclear threats, and particularly how we think about strategic stability and arms control.

While there have been periods of unsettling, rapid, and potentially revolutionary change in the global nuclear order in the past, today appears to be different because the phenomenon is so wide-spread, multifaceted, and because the challenges go right to the heart of how we think about and conceptualise the nuclear condition.

These dynamics are of course inherently global, but while previous conceptualisations of nuclear eras were strongly Euro-Atlantic and even Western-centric, “Asia” broadly conceived (and to a lesser extent the “Global South”) seems set to play a major role in what we might think of as a “Third Nuclear Age”.

## Technological Change

At the core of the challenge to the established global nuclear order is technology. There are a multitude of potential applications and implications of technological innovation across the nuclear space, but when it comes to strategic stability and arms control, three in particular stand out: first, the potential for new or improved strategic military capabilities with different functions (e.g., weapons, various support systems, or both); second, the ability to conduct strategic missions in different, enhanced or even new ways; and third, the blurring distinction between nuclear and non-nuclear weaponry and strategic and tactical missions when it comes to strategic operations.

We can think of this technological challenge as comprising an array of different capabilities or missions including but not limited to: “exotic” nuclear delivery systems; manoeuvrable “hypersonic” glide and cruise missiles as well as conventionally-armed long-range precision-guided ballistic and cruise missiles, all using enhanced data gathering, processing, and target tracking methods; kinetic and non-kinetic counterspace and anti-satellite weaponry; full-spectrum missile defence, combining both right and left of launch operations; autonomous platforms, sensors and weapons to support nuclear and strategic activities across all domains, especially enhanced methods of Anti-Submarine Warfare; Computer Network Operations (or more colloquially “cyber-warfare”); applications of Artificial Intelligence across all parts of the nuclear enterprise; a new digitised nuclear information space vulnerable to deliberate interference and potentially prone to escalation; and renewed interest in Directed Energy Weapons for both defensive and offensive missions.

Technological change is impacting three particular (albeit interlinked) strategic missions, all of which may have the potential to undermine arms control and strategic stability:

- Nuclear counterforce, whereby advances in sensor capabilities, real-time data processing, targeting, and precision “smart” weapons, are potentially making it

easier to “find” stealthy or mobile nuclear weapons systems and undermine or destroy them.

- The potential to attack nuclear command, control and communications with kinetic or non-kinetic weapons able to target command facilities or compromise critical nuclear support infrastructure.
- Missile defence. Essentially, the various methods of interception/prevention and the support infrastructure to stop nuclear armed missiles from hitting their targets (or at least the perception of this) has and is changing and is diffusing to more actors.

A fourth more general implication is the impact on crisis and escalation management as these developments create uncertainty and fear about the security of nuclear systems for all.

However, technology is not, in and of itself, revolutionising the global nuclear order, undermining arms control, and creating new problems and dangers, but rather it is the *political* decisions about this technology and how it is applied, and what it can be used for, that are of the most importance.

## Geopolitical Change and Nuclear Nationalism

Technological advances in military capabilities are a direct product of a burgeoning global system of great power nuclear competition, nuclear-multipolarity and in some cases a form of “nuclear nationalism”. For the best part of a generation, the global nuclear order has been dominated by the United States. But today this balance is shifting due to the re-emergence of Russia as a major competitor, and because of the “rise” of both China and India as significant regional nuclear powers with geopolitical aspirations. This is unsurprisingly impacting strategic stability.

Over the past few years, US deterrence thinking has slowly been realigning to (re)prioritise “great power” nuclear challenges and to develop both nuclear and non-nuclear options to achieve this. But this comes in the wake of a generation spent seeking to respond to the threats posed by rogue and non-state actors, and this has created certain fissures. For example, deploying BMD and precision strike systems in conjunction with regional allies in order to deter North Korea and Iran, has increasingly been seen as destabilising by both China and Russia. When combined with the fact that US nuclear and non-nuclear weapons are becoming increasingly accurate, a direct effect has been a growing concern for Moscow and Beijing about whether these developments have—unintentionally or otherwise—ushered in the spectre of a new era of US “counterforce” against their nuclear arsenals. At best, such moves would appear to undermine the chance of nuclear reductions through arms control, make further limitations to nuclear stockpiles unlikely, and complicate strategic stability. At worst, they may usher in a new era of trilateral arms racing.

Russian nuclear weapons have become an increasingly conspicuous component of statecraft in the past two decades, and nuclear rhetoric and threats have played a particularly prominent role in the 2022 war in Ukraine. But even before the Ukraine war, President Putin had announced a raft of new strategic weapons systems specifically slated

to counteract US and NATO missile defence deployments and “restore” stability. These include: a nuclear-powered cruise missile, nuclear and non-nuclear hypersonic weapons, the Status 6 underwater nuclear torpedo, alongside revamped interest in Russian missile defence and ASAT capabilities. This clearly could have implications for stability and arms control in the Euro-Atlantic space, and more broadly, should Russia and China unite to undermine US global interests.

China seems to have gone through a period of change when it comes to nuclear strategy, and much hype has been generated by the possibility of a rapid expansion of the Chinese nuclear ballistic missile fleet, alongside various other “exotic” weapons such as the fractional orbital bombardment system, and a nascent BMD programme. Like Russia, China is concerned about the deployment of US non-nuclear strategic weaponry and the impact this could have on its deterrent force and stability. It is also concerned about the risk of coercion by a strategically superior adversary in any future conventional conflict in the region (e.g., over Taiwan). This, as well as the need to provide access to deep water for the next generation of Chinese SSBNs, is at least part of the reason why China is trying to expand its influence in the South China Sea. China’s expanding strategic capabilities can therefore also be seen as a challenge to the US-led alliance system in the region.

India has slowly increased the size and capability of its nuclear arsenal over recent years, and has begun developing a range of strategic non-nuclear weapons for various deterrence purposes, notably a multi-layered ballistic missile defence system, various precision strike capabilities, and in 2019 conducted its first ASAT test. These advances have even led one scholar to suggest that India might be developing a “counterforce capability”. But India’s deterrence requirements are mixed: deterring tactical aggression and border conflicts by a nuclear-armed but conventionally inferior Pakistan, and matching an increasingly powerful nuclear-armed and conventionally superior China in Asia. India also appears to be trying to balance the benefits of closer relationships with the US and Russia, with a desire to avoid formal alliances with either. India of course remains outside of the Non-Proliferation Treaty framework.

Taken together, this suggests that we are entering an era where established notions of nuclear arms control (especially in its previously bilateral nature), prospects of nuclear reductions, and strategic stability through mutual nuclear vulnerability, are under threat by a new multipolar nuclear context characterised by the pursuit of advantage rather than restraint.

## **Normative Change**

The third component of the emerging global nuclear landscape that will impact strategic stability and arms control is normative, and involves challenges to existing nuclear frameworks and governance architectures. There are three parts to this: first, a recognition that technological and geopolitical change may require new mechanisms to manage nuclear risks; second, a concurrent rejection of nuclear weapons and an increase in the demand for nuclear energy by large parts of the developing world, particularly from states in the “Global South”; and third, the way we think about nuclear order, and therefore arms control and

strategic stability, is being challenged from the outside. The result is an increasingly bifurcated global nuclear context.

The classical approach to managing the technological and political challenges of the current era is to utilise established methods of arms control, restraint, norm and confidence building mechanisms between the major nuclear powers. The aim of this approach would be to avoid the instability, risks and associated costs of moving to a new paradigm based on rapid expansion of strategic capabilities by the major nuclear powers by manufacturing and moulding the frameworks needed to minimise changes to the current system and strengthen strategic stability. The key here is finding political ways to encourage the US, Russia, China and India to constrain the development and deployment of disruptive and novel technologies and forego any pursuit of strategic advantage.

A more radical approach would be to use the transformative potential of technological innovation, nuclear multipolarity and new nuclear dangers as part of a genuine pathway to disarmament. This could manifest in three ways:

- First, is the potential for strategic non-nuclear weapons to replace nuclear weapons for deterrence, security and stability functions. For example: if strategic non-nuclear capabilities become more “useable” or “credible” for strategic missions for the major powers, then they may replace nuclear weapons for certain roles. This could facilitate *unilateral* nuclear reductions as the perceived value of these forces for the strategic deterrence mission erodes.
- Second, if strategic non-nuclear weapons make nuclear forces more vulnerable to attack or compromise, this would potentially undermine confidence in their ability to act as a deterrent. For some states, this could shift the cost-benefit analysis of continuing to rely on nuclear weapons for deterrence.
- Finally, if strategic non-nuclear weapons proliferate, particularly those capable of denial operations, this could raise the barriers to new nuclear entrants because it would become more difficult to establish a credible nuclear capability and retain it. Future would-be proliferators may also see the development and deployment of non-nuclear capabilities as a better way to meet deterrence and security needs.

Another significant component of the emerging nuclear landscape is a renaissance of interest in nuclear power. There are clearly short-term drivers of this, notably the energy crisis produced by the 2022 Russian war in Ukraine, but also longer-term structural pressures as states outside the developed world seek the means for economic development. While in theory all states have access to nuclear technology for peaceful purposes under the Non-Proliferation Treaty, the reality is that the spoils of the nuclear revolution have disproportionately benefitted the industrialised “western” world. Massive increases in demand for nuclear energy will potentially bring with it new proliferation concerns, but also refocus attention on the safety and security of nuclear installations and potentially their significance as military targets.

The final part of the normative challenge is more holistic, and effectively comes from outside of the formal global nuclear order. The most prominent manifestation of this is the Treaty on the Prohibition of Nuclear Weapons (or nuclear ban treaty), which marks a notable

departure from for example the NPT, which tacitly accepts a role for nuclear weapons in deterrence while working towards abolition. While the ban treaty may not be a disarmament panacea, its symbolism is important. This is because it represents a genuine attempt by those outside of the formal nuclear order to put pressure on the nuclear-armed states and the dominant narrative used by these states that nuclear deterrence is a central and legitimate ordering mechanism in international politics. The ban treaty is also reflective of a growing sub-set of academic scholarship that might be termed as “critical nuclear studies”, which has at its core a desire to challenge the prevailing narratives and ideas that sustain the nuclear condition.

## Looking Ahead

So, what might all of this mean going for the future of global nuclear order?

1. The way we think about nuclear weapons and nuclear threats is changing. We are arguably on the cusp of a new chapter in the nuclear story where arms control and strategic stability may look different to the past.
2. The future of global nuclear order will not be Western-centric. While the US will remain important, the main locus of nuclear politics, arms control and stability will “rebalance” toward Asia, and to a lesser extent the Global South.
3. Technological change has the potential to impact strategic stability and arms control in a negative way. But technological disruption is not preordained; ultimately *political* decisions drive technology, strategy and risks.
4. Strategic non-nuclear weapons seem likely to play an increasingly important and influential role in strategic stability and arms control, complementing and perhaps even replacing nuclear weapons for certain functions.
5. Arms control and strategic stability will become a genuinely multipolar game, with different interests and challenges posed to and by the US and its allies, Russia, China and India.
6. At least part of this will reflect a new nuclear nationalism, where the role and importance of nuclear weapons appears to have been revived and even hyped for the great powers.
7. Some established mechanisms of arms control may not be fit for purpose in this new context, or at least, may not play such a prominent role. This means that we should be creative and consider arms control as a multifaceted toolkit with a wide variety of applications.
8. Notwithstanding the nuclear ban treaty, we may have to accept the temporary suspension of nuclear reductions in favour of managing the disrupted and complex nuclear world we see before us.
9. The legitimacy and centrality of the “managed” system of global stability based on nuclear deterrence is being challenged from the outside and it is unclear where this will lead.
10. We are potentially at the beginning of a major split in the global nuclear order between those who continue to believe in the political benefits of nuclear weapons and those who seek to overthrow the established system based on nuclear weapons.

## Notes

This paper draws on ideas previously published in “Deterrence, Disruptive Technology and Disarmament in the Third Nuclear Age”, *Hiroshima Organisation for Global Peace*, (April 2022). The research for this paper was funded by the European Research Council, grant number: 866155.

## Further Reading

James Acton, “Escalation through entanglement”, *International Security*, 43:1 (2018), pp.56-99.

David Cooper, *Arms control for the Third Nuclear Age*, (Georgetown University Press: 2021).

Kjølv Egeland, “The ideology of nuclear order”, *New Political Science*, 43: 2 (2021), pp.208-230.

Andrew Futter & Benjamin Zala, “Strategic non-nuclear weapons and the onset of a Third Nuclear Age”, *European Journal of International Security*, 6:3 (2021), pp.257-277.

Andrew Futter, “Deterrence, disruptive technology and disarmament in the Third Nuclear Age”, *HOPe*, (April 2022): <https://hiroshimaforpeace.com/en/wp-content/uploads/sites/2/2022/04/Deterrence-Disruptive-Technology-and-Disarmament-in-the-Third-Nuclear-Age.pdf>.

Robert Legvold & Christopher Chyba, “Meeting the challenges of a new nuclear age”, *Daedalus*, (Spring 2020): <https://www.amacad.org/daedalus/meeting-challenges-new-nuclear-age>.

Nick Ritchie, “A hegemonic nuclear order: Understanding the Ban Treaty and the power politics of nuclear weapons”, *Contemporary Security Policy*, 40:4 (2019), pp.409-434

## The Author

**Andrew Futter** is Professor of International Politics at the University of Leicester UK, where he specialises in contemporary nuclear weapons and security issues. He is currently leading the European Research Council-funded “Third Nuclear Age” project (<https://thethirdnuclearage.com>), and is the author of numerous books and articles, including most recently “Hacking the Bomb” (2018), “Threats to Euro-Atlantic Security (2020), and “The Politics of Nuclear Weapons” (2021), as well as writing regularly for professional organisations and the global media. He has held visiting positions at a number of leading institutions including the James Martin Center for Nonproliferation Studies in Monterey and the Nobel Peace Institute in Oslo, and regularly provides expert testimony and advice to governments and NGOs. He can be contacted at: [Ajf57@le.ac.uk](mailto:Ajf57@le.ac.uk), or @andrewfutter

## The Norwegian Institute of International Affairs (NUPI)

The **Norwegian Institute of International Affairs [NUPI]** was established by the Norwegian Parliament in 1959 and is a leading institution for research on international issues in areas of relevance to Norwegian foreign policy. NUPI is an independent institution undertaking basic as well as applied research and advisory services and is committed to excellence, relevance and credibility in all its projects. A central principle is interdisciplinary collaboration, within the institute and with other institutions in Norway and abroad. NUPI aims to be relevant both for professionals in international politics and for the general public.

## Toda Peace Institute

The **Toda Peace Institute** is an independent, nonpartisan institute committed to advancing a more just and peaceful world through policy-oriented peace research and practice. The Institute commissions evidence-based research, convenes multi-track and multi-disciplinary problem-solving workshops and seminars, and promotes dialogue across ethnic, cultural, religious and political divides. It catalyses practical, policy-oriented conversations between theoretical experts, practitioners, policymakers and civil society leaders in order to discern innovative and creative solutions to the major problems confronting the world in the twenty-first century (see [www.toda.org](http://www.toda.org) for more information).

## Contact Us

Toda Peace Institute  
Samon Eleven Bldg. 5<sup>th</sup> Floor  
3-1 Samon-cho, Shinjuku-ku, Tokyo 160-0017, Japan  
Email: [contact@toda.org](mailto:contact@toda.org)