



The Present and Future of Russian Nuclear Weapons

IAN ANTHONY



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Summary

During the Cold War NATO was expected to use nuclear weapons first in a conflict, and the Soviet Union signalled an immediate, massive and guaranteed nuclear response. Newly independent Russia began to think about limited nuclear war, and over four decades strategic forces were renewed and a flexible and modern nuclear arsenal tailored for regional war was constructed.

Building a nuclear weapon capability at scale is a formidable project that can't be accomplished quickly. The rapid increase in Chinese nuclear capability and the US response will force Russia to think through the kind of force needed for the 2030s and beyond. The uncertain outcome of Russia's aggression against Ukraine and the dramatic change it has brought about in Europe requires a reassessment of regional war.

It would be extremely costly for Russia to match the anticipated size of future Chinese and US arsenals. Reciprocal agreements that "freeze" current conditions might be to Russia's advantage, but the barriers to new arms control agreement are formidable.

In an increasingly unfavourable conventional military balance, the most likely outcome is more extensive nuclear coercion through rhetoric, public release of official documents and military exercises.

Russia's objective will be to sow discord and division among its adversaries through uncertainty about when and how nuclear weapons might be used.

Keywords: Russia, nuclear weapons, strategy

Sammanfattning

Under kalla kriget förväntades NATO använda kärnvapen först i en konflikt, och Sovjetunionen signalerade en omedelbar, massiv och garanterad kärnvapenreaktion. Det nyligen oberoende Ryssland började fundera på begränsat kärnvapenkrig, och under fyra decennier förnyades strategiska styrkor och en flexibel och modern kärnvapenarsenal skräddarsydd för regionalt krig byggdes upp.

Att bygga en kärnvapenförmåga i stor skala är ett formidabelt projekt som inte kan genomföras snabbt. Den snabba ökningen av kinesisk kärnvapenförmåga och USA:s svar kommer att tvinga Ryssland överväga vilken styrka som behövs för 2030-talet och framåt. Det osäkra resultatet av Rysslands aggression mot Ukraina och den dramatiska förändring den har medfört i Europa kräver en omvärdering av regionalt krig.

Ryssland befinner sig vid en brytpunkt. Det skulle bli extremt kostsamt att matcha den förväntade storleken på framtida kinesiska och amerikanska arsenaler. Ömsesidiga avtal som "fryser" nuvarande förhållanden kan vara till Rysslands fördel, men hindren för nya avtal är formidabla.

I en alltmer ogynnsam konventionell militär balans är det mest troliga resultatet mer omfattande kärnvapentvång genom retorik, offentliggörande av officiella dokument och militära övningar.

Rysslands mål kommer att vara att så oenighet och splittring bland sina motståndare genom osäkerhet om när och hur kärnvapen kan komma att användas.

Nyckelord: Ryssland, kärnvapen, strategi

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List of acronyms

ABM Treaty	1972 Anti-Ballistic Missile Treaty
ASAT	Anti-Satellite weapon
CIS	Commonwealth of Independent States
CTBT	1996 Comprehensive Nuclear Test Ban Treaty
DIA	US Defense Intelligence Agency
FAS	Federation of American Scientists
12 GUMO	12 Glavnoye Upravleniye Ministerstva Oborony (12 th Main Directorate of the Russian Ministry of Defense)
HEU	Highly Enriched Uranium
ICBM	Intercontinental Ballistic Missile
INF Treaty	1987 Treaty on Intermediate Range Nuclear Weapons
NATO	North Atlantic Treaty Organisation
New START Treaty	The Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms
SALT I	1972 Strategic Arms Limitation Treaty
SIPRI	Stockholm International Peace Research Institute
SLBM	Submarine-Launched Ballistic Missile
SORT	Treaty on Strategic Offensive Reduction (Moscow Treaty)
SSBN	Nuclear Ballistic Missile Submarine
START I	1991 Strategic Arms Reduction Treaty
START II	1993 Strategic Arms Reduction Treaty
VNIEF	Federal Nuclear Centre – Institute of Experimental Physics
VNIITF	Federal Nuclear Centre – Institute of Technical Physics
ZATO	Zakrytoye Administrativno-Territorialnoye Obrazovaniye (Closed Administrative Territorial Formation)

1 Introduction

1.1 Purpose and questions

Might Russia be at a new inflection point today regarding the role of nuclear weapons in safeguarding its security? That is the main question this report seeks to address. Russia has built a large and diverse nuclear arsenal. Nevertheless, President Vladimir Putin points to the need to continue investing in weapons. Russia must decide whether the nuclear forces at its disposal will be adequate to the challenges it is likely to face at global and regional level in the future.

While there is no consensus, experts on Russian military developments have seen indications that a fundamental reappraisal of military science is ongoing in Russia.¹ Behind the reappraisal are changes in the global and regional security environment that have undermined the distinctions drawn in Russia around local, regional and global war. Russian experts were already pointing to the diminishing utility of this classification before Russian launched its war against Ukraine.² That assessment was influenced by technology trends that enhance the role of capabilities in space and cyberspace that are decoupled from geography. However, current tendencies have reinforced this perspective.

Russia has experienced difficulty in achieving its war aims against Ukraine. The scale of the fighting and the level of support provided to Ukraine by Western partners has challenged the differentiation between local war and regional war. The increased focus on the risks of a major conflict in Asia has underlined that there are no longer discrete regional theatres of war as Russian partnerships with China and North Korea have deepened. The differentiation of regional and global war is also less clear.

Will Russia feel a need to reassess key assumptions in light of the dynamic international conditions? To what extent are the capabilities that Russia has tailored to regional war considered to have delivered what was expected of them? Given the changes that NATO states are now making to their own military policies, plans and capabilities will the Russian force be adequate to problems anticipated ten years from now? As the United States implements its own programmes to modernize the nuclear arsenal and strengthen missile defences will Russia still feel confident in the choices it has made to assure a second-strike capability sufficient to meet deterrence requirements?

A main hypothesis in this report is that the role of nuclear weapons has been both changed and magnified in the past when Russia has had to make significant alterations in the approach to military science as a result of world events. Therefore we should anticipate that Russia will follow the same path now.

Making significant changes to the Russian nuclear arsenal of the 2040s would require decisions to be taken now, and President Putin has indicated that a review of future requirements is underway. Russian nuclear forces can be expanded as some systems that are in development reach maturity,³ but will they be and, if they are, with what purpose in mind? If no fundamental alterations are made to the arsenal will Russia try to find new ways to use the existing capability to pursue national objectives?

¹ Maria Engqvist (ed.), Jonas Kjellén, Kristina Melin, Emelie Sandvad, Carolina Vendil Pallin, *The Future of Warfare in Russian Military Thinking*, Swedish Defence Research Agency, FOI-R—5806--SE, January 2026.

² Clint Reach, 'A Review of Andrei Kokoshin, Iurii Baluevskii, Vitor Esin and Aleksandr Shliakhturov, *Escalation and Deescalation of Crises, Armed conflicts, and Wars*', *NATO Russian Studies Series*, March 2022.

³ 'Russia is in a good position to qualitatively and quantitatively expand its strategic arsenal if it chooses to do so', Jacek Durkalec, 'Russia's Approach to Modern Strategic Conflict' in Brad Roberts ed. *Getting the Multi-Domain Challenge Right*, Center for Global Security Research, Lawrence Livermore National Laboratory, 2021.

1.2 Sources

This report relies exclusively on open sources. The most important sources are the published works of experts from Russia and Russian experts in Europe and the United States. In preparing the report the sources are heavily weighted to English language publications. A second important source is 'grey' material collected by the author over several decades from meetings and conferences with Russian counterparts. A third source includes the material from a limited number of face-to-face interviews with protagonists—officials that participated in projects delivering disarmament assistance to Russia or arms control negotiations involving Russian nuclear weapons.

1.3 Summary of rest of the paper

This report will first sketch the context in which Russia must make decisions about its nuclear weapons including the role of nuclear weapons in the Russian approach to deterrence, the financial framework in which decisions must operate and the nuclear forces in being. After that the report will examine policy and doctrinal issues at what appear to be break points in Russian thinking to explain how Russia has arrived at its current positions. The next step in the analysis will be a focus on how current issues and problems influence the role of nuclear weapons. The main points that emerge from the analysis will be drawn together in a concluding section.

The selected break points are the end of the Cold War and its immediate aftermath; the cooling of relations with the West and the almost simultaneous arrival of Vladimir Putin as President; and the most recent developments globally and in Europe that are combining to create what some analysts have identified as a new nuclear order.

2 Theory and method

2.1 Theory

Fielding nuclear weapons at scale is a formidable undertaking that requires systematic implementation of plans over an extended period. Making significant changes is only likely if new circumstances fundamentally impact calculations around national security. Russia's current arsenal is influenced by decisions that stretch back to the 1970s.

Explaining the evolution of Russian nuclear forces therefore needs to pay attention to both persistent factors and discontinuities. Nuclear weapon development can perhaps be compared to a lava stream that flows continuously at a steady pace, but not particularly quickly. However, the direction of the lava flow might be changed by disruptive international or domestic political factors that significantly alter perceptions and policy choices.

Long-term trend analysis might lend itself to the study of nuclear weapons because it tries to recognize persistent patterns and structural changes, identify their underlying causes and separate them from short-term fluctuations that need a different explanation. However, to produce reliable outcomes long-term trend analysis depends on access to a large enough body of data of a sufficient quality. In the case of nuclear weapons some general patterns can be identified in, for example, the size of the strategic arsenal, but pinpointing specific causal factors beyond very general observations would be questionable.

Long-cycle theory might be a better lens through which to consider the evolution of the Russian approach to nuclear weapons. Long-cycle theory concerns itself with an evolutionary process and does not assume any specific structure in the international system. The theory focuses on the relationship between world powers and the impact that their interactions have on the global political system. Based on observed patterns since the start of the early modern period a core finding is that at any given time there is a set of global powers within which one is the 'first among equals'.⁴ The development of Russian nuclear capabilities can be assessed against the two core propositions of long-cycle theory:

- First, that the institutions of world politics are subject to identifiable evolutionary processes. When speaking of institutions long-cycle theory means 'widely accepted arrangements in respect to war and peace, nation states, alliances and international organization'.
- Second, that the rise and fall of major powers is a function of those processes.⁵ The positioning of major powers relative to one another is the mechanism 'that in the recent past has mediated major changes in world political and social organization'.⁶

The purpose of the theory is to identify factors that lead to transition from one long-cycle to another. Theorists have defined a set of cycles, each spanning roughly 100-years, beginning in the late 15th Century. The period spanning the 1940s to the 2040s can be considered the current long-cycle. The main architects are careful to point out that the theory focuses on a world system, and not a specific region.⁷

Within each long-cycle four stages of development are central to the theory: establishment, consolidation, challenge and transition. Establishment is usually the result of a major conflict in which the outcome favours one power over others. Consolidation is a

⁴ George Modelski, 'The Long Cycle of Global Politics and the Nation-State', *Comparative Studies in Society and History*, April 1978. Global powers are defined as those that control or substantially control and regulate global processes.

⁵ George Modelski, 'Evolutionary Paradigm for Global Politics', *International Studies Quarterly*, vol. 40 1996.

⁶ George Modelski, 'Evolutionary Paradigm for Global Politics', *International Studies Quarterly*, vol. 40 1996.

⁷ George Modelski, 'Long Cycles in Global Politics', UNESCO Encyclopaedia of Institutional and Infrastructural Resources.

period where the predominant power develops and uses a range of instruments in ways that shape the system. Challenge is a period in which the advantages enjoyed by the dominant power are progressively diluted and eroded. Transition is the process by which one dominant power attempts to replace another, potentially a violent disruption that marks the start of a new cycle.⁸

After the Second World War the advantage that the United States enjoyed in the development and use of nuclear weapons was perhaps the decisive factor during the consolidation phase of the current long-cycle. With an effective monopoly the United States could threaten massive retaliation if the Soviet Union tried to use its conventional military power to achieve its objectives. Soviet investment in developing nuclear capabilities can be seen as a key factor eroding US advantage during the challenge phase of the current cycle.⁹

Russia's experience in relation to the current long-cycle has been unfortunate. The transition from *Pax Britannica* to a more prominent US role took place as Russia was overwhelmed with the consequences of global war and domestic revolution. Today, Russia has been overtaken by China in many economic, technological and political indicators of power and may well fall further and further behind.

Nuclear weapons might be one of a very few fields in which Russia could make a legitimate claim to remain within the group of world powers that can shape world affairs during the challenge phase of the current cycle. However, the potential role of nuclear weapons is less clear and may depend on how the United States chooses to respond to the rise of China.

Given the typical length of previous cycles it might be that the current long-cycle in which the United States is the dominant power is approaching the end of a challenge phase. The challenge of the Soviet Union was decisively defeated, at which point the theory would predict consolidation of US predominance in a new cycle. Instead, post-Soviet Russia has worked with China to sustain the challenge.

The idea of a multipolar world order was advanced in Russia as the cornerstone of what became known as the 'Primakov Doctrine'. As elaborated by then Foreign Minister Yevgeniy Primakov in 1996 the idea was subsequently incorporated into the 1997 Sino-Russian *Joint Declaration on a Multipolar World and the Establishment of a New International Order*.¹⁰

After 2012 China and the United States briefly explored what President Barack Obama and then new General Secretary of the Chinese Communist Party (later President) Xi Jinping described as a new model of relations between an existing power and an emerging one.¹¹ The emergence of a "G2" configuration would have undermined a central hypothesis of long-cycle theory: that taking the position of the first among equals will be an objective for major powers, either by a successful challenge to the incumbent or because the incumbent survives the challenge. However, the conversation appears to have been short-lived.

By 2017 US official documents recognized China as a long-term strategic competitor and a consensus emerged in the United States that China is a so-called pacing threat, meaning that it is 'the only country that can pose a systemic challenge to the United States in the

⁸ The identity of the dominant actor need not necessarily change, and proponents of long-cycle theory point to the United Kingdom which established itself as the dominant actor between the 1670s and 1780s, but survived the revolutionary and Napoleonic wars to remain the global leader through the next cycle before being superseded by the United States.

⁹ For example, the United States was not able to 'stare down' the Soviet Union during the 1973 Arab-Israeli war in the same way that it could in the Cuban Missile Crisis a decade earlier.

¹⁰ Andrey Kortunov, 'Between Polycentrism and Bipolarity', *Russia and Global Affairs*, No. 1 January/March 2019.

¹¹ *The United States and the Asia-Pacific in 2013*, Remarks By Tom Donilon, National Security Advisor to the President: to The Asia Society, New York, 11 March 2013.

sense of challenging us economically, technologically, politically and militarily'.¹² President Xi Jinping has underlined that a powerful military capability is an essential enabler of China's 'great rejuvenation' and peaceful rise.¹³

The long-cycle theory tries to explain the past based on historical observation, but contemporary authors have used the theory as the basis for projecting into the future. The most cited example is probably the work of Paul Kennedy who asserted that the erosion of US advantages combined with the failure of Russia to develop the economic, political and technological instruments of power would make the Pacific the main power centre, with China predominant.¹⁴

The expanding partnership between China and Russia might be one new dimension of the challenge that long-cycle theory would predict. Kennedy emphasized economic and technological factors as central to the next transition, rather than conflicts of the type characterized by former US Secretary of Defence William Perry as 'Type A'.¹⁵ The 2022 affirmation by the permanent members of the UN Security Council that 'a nuclear war cannot be won and must never be fought'¹⁶ perhaps supports the idea that nuclear weapons could have a potential moderating role in any conflict during transition. Fighting might occur mainly, but not only, with non-nuclear means in the 'nuclear shadow'.

Alternatively, however, a joint effort by China and Russia to leverage perceived advantages over the United States may include exploiting what is believed to be an imbalance in nuclear capabilities in regional contingencies. For Russia nuclear weapons might provide a degree of insulation from the direct effects of a Sino-US conflict.

Russian nuclear weapons might also help to hedge against the outcome of a successful Chinese challenge to the United States, whether peaceful or otherwise. If, after a transition, China becomes the dominant major power then pressure and coercion by Beijing would be as unwelcome to Russia as that from Washington.

2.2 Method

Long-cycle theory suggests that major powers in the global system try to reshape their mutual relations to enhance their influence in key policy areas in a sequential manner. The hypothesis in this report is that significant changes to Russian nuclear weapons policy and plans can be tied to transition points within the current cycle. The method applied is to examine how identified transition points in the current cycle affected Russian nuclear weapons-related policy and practice.

At the end of the Cold War US predominance among great powers created what has been labelled a 'unipolar moment'. In the terms of long-cycle theory the Soviet challenge to US dominance failed decisively. However, although the dramatic developments of the late 1980s and early 1990s broke apart the Soviet military system, they also stimulated thinking about how to challenge US dominance.¹⁷

For the newly created Russian state the strategic nuclear arsenal was one element of power that remained relatively stable in a chaotic and fluid situation. Nuclear weapons would be

¹² Lloyd J. Austin III, Secretary of Defense, Briefs Reporters on NATO Defense Ministerial and Ongoing Department of Defense Issues, 19 February 2021.

¹³ Baohui Zhang, 'Xi Jinping, 'Pragmatic' Offensive Realism and China's Rise', *Global Asia*, June 2014.

¹⁴ Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000*, (Unwin Hyman: London 1988). Kennedy noted that whether Europe would develop as a coherent political and military actor with significant agency in world affairs was a potential outlier in his analysis.

¹⁵ In Perry's classification a Type A conflict would threaten national survival or global disaster. William J. Perry, 'A security strategy for the 21st Century', in Ian Anthony and Adam Daniel Rotfeld eds. *A Future Arms Control Agenda*, (Oxford University Press: Oxford, 2001).

¹⁶ Joint Statement of the Leaders of the Five Nuclear-Weapon States on Preventing Nuclear War and Avoiding Arms Races, 3 January 2022.

¹⁷ Charles Krauthammer, 'The Unipolar Moment', *Foreign Affairs*, Vol. 70, No. 1, 1990/91.

expected to be seen as a key asset to defend Russia against coercion by the United States in what seemed to be a new consolidation phase.

Estrangement between Russia and the United States (and the West more generally) towards the end of the 1990s coincided with the rise to power of President Vladimir Putin, who has continuously emphasized how nuclear weapons support regional ambitions. An enhanced role for nuclear weapons would therefore be an expected outcome in support of the policy objectives of President Putin.

There are new international and regional conditions. At a global level there is a rapid increase in Chinese nuclear capabilities of different kinds. At regional level the outcome of the high intensity war Russia is waging against Ukraine is unpredictable and the associated European reaction is a sustained increase in military capability consolidated within NATO and through closer intra-European cooperation.

Based on the observation of past behaviour Russia would be expected to leverage nuclear weapons as a main element in response to the new conditions.

3 The threat environment from a Russian perspective

President Putin has indicated that a review of future nuclear requirements is underway.¹⁸ To free itself from legal constraints when deciding on the optimal future capability Russia has removed compliance with arms control from its declaratory nuclear policy. The 1987 Treaty on Intermediate-Range Nuclear Weapons (INF Treaty) formally collapsed in late 2019. Russia revoked its ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in October 2023.¹⁹ Though Russia is still verbally bound by the provisions of the CTBT, and it has not stepped away from a moratorium on nuclear testing declared in the early 1990s, the United States has asserted that Russian supercritical tests have aided the development of new warhead designs.²⁰ The Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START Treaty) expired in February 2026 without replacement.

3.1 Changes at the global level

The bilateral relationship between the United States and first the Soviet Union then Russia has been the dominant nuclear paradigm since the 1950s. For a large part of that period the United States enjoyed a nuclear superiority that limited Soviet international freedom of movement.²¹ Over time the Soviet Union was able to reduce the margin of US superiority and then achieve a level of balance to the point where ‘any use of nuclear weapons is certain to involve a level of casualties and devastation out of proportion to foreseeable foreign policy objectives’.²²

As a result of the central US-Soviet/Russian balance decision-makers are believed to face enormous inhibitions against employing nuclear weapons.²³ Today, however, China’s investment in its nuclear arsenal is a potentially transformative factor because a trilateral relationship has never previously existed between states that possess nuclear arsenals broadly similar in size.

In their public diplomacy China and Russia underline the importance of ‘the logic underlying the maintenance of strategic balance’ and allege that it is the United States that is undermining it. In their May 2025 *Joint Statement on Global Strategic Stability* China and Russia repeat long-standing criticisms of Western investment in missile defences and conventional precision strike weapons.²⁴ However, they also draw attention to what they allege to be Western efforts to create the means to ‘defend and defeat’ a nuclear-armed adversary.²⁵ The degree to which China and Russia will coordinate their nuclear weapons policies in response to this perceived threat is not clear.²⁶

¹⁸ ‘Putin says special attention should be paid to nuclear triad in Russia’s new arms programme’, *Reuters*, 11 June 2025.

¹⁹ ‘Russia moves to revoke Nuclear Test Ban Treaty’, *Moscow Times*, 17 October 2023.

²⁰ Guy Faulconbridge ‘Kremlin says Russia has not abandoned moratorium on nuclear testing’, *Reuters*, 3 October, 2023; US Department of State, *Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments (Compliance Report)*, June 2020.

²¹ Prannay Vaddi, ‘I Build, You Build? Analyzing the Contemporary Arms Race Discourse’, *Strategic Simplicity Substack*, 11 December 2025.

²² Henry Kissinger, *The Dangers Posed by Nuclear Weapons*, Speech to the 45th Munich Security Conference, 2009.

²³ ‘Deterrence in the Age of Nuclear Proliferation’, *Wall Street Journal*, 7 March 2011.

²⁴ *Joint statement by the Russian Federation and the People’s Republic of China on Global Strategic Stability*, 8 May 2025.

²⁵ Similar complaints were made in the *Joint Statement of the People’s Republic of China and the Russian Federation on a Multipolar World and the Establishment of a New International Order*, Beijing, 23 April 1997.

²⁶ Linda Bachg and Daniel Kroth, ‘Interrogating China-Russia Nuclear Parallels’, *The Three Swords*, NATO Joint Warfare Centre, December 2025.

3.2 Changes at the regional level

Traditional Russian concerns around the proximity of NATO (particularly US) forces to strategic nuclear forces based in Northwest Russia have taken on a new character. The maritime domain was the primary focus during the Cold War.²⁷ After Sweden and Finland became members of NATO land-based conventional precision strike weapons and a large accretion of air power are being integrated into the NATO regional war plan for the Northern part of the Alliance. Closer integration of Nordic military preparations is taking place in parallel with a stronger regional engagement from the United Kingdom and other allies.²⁸

In their 2025 *Joint Statement* Russia and China pinpointed ‘the employment of forward-deployed and (or) other nuclear weapons in the course of joint “integrated” operations with formally non-nuclear allies, involving the use of bases in their territories, dual-capable platforms transferred to them and (or) their own conventional forces and means, including increasingly advanced missile and anti-missile weapons’ as a matter of concern.

Russia still has a larger stockpile of nuclear weapons earmarked for delivery systems of short and intermediate range than the United States, France and the United Kingdom. However, although that asymmetry is significant and growing, European states have begun to assess Russia’s steady accumulation of diverse and flexible nuclear forces after neglecting their own plans and capabilities over several decades. Combined with the unprovoked Russian use of military force against Ukraine in 2014 and then again at larger scale in 2022 a new and more serious debate has begun in Europe about how to respond.

In 2023 NATO agreed to reappraise nuclear policy and plans to increase the survivability, flexibility and effectiveness of forces that would be under NATO control in a regional war.²⁹ Among the options considered are shortening the time needed for forces to be ready to conduct a nuclear mission, a new dispersal plan to allow for the movement of dual-capable aircraft in a crisis and expanding the number of air bases prepared to receive them.

In contrast to the bilateral Cold War contest, a more complicated action-reaction dynamic is evolving as the United States and its Allies have awakened to the potential implications of the numerical imbalance created by Russian and Chinese investments in nuclear weapons tailored to regional war.

A new momentum in the intra-European discussion of deterrence is leading to changes that were not anticipated in 2022. Examples include the accession of Finland and Sweden to NATO, a deeper dialogue between France and the United Kingdom (the European nuclear-armed states in the Alliance) and the UK decision to rejoin the group of allies with fast jets able to deliver US nuclear weapons.

The aggression against Ukraine, which Russia expected to be a short and successful campaign, has extended into a war of attrition with no clear end point. The outcome could be favourable or unfavourable to Russia, while a ceasefire that is inherently unstable and liable to periodic episodes of violence is also possible. The seizure of Ukrainian territory means that the physical space separating Russian forces from NATO in the Black Sea region has diminished while Ukraine is progressively integrating into a new European strategic system whether or not it joins the Alliance.

3.3 The Russian perspective on deterrence

In 2011 the NATO-Russia Council agreed on a Consolidated Glossary of Cooperation. The definition of deterrence in the glossary is essentially a preventive blocking action.

²⁷ Austin Long, ‘Cold War Pursuit of Escalation Advantage’, parts I and II, *Strategic Simplicity*, 25 July 2025 and 1 August 2025.

²⁸ ‘Norway and the United Kingdom Conclude “Historic” Defence Agreement’, *Nordic Defence Sector*, 5 December 2025.

²⁹ *Vilnius Summit Communiqué issued by NATO Heads of State and Government*, 11 July 2023.

However, Russia substituted a word *sderzhivanie* at the place in the glossary where NATO included the word deterrence. The word translates to containing or restraining, and it was presented in the Glossary as dissuasion. Even when Russian experts use the word deterrence out of convenience, the meaning they want to convey is shaped by unique cultural and linguistic factors.

In his analysis of what he labels ‘deterrence à la Russe’ Dmitry Adamsky has noted that the Russian meaning captures preserving the status quo but also changing it and shaping the environment in which interactions with an adversary occurs.³⁰ Gudrun Persson has pointed out that when Russia uses the term strategic deterrence in official context it means ‘the host of coercion activities in various operational domains’.³¹ Earlier analyses by Western experts traced the internal Soviet discourse on deterrence to the post-Stalin debate on how far nuclear weapons required a radical change in defence policy.³² Points of agreement emerging from that debate can still be traced in the contemporary discourse, such as the critical importance of the first days of a future conflict, the significance of strategic surprise and the difficulty of maintaining large standing forces for extended periods.

The main points of disagreement are perhaps also still present, such as whether the next war will be short or long and the escalation dynamics in limited engagements. British expert John Erickson labelled the compromise engineered by the post-Stalin political leadership the ‘deterrence-superiority formula’: in essence, qualitative and quantitative conventional superiority was still necessary because of the risk that deterrence would fail. The internal debate included reflections on intra-war deterrence. While sections of the military argued that a protracted war in which nuclear weapons were not used was possible and must be prepared for, others asserted that the growing role assigned to battlefield nuclear weapons made that contingency irrelevant.³³

At the end of the Cold War Russia had to come to terms with the consequences of a collapse in conventional military power, something that caused a reassessment of the role of nuclear weapons. The critical change was the reversal of the Cold War equation in which Russia anticipated that NATO would be the first to use nuclear weapons to offset its conventional disadvantage.

After the Cold War Western states largely profiled nuclear weapons as measures of last resort but the Russian approach moved in the opposite direction, and Russia began to think through the potential for limited nuclear use.

Today Russia embraces using nuclear weapons to manipulate adversary decision-makers and key societal groups.³⁴ As seen in Ukraine, Russia makes continuous use of the psychological and political impact of nuclear signaling, threats and coercion to promote favourable outcomes. Adamsky points out that the Western discourse on how to generate effective tailored and cross-domain deterrence in some ways mirrors existing Russian practice seeking ‘to synthesize nuclear, conventional and non-kinetic forms of influence within one scheme’ as part of a holistic construct.³⁵

The Russian approach was already tested in Ukraine in 2014, when Dmitry Kiselyov, at the time the Chief Executive Officer of the newly created *Russia Today*, stated on national television that ‘Russia is the only country in the world that is realistically capable of

³⁰ Dmitry (Dima) Adamsky, *The Russian Way of Deterrence: Strategic Culture, Coercion and War*, (Stanford University Press: Stanford Ca, 2024), p. 32.

³¹ Gudrun Persson, *Russian Military Thought: The evolution of strategy since the Crimean War*, (Georgetown University Press: Washington DC, 2025), p. 138.

³² John Erickson, ‘Détente, deterrence and military superiority: A Soviet dilemma’, *The World Today*, August 1965.

³³ John Erickson, ‘The Soviet View of Deterrence: A General Survey’, *Survival*, Vol. 24, No. 6, 1982.

³⁴ Michael Kofman, Any Fink and Jeffery Edmonds, *Russian Strategy for Escalation Management: Evolution of Key Concepts* (Washington: Center for Naval Analysis, 2020), p. 18-29.

³⁵ Dmitry (Dima) Adamsky, *The Russian Way of Deterrence: Strategic Culture, Coercion and War*, (Stanford University Press: Stanford Ca, 2024), p. 39.

turning the United States into radioactive ash' in parallel with the Russian annexation of Crimea and incursion into Donbas.³⁶

After 2022 Russian commentary has credited nuclear deterrence with preventing Western direct intervention in support of Ukraine but, despite warnings and rhetoric by the political leadership, significant Western military aid continues. As a result, there have been widespread calls to increase the coercive credibility of Russian nuclear threats and to reinstate the fear of Russian nuclear weapons.³⁷ A common theme has been a call to emphasize the word *ustrashnenie*, which translates to fear-inducement or intimidation.³⁸

Political commentators outside the ruling circle have made more radical proposals, including the resumption of nuclear testing, a demonstrative nuclear explosion or in the most extreme proposal a nuclear strike against a non-nuclear armed adversary.³⁹ However, in official statements and speeches President Putin appears content that Russian strategic forces are being adapted in ways that maintain the effectiveness of general deterrence.

The public debate around how to restore or increase the effectiveness of nuclear weapons as an instrument to shape the actions of an adversary probably reflects a serious internal assessment of how to accomplish immediate deterrence of Western military involvement that impedes Russian success in its war against Ukraine. President Putin has repeatedly stated that there is no need to launch attacks with nuclear weapons in the war in Ukraine, but as the conflict continues the issue will continue to be revisited.⁴⁰

3.4 Russian military spending

Whatever Russian leaders might want to do to modify nuclear posture they would have to work within the economic and technical parameters that define research, development, testing, production and evaluation. There is also a human dimension since the forces that are in any way involved with the custody and use of nuclear weapons need to be the most professional. In a high intensity conventional conflict, such as the case of Ukraine, the highest quality Russian units probably can't be committed to the fight.

Russia has stopped publishing some information that was previously used to measure economic performance, which has contributed to greater uncertainty around estimates about the future.⁴¹ The difficulties in understanding the full spectrum of military-related activities compound the uncertainties around future economic performance. Russian military spending is considered more difficult to assess than general trends in the economy and understanding the scale of spending on nuclear weapons is in turn even more challenging.⁴²

One recent report concluded that the overall level of Russian military expenditure has probably reached a sustainable plateau, but further significant increases are unlikely in the foreseen economic conditions.⁴³ That finding is mirrored in the data produced by the

³⁶ 'Russia can turn US to radioactive ash - Kremlin-backed journalist', *Reuters*, 16 March 2014.

³⁷ Anya Fink, Gabriela Iveliz Rosa-Hernandez and Cornell Overfield, *Moscow Does Not Believe in Tears—Russia's Political-Military Establishment Debates Credibility of Nuclear Threats and Potential Nuclear Employment*, (Washington: Centre for Naval Analysis, CNA, 2024).

³⁸ Dmitry Trenin, Sergei Avakians and Sergei Karaganov, *Ot sderzhivaniia k ustrashneniiu, iadernoe oruzhie, geopolitik, koalitsionnaia strategiiia* (Moscow: Molodaia gvardiia, 2024).

³⁹ Anya Fink, Gabriela Iveliz Rosa-Hernandez and Cornell Overfield, *Moscow Does Not Believe in Tears—Russia's Political-Military Establishment Debates Credibility of Nuclear Threats and Potential Nuclear Employment*, (Washington: Center for Naval Analysis, CNA, 2024).

⁴⁰ Angelique Chrisafis, 'Need to use nuclear weapons has not arisen in Ukraine, says Putin,' *The Guardian*, 4 May 2025.

⁴¹ Stockholm Institute of Transition Economics (SITE), *The Russian Economy in the Fog of War*, Stockholm, September 2024.

⁴² The raw data on Russian military spending in roubles is only partly available while issues around inflation and currency conversion make constructing a time series to understand trends and an index to allow for cross-country comparisons challenging. Julian Cooper, *The funding of nuclear weapons in the Russian Federation*, Changing Character of Warfare Centre, Oxford University, October 2018.

⁴³ Julian Cooper, *Preparing for a Fourth Year of War: Military Spending in Russia's Budget for 2025*, SIPRI Insights on Peace and Security, Stockholm, April 2025.

Stockholm International Peace Research Institute (SIPRI), which provides the only long time series of the general trend in Russian military spending. The SIPRI time series indicates steady increases in every year from 1999 to 2017 after correcting for inflation. After several years in which declining oil prices restricted Russian economic growth military spending resumed a strong upward trend from 2022 until 2024.⁴⁴

An analysis of spending in the period 2010-17 suggests that during this period of increased military spending nuclear weapons projects were treated favourably and the Russian nuclear weapon complex was shielded from economic stress.⁴⁵

The State Armament Programme pays for weapon platforms, delivery systems and supporting capabilities but the complex responsible for research, development and production of nuclear warheads is financed separately. To finance the State Armament Programme 2011-20 Russia set aside 23 trillion roubles, to pay for equipment but also capital investment into the defence industry. President Putin underlined that projects must respect this financial envelope, and that the overall cost of the armament programme should not grow.⁴⁶ The implementation of the programme has been judged as broadly successful, even if some projects important to the nuclear capability were delayed and stretched out over time.⁴⁷ Remaining within agreed financial limits proved challenging and the Russian Ministry of Defence ran up large debts to suppliers that reached a scale endangering the survival of the companies. Payments to relieve debt contributed to 'spikes' in military spending but may also have drawn on classified accounts that do not appear in official defence statistics.⁴⁸

The follow-on State Armament Programme scheduled to run until 2027 is reported to have received the same level of funding as its predecessor, meaning that inflation would be eroding purchasing power.⁴⁹ However, the need to allocate additional funds in wartime through supplementary budget decisions or to find finance elsewhere in the state budget makes it difficult to be confident about the trajectory. In June 2025 President Putin initiated the series of meetings intended to produce a new State Armament Programme out to the year 2036. The intention is to separate questions around increasing the volume of deliveries and raising the efficiency of weapons and equipment used in the current war from longer-term requirements.⁵⁰

Julian Cooper has traced the growth in spending on the nuclear weapons complex as reported by the Russian Federal Treasury. The amount spent grew from roughly 19 billion roubles in 2010 to roughly 44.5 billion roubles in 2017.⁵¹ In 2023 over 49 billion roubles was budgeted for the nuclear weapons complex and Rosatom pointed to revenue growth for military activities.⁵² Estimates after 2023 are considered unreliable, but a planning document sent to the Duma projected an increase to almost 63 billion roubles in 2024 with roughly stable financing at that level for 2025 and 2026.⁵³

⁴⁴ SIPRI Military Expenditure Database, accessed at URL <https://milex.sipri.org/sipri> on 18 August 2025.

⁴⁵ Julian Cooper, *The funding of nuclear weapons in the Russian Federation*, Changing Character of Warfare Centre, Oxford University, October 2018.

⁴⁶ Prime Minister Vladimir Putin meets with experts in Sarov to discuss global threats to national security, strengthening Russia's defences and enhancing the combat readiness of its armed forces, Office of the Prime Minister, 24 February 2012.

⁴⁷ Ann Marie Dwyer, *Assessment of the Russian Armed Forces State Armament Programme in 2011–2020*, PISM Report, Warsaw, June 2021.

⁴⁸ Julian Cooper, *Another Budget for a Country at War: Military Expenditure in Russia's Federal Budget for 2024 and Beyond*, SIPRI Insights on Peace and Security, Stockholm International Peace Research Institute, December 2023.

⁴⁹ Richard Connolly and Mathieu Boulègue, *Russia's New State Armament Programme Implications for the Russian Armed Forces and Military Capabilities to 2027*, Royal Institute of International Affairs, London May 2018.

⁵⁰ Office of the President of the Russian Federation, *Meeting on discussing key parameters of draft State Armament Programme for 2027–2036*, 11 June 2025.

⁵¹ Julian Cooper, *The funding of nuclear weapons in the Russian Federation*, Changing Character of War Centre, Oxford University, October 2018.

⁵² Alexei Likhachev, Director General of Rosatom, quoted in *Rosatom during the war in Ukraine: How militarization of the Russian nuclear giant took place*, Bellona Foundation, Vilnius, 2023.

⁵³ Julian Cooper, *Another Budget for a Country at War: Military Expenditure in Russia's Federal Budget for 2024 and Beyond*, SIPRI Insights on Peace and Security, Stockholm International Peace Research Institute, December 2023.

The complex also benefits from public finance in the form of subsidies to ten cities where nuclear weapons are developed and produced, though these may be declining. The enterprises in these cities might be indirect beneficiaries of economic sanctions. As Russia tries to substitute for foreign suppliers, enterprises in so-called science cities have growing revenues from sectors that require high technology products such as information technology, medical machinery and numerical control systems.

Sustained spending allowed the modernisation of nuclear forces and the recapitalization of the nuclear weapons complex. Russian analysts have pointed out that since the military has priority access to state finance there has been less of a ‘guns versus butter’ competition in Russia, but there is competition over how to invest the available resources.⁵⁴ If the scope for continuing to increase military spending is reduced then inter-service rivalries might limit the scope for any substantial modification of nuclear forces.

Russian military reforms dismantled the Soviet force structure, but the replacement did not perform well in the first years of the war against Ukraine.⁵⁵ The decision Russia reaches about its future armed forces is not yet clear, but trying to move closer to the Western approach to modern combat would require a commitment to fundamental changes sustained over a long period. Therefore, Russia specialists have pointed to what the RAND Corporation has described as revisiting an older model involving ‘a return to a pre-New Look military, emphasizing mass, conscription, mobilization, nuclear capabilities and domestic production’.⁵⁶

The scale of losses in Ukraine and the turn away from negotiated limits on conventional capabilities in Europe has created a demand in Russia for weapons to equip general-purpose forces. Bomber aircraft and intermediate-range missiles launched from aircraft, surface ships and submarines that could be assigned nuclear missions are in demand for conventional strikes against Ukraine. Innovations such as the December 2024 announcement of an Unmanned Systems Force as a separate branch within the Armed Forces will create new requirements that will have to be financed.⁵⁷

3.5 Russian forces in being

The choices Russia made around the modernization of strategic nuclear forces in the past are the platform on which the future force must be based and the basic guidance for the current and future Russian nuclear arsenal remains: (a) for foreseeable future all three elements of the nuclear ‘triad’—land based inter-continental ballistic missiles (ICBMs), submarine launched ballistic missiles (SLBMs) and strategic bombers—should be retained; (b) nuclear forces must be of a size and type that guarantee nuclear deterrence ‘on a sufficient level’.⁵⁸

The Russian nuclear arsenal, which is already large and diverse, continues to add new delivery systems that launch from a variety of platforms with ranges from hundreds of kilometres to intercontinental reach. The evolution of the arsenal strengthens the argument that Russia is continuously thinking about how to use nuclear weapons and modifying the nuclear force in line with what is considered necessary to ensure its effectiveness in achieving doctrinal objectives.

According to a recent estimate by the most often cited non-governmental source, the Federation of American Scientists (FAS), the active Russian nuclear arsenal consists of

⁵⁴ Alexander Yermakov, *The Three Body Problem*, Russian International Affairs Council, 23 May 2025

⁵⁵ Jonas Kjellen, *Bringing the Soldier Back In: Russian military manning, manpower and mobilisation in light of Russia’s war in Ukraine*, FOI Report FOI-R--5461-SE, March 2023.

⁵⁶ Michelle Grisé, Mark Cozad, Anna M. Dowd, Mark Hvizda, John Kennedy, Marta Kepe, Clara de Lataillade, Krystyna Marcinek, David Woodworth, *Russia’s Military After Ukraine: Potential Pathways for the Postwar Reconstitution of the Russian Armed Forces*, RAND Corporation, Santa Monica CA, 16 January 2025.

⁵⁷ Roger N. McDermott, *Russia’s New Unmanned Systems Forces and the Strategic Role of DKO Weapons*, Saratoga Foundation, 20 June 2025.

⁵⁸ Umnov, S., ‘SYaS Rossii: naraschivaniye vozmozhnostey po preodoleniyu protivoraketnoy oborony’ [Russia’s SNF: building up ballistic missile defence penetration capacities], *Voenna-Promyshlennyy Kur’er*, 8–14 March 2006.

roughly 4,300 warheads of which more than 1,700 are deployed as strategic weapons, consistent with the limits laid down in the New START Treaty prior to its expiry in February 2026.⁵⁹

According to the FAS Russia maintains an active reserve stockpile of just over 1,100 warheads that could be uploaded to delivery systems with intercontinental reach. Russia could also surge the production of warheads because it has continued to invest in the nuclear weapons complex. Christopher Yeaw, currently the Assistant Secretary for Arms Control and Nonproliferation at the US State Department, has asserted that Russia may be able to produce as many as 1200 plutonium ‘pits’ per year.⁶⁰ However, the Russian practice of replacing warheads in the active stockpile on a regular basis means that many would probably be remanufactured pits for existing warheads. The need for a maintenance reserve and the limited number of crews certified to upload warheads to weapons probably also constrain the number of additional warheads that could be deployed relatively quickly.

Strategic nuclear forces

The Russian inventory of strategic delivery vehicles consists of 330 ICBMs, 192 SLBMs carried by 12 ballistic-missile submarines (SSBNs), and roughly 50 strategic bombers armed with air-launched cruise missiles. Although Russian statements frequently assert that a modernization of its strategic nuclear forces is nearing completion, according to the US Defense Intelligence Agency (DIA) the current focus is to deploy the RS-28 Sarmat heavy ICBM, the Yars ICBM, and the Borei class SSBN.⁶¹

The most modern element of the land-based component of the Russian triad has consolidated around two missiles (the Topol-M and the Yars), each of which has both silo-based and mobile launch systems and that exist in single warhead and multiple warhead variants.⁶² The redesign of the warhead carried by the Topol-M has meant that size and weight of the payload it carries was reduced from the version that it replaced, but not the yield of each warhead. As a result of the warhead redesign the Topol-M is deployed with 3 warheads, but can carry six.

Rebalancing the shares of silo-based and mobile missiles within the strategic force nonetheless reduced the numbers of strategic nuclear delivery systems and deployed warheads. A large, heavy ICBM (the RS-20 Voevoda) is able to carry 10 warheads. Russia extended the life of the Voevoda pending the introduction of a modern equivalent, but reduced the number of warheads on each missile, in this way retaining a ‘hedge’ should larger numbers be needed in future.⁶³

The service life of the Voevoda was expected to end in 2020, and even after life extension routines it will probably have to be retired by the early 2030s. Russia’s ability to maintain broad parity with the United States (which can upload additional warheads onto Minuteman ICBMs and Trident SLBMs and reopen launch tubes on submarines to accommodate additional missiles) depends on the progress of a new silo-based missile, the RS-28 Sarmat.

In 2022 Dmitry Rogozin, at the time head of the Russian Space Agency Roscosmos, suggested that up to 50 Sarmat missiles could be produced, each with the capacity to carry 10-15 nuclear warheads depending on the warhead type.⁶⁴ The Sarmat programme is said

⁵⁹ Hans M. Kristensen, Matt Korda, Eliana Johns and Mackenzie Knight, ‘Russian nuclear weapons’, *Bulletin of the Atomic Scientists*, May 2025.

⁶⁰ Dan Parsons, ‘Sluggish plutonium-pit production tells allies and adversaries U.S. nuke modernization ‘not important,’ expert says’, *Los Alamos Study Group*, 26 May, 2023.

⁶¹ Quoted in Anya Fink, *Russia’s nuclear weapons*, Congressional Research Service, 11 December 2025.

⁶² Hans M. Kristensen, Matt Korda, Eliana Johns & Mackenzie Knight, ‘Russian nuclear weapons, 2025’, *Bulletin of the Atomic Scientists*, May 2025.

⁶³ Pavel Podvig *Russian Strategic Forces in the Next Decade*, Aspen Institute Italia, News Analysis Series, January 2005.

⁶⁴ ‘Russia to Deploy 50 Uninterruptable Sarmat Intercontinental Missiles in the Near Future’, *Defense Mirror*, 22 May 2022.

to be experiencing significant difficulties and between February 2023 and November 2025 four out of five scheduled tests of the missile may have failed, while the fifth test may have been cancelled.⁶⁵ If it comes to full fruition, however, the warheads deployed on the Sarmat would represent a significant share of the total Russian strategic force and the largest force able to launch at short notice.⁶⁶

A somewhat similar pattern can be observed with the modernization of Russian submarine-launched strategic weapons. The last of the Delta IV Class SSBNs was commissioned in 1992, and the vessels have been kept in service perhaps longer than originally intended because of the slow pace of building the successor, the Borei Class. The Delta IV Class remains important to Russia's strategic arsenal because it is the carrier for the R-29 Sineva SLBM that has been tested successfully multiple times as well as a variant, the R-29 Liner SLBM. While the Sineva is said to carry 4 warheads, the Liner variant is said to carry a larger number but of lower yield.⁶⁷

Eight Borei Class submarines have been accepted into service of an anticipated 12 vessels. The submarines are to be armed with the R-30 Bulava submarine-launched ballistic missile. The Bulava, said to be based on the Topol-M ICBM, has been called the future backbone of the sea leg of the Russian nuclear triad.⁶⁸ The Bulava has had a chequered history with test failures said to reveal the difficulty of converting a missile designed for launch on land into a sea-based weapon.⁶⁹ Russian production enterprises are also said to find it difficult to manufacture missiles to agreed technical standards.⁷⁰

The technical problems encountered by the Bulava SLBM are said to have been overcome, but at the current pace of production the introduction of all 12 Borei Class might not be accomplished for several decades. In the meantime, programmes to extend the life of Delta IV Class submarines are also slow.

Uploading additional warheads onto missiles such as Sarmat and Bulava, could be a pathway to increase warhead numbers in the context of a political requirement for broad parity with nuclear peers.⁷¹ However, the pace at which missiles with a large warhead capacity will be produced depends on overcoming identified technical problems, while the number of warheads that can be accommodated in the current arsenal of mobile missiles is limited by their smaller size.

In broad terms the current priority in Russian strategic forces appears to be a preserving the capability invested in heavy missiles armed with multiple warheads. However, the main constraint on Russia's strategic arsenal might be production schedules for missile delivery systems and the carriers for them not warheads. The success of the Sarmat programme and the pace at which Borei Class submarines can be constructed will have an important influence unless weapon systems that have not been fully validated in tests are going to be introduced into service.

Blurred lines between strategic and non-strategic nuclear weapons

Russia relies on being able to launch a nuclear strike sufficient to create the effect called for in current doctrine, and has therefore always paid close attention to adversary offensive

⁶⁵ Christian Maire and Étienne Marcuz, 'Analysis and possible consequences of the failure of a Russian ICBM flight on 28 November 2025', *Fondation pour la Recherche Stratégique*, FRS Note No. 3, 29 January 2026.

⁶⁶ Timothy Wright, *Russia's Sarmat ICBM Woes*, International Institute for Strategic Studies, 26 September 2024.

⁶⁷ Pavel Podvig, 'Liner version of the R-29RM SLBM accepted for service', 2 April 2014.

⁶⁸ Dave Majumdar, 'One of Russia's Most Advanced Nuclear Missiles Self-Destructed During a Test Flight', *Medium*, 30 September 2016.

⁶⁹ Steve Balestrieri 'Russia's Borei-Class Nuclear Missiles Submarines Have a Message for NATO', *National Security Journal*, 24 September 2025.

⁷⁰ Dave Majumdar, 'One of Russia's Most Advanced Nuclear Missiles Self-Destructed During a Test Flight', *Medium*, 30 September 2016.

⁷¹ Hans M. Kristensen, Matt Korda, Eliana Johns and Mackenzie Knight, 'Russian nuclear weapons, 2025', *Bulletin of the Atomic Scientists*, 13 May 2025.

capabilities that could put the survivability of the nuclear arsenal in question as well as adversary capabilities that could blunt the impact of a Russian nuclear offensive.

After a long period in which the United States did not make any significant changes to its own nuclear forces there is now a commitment to complete the so-called ‘programme of record’, which will modernize all three legs of the US strategic nuclear triad and recapitalize the nuclear weapons complex to enable the production of new warheads.⁷²

The US nuclear doctrine focuses on deterring any attack on the homeland or on allies by ensuring a secure and effective response. Should general deterrence fail, however, US plans aim to provide the President with the option of limiting the damage from any adversary nuclear use by destroying as many enemy weapons as possible before launch.⁷³ In the current discourse a damage limiting operation (which could be with nuclear or non-nuclear weapons) would work alongside complementary elements such as the renewed interest in the potential for missile defences and investment to ensure resilience in governance systems and secure nuclear command and control during a conflict.

Russia is already putting in place capabilities intended to address concerns associated with the anticipated trajectory of US force development.⁷⁴ The head of the US Northern Command, General Gregory Guillot, has asserted that the capabilities Russia is developing could ‘severely challenge [the US] ability to detect and characterize an inbound attack and determine an appropriate response during a conflict.’⁷⁵

In 2024 President Putin described the Oreshnik missile, used in an attack on Ukraine, as a new medium-range ballistic missile, though the US Department of Defence described it as a variant of Russia’s RS-26 Rubezh ICBM, production of which was previously believed to have been terminated in 2018.⁷⁶

The Avangard hypersonic glide vehicle is maneuverable in the final attack phase, a characteristic intended to evade modern missile defences. Around six or twelve older heavy UR-100 ICBMs have been kept in service as carriers for the Avangard. Given the small numbers likely to be built the Avangard may be intended to destroy enemy missile defence infrastructure to open a pathway through which other missiles would follow.

A nuclear-powered, nuclear-armed submarine drone called Poseidon has been described as ‘a second-strike, strategic-range weapon targeted at coastal infrastructure or carrier groups using a delivery approach entirely distinct from ballistic missiles.’⁷⁷

The Burevestnik has been described as a ‘nuclear-powered, nuclear-armed strategic-range subsonic cruise missile’.⁷⁸ The missile is believed to be assigned a land attack mission, able to evade US missile defences because its long range provides a variety of avenues of approach to targets.

Russia has vetoed a proposal reinforcing the prohibition on the deployment of nuclear weapons in orbit around the earth.⁷⁹ Based on a classified briefing, in 2024 Congressman Mike Turner asserted that ‘Russia is developing a nuclear anti-satellite weapon intended to

⁷² Anthony J. Cotton, Commander, United States Strategic Command, *Statement on Strategic Forces* before the Senate Armed Services Committee, 26 March 2025.

⁷³ US Department of Defense, *Report on the Nuclear Employment Strategy of the United States*, 7 November 2024.

⁷⁴ Pavel Baev, ‘Russian Nuclear Modernization and Putin’s Wonder Missiles’, *Russie.Nei.Visions*, IFRI, Paris, August 2019.

⁷⁵ Quoted in Anya Fink, *Russia’s nuclear weapons*, Congressional Research Service, 11 December 2025.

⁷⁶ Joseph Trevithick, ‘Russia’s Experimental Ballistic Missile Used To Strike Ukraine Is Based On The RS-26 Rubezh’, *The War Zone*, 21 November 2024.

⁷⁷ Mark Meland, Jill Hruby and Lynn Rusten, *Russia’s New Nuclear Weapon Delivery Systems: An Open-Source Technical Review*, Nuclear Threat Initiative, 13 November 2019, p.10.

⁷⁸ Mark Melamed and Lynn Rusten, *Russia’s New Nuclear Weapon Delivery Systems: Implications for New START, Future Arms Control, and Strategic Stability*, Nuclear Threat Initiative, November 2019.

⁷⁹ *Statement from National Security Advisor Jake Sullivan on Russia’s Veto of the UN Security Council Resolution on the Outer Space Treaty*, 24 April 2024.

be placed in orbit in outer space'.⁸⁰ The US Space Force also believes that Russia is developing an ASAT capability using a new satellite designed to carry a nuclear weapon.⁸¹

Russia has invested in nuclear-powered attack submarines able to carry nuclear weapons since the 1950s, and they have been described as the class of weapons that the US Navy truly hates.⁸² Earlier attack submarines were primarily armed with anti-ship nuclear weapons but the Yasen Class, five of which are in service in early 2026 with seven others planned, can be armed with modern nuclear-capable land attack cruise missiles and ever since the first vessel was commissioned it has conducted patrols within firing range of the United States.⁸³ The performance of the submarine is said to be greatly improved in comparison to earlier classes because of significant noise reduction.⁸⁴

The nuclear-capable intermediate-range Tsirkon missile that has armed the Yasen Class has attracted attention because of its high speed, maneuverability and well publicized testing programme.⁸⁵ In future the vessels may be armed with a nuclear-capable version of the 3M14 Kalibr said to be in development with longer range.⁸⁶

Russian programmes are also said to include extending the range of the Kh-102 nuclear-armed air-launched cruise missile, which already falls within the range parameters of past strategic arms control agreements.

Non-strategic nuclear weapons

The systems noted in the previous section do not fit neatly into traditional categories of strategic and non-strategic weapons, but it has been pointed out that Russia never fully adopted a binary classification.⁸⁷ Russian officials have explained that the term non-strategic weapon was a catch-all for anything not captured by the definition of strategic weapons in legal agreements, essentially a range parameter including weapons shown in tests to have an operational range of over 5500 km.

According to what is known about Russian practice non-strategic nuclear warheads are held in central storage sites or in dispersed regional sites under the custody of a specialized military formation that is part of the 12th Main Directorate of the Russian Ministry of Defence (12 GUMO). Personnel from 12 GUMO maintain physical control of the warheads from the time they are handed over from a production facility to the point where they are loaded onto a delivery platform.

The movement of any warhead would be on the direct order of the Russian General Staff. The rigid segregation between the force tasked with custody and the unit that would fire a dual-capable weapon means that 12 GUMO may have no knowledge of the targets assigned to weapons in their custody and a field officer may not know whether the warheads assigned to them in a given operation are conventional or nuclear.⁸⁸

The 12 GUMO has been described as the 'heartbeat' of the Russian nuclear forces with a presence throughout the entire establishment and reporting directly to the General Staff.⁸⁹ Unlike the United States, which builds nuclear warheads with a long life-expectancy,

⁸⁰ House of Representatives Permanent Select Committee on Intelligence, Press Release, *Turner Warns of Russia's Nuclear Anti-Satellite Weapons Program During Speech at CSIS*, 20 June 2024.

⁸¹ United States Space Force, *Space Threat Fact Sheet*, December 2025.

⁸² Maya Carlin, 'Akula: The Russian Submarine the U.S. Navy Truly Hates', *The National Interest*, 23 July 2024.

⁸³ Sam LaGrone, 'NORTHCOM: Russia Close to Persistent Nuclear Cruise Missile Attack Sub Presence off U.S. Coasts', *US Naval Institute News*, 23 March 2023.

⁸⁴ Sidharth Kaushal, James Byrne, Joe Byrne and Gary Somerville, 'The Yasen-M and the Future of Russian Submarine Forces', *Royal United Services Institute*, 28 May 2021.

⁸⁵ The first Yasen Class vessel armed with the Tsirkon embarked on sea trials in August 2025. Thomas Nilsen, 'Nuclear-powered multi-purpose submarine Perm heads out for sea trials', *Arctic Today*, 22 August 2025.

⁸⁶ Ankit Panda, 'Report: Russia Developing 4,500 Kilometer Kalibr-M Range Land-Attack Cruise Missile', *The Diplomat*, 10 January 2019.

⁸⁷ William Alberque, *Russian Military Thought and Doctrine Related to Nonstrategic Nuclear Weapons: Change and Continuity*, International Institute for Strategic Studies, January 2024.

⁸⁸ Authors interview, 28 April 2025.

⁸⁹ Authors interview, 28 April 2025.

Russian nuclear warheads are replaced frequently with newly produced devices. Therefore, there is a constant communication between 12 GUMO and the nuclear weapon complex as well as with the General Staff in order to provide real time information on the status of the arsenal down to the current location of every warhead, each of which has a unique identifier. The stockpile maintenance system means that warheads are in relatively frequent movement, under the supervision and protection of 12 GUMO.

Estimates for the number of nuclear weapons with less than intercontinental range are uncertain. While the Federation of American Science estimates an arsenal of roughly 1,400 such weapons the US State Department limits its estimate to a range of between 1-2,000 nuclear warheads for nonstrategic weapons earmarked for delivery by a variety of systems that could be armed with either conventional or nuclear warheads.⁹⁰ Using a different methodology Igor Sutyagin estimated that Russia had a stockpile of 1900 non-strategic nuclear weapons in 2012, of which approximately 1,000 were 'operationally assigned' to identified nuclear-capable units of Russia's land, sea, air and air-defence forces.⁹¹ Other authors estimate that the number of non-strategic weapons in the Russian arsenal is significantly higher.⁹² Some experts with knowledge of Russian practice believe that a nuclear warhead is available for every dual-use delivery system (and therefore the public estimates of the stockpile should be treated with great deal of caution). However, this might no longer be the case since the use of missiles to attack Ukraine has prompted an increase in production of cruise and ballistic missiles that are likely to be one of the primary delivery means for nuclear weapons.⁹³

The US Defense Intelligence Agency has pointed to the retention of nuclear-armed torpedoes, depth charges for anti-submarine operations and surface-to-air missiles in the Russian stockpile, in spite of undertakings in Presidential Nuclear Initiatives.⁹⁴ It has been said that it is uncertain whether non-strategic nuclear warheads 'are only assigned to, rather than actively deployed on' Russian naval vessels in the surface fleet.⁹⁵ A proportion of warships and shipborne aviation in the Russian general naval forces are certified each year for nuclear operations, but it has been generally acknowledged that nuclear weapons are not routinely carried onboard surface ships in peacetime. Several classes of surface ships in the Russian Navy are armed with dual-capable land-attack cruise missiles that have been fired with conventional warheads at targets in Ukraine and Syria. The launch vessels have been deployed in Lake Ladoga and the White Sea where they are protected from submarine threats.⁹⁶

The *Foundations for Russia's Naval Activity for the Period up to 2030* signed by President Putin in July 2017 stated that in an escalating conflict 'a demonstration of preparedness and readiness to use nonstrategic nuclear weapons would be a strong deterrent factor.'⁹⁷ The Commander-in-Chief of the Russian Navy, Alexander Moiseev, has referenced the potential of equipping general purpose naval forces with nuclear weapons.⁹⁸ The Russian assumption has been that in a future war surface vessels would not survive for long, and if there are indications that they are carrying nuclear weapons they would be high priority

⁹⁰ Anya Fink, *Russia's nuclear weapons*, Congressional Research Service, 11 December 2025.

⁹¹ Igor Sutyagin, *Atomic Accounting: A New Estimate of Russia's Non-Strategic Nuclear Forces*, Royal United Services Institute, November 2012.

⁹² Mark B. Schneider, *New START: The anatomy of a failed negotiation*, National Institute for Public Policy, July 2012.

⁹³ Authors interview, 28 April 2025.

⁹⁴ US Defense Intelligence Agency, *Russia Military Power: Building a Military to Support Great Power Aspirations*, 2017.

⁹⁵ Igor Sutyagin, *Atomic Accounting: A New Estimate of Russia's Non-Strategic Nuclear Forces*, Royal United Services Institute, November 2012.

⁹⁶ Thomas Nilsen, 'Admiral Moiseev launches massive Ocean-2024 strategic exercise', *The Barents Observer*, 10 September 2024.

⁹⁷ Quoted in Gudrun Persson, *Russian Military Thought: The evolution of strategy since the Crimean War*, (Georgetown University Press: Washington DC, 2025), p. 141.

⁹⁸ Jonas Kjellén, 'The Navy' in Maria Engqvist (ed.), Jonas Kjellén, Kristina Melin, Emelie Sandvad, Carolina Vendil Pallin, *The Future of Warfare in Russian Military Thinking*, Swedish Defence Research Agency, FOI-R--5806--SE, January 2026.

targets. Therefore, any nuclear weapons on board surface ships would have a 'use or lose' character.

Russia sorts non-strategic weapons into tactical and tactical-operational classes that combine range parameters with the task weapons are expected to accomplish.⁹⁹ Tactical nuclear weapons are designed to engage enemy objects to a depth of up to 300 km to accomplish a specific tactical mission close to the line of contact with the enemy while tactical-operational nuclear weapons are designed to engage enemy objects to a depth of 500 km.¹⁰⁰ Tactical-operational weapons (such as missiles on submarines on patrol) could be assigned to strategic missions under certain circumstances.

In considering their impact Russian nuclear weapons are better differentiated around range rather than the label attached to them once legal agreements no longer apply. Moreover, nuclear coercive rhetoric means that Russia now emphasizes the nuclear mission for weapons rather than labelling them 'dual-use'. The pattern of procurement suggests that nuclear weapons are unlikely to be used at the line of contact with an enemy and probably intended for targets deeper in adversary territory.

Russia has produced significant quantities of the 9M729 ground-launched cruise missile with a range of 2,500 km, which was the proximate cause for US withdrawal from the INF Treaty. Russia is building larger numbers of weapons with intermediate range without the need for subterfuge now that the INF Treaty is no longer in effect. Russia is also increasing the stockpile of weapons with 300-500 km range, mainly the 9K720 Iskander mobile ballistic missile.

To summarize, the Russian arsenal of nuclear weapons, which is already large and diverse, continues to add delivery systems that launch from a variety of platforms with ranges from hundreds of kilometres to intercontinental reach. The evolution of the arsenal strengthens the argument that Russia is continuously thinking about how to use nuclear weapons even if some basic tenets are of long-standing.

⁹⁹ Gunnar Arbman and Charles Thornton, *Russia's Tactical Nuclear Weapons. Part I: Background and policy issues*, FOI Report R-1057-SE, November 2003, p. 11.

¹⁰⁰ *NATO-Russia Glossary of Nuclear Terms and Definitions*, Revised 2006 version, 26 January 2007, p. 26.

4 The impact of the end of the Cold War

The norm among nuclear-armed states is a great deal of continuity in nuclear strategy around certain basic and enduring principles. Nuclear-armed states only tend to make radical changes in strategy or doctrine that require reshaping nuclear forces, which is a long and expensive process, if there is a major dislocation in the wider context. The end of the Cold War and the emergence of a new Russian state compelled major changes in thinking about nuclear weapons and their role in national security.

To place the end of the Cold War into the context of long-cycle theory, it marked a systemic transition point. The theory predicts that the shift in power dynamics between major powers caused by the defeat of the Soviet challenge would lead to a consolidation of US power, which would be exercised to shape the international system in ways beneficial to Washington. Coming to terms with the consequences would cause a reassessment of the role of nuclear weapons in mitigating the negative effects of collapsing conventional power.

The new context for relations with the United States and Western states shaped elements of the Russian programme to replace Soviet-era weapons systems with more modern equivalents that remain in service today. Some important decisions taken in the 1990s continue to inform Russian nuclear strategy. Perhaps the most important was assessment of how nuclear weapons might offset conventional disadvantage in a future conflict.

4.1 Strategic calculations

The inability of the Soviet military to adapt in line with the decisions of the civilian leadership followed by the drama of the 1991 coup were the backdrop for changes in the Russian approach. The creation of the Russian Ministry of Defence in May 1992 was partly a response to the frustration at lack of constructive ideas for change emerging from the armed forces. The change in political context included an important shift in the balance of influence between civilian and military advice once the most senior decision makers insisted on diverse channels of information.¹⁰¹

From its post-Cold War creation Russia began to publish documents purporting to describe nuclear strategy and doctrine and the basic principles on which they rest. As more information emerged from the Russian Federation the main contours of Soviet nuclear doctrine were revealed. In essence, the Soviet assumption was that escalation to nuclear use in a war between NATO and the Warsaw Pact was highly probable, with the West more likely to find itself in a position where first use would be considered necessary.¹⁰² When the Soviet command authority considered US nuclear use imminent they would prepare initial tactical nuclear strikes that would be massive and coordinated with strategic strikes.¹⁰³ The priority would be to destroy as many enemy weapons as possible before they could be used and decapitate the nuclear command authority in the United States, identified as the key enemy.

The end of the Cold War required a change in approach. Consideration was initially given to moving from a doctrine of pre-emption to one based on launch-on-warning that assumed cooperation with the Commonwealth of Independent States (CIS) where key assets were located. The approach was quickly undermined as it became clear that the

¹⁰¹ Civilian analysts, of which Andrei Kokoshin was the most prominent, had the ear of senior decision-makers in spite of attempts by the Russian military establishment to isolate and marginalize them.

¹⁰² Mike Albertson, 'Counterforce and Countervalue Targeting in Soviet and Russian Nuclear Strategies' in Brad Roberts ed. *Counterforce in Contemporary U.S. Nuclear Strategy*, Center for Global Security Research, Lawrence Livermore National Laboratory, 2025.

¹⁰³ United States Directorate of Intelligence, *Soviet Planning for Front Nuclear Operations in Central Europe*, June 1983.

national security policies of newly independent states diverged, making it impossible to restore the Soviet system for early-warning.¹⁰⁴

In its 1993 iteration the Russian military doctrine retained the option of a massive counterforce response to any imminent nuclear attack on Russia and removed references to no first use of nuclear weapons.¹⁰⁵ However, the political basis for threat assessment now pointed to a greatly reduced risk that the United States would attack Russian nuclear capabilities.

In Russia some influential figures apparently already perceived language on the massive use of nuclear weapons as ‘a tribute to Russia’s traditional military theorists and to the domestically motivated pandering to the defence establishment’.¹⁰⁶ A former Chief of the Soviet General Staff, Marshal Nikolai Ogarkov, was one voice arguing that parity with the United States was not necessary and Russia could reduce its nuclear forces safely. However, his successor, Marshal Sergey Akhromeyev, was of a different view and had support from influential figures in the defence industry.¹⁰⁷

Post-Cold War doctrine brought Russian declaratory policy closer to the way senior leaders thought by pledging never to be the party initiating any form of armed conflict, but reserving the right to use nuclear weapons first should Russia be the victim of armed attack.¹⁰⁸

4.2 The role of nuclear weapons in regional contingencies

In the immediate aftermath of the dissolution of the Soviet Union there was an urgent need to consolidate the stockpile containing tens of thousands of nuclear weapons and to ensure that they were in safe storage. Avoiding the risk of so-called ‘loose nukes’ was the immediate priority for Russia and the focal point for the assistance provided by international partners. However, it was also apparent that a new way of thinking about the role of nuclear weapons would be needed.

The primary catalyst for the revision in thinking was the recognition that Russia faced a different set of challenges from the Soviet Union. The likelihood of a large-scale conventional war in Europe had diminished, but Russia quickly found itself responding militarily to crises in the Caucasus, in Central Asia and in Moldova as well as internal conflicts with separatist regions. The probability of local wars of different type was much greater, but nuclear weapons had little relevance to the actual scenarios.

Escalation into a confrontation with the West was very unlikely – in fact Western countries encouraged Russia to take the lead in managing problems on the territory of the former Soviet Union – and it was assumed that military action would be taken together with CIS partners.

The Russian military establishment was also digesting the outcome of the US military action against Iraq in 1991, where the effectiveness of air power and precision weapons had been demonstrated. For Russia, which had no obvious answer to that kind of capability, the initial response was to think about how the strategic arsenal could be leveraged, for example using selective strikes with a single or limited number of strategic

¹⁰⁴ Pavel Podvig concluded that as the result of degradation over time by 2002: ‘the Russian early-warning system seems to have reached the point at which it has virtually lost its importance as an integral component of the command and control system of nuclear forces’. Pavel Podvig, ‘History and the Current Status of the Russian Early Warning System’, *Science and Security*, February 2002.

¹⁰⁵ *The Basic Provisions of the Military Doctrine of the Russian Federation*, adopted by edict No. 1833 of the president of the Russian Federation, dated 2 November 1993.

¹⁰⁶ Alexei G. Arbatov, *The Transformation of Russian Military Doctrine: Lessons Learned from Kosovo and Chechnya*, George Marshall European Center for Security Studies, July 2000.

¹⁰⁷ Andrei A. Kokoshin, *Nuclear Conflict in the Twenty-First Century*, Belfer Center for Science and International Affairs, April 2007.

¹⁰⁸ James F. Holcomb and Michael M. Boll, *Russia's New Doctrine: Two Views*, US Army War College, 20 July 1994.

weapons and warheads of low yield. This new role for strategic weapons was intended to provide a 15 year 'window of security' during which time Russia would rebuild conventional forces adequate to the prevailing circumstances.¹⁰⁹

The United States had far greater discretion in deciding whether and how to reduce the nuclear arsenal. As such, the September 1991 US initiative to eliminate all short-range nuclear weapons, including field and rocket artillery, was helpful from a Soviet and then Russian perspective. In response Soviet President Mikhael Gorbachev announced reciprocal measures that Russian President Boris Yeltsin then built on. President Gorbachev promised to destroy all nuclear artillery shells, artillery rockets and landmines. He also promised to remove nuclear weapons from surface vessels and anti-ballistic missile systems and move them to storage sites along with free-fall nuclear bombs earmarked for delivery by strategic bombers. President Yeltsin subsequently announced that one third of the naval weapons and half of the anti-ballistic missile weapons would be destroyed.¹¹⁰

Russia has never fully implemented these commitments and, as will be discussed further below, has indicated that it never will.

4.3 The nuclear weapon complex: Crisis management and planning for downsizing

At the point where the Cold War ended the Soviet Union was well advanced with a spectrum of nuclear weapon programmes that had been initiated as part of the response to the rather gloomy assessment of the way in which Western (first and foremost US) investments in military technology had affected the correlation of forces. Seen through Soviet eyes the more assertive language and ambitious objectives of US governments in the 1980s, combined with increased resources and a shift in technology paradigm, produced what Marshal Ogarkov called 'dangerously explosive international circumstances' that demanded a response.

The outcome was a continuous expansion in the size of the Soviet nuclear weapon complex during the 1980s. The Soviet nuclear modernization rested on a research, development, testing and manufacturing network that had a privileged place in the wider military-industrial complex. Continuous expansion meant that by the end of the 1980s the core of the nuclear-weapons complex included more than 20 industrial enterprises and scientific research institutes where approximately 75,000 persons were directly engaged in weapon projects.

The most important parts of the nuclear weapon complex were located in cities designated as Closed Administrative Territorial Formations (with the Russian acronym ZATO) because of the sensitive military nature of the work being carried out in them. Ten of the 42 ZATOs in the Soviet Union were central to the nuclear weapons complex and under the supervision of Minatom.¹¹¹ In line with the expanding complex, the population of these 10 cities expanded from 690,000 to 748,000 during the 1980s.

From a Russian perspective adjusting to new economic conditions in a period of upheaval had to respect important national priorities and although the nuclear weapons complex had to be reduced in size, it should not collapse.

Preserving the scientific and technological capability and intellectual property locked inside the nuclear enterprise, where many of the best qualified and most skilled workers

¹⁰⁹ Vladimir Dvorkin, 'The Future of Nuclear Weapons in Russia', *The Monitor*, Winter-Spring 1999. It can be noted that at this time how to reform the armed forces was hotly contested by advocates of different approaches though the need for reform was recognized.

¹¹⁰ Dunbar Lockwood and Jon Brook Wolfsthal, 'Nuclear weapon developments and Proliferation', *SIPRI Yearbook 1993: World Armaments and Disarmament*, (Oxford University Press: Oxford 1993), pp. 227-28.

¹¹¹ Anatoli S. Diakov, *Russia's Closed Nuclear Cities: Social and Economic Conditions*, Conference Paper prepared for Helping Russia Down-Size Its Nuclear-Weapons Complex, Princeton University, 14-15 March 2000).

were employed during the Soviet period, was the priority. The weapon design complex was notably held outside the most intrusive cooperation projects with the United States. Access to Lesnoy (Sverdlovsk-45), Sarov (Arzamas-16), and Snezhinsk (Chelyabinsk-70), the closed cities considered most sensitive by Russia, was heavily restricted.¹¹²

Russia also needed to ensure that key tasks could still be performed after restructuring and downsizing. The volume of highly-enriched uranium (HEU) and plutonium in the system (including material in weapons to be retired and in stocks) was large enough that Russia decided at an early stage that military and civilian uranium enrichment capability could be integrated. While administrative control over enrichment plants was transferred the facilities themselves still remain today, three located in closed cities and one at Angarsk that became the International Uranium Enrichment Centre. A specialized division at Rosatom manages the facilities and they continue to produce HEU and other nuclear materials for military applications, such as naval propulsion reactors, when necessary.¹¹³

Retiring nuclear weapons released over 500 tonnes of HEU that could either be retained as a reserve for future military use or blended for use in reactor fuel. In 1993 Russia agreed to sell the United States low enriched uranium that had been down blended in Russia from HEU in retired weapons for use in nuclear reactor fuel fabrication.¹¹⁴ The amount of material released was large enough to have a knock-on impact for the international uranium mining, conversion and enrichment markets.¹¹⁵

Plutonium for nuclear weapons was produced in three locations (Ozersk, Seversk and Zhelesnogorsk), where military activity took place in reactors that also generated electricity and heat for cities that had been deliberately built in remote locations. Closing the reactors required US financial assistance to build alternative sources for energy production.¹¹⁶ The last plutonium production reactor was shut down in 2010, and the facilities are currently being decommissioned.¹¹⁷

4.4 Arms control

Legally binding agreements that codified deep reductions in the number of nuclear weapons in the arsenals of the United States and the Soviet Union (and then Russia) seemed to be a realistic possibility for the first time in the period immediately after the end of the Cold War. However, the negotiations that eventually led to the 1991 Strategic Arms Reduction Treaty (START I) began in the early 1980s when President Ronald Reagan laid out an approach based on simultaneous reductions in strategic nuclear weapons and the development of missile defences. In the so-called Eureka Plan the US proposed reducing the number of ballistic missile launchers to 850 on each side and capping the number of ICBM warheads at 5000 each. The proposal on numbers of weapons was combined with a proposed limit on total 'throw weight' that would in effect have limited the number of heavy missiles on both sides.¹¹⁸

The initial proposal heavily favoured the United States (and was unacceptable to the Soviet Union) but it was the basis for a nine-year negotiation eventually producing START I that had very different provisions. The negotiations took place alongside changes in strategic arsenals during a period of significant tension between the United States and the Soviet Union. The Soviet deployment of mobile ICBMs and the US development of air and sea-launched nuclear-armed cruise missiles were perhaps the most significant changes that led each side to compromise on terms for the START Treaty.

¹¹² *Site Description, Economic Status, Personnel Policies and Social Programs in the 10 Russian Closed Nuclear Cities*, Landau Network Centro Volta (LNCV) Como, February 2006.

¹¹³ *Russia's Nuclear Fuel Cycle*, World Nuclear Association, 6 January 2022.

¹¹⁴ United States Energy Information Agency, *Megatons to Megawatts program will conclude at the end of 2013*, 24 September 2013.

¹¹⁵ 'Megatons to Megawatts: The missile deal that almost blew up', *Mines Magazine*, July 2012.

¹¹⁶ Stephen Bunnell, 'Russian Plutonium-Producing Reactors Closed', *Arms Control Today*, August 2008.

¹¹⁷ 'Russia starts decommissioning plutonium-producing reactor', *World Nuclear News*, 13 December 2024.

¹¹⁸ April Carter, *Success and Failure in Arms Control Negotiations*, (Oxford University Press: Oxford 1989).

Nonetheless negotiations appeared to be deadlocked and heading for collapse prior to two key enablers: the change in the political leadership in the Soviet Union and the change in the Soviet approach to verification that followed from it. Agreement only became possible when the Soviet Union accepted more transparency and an intrusive inspection regime, including on-site inspection and continuous monitoring.

The outcome was the first treaty to significantly reduce strategic offensive arms that included a sub-ceiling on ballistic missiles, including a limit on the number of 'heavy' ballistic missiles either party could possess.¹¹⁹ Reductions were to be carried out in a phased manner over seven years. The Soviet Union (and then Russia) was unable to include numerical limits on sea-launched cruise missiles (SLCMs) into the Treaty—though Russian sources assert that politically binding but unverified agreements were reached on a confidential exchange of information on the number of deployed SLCMs, and that SLCMs would not carry multiple warheads.¹²⁰

As the START I Treaty was signed and entered into force Russia and the United States also agreed on the text of a follow-on START II Treaty. While the two treaties were intended to be implemented in parallel, the reductions mandated in START II would stretch beyond the completion of the reductions required under START I. The main provisions of START II were substantially lower limits on deployed strategic warheads, a ban on all land-based 'MIRVed' ballistic missiles, and limits on the number of warheads deployed on submarine launched ballistic missiles. The treaty also differed from START I by making all warheads deployed on heavy bombers attributable under counting rules. The net effect of implementing START II would have been to reduce deployed Russian and US strategic arsenals by roughly two-thirds compared with the number in service at the end of the Cold War.

While the START Treaty was being negotiated Russian analysts underlined that the prospect of deep cuts increased the importance of the 1972 Anti-Ballistic Missile (ABM) Treaty. Soviet negotiators proposed language to address concerns about the US investment in missile defence under the Strategic Defence Initiative (SDI) designed under the Reagan Administration. The Soviet proposal was to include a specific interpretation of Article V of the Treaty that would ban the development, testing and deployment of space-based ABM systems.¹²¹

The Soviet and later Russian position on the ABM Treaty reflected a long-standing view that 'with parity of strategic offensive weapons deployment by one of the parties of additional defence potential would be tantamount to gaining the capability for a preventive first strike'.¹²² The Soviet position was that the US SDI project undermined the fundamental agreement on the relationship between offensive and defensive weapons established in the early 1970s when the Strategic Arms Limitation Treaty (SALT I) and the ABM Treaty were negotiated in parallel.

While strategic arms control was being negotiated talks were also taking place on intermediate- and short-range nuclear forces in Europe. Soviet deployment of the SS-20 ballistic missile from the late 1970s onwards introduced an accurate, mobile missile armed with multiple warheads and a range that could cover targets in Western Europe from launch sites in the Soviet Union. In response to European concerns the United States

¹¹⁹ The treaty defined heavy ICBMs and SLBMs as those with a launch weight greater than 106,000 kilograms or a throw-weight greater than 4350 kilograms.

¹²⁰ Konstantin Bogdanov, 'Hypersonic Precision-Guided Weapons, Strategic Stability and Arms Control', in Alexei Arbatov, Sergey Oznobishev and Natalia Bubnova eds. *Russia: Arms Control, Disarmament and International Security, Supplement to the Russian Edition of the SIPRI Yearbook 2018*, IMEMO, Moscow, 2019.

¹²¹ Vladlen S. Vereshchetin, 'Issues related to the current US and Soviet views of the Treaty: a Soviet jurist's perspective', in Walther Stützle, Bhupendra Jasani and Regina Cowen eds. *The ABM Treaty: To Defend or not to Defend?*, (Oxford University Press: Oxford 1987).

¹²² Vladimir Semenov, 'The Treaty's Basic Provisions: view of the Soviet negotiator' in Walther Stützle, Bhupendra Jasani and Regina Cowen eds. *The ABM Treaty: To Defend or not to Defend?*, (Oxford University Press: Oxford 1987).

agreed to develop and deploy a mix of ground-launched cruise missiles and a modern intermediate-range ballistic missile onto the territory of European allies.

The initial deployment of US weapons appeared to end the prospects for agreement on numerical limits as Soviet negotiators were not willing to accept any US INF in Europe, arguing that the SS-20 was a necessary response to the nuclear arsenals of France and the United Kingdom. The change in political leadership in the Soviet Union was the catalyst for the agreement to ban US and Soviet ground-launched intermediate-range missiles in the 1987 Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty).¹²³

The Soviet political leadership agreed to the terms of the INF Treaty over the opposition of both the military and the defence industrial complex. The military were dissatisfied with the failure to capture US Tomahawk SLCMs in agreements on either strategic or non-strategic weapons. Because both sides agreed to eliminate two classes of ballistic missile and ground-launched cruise missiles the reductions under the Treaty were highly asymmetrical. The Soviet Union/Russia eliminated almost 2,000 missiles while the United States eliminated fewer than 900.¹²⁴ To the anger of industrialists, the Soviet leadership agreed to eliminate a modern missile that was already in production and that had a range below INF Treaty parameters (the OTR-23) in exchange for a US decision not to proceed with a missile that did not yet exist (an updated version of a much older missile, the Lance).¹²⁵ At this time Soviet designers began to develop the Iskander missile, labelling it a 'dual-use' system rather than a missile designed to deliver nuclear weapons.

¹²³ President Reagan and General Secretary of the Soviet Communist Party, Mikhail Gorbachev, agreed on the so-called 'zero option' at their 1986 Summit meeting in Reykjavik.

¹²⁴ Alexei Arbatov, 'The INF Treaty: Twentieth Anniversary', in Alexandre Kaliadine and Alexei Arbatov eds. *Russia: Arms Control, Disarmament and International Security. Supplement to the Russian Edition of the SIPRI Yearbook 2007*, IMEMO, Moscow, 2008.

¹²⁵ Alexei Arbatov, 'The INF Treaty and BMD Controversies', in *Russia: Arms Control, Disarmament and International Security*, IMEMO Supplement to the Russian Edition of the SIPRI Yearbook, 2007 (IMEMO, Moscow 2008).

5 The cooling relationship with the United States and NATO

From a Russian perspective the period of the 1990s conformed to what could have been expected seen in the context of long-cycle theory. The post-Cold War transformation of the Russian nuclear enterprise was planned as a 30-year process assuming that the cooperative relationship with the West was maintained and even progressively deepened. Russia was born in 1991 as a new democratic state, and an internal Russian transformation was considered by Western partners to be logical and inevitable. However, after the defeat of the Soviet challenge the Russian explanation of events increasingly alleged that the United States was using its 'unipolar moment' to exploit Russia's weakness for its own advantage. NATO accession by former members of the Warsaw Treaty Organisation was also transforming Russian relations with the West into a 'Cold Peace'.¹²⁶

According to the long-cycle theory Russia would be expected to explore ways to reduce and erode US (and Western) advantages. One consequence was that the Russian troops originally sent to dampen local conflicts in the post-Soviet space became instruments for political control over several newly independent states. A second consequence was that Russia relatively quickly reappraised the utility of nuclear weapons.

5.1 Strategic calculations

A new national approach to the role of nuclear weapons would be based on retaliation tailored to the nature of an attack on Russia in the context of a local, regional or global conflict. By the late 1990s Russia had a revised set of missions for nuclear forces that took account of the risk of escalation from a regional to a global war, and that also introduced the idea of 'tailored damage' to replace 'unacceptable damage' as the yardstick by which specific strike packages would be devised.¹²⁷

Unacceptable damage rested on the ability to destroy an agreed set of targets with a high degree of confidence. The concept of tailored damage moved away from a mathematical equation to a judgement combining the level of physical damage with an assessment of the importance of a destroyed target to the enemy in relation to their war aims. The level of tailored damage that would impact the decision-making of the adversary may be low or high, depending on what is at stake in the conflict, and could avoid inflicting large scale civilian casualties.¹²⁸

Tailored damage, sometimes referred to as dosing, introduced a subjective element into decisions and required a wider set of options for the supreme command authority to choose from. The modified approach to nuclear targeting was a catalyst for reshaping the nuclear arsenal into its contemporary form.¹²⁹

With the degraded early-warning system the emphasis that Russia now placed on retaliation demanded a force able to absorb an attack but still be able to strike back with sufficient effect to achieve Russia's objectives. While Russia was continuing to reduce the number of strategic nuclear systems and consolidate them into fewer types, a greater emphasis on mobile ICBMs armed with multiple warheads could create a dispersible capability less vulnerable to damage limitation strikes but still able to threaten the United States.

¹²⁶ Alexei Arbatov, 'The National Idea and National Security', *Mirovaya Ekonomika i Mezhdunarodnyye Otnosheniya* (World Economy and International Relations), May 1998.

¹²⁷ Mike Albertson, 'Counterforce and Countervalue Targeting in Soviet and Russian Nuclear Strategies', in Brad Roberts ed. *Counterforce in Contemporary U.S. Nuclear Strategy*, Center for Global Security Research, Lawrence Livermore National Laboratory, May 2025.

¹²⁸ Nikolai Sokov, *Nuclear Deterrence and Arms Control in the Post-Post-Cold War Environment*, Presentation at the US Strategic Command Deterrence Symposium, July 2009.

¹²⁹ Anatoliy Yurkin, 'Secret Cards of the Kremlin', *Kalingradskaya Pravda*, 14 August 1998; *Moscow Interfax*, 7 October 1999.

At a time when NATO made a political commitment not to modify its nuclear posture and plans while incorporating new members Russia showed no reciprocity.¹³⁰ In Russian publications the NATO Operation Allied Force (the air campaign against the Federal Republic of Yugoslavia in 1999) is pinpointed as a catalyst for a change in the approach to non-strategic nuclear weapons. At this time Russia stepped back from the Presidential Nuclear Initiatives.¹³¹

The political background to the change was the message that NATO sent by carrying out the 1999 campaign, namely that the Alliance retained freedom of action, and where important interests were at stake it was not constrained by a requirement for UN Security Council endorsement prior to use of force. At the time of Operation Allied Force President Yeltsin intervened into the debate within the Russian military around the relative priority of rebuilding conventional forces and greater reliance on non-strategic nuclear forces and settled the matter in favour of the latter.¹³²

Alongside from the signal about how NATO would approach military actions ‘out of area’, in Russian eyes the changing membership of NATO increased the potential impact that forward-based air-launched cruise-missiles might have on Russian nuclear forces, particularly the sea- and air-based elements of the triad. At this time ‘Russian conventional capabilities were so inferior, compared to NATO’s military capabilities, that Russia deemed it necessary to threaten the early and limited use of nuclear weapons in the face of conventional threats’.¹³³ Non-strategic nuclear weapons might assume an important role in defending Russia’s strategic arsenal as well as being an instrument to degrade NATO air power as quickly as possible, critical to shaping the conventional battlefield.

In 2008 Russia put forward proposals for new European security treaty that would have rolled-back decisions taken by former adversaries at the end of the Cold War.¹³⁴ After Western states firmly rejected the proposal and a period of diplomatic discussion in the so-called Corfu Process proved fruitless, the then Prime Minister Putin asserted that additional force posture changes relevant to regional war were needed.¹³⁵

5.2 A changing perspective on regional war

Based on analysis of exercises in the 1990s Russia made important changes that were embedded in new steering documents, the National Security Concept of 2000, the Military Doctrine of the same year and Immediate Tasks for Development of the Armed Forces of 2003.¹³⁶ Russia reintegrated nuclear and conventional weapons into thinking about how to fight a regional war, a change that was trailed in the first public documents describing Russia’s nuclear doctrine.¹³⁷

Non-strategic nuclear weapons would not only be seen as deterring military aggression against Russia, they would also have a critical role in a regional war, including potential first use in a scenario where conventional forces were being heavily degraded. In a briefing on the Russian military doctrine that was approved in April 2000 Dmitry Rogozin

¹³⁰ In 1997 NATO codified a political commitment not to deploy nuclear weapons and not to permanently station substantial combat forces on the territory of new members in the NATO-Russia Founding Act of 1997.

¹³¹ Stefan Forss, ‘Russia’s Nuclear Arms Capability: Implications for the Nordic-Baltic Region and Beyond’, in Kari Liulto and Joonas Sipilä eds. *Inevitable Instability in Russia*, (Springer: Switzerland 2026).

¹³² Gunnar Arbmán and Charles Thornton, *Russia’s Tactical Nuclear Weapons*, FOI Report R-1057-SE, November 2003, pp. 34-35.

¹³³ Kristin van Bruusgaard, ‘Russian nuclear strategy and conventional inferiority’, *Journal of Strategic Studies*, vol. 44, No. 1, 2021.

¹³⁴ Andrei Zagorski, ‘The Russian Proposal for a Treaty on European Security: From the Medvedev Initiative to the Corfu Process’, *OSCE Yearbook 2009*.

¹³⁵ Prime Minister Vladimir Putin meets with experts in Sarov to discuss global threats to national security, strengthening Russia’s defences and enhancing the combat readiness of its armed forces, Office of the Prime Minister, 24 February 2012.

¹³⁶ Steven J. Main, *Russia’s Military Doctrine*, Conflict Studies Research Centre, Sandhurst, April 2000.

¹³⁷ Gudrun Persson, *Rysslands kärnvapendoktrin – oförutsägbarheten stadfäst* [Russia’s nuclear weapon doctrine – unpredictability confirmed], FOI memo 7332, 11 November 2000.

(at that time Chairman of the Duma Defence Committee) noted that ‘the doctrine is a defensive one but at the same time it presupposes the use of every possible means of warfare including the use of nuclear weapons’.¹³⁸

Stefan Forss has pointed out that during this period there was an unprecedented degree of transparency in the Russian internal discourse around the role of nuclear weapons.¹³⁹ The window for transparency quickly closed, but Forss notes that as a side-effect information from the early 2000s still influences contemporary Western discussions such as the concept of ‘escalate to deescalate’.

The headline documents of 2000 and 2003 point to nuclear missions in a regional war, including limited use against military targets in the first instance but expanded to more extensive use should the first campaign fail to achieve its objectives. An initial limited use was tailored to cause ‘damage subjectively perceived by the opponent as unacceptable, and exceeding the benefits the opponent expects to gain.’¹⁴⁰ By inflicting damage that would ‘sober but not enrage’ an adversary the initial objective would be to induce an adversary to accept Russian terms for war termination.¹⁴¹ At this point in the conflict the underlying assumption was that the United States would be deterred from a symmetrical response by the risk of escalation. The second, more extensive, nuclear use would cause unacceptable damage to the opponent and could be a transition to a general war in which Russian strategic forces would be expected to provide a degree of protection.

The steering documents were combined with parallel decisions on nuclear force posture. In 1999 President Yeltsin authorized a nuclear warhead for the Iskander missile at a meeting of the National Security Council and promised additional funds to support nuclear weapon research and development.¹⁴² Leaking this information from an otherwise highly classified discussion was followed by the inclusion of a nuclear dimension into the Zapad-99 military exercise.¹⁴³ By 2000 the Minister for Atomic Energy, Yevgeniy Adamov, spoke publicly about instructions to begin developing a new family of very low-yield nuclear weapons.¹⁴⁴

US officials with knowledge of the Russian arsenal doubt if older weapons in the stockpile had variable yields, and the timing would match the point where Russia informed the US that the political commitments given under Presidential Nuclear Initiatives would not be implemented.¹⁴⁵ A reasonable conclusion would be that Russia began modifying the arsenal of operational and tactical nuclear weapons at this time and initiated projects that produced the main elements of Russia’s non-strategic nuclear force today.

5.3 The nuclear weapons complex

In June 1998 the Russian government adopted a plan *On Restructuring and Conversion of the Nuclear Weapons Complex* and addressed many of its legal, administrative and

¹³⁸ Quoted in Gunnar Arbman and Charles Thornton, *Russia’s Tactical Nuclear Weapons*, FOI Report R-1057-SE, November 2003.

¹³⁹ Stefan Forss, ‘Russia’s Nuclear Arms Capability: Implications for the Nordic-Baltic Region and Beyond’, in Kari Liuhto and Joonas Sipilä eds. *Inevitable Instability in Russia*, (Springer: Switzerland 2026).

¹⁴⁰ Nikolai Sokov, *Russian Nuclear Strategy: Background, Current Status, Future*, James Martin Center for Nonproliferation Studies, Monterey, California, June 2016.

¹⁴¹ Jacek Durkalec, ‘Russia’s Approach to Modern Strategic Conflict’, in Brad Roberts ed. *Getting the Multi-Domain Challenge Right*, Center for Global Strategic Research, Lawrence Livermore National Laboratory, 2021.

¹⁴² Gunnar Arbman and Charles Thornton, *Russia’s Tactical Nuclear Weapons*, FOI Report R-1057-SE, November 2003.

¹⁴³ Following the accession of the Czech Republic, Hungary and Poland to NATO in March 1999 the scenario for the June 1999 Russian Zapad-99 exercise tested the role of theatre nuclear forces against NATO. According to the exercise findings a NATO attack on Kaliningrad could only be repelled using nuclear strikes, including on Poland and Hungary. Jacob Kipp, ‘Russia’s Nonstrategic Nuclear Weapons’, *Military Review*, May-June 2001; Nikolai Sokov, *The “Tactical Nuclear Weapons Scare” of 2001*, James Martin Center for Nonproliferation Studies, 3 January 2001.

¹⁴⁴ Pavel Felgengauer, ‘An Atomic Bomb for Local Wars’, *Moskovskaya Novosti*, 26 December 2000.

¹⁴⁵ Authors interview, Washington DC 28 April 2025.

financial dimensions.¹⁴⁶ Specific restructuring plans were prepared for all of the facilities in the complex under the supervision of a new Department for Conversion of Nuclear Industry created at Minatom in 1999.

According to the 1998 Minatom consolidation plan, between 2000-05 two (of four) warhead production facilities were to close along with one of the two facilities producing key components for weapons.¹⁴⁷ The workforce would be reduced at the remaining facilities. Weapon research and development would be concentrated at in Sarov (at the Federal Nuclear Centre – Institute of Experimental Physics, VNIIEF) and Snezhinsk (at the Federal Nuclear Centre – Institute of Technical Physics, VNIITF). The Avangard warhead assembly facilities at Sarov and Zarechny were scheduled for closure while those at Lesnoy and Trekhgorny were to remain open. The production of key components for nuclear weapons was to continue at VNIIEF and VNIITF. The manufacture of plutonium and HEU into the physical form required for nuclear weapons as well as tritium production continued in Ozersk (at the Mayak Production Association).

The projected complex would be significantly smaller than during the Cold War. However, as Oleg Bukharin noted ‘plans are only plans, implementation will depend on many factors and the problems are numerous’.¹⁴⁸ Dismantling roughly 6,000 strategic nuclear warheads and perhaps as many as 18,000 non-strategic weapons created a workflow that delayed reductions in the complex. Alongside the practical challenge of warhead dismantlement schedules, a change of mind over political undertakings on non-strategic weapons may also have had an impact. At the time the reorganization of the nuclear weapons complex was being planned the assessment of future requirements described above was taking place. A decision not to implement all the commitments in Presidential Nuclear Initiatives enabled a switch from dismantlement to building new warheads for non-strategic weapons while continuing to implement strategic arms control obligations.

While agreed plans were being implemented Minatom also began to think through the possible implications of further deep reductions in the strategic nuclear stockpile that could potentially be required under new arms control agreements. The 1998 plan assumed a nuclear weapon stockpile of 5000 weapons, but the most far-reaching arms control scenario envisaged would reduce the strategic arsenal to 500 weapons. Such an agreement would have meant consolidating virtually all core activities at two locations.¹⁴⁹

Russian willingness to share information about reductions in non-strategic weapons rapidly waned and understanding what has been happening inside closed nuclear cities has also become more difficult. It is confidently assessed that closure or conversion of important facilities such as plutonium production reactors and dedicated military uranium enrichment facilities was accomplished, whether the expected closure of other facilities took place is less clear. One estimate has suggested that the subsequent recapitalization of the complex has left Russia with a manufacturing base able to produce ‘at least 1,000 plutonium pits per year’ for use in nuclear weapons if so ordered.¹⁵⁰

The intellectual property generated in closed cities was considered a key national asset, but the cities had characteristics that made it difficult to move them out of the nuclear weapon

¹⁴⁶ Matthew Bunn, Oleg Bukharin, Harold Feiveson, Frank von Hippel, William Hoehn, Kenneth Luongo and Sharon K. Weiner, *Helping Russia Downsize its Nuclear Complex: A Focus on the Closed Nuclear Cities*, Report of an International Conference held at Princeton University, 14-15 March 2000.

¹⁴⁷ Oleg Bukharin, *The Complex Remains Oversized and Configured for the Cold War: Reductions are inevitable*, Paper presented at the International Conference *Helping Russia Down-Size Its Nuclear-Weapons Complex*, Princeton University, 14 March 2000.

¹⁴⁸ Oleg Bukharin, *The Complex Remains Oversized and Configured for the Cold War: Reductions are inevitable*, Paper presented at the International Conference *Helping Russia Down-Size Its Nuclear-Weapons Complex*, Princeton University, 14 March 2000.

¹⁴⁹ Oleg Bukharin, ‘Downsizing Russia’s Nuclear Warhead Production Infrastructure’, *The Nonproliferation Review*, Spring 2021.

¹⁵⁰ Houston T. Hawkins, ‘Rethinking the Unthinkable’, *National Security Science*, Los Alamos National Laboratory, June 2014.

complex. The small size of closed cities meant that the military activities carried out there dominated the local economy. Many of the facilities were deliberately located in remote places with relatively poor road and rail communications. They were recognized to have extensive environmental problems connected to their inherently hazardous activities. Combined with residual security regulations it was very difficult to attract alternative investment from Russian sources while foreign direct investment was even more difficult. Over time, as more state finance for defence became available, it is possible that investment into military activities was an easier pathway to arresting the socio-economic decline in closed cities than continuing down the path of reform.

In the decade after 2005 it may be that the planned streamlining and consolidation of the nuclear weapons complex was shelved for a combination of strategic, economic and societal reasons.

5.4 Arms control

The improvement in political relations that accompanied the end of the Cold War generated significant momentum in nuclear arms control and the impact was still being felt even as new tensions arose. For example, the phased reductions in strategic arsenals required under START I were accomplished ahead of schedule in a verified manner. Moreover, there was progress towards a follow-on agreement on strategic arms and obstacles to preserving the ABM Treaty initially seemed to have been managed successfully. However, this is also the window in which nuclear arms control began to run into serious difficulty.

In 1997 President Bill Clinton and President Boris Yeltsin agreed on guidance prior to talks on a START III Treaty. The Presidents instructed negotiators to achieve further reductions of roughly one-third in strategic arsenals by the end of 2007. As those reductions were implemented measures for greater transparency around nuclear warhead inventories and the destruction of strategic nuclear warheads were intended to prevent the rapid reconstitution of deactivated weapons. The United States agreed to allocate additional resources as part of the Nunn-Lugar programme to facilitate early deactivation.¹⁵¹

At the same time the START II Treaty fell victim to the long-standing Russian concerns about the relationship between reductions in offensive forces and investment in missile defences. Concern over the incremental advances in the ballistic missile forces of North Korea as well as countries in Latin America and the Middle East prompted the United States to increase investment in missile defences. Russia claimed that these investments were leading to technical advances that could undermine the ABM Treaty. Some Russian experts claimed that this was intentional and that 'the real task which the US set itself in planning the deployment of 'limited' missile defence was the building, in the future, of a 'dense' ballistic missile defence directed against Russia'.¹⁵²

At their 1997 Summit meeting in Helsinki Presidents Clinton and Yeltsin agreed on guidelines for the technical parameters of theatre ballistic missile defences considered sufficient to preserve the integrity of the ABM Treaty while allowing the US to defend against a limited North Korean missile force. The guidelines were the basis for the Standing Consultative Commission of the ABM Treaty that designed a technical demarcation agreement. Despite the agreement the Russian Duma continued to block

¹⁵¹ *Russia-United States Joint Statement on Parameters on Future Reduction in Nuclear Forces*, 21 March 1997. Separate from the negotiation of a new treaty on strategic nuclear weapons the Presidents also agreed to explore confidence-building and transparency measures for nuclear long-range sea-launched cruise missiles and tactical nuclear systems, as well as measures to make fissile material stockpiles more transparent.

¹⁵² Alexandre Savelyev, 'The ABM Treaty and Russia's Position', 8 December 1999 in *Russia: Arms Control, Disarmament and International Security, IMEMO Contributions to the Russian edition of the SIPRI Yearbooks 1997-2000*, Moscow 2001.

ratification of START II while elements of the US Congress remained convinced that an emerging threat to the US homeland justified lifting restrictions on missile defences.¹⁵³

In May 2000 President Putin proposed ratification of START II, conditional on US Congressional approval of the 1997 ABM agreements -- which was never forthcoming. After the change of Administration in the United States and the decision of President George W. Bush to appoint Donald Rumsfeld as Secretary of Defence the arms control framework came under increased scrutiny and challenge. As Chairman of the 1998 Commission assessing ballistic missile threats to the United States then Senator Rumsfeld was a strong advocate of missile defence. He also argued that the United States should shape its nuclear arsenal according to a national assessment of needs and should not tie it negotiated agreements with Russia.

In December 2001 the United States gave notice that it would withdraw from the ABM Treaty, invoking a clause on unilateral withdrawal in case of extraordinary events that jeopardized supreme national interest.¹⁵⁴ At the point of US withdrawal from the ABM Treaty President Putin announced that Russia no longer considered itself obliged to implement the provisions of the START II Treaty.

The demise of START II meant that there was no binding commitment on the size of strategic nuclear arsenals after the expiry of START I in 2006. The United States was unconcerned by the absence of a legal agreement given the stated intention to decouple the US strategic nuclear arsenal from negotiations with Russia, a significant change from the approach of the Clinton Administration. The perspective of the Clinton Administration was that START II was 'the doorway to START III', and without START II the US would maintain the strategic arsenal at START I levels, which Russia could only match 'at ruinous expense and with no prospect of further reductions'.¹⁵⁵ However, at their November 2001 Summit President Bush informed Putin that the United States would unilaterally reduce operationally deployed strategic nuclear warheads to a level consistent with START II over the next decade without expecting reciprocity.¹⁵⁶

Shortly afterwards Putin stated that Russia would match the US reductions if codified in a treaty. The United States agreed to include the reciprocal commitments in a legal document, the Treaty on Strategic Offensive Reduction ((SORT) known colloquially as the Moscow Treaty signed in May 2002), that rested on the verification procedures of START I and left the timetable for reductions to the discretion of the parties.¹⁵⁷ To achieve the required reductions the US would not eliminate warheads removed from deployed systems but rather place them in storage. Neither would the US destroy de-activated strategic missiles or the silos and submarine tubes from which they would have been fired.¹⁵⁸ Secretary of Defense Rumsfeld pointed to the need for arrangements that would allow the US to offset Russia's 'distinct advantages' if it became necessary to reconstitute nuclear forces due to an unexpected change in the security environment.¹⁵⁹ Russia maintained 'warm' production lines for nuclear warheads and strategic nuclear delivery

¹⁵³ *Report of the Commission to Assess the Ballistic Missile Threat to the United States*, (colloquially known as the Rumsfeld Commission), 15 July 1998; Alexander Pikayev, *The Rise and Fall of START II: The Russian View*, Carnegie Endowment for International Peace, September 1999.

¹⁵⁴ Christer Ahlström, 'Withdrawal from arms control treaties', *Arms Control, Disarmament and International Security: SIPRI Yearbook 2003*, (Oxford University Press: Oxford, 2003). The US cited the development by several states of long-range ballistic missiles as a means of delivering weapons of mass destruction in the notice to withdraw from the Treaty. US Department of State, *US diplomatic notes on ABM Treaty*, 14 December 2001.

¹⁵⁵ John D. Holum, Director, US Arms Control and Disarmament Agency, *Remarks to the Congressional Research Service Conference on the Future of Arms Control*, Washington DC, 9 January 1997.

¹⁵⁶ *President Announces Reduction in Nuclear Arsenal*, Press Conference by President Bush and Russian President Vladimir Putin, 13 November 2001.

¹⁵⁷ *Nuclear Arms Control: The Strategic Offensive Reductions Treaty*, Congressional Research Service, 7 February 2011.

¹⁵⁸ Anatoli Diakov and Frank von Hippel, *Challenges and Opportunities for Russia-U.S. Nuclear Arms Control*, New Century Foundation, 2009.

¹⁵⁹ US Secretary of Defense Donald H. Rumsfeld, statement as prepared for delivery to the Senate Foreign Relations Committee *Hearings on the Treaty on Strategic Offensive Reduction: The Moscow Treaty*, 17 July 2002.

vehicles. The US had not produced a nuclear weapon for more than a decade and could not begin new production quickly.

The Moscow Treaty was to expire at the end of December 2012. It created a degree of certainty for Russia about the size of the US strategic arsenal beyond the 2009 expiry of START I. The agreement that Russia and the United States could configure their strategic nuclear forces in any way they chose confirmed the movement to arsenals of the size anticipated in START II but without a ban on heavy missiles with multiple warheads, allowing Russia to extend the life of missiles that were already in the arsenal.¹⁶⁰

¹⁶⁰ Lydia Wachs, 'Security versus status: explaining Russia's interest in the Presidential Nuclear Initiatives and the Strategic Offensive Reductions Treaty', *The Nonproliferation Review*, 27 August 2024.

6 A new inflection point?

After a period in which Russia made substantial investment in its strategic and non-strategic weapons while the United States and its Allies paused the modernisation of their nuclear forces a challenge to US and Western predominance would be consistent with long-cycle theory. The theory does not concern itself with the motivations for a challenge. A state that feels it has balanced the power equation with the dominant actor in the international system might attempt an offensive challenge. Conversely, a state might consider a defensive challenge essential if it considers its vital interests at stake and sufficient power has accumulated.

Representatives of the West have tried to implement the agreements freely entered into in the 1990s, and do not believe that Russia has made a good faith effort to mitigate (or even understand) the reasons why states in the ‘near abroad’ turned away from Moscow. From a Russian perspective, however, the opportunity to build stability in Europe was lost as the result of Western triumphalism and sense of entitlement based on the self-perception as victors in the Cold War. Senior officials have asserted that the US and the EU deliberately marginalized or excluded Russia from the discussion of economic development in Ukraine and that they were complicit in the spread of a ‘nationalist virus’ in Ukraine. Ukraine is described as ‘a pawn and a tool used by the West to build up a bridgehead right on the borders of the Russian Federation in order to create direct threats to our security’.¹⁶¹

Although Russian is unable to make a global challenge to the United States by itself, President Putin felt increasingly confident in his ability to promote Russian interests regionally, including by use of force.

In December 2021 Russia passed to the United States two draft documents proposing a treaty between the two states and an agreement on future Russian relations with the North Atlantic Treaty Organization (NATO). The proposals were similar in philosophy to those laid out in the 2008 Medvedev proposal, but they contained more extreme ideas, and they were put forward in a threatening tone with the appearance of being an ultimatum.¹⁶² The 2021 proposals were once again rejected by the United States and members of NATO, and soon thereafter Russia’s unprovoked aggression against Ukraine confirmed their threatening nature.

6.1 The changing strategic context

Since President Putin was heavily engaged in framing the policies that shaped Russia’s current nuclear posture it is not surprising that there is a considerable continuity. Consistent investment has created nuclear forces considered to be the ultimate guarantee of Russia’s sovereignty and international status, the main instrument in preventing aggression towards Russia, the central pillar of Russia’s strategic deterrence and (based on the Ukraine conflict) to provide cover that enables conventional aggression.

The war against Ukraine has fundamentally changed the regional security of Europe, but it is also unfolding in a period where rivalry between the most powerful states in the world has taken on a sharper edge. Relations among the largest nuclear-armed states are deteriorating to the point where a US expert report has pointed to ‘mounting anxiety about the durability of the long nuclear peace’.¹⁶³ Russia must decide whether the nuclear forces at its disposal are adequate to the challenges it faces at global and regional level.

¹⁶¹ Ministry of Foreign Affairs of Russia, *Foreign Minister Sergey Lavrov’s interview with Turkish media (state television channel TRT and newspaper Türkiye)*, Moscow, 29 January 2026.

¹⁶² *Draft Treaty between the United States of America and the Russian Federation on Security Guarantees*, 17 December 2021; *Draft Agreement on measures to ensure the security of the Russian Federation and members of the North American Treaty Organization*, 17 December 2021.

¹⁶³ *Sustaining the Nuclear Peace: On the Urgent Need for a New Strategy for Stability*, Final Report of the Senior Study Group on Strategic Stability, United States Institute for Peace, February 2025.

Although President Putin has regularly underlined that he is broadly satisfied that the existing Russian arsenal and associated nuclear doctrine is sufficient for general deterrence this is kept under constant review. As described above, Russia has developed an inventory of nuclear weapons specifically designed to ensure that the President will always have sufficient options at his disposal to inflict tailored damage on an adversary in wartime. Russian capability development has also emphasized modernizing the system for early warning and nuclear command and control.

6.2 Strategic nuclear weapons

The historical Russian concern about the risk of a disarming strike against land-based strategic systems has probably been alleviated by the progress made in restoring the chain of early warning radars that was degraded at the time the Soviet Union dissolved. Russia has also paid close attention to the system for nuclear command and control in recent years to make it resilient if attacked. In combination several processes should give the President more time to make a decision, reduce the time needed to mount the necessary response if required and ensure that orders are carried out.

According to President Putin all the gaps created in the ground-based early warning system have now been filled.¹⁶⁴ In parallel Russia began investing in updating the satellite-based early warning system in 2015. While the system is said to be incomplete, it is also said to have reached its minimum operating capability in 2020.¹⁶⁵ The system is eventually intended to include 10 satellites. However, the tempo of building and launching new satellites is said to be slower than the rate at which older machines are taken out of service.¹⁶⁶

According to Western analysts, unlike their Soviet predecessors the new satellites ‘should have enough computing power to do much of the data processing on board, allowing operators on the ground to make swift recommendations to the country’s leadership on the need to activate anti-ballistic missile systems or launch a retaliatory strike. The satellites may also be integrated into the communication network needed to ensure a quick response to a missile attack.’¹⁶⁷

Restoring the early-warning system provides assurance in combination with past diplomatic efforts. Russia agreed ‘unverifiable and quickly reversible’ bilateral de-targeting agreements with the United Kingdom and the United States as a confidence building measure.¹⁶⁸ Developments in early warning and nuclear command and control may help Russia keep to these agreements with confidence.¹⁶⁹ In 1997 then Commander of the Strategic Rocket Forces stated that although Russian ICBMs are not targeted against any country in their day-to-day peacetime mode, they can be retargeted and launched ‘in a matter of minutes’.¹⁷⁰ Russian strategic submarines on the other hand ‘are believed to have safety devices blocking accidental or unauthorized launches of SLBMs which can only be unblocked after a special code is received from the chain of command’.¹⁷¹

In 2014 Russia opened a new National Defence Control Centre under the General Staff that included command and control of strategic nuclear forces among its main tasks.¹⁷² The

¹⁶⁴ *Presidential Address to the Federal Assembly*, 1 March 2018.

¹⁶⁵ Pavel Podvig, ‘Russia has four operational early-warning satellites of the EKS/Kupol system’, *Russian Strategic Nuclear Forces*, 20 January 2024.

¹⁶⁶ Pavel Podvig, ‘Space segment of Russia’s early-warning system seems to be down to three satellites’, *Russian Strategic Nuclear Forces*, 30 March 2025.

¹⁶⁷ Bart Hendrickx, ‘EKS: Russia’s space-based missile early warning system’, *The Space Review*, 8 February 2021.

¹⁶⁸ Alexei Arbatov, ‘Russia’ in Hans Born, Bates Gill and Heiner Hänggi eds., *Governing the Bomb: Civilian Control and Democratic Accountability of Nuclear Weapons*, (Oxford University Press: Oxford), 2010), pp. 59-60.

¹⁶⁹ *Moscow Declaration by President Clinton and President Yeltsin*, Moscow, 14 January 1994.

¹⁷⁰ David Markov, ‘The Russians and Their Nukes’, *Air and Space Forces Review*, 1 February 1997.

¹⁷¹ Gunnar Arbman, Charles Thornton, *Russia’s Tactical Nuclear Weapons Part II: Technical Issues and Policy Recommendations*, FOI-R--1588—SE, Stockholm, February 2005.

¹⁷² ‘Russia Opens New National Defense Control Center’ *Space Daily*, 3 December 2014.

Centre is intended to accelerate the acquisition and analysis of information and prepare the Chief of the General Staff to brief the President, who is the supreme command authority.¹⁷³

Russian military writers currently pay close attention to the potential for artificial intelligence (AI) to contribute to rapid decision-making. From 2022 Russia is said to have been ‘actively working on integrating AI into automated C2 systems, with efforts aimed at developing natural language processing capabilities and creating advanced software and hardware systems.’¹⁷⁴ However, there is agreement that AI should not make independent decisions in nuclear employment.¹⁷⁵

New challenges to Russian strategic nuclear deterrence

Russia is now having to take account of a new context for missile defence as part of the wider change in the relations among nuclear-armed states. With the increases taking place in the Chinese (and North Korean) arsenals of inter-continental range nuclear weapons the United States is planning to increase the scale of missile defences.

The US probably cannot achieve comprehensive coverage of the homeland, but plans aim at effective defence against ‘large missile barrages and other advanced aerial attacks’.¹⁷⁶ The bipartisan Congressional Commission on the Strategic Posture of the United States agreed in 2023 that additional investment in missile defences is justified considering a growing number of missile threats.

The Commission concluded that the United States does not need impenetrable missile defences covering the entire U.S. homeland. However, by defending critical capabilities the US could complicate adversary decision-making by creating uncertainty about the success of offensive missile use; reduce incentives to conduct coercive attacks by increasing the size of the attack required to be effective; assure Allies and partners that the United States will not be deterred from fulfilling its global security commitments; and in crisis or conflict, offer a military option that may be less escalatory than offensive strikes.¹⁷⁷

The current US Administration plans to make a significant increase in investment in a broad spectrum of missile defence capabilities, and Russia is assessing the implications.¹⁷⁸

Alongside the investment in new weapon systems that can defeat missile defences, described earlier, Russian analysts have asserted that counter-space capabilities are needed to avoid any vulnerability to interdiction in the moments after missiles launch. Russia will address any US plans for space-based missile interceptors.¹⁷⁹ According to the Strategic Posture Commission, holding US and Western space assets at risk or selectively targeting them gives Russia an additional tool that can be used in intra-war deterrence.

Defences at Russian strategic missile bases are being upgraded and Russia is also testing laser systems that can ‘blind’ adversary satellites to create a time window during which the dispersal of mobile missiles is less likely to be detected.¹⁸⁰ A recent Western assessment based on analysis of papers from the Russian professional military points to the role played by the Aerospace Forces that were created in 2015 by combining the Russian Air Force with missile defence and space forces. The main purpose of the force would be to

¹⁷³ Dmitry Sudakov, ‘Russian Armed Forces launch brain center’, *Pravda*, 1 December 2014.

¹⁷⁴ Timothy Thomas and Glen Howard, *Emerging Russian Perspectives on the Military Uses of AI in Warfare*, The Saratoga Foundation, 6 February 2025.

¹⁷⁵ Oleg Shakirov, *Russian thinking on AI integration and interaction with nuclear command and control, force structure, and decision-making* (London: European Leadership Network, 2023).

¹⁷⁶ US Department of War, *2026 National Defense Strategy: Restoring Peace Through Strength for a New Golden Age of America*, Washington DC, January 2026.

¹⁷⁷ *America’s Strategic Posture: The Final Report of the Congressional Commission on the Strategic Posture of the United States*, Institute for Defense Analysis, October 2023.

¹⁷⁸ Vadim Sukhorutchenko and Sergei Kreidin, ‘Iademoe sderzhivanie v usloviakh razvitiia globalnoi sistemy protivoraketnoi oborony SShA,’ [Nuclear deterrence in the context of the development of the US global missile defence system], *Voennaya Mysl*, 2022, no. 5.

¹⁷⁹ Jaganath Sankaran, ‘Russia’s anti-satellite weapons: A hedging and offsetting strategy to deter Western aerospace forces’, *Contemporary Security Policy*, vol. 43, No. 2, 2022.

¹⁸⁰ United States Space Force, *Space Threat Fact Sheet*, December 2025.

protect the leadership and ensure continuity in government in wartime, but a critical secondary function would be ‘to ensure the Russian nuclear option remains available’.¹⁸¹

Russia also pays attention to the discourse on multi-domain operations, including non-kinetic capabilities. Cyber-attacks that might target nuclear command and control, and early warning systems are one such capability about which Russian authors have raised concern.¹⁸² Another is the risk that adversary information operations could undermine combat readiness among the strategic nuclear forces. After incidents of insubordination in the 1990s, including in the 12 GUMO, a strict system was put in place to ensure the loyalty and integrity of personnel working with nuclear weapons. Researchers now call for new measures to protect strategic forces personnel against ‘negative information influence.’¹⁸³

6.3 The regional dimension to nuclear deterrence

One long-standing Russian concern has been the potential for US air power to target parts of Russia’s nuclear arsenal (such as the bomber force and missile-carrying naval vessels) with conventional long-range precision fire systems.¹⁸⁴

The accession of Finland and Sweden to NATO has facilitated an integrated Nordic concept of air operations that aims to control the air space in the High North.¹⁸⁵ The investment in an offensive concept of air defence is intended to support Finnish ground operations by attacking Russian forces in an area adjacent to the part of Northwest Russia where strategic submarines and strategic bombers are based.

Russian concern has perhaps been further exacerbated by the relative ease with which Ukrainian unmanned air vehicles have penetrated Russian air defences. Ukrainian willingness to target strategic assets such as long-range radars, heavy bombers and airborne control systems has probably reinforced this concern.¹⁸⁶

An expanding mission and changed doctrine?

In the traditional Russian discourse military experts often place deterrence actions on a linear spectrum progressing from threats of force prior to a conventional operation that precedes a nuclear option typically involving non-strategic weapons before strategic.¹⁸⁷ In this conceptualisation, which is widespread among the published work of Russian military thinkers, nuclear employment takes place in a step-by-step manner as conflict intensity increases.¹⁸⁸

¹⁸¹ Lt. Col. F. Jon ”Spinner” Nesselhuf, ‘Meeting Expectations: Failure in Ukraine will not Change the Russian Aerospace Defense Force’, *Military Review*, January-February 2025, p. 44.

¹⁸² Roman Nogin, ‘O roli i meste Raketnykh voisk strategicheskogo naznacheniia v perspektivnoi sisteme kompleksnogo strategicheskogo iadernogo sderzhivaniia vozmozhnoi agressii protiv Rossiiskoi Federatsii,’ [On the role and place of the Strategic Missile Forces in the prospective system of comprehensive strategic nuclear deterrence of possible aggression against the Russian Federation], *Voennaia Mysl*, 2022, no. 7 (July 2022).

¹⁸³ Roman Nogin, Dmitrii Palachev, Sergei Kornev, ‘Vozmozhnye podkhody k razrabotke kompleksa meropriatii po sovershenstvovaniiu boevogo dezhurstva v RVSN v sovremennoi voenno-politicheskoi obstanovke,’ [Possible approaches to developing a set of measures to improve combat duty in the Strategic Missile Forces in the current military-political situation], *Voennaia Mysl*, 2024, no. 9, p. 34-9.

¹⁸⁴ Roman Nogin, ‘Ob ugrozakh obiekтам Raketnykh voisk strategicheskogo naznacheniia ot udarov sredstv vozdušno-kosmicheskogo napadeniia,’ [On the threats to the Strategic Missile Forces’ facilities from air and space attack weapons], *Voennaia Mysl*, 2022, no. 5.

¹⁸⁵ Jan Henningson, *Natomedlemskapets konsekvenser i luftdomänen* (The consequences of NATO membership for the air domain), Swedish Defence Research Agency (FOI), March 2025.

¹⁸⁶ ‘Satellite Photos Show Ukrainian Drone Strike Damaged Russian Radar Station’, *RFE/RL Russian Service*, 25 May 2024; Charlie Hancock, ‘We Analyzed New Drone Footage of Ukraine’s Operation Spider’s Web’, *Moscow Times*, 4 June 2025.

¹⁸⁷ Michael Kofman, Any Fink and Jeffery Edmonds, *Russian Strategy for Escalation Management: Evolution of Key Concepts* (Washington: Center for Naval Analysis, 2020), p. 20, 22-3.

¹⁸⁸ Dima Adamsky, *The Russian Way of Deterrence— Strategic Culture, Coercion, and War* (Stanford University Press, 2023).

Reflecting on doctrinal changes made in the early 2000s one analyst has noted that the way in which nuclear weapons might be used first in any regional conflict would be context specific, but would always involve a ‘preliminary warning’ before more extensive use.¹⁸⁹

Whether this is still the primary lens through which to view Russian nuclear weapons use has been questioned in some Western writing. The emphasis on nuclear deterrence as a principal pillar of Russian security was supplemented by plans to build a different type of conventional defence force that would be more agile and not tailored to mobilising the entire society to meet the ends of a war between great powers.¹⁹⁰

In a regional war the Chief of the General Staff, Valery Gerasimov, pointed to accurate missile systems such as Iskander-M ballistic missile and the Kalibr and Kh-101 cruise missiles as evidence that ‘non-nuclear deterrence forces have gained high momentum’.¹⁹¹ The force produced by what have been labelled the Serdiukov-Makarov reforms was intended to be more compact and modern, primarily tailored to local, including internal, conflicts. However, the force failed to achieve Russia’s war aims in Ukraine. In spite of extensive use, conventional stand-off weapons have not brought the Ukrainian political leadership to conclude the fighting on Russian terms or facilitated significant breakthroughs on the battlefield.

The failure of the two central pillars of recent reform alongside Russia’s growing disadvantage in conventional air power *vis-à-vis* NATO could further emphasize the role of land-attack missiles, perhaps relying on combined missile/drone salvos, to swamp enemy defences and overcome them through weight of numbers, seems more likely than a campaign to gain air superiority.

Russian investment has produced an inventory of missile types with a spectrum of ranges, delivery systems and deployment options. However, the performance of Russian dual-capable missiles puts into question whether they can genuinely be regarded as precision weapons. Moreover, Russian targets seem to be largely restricted to identified static nodes, locations where air and missile defences are likely to be strongest.

The Ukraine experience suggests that achieving the desired impact exclusively with conventional warheads would demand very large numbers, if it can be done at all. Information published by Western intelligence agencies has pointed to the Russian development of very low yield and ultra-low yield nuclear weapons.¹⁹² Using these weapons to degrade Western air power has been argued to be ‘the inevitable opening gambit of any conflict with the West’.¹⁹³

In a 2020 analysis a ‘red theory of victory’ could be based on the proposition that ‘if war with the United States appears inevitable, it is necessary and possible to go first, to go hard, and to create a *fait accompli*’.¹⁹⁴ This would be consistent with a long-standing preference favouring offence over defence below the strategic level. Soviet thinking leaned towards the view that once the decision to fight has been made the best approach is ‘a surprise powerful fire onslaught’ with the objective of immediately inflicting a stunning blow, catching the enemy unawares, inflicting significant losses, disrupting control and thereby reducing the ability of the enemy to resist.¹⁹⁵

¹⁸⁹ Vladimir A. Zolotarev ed. *History of Russia’s Military Strategy*, quoted in Andrei A. Kokoshin, *Nuclear Conflict in the Twenty-First Century*, Belfer Center for Science and International Affairs, April 2007.

¹⁹⁰ Maria Engqvist (ed.), Jonas Kjellén, Kristina Melin, Emelie Sandvad, Carolina Vendil Pallin, *The Future of Warfare in Russian Military Thinking*, Swedish Defence Research Agency, FOI-R—5806--SE, January 2026, p. 17.

¹⁹¹ Quoted in Stefan Forss, ‘Russia’s Nuclear Arms Capability: Implications for the Nordic-Baltic Region and Beyond’, in Kari Liuhto and Joonas Sipilä eds. *Inevitable Instability in Russia*, (Springer: Switzerland 2026).

¹⁹² US Central Intelligence Agency, Office of Transnational Issues, *Evidence of Russian Development of New Subkiloton Nuclear Warheads*, 20 August, 2000.

¹⁹³ Roy Boone, David Rehbein, John Swegle, Christopher Yeaw, *The Challenge of Russia’s Non-Strategic Nuclear Weapons*, National Strategic Research Institute, University of Nebraska, 29 October 2021

¹⁹⁴ Brad Roberts, *On Theories of Victory, Red and Blue*, Lawrence Livermore Papers on Global Security, Center for Global Security Research, June 2020, p. 42.

¹⁹⁵ Andrei A. Sidorenko, *The Offensive (A Soviet View)*, Military Publishing House, Moscow, 1970 translated and published by the US Air Force in the Soviet Military Thought series, 1970, p. 121.

The strategic environment has changed quickly since 2020, and Russia has been given a great deal of food for thought from the difficulties encountered in Ukraine. The investment Russia has made to create flexible nuclear forces is likely to be an important part of Russian thinking about how to respond to change but there is not full clarity about future tendencies. Russia has built a nuclear arsenal that could be employed in different ways and ‘the evidence does not provide a basis for knowing in advance (1) whether such weapons would actually be employed and if so (2) how early in a conflict that would occur.’¹⁹⁶ However, researchers at the US Institute for Defense Analysis have pointed out two ways in which Russia might use limited nuclear strikes in a regional war scenario: (a) to achieve a psychological effect by underlining the potential for further escalation, and (b) to achieve an instrumental benefit by improving the correlation of forces in the conflict.¹⁹⁷

The psychological effect would seek to exploit potential ‘fracture lines’ within NATO by forcing the Alliance to confront a series of difficult questions:¹⁹⁸ Is the potential risk from Russian nuclear use assessed in the same way across the Alliance? Will members of the Alliance geographically removed remain in solidarity with states at the frontline of a conflict? Are Allies directly engaged in nuclear operations willing to accept increased risk? Do Allies hold a common commitment to protect the territorial integrity of all members? Russia would be playing on long-standing NATO concerns about Alliance solidarity and willingness to share risk in case nuclear weapons are used.

This use would be consistent with the way in which Dmitry Adamsky has presented the Russian concept of deterrence, emphasizing the combination and manipulation of negative incentives, threats and actions that are combined to try and shape the strategic calculus of an adversary.¹⁹⁹

In 2019 the US Defense Intelligence Agency described the modernization of Russia’s arsenal to include nuclear weapons of ‘greater accuracy, longer ranges and lower yields to suit their potential war fighting role’.²⁰⁰ Exploring the potential effect of ultra-low yield weapons researchers at the University of Nebraska simulated an attack on a German port that left the port unable to operate ‘with as few as about 300 killed and 1200 injured’.²⁰¹ Russia may believe that attacks of this kind across the Alliance would inflict ‘a dosed level of deterrent damage’ and reduce the risk of retaliation or escalation, particularly if attacks did not inflict major casualties on US citizens.²⁰²

If the construction of the Russian nuclear capability does place a question-mark against the expectation of a linear escalation dynamic, is there evidence that this change is reflected in recent guidance from senior leadership?

The 2024 iteration of Russian declaratory policy

In November 2024 President Putin published new declaratory nuclear policy that linked nuclear deterrence to additional security challenges.²⁰³ Elements of the update were made public in advance and placed in the context of Russia’s war against Ukraine and Western

¹⁹⁶ Brad Roberts, *On Theories of Victory, Red and Blue*, Lawrence Livermore Papers on Global Security, Center for Global Security Research, June 2020, p. 49.

¹⁹⁷ William A. Chambers, John K. Warden, Caroline R. Milne, James A. Blackwell, *An Assessment of the U.S.-Russia Nonstrategic Nuclear Weapons Balance*, Institute for Defense Analyses, IDA Paper P-14248, January 2021.

¹⁹⁸ Roy Boone, David Rehbein, John Swegle, Christopher Yeaw, *The Challenge of Russia’s Non-Strategic Nuclear Weapons*, National Strategic Research Institute, University of Nebraska, 29 October 2021.

¹⁹⁹ Dmitry (Dima) Adamsky, *Cross-domain coercion: The current Russian art of strategy*, IFRI Security Studies Center, Proliferation Paper No. 54, Paris, November 2015.

²⁰⁰ Quoted in Roy Boone, David Rehbein, John Swegle, Christopher Yeaw, *The Challenge of Russia’s Non-Strategic Nuclear Weapons*, National Strategic Research Institute, University of Nebraska, 29 October 2021.

²⁰¹ Roy Boone, David Rehbein, John Swegle, Christopher Yeaw, *The Challenge of Russia’s Non-Strategic Nuclear Weapons*, National Strategic Research Institute, University of Nebraska, 29 October 2021.

²⁰² William A. Chambers, John K. Warden, Caroline R. Milne, James A. Blackwell, *An Assessment of the U.S.-Russia Nonstrategic Nuclear Weapons Balance*, Institute for Defense Analyses, IDA Paper P-14248, January 2021.

²⁰³ President of Russia, *Executive Order Approving the Basic Principles of State Policy of the Russian Federation on Nuclear Deterrence*, 19 November 2024.

involvement in it.²⁰⁴ The new document extended the list of military dangers to which nuclear deterrence should adapt. A reference to adversary military infrastructure and large-scale military exercises near Russia's borders is a mirror of the way Russia itself has masked offensive operations behind large-scale exercises. Reference to the widening of adversary alliances is a warning that it remains a Russian 'red line' that Ukraine should not become a member of NATO. The reference to the isolation of parts of Russian territory can be assumed to be a reference to the enclave of Kaliningrad that would be difficult to defend using only conventional means.

These links to nuclear deterrence underline Russian concerns, but the implications are unclear. In the 2010 iteration of Russia's military doctrine 'military dangers' were differentiated from 'military threats'. In the Russian lexicon a military danger a situation that could lead to a military threat.²⁰⁵ Listing military dangers is probably best interpreted as a signal of opposition to what Russia sees as negative developments. If so, it stops short of saying explicitly that a direct military response to those developments is needed, though such a response would in any case not have been precluded in previous iterations of Russian policy guidance.

The November 2024 document underlines that in a regional war scenario preventing the loss of territory in Belarus is of a Russian vital interest. Belarus is the only country where Russia has extended nuclear deterrence in case of a large-scale conventional attack. If a conflict presented 'critical threats to the sovereignty and territorial integrity of Russia and Belarus' the use of nuclear weapons would be contemplated.²⁰⁶

Russia has announced preparations to station nuclear weapons in Belarus, perhaps to add credibility to the warning. In June 2022, President Putin announced that Russia intended to transfer the Iskander-M tactical missile system to Belarus and underlined that the missile was nuclear-capable. This would be the first such deployment outside Russia since the end of the Cold War.²⁰⁷ In March 2023 Putin announced that the missile systems had been transferred and added that Russia intended to base nuclear warheads for them in Belarus. The refurbishment of storage sites in Belarus able to receive nuclear weapons was said to have been completed in July 2023.²⁰⁸

In September 2025 the Russian Ministry of Defence underlined in a public statement that the Zapad-25 exercise included practice launches of cruise missiles from nuclear-capable aircraft flying over the Barents Sea in the vicinity of the space designated by NATO as the High North.²⁰⁹ The Belarus Ministry of Defence meanwhile explained that the Zapad-25 exercise also included practising the deployment of dual-capable missiles, including the Oreshnik missile, and the movement of Russian nuclear weapons into the country.²¹⁰

²⁰⁴ Deputy Foreign Minister Sergei Ryabkov quoted in 'Moscow Announces Enhanced Revision of its Nuclear Doctrine', *ORF*, 18 June 2024.

²⁰⁵ Carolina Vendil Pallin and Fredrik Westerlund, *Russia's Military Doctrine*, RUFS Briefing No. 3, FOI, February 2010.

²⁰⁶ President of Russia, *Executive Order Approving the Basic Principles of State Policy of the Russian Federation on Nuclear Deterrence*, 19 November 2024.

²⁰⁷ Kristina Melin, *Tools of coercion and control—Russian nuclear weapons in Belarus* (Stockholm: Swedish Defence Research Agency, 2023); Kristina Melin, *Russia's Updated Basic Principles for Nuclear Deterrence A Broom for All Corners?*, FOI Memo 8829 (Stockholm: Swedish Defence Research Agency, 2025); William Alberque, *Russian Military Thought and Doctrine Related to Non-strategic Nuclear Weapons: Change and Continuity* (London: Institute for International Security Studies, 2024), p. 11.

²⁰⁸ US Department of State, *Report to the Senate on the Status of Tactical (Nonstrategic) Nuclear Weapons Negotiations Pursuant to Subparagraph (a)(12)(B) of the Senate Resolution of Advice and Consent to Ratification of the New START Treaty*, 16 April 2024.

²⁰⁹ Tomas Nilsen, 'Two MiG-31K armed with ballistic Kinzhal missiles conduct mock strikes over the Barents Sea', *The Barents Observer*, 13 September 2025.

²¹⁰ Andrew Osborn and Mark Trevelyan 'Moscow and Minsk rehearse launch of nuclear weapons deployed in Belarus, Lukashenko says', *Reuters*, 16 September 2025.

Emphasizing the potential role of nuclear weapons to defend Belarus is perhaps further evidence that in a regional war Russia is moving away from trusting its conventional capabilities in favour of nuclear use.²¹¹

The continuous development of dual-use capabilities is consistent with the Russian emphasis on using all available instruments in a cross-domain strategy. Recent statements indicate that Russia is expanding its use of chemical agents in Ukraine from agents designed for riot control to more toxic chemicals.²¹² The experimentation with how chemical weapons might impact the battlefield in Ukraine could be another avenue for achieving military and political effects short of nuclear use.

6.4 The nuclear weapon complex: The rise of Rosatom

In 2008 Russia created the State Atomic Energy Corporation, Rosatom, in what can be seen as a next phase in consolidation. Through Rosatom Russia created greater vertical integration in the nuclear sector. The corporation was formed by merging the relevant parts of government ministries as part of the plan for privatizing the Russian nuclear energy complex. It operates as a private entity, but it also implements government decisions directly.

Responsibility for the nuclear weapons complex, control of the civil nuclear energy sector and expansion into other military and civilian activities have made Rosatom a huge conglomerate. While the Soviet nuclear weapon complex was sometimes described as a ‘state within the state’ the same epithet could be applied to Rosatom, albeit with a civil/military character. As a holding company for almost 300 research institutes, production facilities, sales offices as well as a large private security service Rosatom is the dominant player in Russia’s entire nuclear energy complex and a major domestic economic actor with significant political influence.

The Federal Law on the State Atomic Energy Corporation Rosatom delineates the boundaries of private and public activity. Rosatom took over the responsibilities of the Federal Agency on Atomic Energy, which was itself a short-lived successor to Minatom. The process of reform and consolidation produced a weapon complex that preserved key tasks intact.²¹³

Rosatom has responsibility for nuclear weapon-related research and development, surveillance of the health of the weapon stockpile (with remanufacturing and life extension when necessary), research into how nuclear material behaves in different conditions, the assembly and disassembly of nuclear weapons and the production of key components of weapons. To avoid revealing information about the composition of nuclear material in weapons Rosatom is also responsible for managing waste produced by the nuclear weapon complex separately from civilian waste.

²¹¹ Anya Fink and Michael Kofman, *Russian Strategy for Escalation Management: Key Debates and Players in Military Thought Key players and Debates* (Washington: Center for Naval Analysis CNA, 2020), p. 6-17.

²¹² *Addressing the Threat from Chemical Weapons*, Statement of Germany at the OPCW, 29 November 2023; *Statement by Dr Nikolaus Korczynski on behalf of Germany and the Netherlands*, OPCW, July 2025.

²¹³ Pavel Podvig, *Consolidating Fissile Materials in Russia’s Nuclear Complex*, International Panel on Fissile Materials, May 2009.

Table 6.1: Core Entities in the Rosatom Nuclear Weapon Complex Division

Full name	Abbreviated name
All-Russian Scientific Research Institute of Experimental Physics (FSUE Russian Federal Nuclear Centre)	FSUE RFNC VNIIEF
Sedakov Scientific Research Institute of Measuring Systems (branch of FSUE Russian Federal Nuclear Centre – All-Russian Scientific Research Institute of Experimental Physics)	NIIS (branch of FSUE RFNC VNIIEF)
JSC M.V. Protsenko Federal Scientific and Production Centre Production Company Start	JSC M.V. Protsenko FSPC PC Start
Research and Design Institute of Radio-Electronic Engineering (branch of JSC M.V. Protsenko FSPC PC Start)	NIKIRET (branch of JSC M.V. Protsenko FSPC PC Start)
FSUE Dukhov Automatics Research Institute	FSUE VNIIA
FSUE Integrated Plant Elektrokhimpribor	FSUE Integrated Plant Elektrokhimpribor
FSUE Instrumentation Factory	FSUE PSZ
FSUE Russian Federal Nuclear Centre – Academician E.I. Zababakhin All-Russia Research Institute of Technical Physics	FSUE RFNC VNIITF
All-Russian Electrotechnical Institute (branch of FSUE Russian Federal Nuclear Centre – Academician E.I. Zababakhin All-Russia Research Institute of Technical Physics)	VEI (branch of FSUE RFNC VNIITF)
High-Voltage Research Centre (division of FSUE Russian Federal Nuclear Centre – Academician E.I. Zababakhin All-Russia Research Institute of Technical Physics)	HVRC (division of FSUE RFNC VNIITF)
FSUE Mayak Production Association	FSUE Mayak PA
Bazalt (branch of FSUE Mayak Production Association)	Bazalt (branch of FSUE Mayak PA)
JSC Urals Electromechanical Plant	JSC UEMP
JSC Production Association Sever	JSC PA Sever
FSUE A.P. Alexandrov Research Institute of Technology	FSUE Alexandrov NITI
JSC Federal Centre of Science and High Technologies SNPO Eleron	JSC FCS&HT SNPO Eleron
JSC Red Star	JSC Red Star
JSC N.A. Dollezhal Research and Development Institute of Power Engineering	JSC NIKIET
JSC Scientific Production Complex Dedal	JSC SPC Dedal
JSC D.V. Efremov Institute of Electrophysical Apparatus	JSC NIIEFA
FSUE Mars Moscow Experimental Design Bureau	FSUE MOKB Mars

Source: Rosatom, List of organizations providing information using corporate reporting forms February 2020.

Rosatom is responsible for the reactors that provide propulsion for naval vessels and civilian ships such as ice breakers. Rosatom also developed the reactor that is part of the Burevestnik cruise missile, which remained in development after the August 2019 accident at the Nyonoksa test site. Following the accident testing is reported to have moved to the Novaya Zemlya test site.

Russia was a key actor negotiating the Comprehensive Test Ban Treaty (CTBT) between 1994 and 1996 and one of the first countries to sign it. When the CTBT was opened for signature Russia joined other permanent members of the UN Security Council in declaring a moratorium on nuclear weapons test explosions or any other nuclear explosions pending

entry into force.²¹⁴ However, the Russian Duma made developing of a system for simulating nuclear tests a condition for ratification of the CTBT in June 2000.

Rosatom is maintaining the capability to resume nuclear testing should a political decision be taken. In 2012, Rosatom began preparing a new site at the Russian nuclear test complex in Novaya Zemlya that might include a facility for conducting experiments that the United States regards as non-compliant with the CTBT.²¹⁵ The United States has consistently expressed concerns over alleged Russian ‘supercritical’ nuclear weapons tests in sealed containers underground and urged greater transparency.²¹⁶

US experts have pointed to the probability that President Putin would be under some pressure from the nuclear weapons establishment to resume nuclear testing given the multiple new weapon types he has authorized.²¹⁷ In February 2023 President Putin instructed the Russian Ministry of Defence and Rosatom to ‘ensure readiness for testing Russian nuclear weapons. Of course, we will not be the first to do this, but if the United States conducts tests, then we will conduct them.’²¹⁸ In a 2024 interview Rear Admiral Andrei Sinitsyn, responsible for the Novaya Zemlya test site, explained that the site was now prepared to conduct a test on receiving a political instruction to do so.²¹⁹

Rosatom plays a key role in nuclear security because huge quantities of special nuclear material are still located at sites owned and controlled by its subsidiaries. During the thorough review of nuclear counter-terrorism in the early 2000s the government acknowledged that some nuclear material was outside state control.²²⁰ To perform the task of physical protection and emergency response Rosatom created a large paramilitary security force deployed at industrial facilities, storage sites and to accompany nuclear materials (but not weapons) under transport. This large private security force operates in parallel with forces from the Ministry of the Interior, perhaps because of past concerns about a lack of professionalism in the governmental system.

As a conglomerate Rosatom has become a major investor in civilian technology with military applications through its subsidiaries and President Putin has recognized the contribution to Russia’s war against Ukraine.²²¹ Subsidiaries of Rosatom have been important in developing and producing, for example, air and missile defence systems, rocket artillery and armoured vehicles. The corporation has also expanded services such as component manufacture as a contribution to the war effort.²²²

6.5 Arms control

The change of US Administration after 2009 also saw a change in the US approach to bilateral arms control with Russia. The previous Administration saw no need for bilateral agreements beyond the Moscow Treaty, which Russian experts labelled a ‘statement of

²¹⁴ *Joint Statement on the Comprehensive Nuclear-Test-Ban Treaty by the Nuclear Nonproliferation Treaty Nuclear-Weapon States*, 15 September 2016.

²¹⁵ Jeffrey Lewis, *U.S.-Russia Test Site Transparency Measures: Avoiding a Return to the Arms Race*, Nuclear Threat Initiative, 14 November 2018.

²¹⁶ Julien de Troullioud de Lanversin, Christopher Fichtlscherer, and Frank N. von Hippel, ‘Reducing Tensions Over Nuclear Testing at Very Low Yield’, *Arms Control Today*, November 2023; US Department of State, *Adherence to and Compliance with Arms Control, Nonproliferation and Disarmament Agreements and Commitments*, April 2025.

²¹⁷ For example, former Secretary of Defence William Perry ‘Lowering Nuclear Risks’, *Arms Control Association*, January/February 2016.

²¹⁸ *Presidential Address to Federal Assembly*, 21 February 2023.

²¹⁹ Alexander Stepanova, ‘Head of Russia’s Central Nuclear Test Site on Novaya Zemlya Andrei Sinitsyn: If the order comes, we will begin testing at any moment’, *Rossiskaya Gazeta*, 17 September 2024; Astri Edvardsen, ‘All Clear for Nuclear Testing at Novaya Zemlya, Says Russian Head of Test Site’, *High North News*, 21 September 2024.

²²⁰ *Annual Report to Congress on the Safety and Security of Russian Nuclear Facilities and Nuclear Forces*, US National Intelligence Council, April 2004.

²²¹ Representative Lloyd Doggett, ‘Russia’s Rosatom Fuels Putin’s War Machine’, US House of Representatives, 9 April 2024.

²²² Catherine Belton, ‘Russia’s state nuclear company aids war effort, leading to calls for sanctions’, *Washington Post*, 20 January 2023.

intent’ rather than a treaty.²²³ President Barack Obama had a personal commitment to promoting a wide range of processes intended to reduce nuclear risks, including generating a new momentum in bilateral negotiations with Russia. The US outreach on arms control met with a positive response from the then Russian President, Dmitri Medvedev.

The Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms, known colloquially as the New START Treaty, was signed in 2010 and gave Russia and the United States a seven-year window to reduce their deployed strategic forces to the agreed levels. The strategic forces would then respect those levels for the duration of the Treaty, which entered into force on 5 February 2011 and which was originally set to expire in 2021. The expiry date was subsequently extended by five years to 6 February 2026.

The limits laid down for each party in New START were:

- 700 deployed ICBMs, deployed submarine-launched ballistic missiles SLBMs, and deployed heavy bombers equipped for nuclear armaments;
- 1,550 nuclear warheads on deployed ICBMs, deployed SLBMs, and deployed heavy bombers equipped for nuclear armaments (each such heavy bomber is counted as one warhead toward this limit);
- 800 deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers equipped for nuclear armaments.

New START included extensive transparency and verification provisions. The conversion and elimination of weapons were regulated. Data exchange and a database of treaty-required information created a shared baseline of strategic offensive forces. On-site inspections and an agreement not to interfere with aspects of national technical means to monitor nuclear forces as well as a Bilateral Consultative Commission to discuss implementation were important elements of the verification regime.

In February 2023 President Putin announced a suspension of New START while promising to continue respecting the central limits laid down in it. The Russian explanation for the decision was partly technical but mostly rested on the assertion that the United States was following an ‘overall policy line to weaken the security of the Russian Federation and “strangle” our country in political and economic terms’.²²⁴

Russia rejected a June 2023 proposal made while President Joe Biden was in office to begin negotiations on a follow-on Treaty to replace New START. The rejection underlined that Russia was not willing to decouple arms control from wider security considerations, notably progress in implementing the content of the draft documents Russia sent to the United States and NATO in December 2021.²²⁵ The Russian response also made a direct link between the resumption of arms control and the war against Ukraine.²²⁶

In September 2025 President Putin said that Russia is ‘prepared to continue observing the ... central quantitative restrictions [of New START] for one year after its expiration if the United States acts in a similar spirit’.²²⁷ The United States did not respond to the Russian proposal to regulate strategic weapons using what was, in effect, an unverified political declaration.

²²³ Alexei Arbatov, ‘Back to Arms Control?’ in *Russia: Arms Control, Disarmament and International Security, IMEMO Supplement to the Russian Edition of the SIPRI Yearbook 2007*, (IMEMO: Moscow 2008).

²²⁴ Russian Ministry of Foreign Affairs, *Foreign Ministry statement in connection with the Russian Federation suspending the Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START)*, 21 February 2023.

²²⁵ ‘Letter marked “Refused”: Why Russia Rejected the US Proposal to Launch an Arms Control Dialogue’, *Kommersant*, 18 January 2024.

²²⁶ Nicholas Lokker, *In Russia’s perceived war with the West, arms control is collateral damage*, European Leadership Network, 13 January 2025.

²²⁷ Vladimir Putin, *Opening statement to the meeting with permanent members of the Security Council*, 22 September 2025.

The expiry of New START in February 2026 was the most recent in a series of event reducing the scope of an integrated set of arms control measures including the 1987 INF Treaty and the 1990 Treaty on Conventional Armed Forces in Europe (CFE Treaty) and the 1992 Treaty on Open Skies. In early 2026 the immediate prospect for Russian engagement with negotiated reciprocal restraint on military capabilities was highly uncertain.

7 Conclusions

The brief assessment of the strategic context would suggest that at the moment the major powers are in the 'challenge' phase of a current long-cycle. Russia, along with others (first and foremost China), has worked to dilute and erode the advantages that the predominant power, the United States, tries to use to shape international affairs for its convenience. Based on the roughly 100-year duration of each long cycle the 2040s will be a time of transition, when the United States either survives the challenge or is replaced as first among equals in the hierarchy of global power.

The main hypothesis of this report was that nuclear weapons would be one main instrument that Russia would use in the effort to challenge US predominance. The way in which Russian nuclear plans, policies and capabilities have developed does seem broadly consistent with what long-cycle theory would predict. Key decisions that altered the trajectory of Russian nuclear posture have coincided with important discontinuities in major power relations.

Although Russia has a preference for continuity and systematic implementation of plans, each time that the country has experienced a major shock nuclear forces have been instrumental in shaping the response. To Western eyes and ears the underlying premises on which Russian nuclear policies have been based have seemed either poorly informed or incorrect. However, those policies were usually internally consistent and had a logic that can be assessed on its own terms.

The first shock was the almost simultaneous collapse of the Warsaw Treaty Organisation and the dissolution of the Soviet Union at a time when the United States was demonstrating how effective its technological advantage could be in wartime. In response, Russia designed more creative uses for the strategic arsenal that was still reliable at a time of upheaval in the armed forces.

The two most important changes were the recognition that Russia, and not NATO, might be the first to use nuclear weapons in a regional war and the associated imperative to think through the implications of limited nuclear use. One important result was to replace certainty with uncertainty. Soviet war plans guaranteed a large-scale nuclear response to what was expected to be first use of nuclear weapons by NATO. The new approach was based on creating uncertainty in the mind of the adversary about how Russia would respond to any aggression.

The process of assessment required changes in the nuclear arsenal to provide the supreme command authority with a broader range of choices around the employment of nuclear weapons. After the collapse of Soviet military power other changes were needed to assure the survivability of nuclear forces. A rebalancing of the nuclear force included more emphasis on mobile weapons within the overall mix and a range of warhead configurations to enable a spectrum of use from demonstration explosions of low-yield weapons to large barrages of multi-megaton weapons.

A second discontinuity was the combined effect at the end of the 1990s of a change in European strategic geography as the result of NATO enlargement; a financial crisis; and the risk that internal conflict could spill over to neighbouring regions. Russia designed a new approach to the use of non-strategic nuclear weapons in a regional war to compensate for the significant overmatch in conventional forces enjoyed by NATO.

Russia has built a large, diverse and flexible nuclear arsenal but today it must adapt to a new strategic shock in Europe and a rapidly evolving global security environment. The bilateral paradigm that has largely shaped the global nuclear order is being overturned by the expanding Chinese arsenal. Today escalation to nuclear use in a Sino-American war is a planning scenario for both countries. The kinds of cooperation with China that would be in Russia's interest in different scenarios as well as the degree to which Russia must 'hedge' against a future deterioration in Sino-Russia relations must be under consideration.

The outcome of the war with Ukraine is uncertain and Russia must think through what to do if it becomes clear that war aims can never be met using conventional means or, in a more extreme scenario, if Russian gains were being reversed. Outwardly Russia has continued to maintain that there is no need to use nuclear weapons to achieve its war aims, but as the conflict extends into the future that must be kept under review. Moreover, aggression against Ukraine has awakened NATO Allies to the potential consequences of Russia's investment in nuclear forces tailored for regional war. Western states have begun to think more deeply about how to respond and the European strategic environment is certain to be unstable for at least the next decade.

As the boundaries blur between the local, regional and global war classification that Russia has applied in its nuclear weapons doctrine it may be harder to say with confidence how Russia will act beyond saying that nuclear weapons will continue to be central to Russian security and defence. It seems safe to conclude that Russia will continue to invest in nuclear weapons with range parameters and performance characteristics that escape from the method of classification familiar from the past. In the process distinctions between strategic and non-strategic weapons are also being blurred if not erased.

Assuming that some change is believed to be necessary Russia is not locked into a single pathway. Increasing the size of the nuclear arsenal; returning to a more traditional approach to arms control; and modifying how nuclear weapons are used in a period of neither peace nor war and in wartime are all potential options.

7.1 Increasing the size of the nuclear arsenal

Nuclear forces have had preferential access to finance, and the Russian nuclear weapon complex has been recapitalized to support the existing arsenal and to develop the range of weapons needed to arm the delivery systems revealed in Presidential speeches. Rose Gottemoeller has asserted that because the Russian nuclear establishment is more agile than its US counterpart, Russia might be able to 'sprint away' from the United States by uploading warheads.²²⁸

Parity (but not symmetry) with the United States has been an important guideline for Russian strategic forces. Uploading additional warheads into existing missiles could signal the intention to maintain rough parity with both China and the US for the short term. However, the impact of the so-called 'three body problem' on Russian thinking is not known and will depend to a degree on the US response to the growth in Chinese nuclear forces. Maintaining broad parity with two nuclear peers over the medium to long-term would impose a heavy burden.

Russia has a complex capable of producing more warheads and an industry that can make more delivery systems for them. Moreover, the Russian military establishment enjoys privileged access to national wealth. However, the imperative to meet wartime needs might mean that even in a 'time of plenty' Russia has to balance different military priorities.

From a military-technical standpoint Russia could increase the number of warheads on silo-based missiles as the quickest route to a larger strategic arsenal but a further extension for the heavy Voevoda missile would mean taking the missile far beyond its anticipated service life. There are still problems reported in the successor Sarmat programme and the submarines that carry the Bulava are being constructed at a slow pace.

Investing in large silo-based missiles that can accommodate many warheads would be one way to increase warhead numbers at a time when China and the US are modernizing their nuclear arsenals. However, the number and location of missile launch silos would not change. Therefore, the question of how adversary plans would be offset could be seen to remain unaddressed.

²²⁸ Testimony of Rose Gottemoeller to the *Hearing before the Senate Armed Services Committee Concerning strategic competition in an unconstrained, Post-New START Treaty environment*, 3 February 2026.

As described earlier, Russia placed a heavy emphasis on road-mobile missiles with multiple warheads to create confidence in a second-strike capability. Recent investment has emphasized defending these assets in near-war conditions, dispersing them without detection and keeping them under secure central command and control to ensure their availability for use.

The development of nuclear-capable air- and sea-launched weapons with longer (but less than intercontinental) range has become a high priority. Russia has explained that shorter and intermediate range weapons can have strategic effects. The continuous investment in an arsenal of weapons with different operational ranges and a variety of yields launched from a diverse set of platforms could make traditional classifications of 'strategic' and 'non-strategic' redundant.

It is not clear whether these kinds of nuclear delivery systems will be a relatively small share of the nuclear arsenal or if they are seen as part of the 'backbone' of a future strategic nuclear force designed to defeat enhanced US missile defences. Whether the Russian missile production system is agile and large enough to switch production to larger numbers of long-range land attack cruise missiles of different kinds while still producing other strategic weapons is unclear.

7.2 A return to negotiated restraint

In September 2025 President Putin noted that a complete renunciation of the legacy of nuclear arms control would be a grave and short-sighted mistake and that he saw value in 'an acceptable degree of predictability and restraint' at a turbulent time.²²⁹ Returning to a more traditional approach to arms control might be seen to be in Russia's interest if the alternative is trying to keep pace with increases in the Chinese and US nuclear arsenals.

The obstacles to further progress in arms control are formidable but the sincerity of the Russian approach can also be challenged. The offer of an unverified political declaration as the instrument to regulate strategic nuclear arsenals and maintain deployed forces at New START levels could be consistent with deception.

In this case Russia would rely on the tendency for the US to implement agreements in good faith, including those that are politically but not legally binding. By inhibiting steps that the US might take to move beyond New START limits Russia would more quickly bring its Chinese partner to broad parity with the United States. Resisting verification could allow Russia to either begin expanding its own forces beyond agreed limits undetected (or with a degree of deniability) or to make preparations for a rapid expansion when a political moratorium expired.

President Putin has continuously linked the possibility of a transition to substantive strategic dialogue with the United States to broader steps to remove 'core security contradictions.' This linkage creates an obstacle to progress while Russian demands for change remain maximalist, and the United States did not find the proposal for an unverified political declaration on nuclear forces convincing enough to be worthy of any response.

If new negotiations were to be possible Russia knows that some of its objectives, such as rolling back missile defence initiatives or restricting advanced US conventional capabilities, are improbable outcomes unless it was willing to surrender the progress made over three decades in tailoring its own nuclear force to current strategic conditions. Notably, Russia is not likely to be ready to concede on predictable US demands for the inclusion of non-strategic nuclear weapons in any future agreement.

²²⁹ Vladimir Putin, *Opening statement to the meeting with permanent members of the Security Council*, 22 September 2025.

7.3 A different approach to the use of nuclear weapons

President Putin was highly influential in building the large, flexible Russian nuclear arsenal and there are some indications of how his thinking has evolved. For an extended period the main characteristics of the bilateral nuclear paradigm were to induce caution, avoid direct confrontations that could increase the risk of nuclear weapon use and recognize the benefits of cooperative management alongside unilateral restraint.

The likelihood of a great power war with existential stakes is still considered remote, but Russia has moved away from the previous approach in favour of coercive rhetoric, greater tolerance of risk and a retreat from arms control. Russia might address uncertainty by continuing to manipulate risk to further its objectives. Recent declaratory policy statements already hint that nuclear use could be considered in a wider range of scenarios than previously anticipated. The assessment of the role nuclear weapons play in the war against Ukraine would have to include the diminishing impact of threats that are not followed by actions, particularly as NATO appears relatively unmoved by posture changes such as the development of cooperation with Belarus.

Russia also has to consider the military operational implications of changes underway in Europe. The effectiveness of NATO conventional capabilities that target dual-capable air, land and sea-based missile launchers will increase in the coming years with the widespread introduction of modern combat aircraft and longer-range conventional precision strike missiles. Russian plans based on attacking stationary nodes that are important to NATO operations are likely to be undermined by new plans for dispersal of assets, strengthened missile defences and redundancy.

Nuclear coercion could aim to reduce the solidarity that underpins deterrence among US Allies, divide political opinion and induce fear in the population of Western states. There is an inherent asymmetry in the approach to non-strategic nuclear weapons in Russia and in NATO. Promoting Alliance solidarity is their main purpose for NATO, but the issue is different for Russia. Coercive rhetoric might reveal a pre-existing Russian position for political effect, but it could signal a greater willingness to use nuclear weapons to shape the battlefield in a regional conflict where Russia determines that it has a vital interest at stake.

Threatening the early use of nuclear weapons at scale is the main scenario of concern. Russia may decide that current thinking around the level of nuclear ‘dosing’ that is appropriate in a regional war scenario a decade from now needs to be revised. A regional war with global implications would be consistent with a ‘theory of victory’ that overturns the linear model of escalation from conventional to nuclear use and from nuclear demonstration to nuclear attack.²³⁰

Long-cycle theory predicts that a challenge to the United States will occur in the coming 15-20 years, but under present conditions it will be mounted by China not Russia. The dynamic security environment with new regional security challenges, changing strategic geography and competing priorities for limited resources might have put Russia at a new inflection point regarding the role of nuclear weapons in national security and defence.

Historical precedent suggests that Russia will currently be engaged in a serious and professional internal process of understanding and adapting to change, and that nuclear weapons will play a central role in that discourse. It is not clear whether announced changes in declaratory policy have already translated into changes in plans and posture. However, exploiting an expanded nuclear arsenal to intimidate seems a more likely pathway than either new programmes that try to mirror the pace of the Chinese build-up or returning to arms control.

²³⁰ Brad Roberts, *Between Tragedy and Catastrophe: Taking intra-war deterrence seriously*, Center for Global Security Research, Lawrence Livermore National Laboratory, September 2025.

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