Running to Stand Still: Russian Nuclear Modernization after New START

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February 13, 2026

John Maynard Keynes once wrote, "The difficulty lies, not in the new ideas, but in escaping from the old ones": an apt depiction of the current discourse and debate of what the world will look like now that the New Strategic Arms Reduction Treaty (START) treaty has expired. The passing of New START marks the end of treaties formally limiting strategic nuclear weapons between the United States and Russia. While there are still a few multilateral agreements — like the Outer Space, Seabed, and Moon treaties — along with deals on missile launch notifications, for all intents and purposes traditional arms control between the United States and Russia is done.

The question is what now?

Some think that, without binding arms control, a new arms race is likely. This view suggests that U.S., Russian, and Chinese nuclear arsenals essentially pose a three-body problem, whereby nuclear force buildups are inevitable as one actor reacts to the decisions of another. Others like Heather Williams posit

the opposite: “The end of New START does not augur the start of an arms race.”

This is not uncharted territory, but it might as well be, since most professionals working these problems have only known a time when there was bilateral arms control with Russia. In the defense analytical community, foretelling arms races is more art than science and often suffers from if-should problems (the conflation of prediction with preference). To put it another way, predictions depend in part on whether you see the problem through the lens of disarmament, deterrence, or pursuing nuclear primacy. This is why for some the end of New START is a tragedy, and for others it offers the United States new opportunities.

Yet while many mourn the passing of the main pillar of arms control with Russia, it’s not clear why we’re destined to bear witness to a new arms race. Moscow will tread likely with care (on this issue, if not with others), focusing on maintaining its status as a nuclear peer to the United States, and ensuring it has enough hedge in the event the United States achieves technological breakthroughs in missile defense or counterforce capabilities. That’s not a radical shift, but more of the same. On paper, Russia appears advantaged because it is ahead in nuclear modernization compared to the United States. Frankly, compared to Russia and China, the United States is behind. However, Russia is ill positioned to sustain an arms race when considering its defense industrial constraints, the state of its economy, and the looming costs of reconstituting its conventional forces after the Russo-Ukrainian War.

Moscow continues to hold an advantage in non-strategic nuclear weapons and the diversity of delivery systems it has available for theater nuclear employment, which were never covered by the New START treaty. New START did nothing to limit this part of the force. Continued Russian investment in nuclear weapons meant for theater employment, along with China’s, had spurred conversations in the United States on the need for greater force diversity to deal with the present asymmetry in forces. Under Secretary of State for Arms Control Thomas DiNanno emphasized this very problem at the most recent conference on disarmament in Geneva, saying that Russia “modernized and expanded those nuclear forces,” which constituted “an intolerable disadvantage” for the United States since most of our deployed nuclear weapons were subject to New START and a large part of Russia’s arsenal wasn’t.

Although the conventional wisdom holds that Russia has an initial advantage in nuclear modernization and warhead production, and could therefore quickly build up its nuclear forces, the reality is that Russia is not meaningfully advantaged post-New START. As DiNanno recently stated, America “retains non-deployed nuclear capacity that can be used to address the emerging security environment.” Whatever bluster may come from Moscow, Russia will seek to avoid an expensive quantitative arms race. The Russian military can add warheads to currently deployed missiles, but it will struggle to expand the actual number of deployed launchers. Current Russian programs to replace existing heavy intercontinental ballistic missiles are far behind schedule. New ballistic missile submarine production is slow, although comparably fast to new heavy bomber production, which is near nonexistent. Meanwhile Russia’s novel nuclear weapon systems like Poseidon, Avangard, and Burevestnik, will be deployed in small quantities and do not alter the existing dynamic in the strategic nuclear balance.

In short, Russia has cheap ways of maintaining deployed warhead parity and has already spent billions on a hedge against missile defense systems the United States has not yet developed. This means that significant shifts in Russian nuclear forces are unlikely in the future. The Russian constraint on means of delivery is much more relevant for U.S. counterforce considerations, since the number of warheads Russia uploads does not change the number of launchers the United States must hold at risk. This may be why Moscow has proposed a moratorium on quantitative force expansion even after the treaty expires for at least one year. Russian President Vladimir Putin has regularly praised the treaty, and offered to maintain New START quantitative limits.

There are rumors that talks are under way between Washington and Moscow on a deal to continue observing the treaty limits after expiration for at least another six months, but most likely this is also another case of the Trump administration's left hand not knowing what its right hand is doing.

Given Russia's constraints, and rather different force requirements from the United States, it's not clear why Moscow would want an arms race. This might be why Russian Foreign Minister Sergei Lavrov reiterated the offer recently to observe treaty limits — and to position Moscow publicly as interested in arms control, even as it continues to modernize its nuclear force. Washington extends nuclear deterrence to a large network of allies in different parts of the world, Russia does not. Notably, China is now a growing factor in U.S. nuclear strategy, which historically had focused on deterring Russia. The current U.S. position is that future arms control must include Russia and China, not harm U.S. interests or ignore noncompliance, and Washington will negotiate from a "position of strength."

Slogans are not strategy, but the present will likely mark the low point of deployed nuclear arsenals, as the world witnesses a new period of nuclear modernization, force expansion, and possibly proliferation. Russia stands to gain nothing from these developments, and if anything will find itself reacting to them, seeking to maintain parity as cheaply as possible while hedging against developments that could threaten arsenal survivability.

Arms Control with Russia: What is Dead Can Never Die

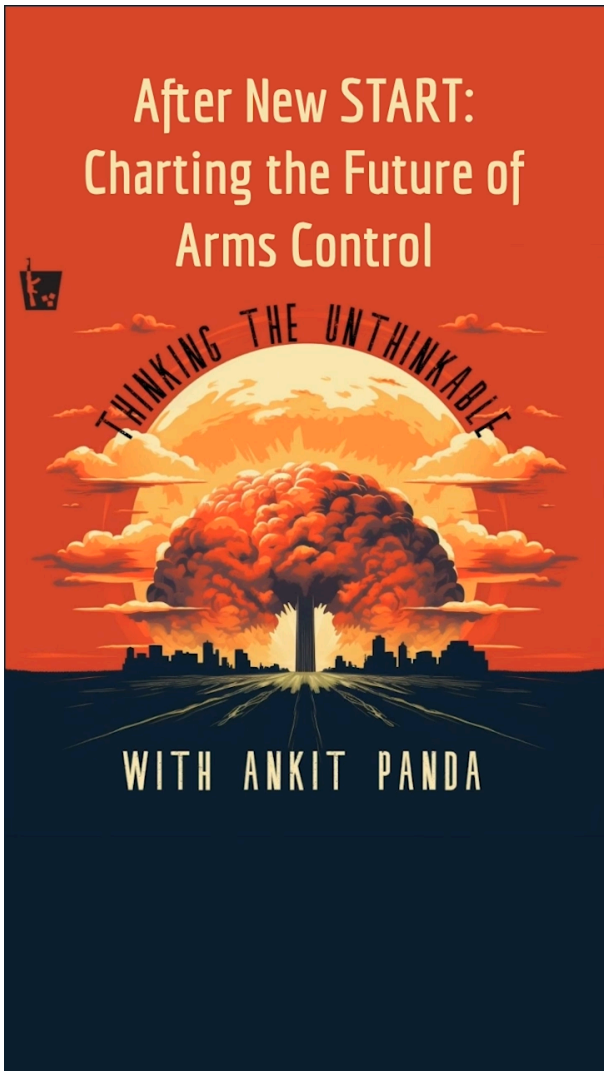
Bilateral arms control with Russia had been fraying since the early 2000s, and in recent years had been on life support. The United States withdrew from the 1972 Anti-Ballistic Missile Treaty in 2002. Russian violations led to the U.S. withdrawal from the Intermediate-Range Nuclear Forces treaty in 2019. New START was the last major arms control treaty between Russia and the United States. This left New START as the main agreement featuring on-site inspections for verification of limits on warheads and launchers. Signed in 2010, it went into force on Feb. 5, 2011 with limits to be met by the same date in 2018. Russia and the United States extended the treaty for five years in 2021. New START limited each side to

700 deployed intercontinental ballistic missiles, submarine-launched ballistic missiles, and nuclear-capable heavy bombers; 1,550 nuclear warheads deployed on those systems, with each heavy bomber counted as one warhead; and 800 total launchers, deployed and non-deployed, for intercontinental ballistic missiles, submarine-launched ballistic missiles, and nuclear-capable heavy bombers.

Despite its successes, the New START treaty had for some time been a dead man walking. The treaty required 18 on-site inspections per year, and a total of 328 inspections had been conducted since it was signed. The treaty also provided for annual notifications, telemetric information exchanges, and a semiannual Bilateral Consultative Commission. However, in March 2020 scheduled inspections were suspended due to the COVID-19 pandemic. Following its invasion of Ukraine, Moscow began visibly dragging its feet on renewing inspections. In August 2022, Russia extended that suspension by blocking U.S. attempts to conduct onsite inspections, claiming that the United States tried to do it without prior notice. Later that year it postponed on short notice its participation in the Bilateral Consultative Committee as well. This behavior eventually led the State Department to declare in January 2023 that Russia was not complying with the terms of the treaty.

In effect, Moscow had been looking for reasons to not renew onsite inspections for several years when Putin announced on February 2023 that he was suspending Russia's participation in New START. This is in some ways ironic, given the United States has historically had better means of national technical intelligence and was less dependent on inspections into the state of Russia's strategic nuclear forces (which reporting at times suggests). In its efforts to leverage arms control as part of a broader conversation on Ukraine and U.S. military support for Kyiv, Moscow was largely spiting itself.

That behavior had been consistent with prior Russian arms control violations or unilateral suspensions. Most recently, Russia is also on a path to violate the Outer Space Treaty by developing a nuclear anti-satellite weapon to be employed space. Over time, this has poisoned the well in U.S. policy circles among those interested in pursuing arms control with Russia.



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Does Russia Have the Advantage?

Some of the best work on Russian nuclear weapons has been done by Hans Kristensen, along with Matt Korda. Their annual publication on Russian nuclear weapons for 2025 estimates that Russia has 1,718 strategic warheads deployed, with 870 on intercontinental ballistic missiles, 640 on submarine-launched ballistic missiles, and over 200 at heavy bomber bases. They estimate that Russia "could theoretically upload hundreds of warheads onto its deployed delivery systems, potentially increasing its deployed

nuclear arsenal by up to 60 percent." Some of that could take days or months, but ultimately this would require several years to do across the force. Russia also has a robust warhead manufacturing complex, because as Oleg Bukharin noted back in 2002:

> manufacturing and technology problems that limit the lifetime of Russian warheads to 10 to 15 years and because of stockpile management practices that emphasize routine rebuilding of nuclear warheads, the Russian complex also maintains high levels of production.

This asymmetry has continued to this day: Russia's warhead manufacturing complex yields a greater ability to produce, or reassemble warheads, while the United States maintains a stockpile which also enables uploading options.

However, the last State Department release on aggregate numbers under the New START treaty in September 2022 showed the United States at 659 deployed intercontinental ballistic missiles, submarine-launched ballistic missiles, and heavy bombers — while Russia was at 540 — with 1,549 deployed warheads (again, the actual count is higher since the treaty counted bombers as one warhead). There was greater parity in deployed and non-deployed launchers with the United States at 800 to Russia's 759. This is the crux of the issue for Russian nuclear forces, which were nowhere near the 700 deployed limit of the treaty a few years ago. Although Russia has invested heavily in nuclear modernization, the guiding philosophy was replacing Soviet missiles with modernized variants, but not necessarily a one for one missile replacement. Hence the force is more modern, but the number of deployed missiles and bombers has not expanded.

Ukraine's attack against Russian airbases in 2025 removed a further nine heavy bombers from the operational fleet. At current rates of bomber production, which can at best be called artisanal, it will take Russia that many years just to replace what was lost in 2025 and the fleet may shrink before it grows in size. Russia's ability to upload more warheads onto the same number of launchers and bombers does not significantly change force requirements for the United States. This may be why nuclear expert Frank Miller in a recent discussion shrugged at the proposition of Russia uploading warheads: "and to be perfectly honest, that doesn't bother me one bit."

Of course, with warhead upload capacity the devil is in the details. There are technical constraints which are not publicly known, defense industrial limitations, and tradeoffs to uploading like missile range. Optimization requires a combination of loads rather than stacking missiles with the maximum number of warheads possible on paper.

Russian development of novel nuclear weapons and intermediate range systems is concerning, but here too Russian nuclear force expansion would face tradeoffs. For example, production of the intermediate range ballistic missile Oreshnik will likely come at the expense of building more RS-24 Yars (SS-27 Mod 2) for road-mobile intercontinental ballistic missile units since they are made at the same plant. So far Russia has produced three to four Oreshniks (and fired two), which appears to be a fairly low production rate.

Russia plans to deploy the Poseidon strategic nuclear torpedo on the Belgorod and Khabarovsk submarines, but this is a boutique capability that offers an alternative second or third strike option for Russian forces, without changing the military balance. As a strategic nuclear weapon, Poseidon holds at risk coastal cities on the off chance they survive a traditional second strike by ballistic missiles. Given how long it takes Russia to build submarines, it's doubtful it will even build the four currently planned Poseidon carriers. The main bottleneck remains missile and submarine production.

A brief look at the Russian navy would show that it has in active service eight Borei-class ballistic missile submarines, and five aging Delta IVs which are steadily being replaced. There are plans to build a total of 14, but the program, like all Russia's shipbuilding programs, has been marked by delays. The Boreis (particularly the Borei-A modification) have taken seven to eight years to build, a production rate that does not bode well for rapid force expansion. Like everything else, they too are delivered often at least year late. At current rates Russia will be busy replacing Deltas, the youngest of which is 36, well into the 2030s. Russia's RS-28 Sarmat, a heavy liquid fueled intercontinental ballistic missile intended to replace the SS-18, was scheduled to enter service in 2018, but has suffered from repeated delays, cancellations, and failed tests. Even when deployed, it will carry the same number of warheads as the R-36M2 (SS-18) it is meant to replace. Russia's hypersonic boost glide vehicle, Avangard, which is currently deployed on the SS-19 is going to take away from some of those numbers as it was ultimately meant to be deployed on the RS-28 Sarmat.

Russia continues to test Burevestnik (NATO reporting name Skyfall), a ground launched nuclear powered cruise missile, but it too has had a very rocky development phase, and it's unclear whether it can be produced in significant numbers. Deploying more novel nuclear weapons, designed as a hedge against U.S. breakthroughs in missile defense, will take resources away from expanding other parts of the strategic nuclear force. Many of the other Russian modernization investments went into infrastructure upgrades and to deploy additional capabilities to Russia's Strategic Rocket Forces regiments, like the Peresvet laser to dazzle satellites.

The bigger issue, which was not constrained by New START, is Russia's diverse and rather modern arsenal of non-strategic nuclear weapons. The United States estimated Russia's non-strategic nuclear weapons inventory at 1,000 to 2,000 nuclear weapons, but anticipated growth such that this arsenal could exceed the deployed strategic nuclear warhead count. In some categories production of means of delivery has increased severalfold. For example, Russia made around 72 Iskander-M short-range ballistic missiles per year prior to the war, and now produces in the 500 to 600 range annually. Russian production of most precision guided munitions has increased considerably since 2022, including new variants and types of standoff capabilities that did not exist prior to the war. Hence Russia's real force expansion capacity lies in theater range nuclear weapon systems, which were previously unconstrained to begin with.

Unsurprisingly, Moscow may want to lock down strategic force expansion by offering a moratorium, while continuing to build out its advantage in non-strategic nuclear weapons.

The United States also has options, as Williams lays out in a recent piece. These include uploading warheads on existing systems, more forward deployed or deployable systems in theater, and expanded modernization programs with more B-21 bombers or ballistic missile submarines. Some like Greg Weaver argue for the United States to revert submarined ballistic missile launchers on current ballistic missile submarines, upload Minuteman III intercontinental ballistic missiles, and convert additional B-52 bombers to nuclear delivery roles. All of this would take years. While the United States is advantaged in both technology and capital, U.S. nuclear modernization isn't exactly proceeding without its own delays and cost overruns. The Columbia-class next generation ballistic missile submarine is facing 17 month delays. The LGM-35A Sentinel intercontinental ballistic missile is facing both delays and major cost overruns, largely tied to the need to build new silos. Albeit for different reasons, the U.S. Air Force and Russia's Strategic Rocket Forces are in a tight competition for who can perform worse in delivering the next silo-based intercontinental ballistic missile. It's an inauspicious start to the much anticipated arms race.

Deterrence is Expensive but Parity is Priceless

Other than the Russian Strategic Rocket Forces, which continue to argue for an expanded mission, there aren't obvious endogenous factors for Russian force expansion. Doctrinally, most of the evolution in recent decades had been on the utility of nuclear weapons in escalation management and limited nuclear war. This chiefly concerns Russia's non-strategic nuclear arsenal and its utility in theater warfighting scenarios, or calibrated escalation. Russia's strategic nuclear force requirements are still pegged to inflicting unacceptable damage, but much of the Russian military writing suggests that how unacceptable is defined, and the number of warheads required to inflict it, has been steadily revised down over time. In the past decade more flexible and subjective criterion have also emerged like "assigned damage" and

"deterrent damage," though more applied to limited employment scenarios. Russian nuclear doctrine seems more concerned with ensuring its forces can affect assured retaliation much more so than the U.S. fixation on damage limitation and its associated counterforce requirements.

Although what evidence is available remains at best incomplete, doctrinal changes have probably decreased rather than increased the retaliatory requirements for Russia's strategic nuclear forces. Where Russian concerns lie is in survivability, and the pervasive fear that some combination of a conventional and nuclear first strike could neutralize its arsenal. This is also probably why Moscow seems leless concerned about Chinese nuclear force expansion, which the United States has taken to calling "historic." The prospective Chinese nuclear buildup, which could reach 1,000 deployed strategic warheads by 2030, would be considered a rounding error in Soviet stockpile management during the Cold War. Because the United States and Russia have a somewhat different philosophy and approach to nuclear force requirements, it's unclear why an action-reaction mechanism will dominate future force modernization decisions, leading to a quantitative arms race.

From a resource perspective, the Russian economy is no position to support an arms race. From economic stagnation, low oil prices, and regional budget crises to annual tax hikes, it is now in a negative cycle. On top of maintaining the already expanded Russian military, which is currently consuming 40 percent of government spending, Russia is unlikely to afford a substantial nuclear force expansion. Nuclear weapons are relatively cheap, but delivery systems and the infrastructure required to support them are not. It is difficult to say with much confidence how much Russia spends on nuclear weapons, related infrastructure, and the 12th Main Directorate of the Ministry of Defense, which is the directorate responsible for storage, maintenance, and transport of Russia's nuclear arsenal. Julian Cooper in 2018 made a noble effort, conservatively estimating that total spending on nuclear weapons amounted to 18 percent of the Russian defense budget and almost 16 percent of total military related expenditure (a much broader category). Historically, Russia has prioritized nuclear weapons within the defense budget, and so if push comes to shove, they will find the money, but it will come at the expense of conventional force modernization and rearmament.

Initially, Russia will find itself in a reactionary role and focus on retaining parity. Arms control was first and foremost a political process, even if the experts focused on warheads, launchers, and verification regimes. It emerged in the late 1960s after the Berlin and the Cuban Missile crises. What began as a hotline agreement, eventually led to the Strategic Arms Limitations Talks, Strategic Arms Reduction Treaties, the Moscow Treaty, and New START. Politically, the expiration of New START is much worse for Russia's status and perception of its position in international politics than it is for the United States. Moscow remains status driven, ever searching for the recognition the Soviet Union earned during the 1969-1979 period of détente. Bilateral arms control enabled Moscow to claim that it still occupies a special place on the international arena and holds responsibility for international security alongside the United States because of said arms control agreements — though in its behavior it demonstrates the opposite.

Even if Russia was in no way America's equal, these arrangements remained important not just for practical reasons, but also because of the status they conferred onto an elite constantly searching for recognition. As long as bilateral arms control remained with the United States, then something too remained of Soviet status. This is why, whether requirements call for it or not, Moscow will work to maintain nuclear parity with the United States — at least in deployed warheads — for as long as possible. How Russia responds to changes in U.S. forces remains contingent on the options the United States elects, but America is also operating within a host of defense industrial and economic constraints. Rather than an arms race, what we may see is a slow U.S. build up to address deterrence concerns posed by China's and Russia's nuclear arsenal, along with greater force diversification to redress the current imbalance in theater nuclear weapons. Russia can respond relatively cheaply by uploading warheads to existing missiles, while continuing to retain the edge in non-strategic nuclear weapons, and investing in novel systems that hedge against U.S. counterforce developments. This would not necessarily spur additional U.S. responses because it won't significantly alter force requirements for Washington. U.S. investments in theater nuclear weapons will be redressing what is already a heavily slanted asymmetry, and likely will still leave Moscow a considerable edge.

Of course, there is a school of thought that assumes an arms race will ensue any time the United States does something with its arsenal, even if it is to redress disparity or respond to the nuclear force developments of other states. Those fears may prove founded, but changes to U.S. forces are unlikely to engender a major departure from the current path of Russian force modernization. Industrial and economic constraints will impose limits on what Russia can pursue, and internal doctrinal discourse doesn't suggest that Russian force requirements will suddenly grow far above where they have been.

Arguably, both countries have evolved from simplistic quantitative calculations at the center of their thinking about nuclear deterrence and relative advantage. If so, this will be tested in the years to come. Admittedly, some nuclear primacy arguments still suffer from more is more thinking, fixation on capability gaps, and unnecessarily onerous assumptions about force requirements that combine Russian and Chinese arsenals. Similarly, arguments that presume an arms race is inevitable in the absence of arms control may run headlong into a scenario where there is no destabilizing arms race at a time when there is no arms control.

Ultimately, defense planners in Russia, China, and the United States will have to grapple with DiNanno's question in Geneva, "How much deterrence is enough?"

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