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NUCLEAR ARMS CONTROL WITHOUT A TREATY?

RISKS AND OPTIONS AFTER NEW START

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Approved by:

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A handwritten signature in black ink that reads "Ken G. Gause".

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EXECUTIVE SUMMARY

This report explores risks and US policy options for a specific scenario: The New Strategic Arms Reduction Treaty (START) expires with no follow-on treaty in tow. We identify the key risks and uncertainties the United States and Russia would face after New START and develop a portfolio of policy options for mitigating them. We also identify the impact US-Russian nuclear dynamics after New START may have on China's nuclear policy and posture, and then explore potential policy options for the US-China relationship. By exploring the risks of a world without a treaty, as well as the value and limitations of arms control options outside of a treaty framework, this report also provides a frame of reference as the United States and Russia prepare for the near-term decision on New START extension and the longer-term decision on how to approach its eventual expiration.

Our working definition of arms control for this study is any form of cooperation between potential adversaries designed to reduce the risks of war and nuclear escalation and/or restrain arms competitions. When we use the term “nuclear arms control without a treaty,” we are referring to cooperative options that serve these objectives through means other than a treaty.

In practice, the United States has relied upon strategic nuclear arms control with Russia to further these objectives by fulfilling one primary role and two secondary roles in US strategy:

- Primary Role: Fostering a predictable nuclear relationship with Russia through transparency and binding constraints on nuclear forces.

- Secondary Roles: Strengthening US nuclear non-proliferation strategy and contributing to sustaining US extended deterrence and alliance solidarity.

RISKS AFTER NEW START

If New START expires without an imminent replacement treaty, the United States would face increased risks and uncertainties in its relationship with Russia, its nuclear non-proliferation strategy, and its ability to sustain solidarity within the North Atlantic Treaty Organization (NATO).

From Transparency to Opacity

Without New START's cooperative transparency practices, the US intelligence community would likely devote more resources to monitoring Russian strategic nuclear forces but have less insight and less confidence in its analytical judgements. The United States would face an opportunity cost of diverting scarce national technical means (NTM), such as satellites, and technical analysts from other missions. Russian defense officials would also navigate increased uncertainty and lose the ability to confirm that the United States has not reversed its New START reductions. Neither country would have the same degree of confidence in its ability to assess the other's precise warhead levels. Worst-case scenario planning is also more likely as a result.

Over the longer term, both countries are likely to face greater uncertainty about each other's strategic nuclear forces and operations. Understanding of day-to-day postures and movements of forces will diminish and both will have less insight into the characteristics and

operations of new strategic nuclear systems. Based on current trends, increased opacity between US and Russian strategic nuclear forces would unfold within the broader context of growing mistrust and diverging perceptions about strategy, intentions, and capabilities.

No Constraints on Strategic Nuclear Forces

The loss of legally-binding constraints on US and Russian strategic nuclear forces would also confront each country with near- and long-term risks and uncertainties. In the mid-to-late 2020s, both countries will have the capacity to exceed New START limits in different ways. Each can increase their available warheads by hundreds, but neither has the capacity to significantly alter the relative balance by exceeding New START limits if the other chooses to do so as well. Based on their existing policies, however, both countries would have logical reasons to increase strategic nuclear force levels as a hedge against the other surpassing the New START limits. The loss of New START's transparency measures exacerbates this dynamic. Compounding uncertainties, such as US and Russian strategic nuclear force levels and investments in the 2030s, cloud assessments about an unconstrained US-Russian nuclear relationship over an extended period of time.

Challenges to Nuclear Non-Proliferation and Extended Deterrence

Washington and Moscow would face heightened credibility challenges within the Nuclear Non-Proliferation Treaty (NPT) and would no longer have their bilateral arms control framework as a tangible example of cooperation under their Article VI obligations to work toward complete nuclear disarmament. The narrative of a renewed arms race could fuel discontent within the NPT and

elevate alternative mechanisms, such as the Treaty on the Prohibition of Nuclear Weapons, that would be less effective for reducing nuclear risks and could have counterproductive consequences.

If US allies perceive the United States as mismanaging its relationship with Russia and failing to put forward a serious nuclear risk reduction strategy, it would also face greater challenges uniting NATO around a common security strategy. Some NATO states might see a domestic backlash against nuclear burden sharing.

China after New START

China postures its nuclear forces to provide an assured ability to retaliate after a nuclear attack, with the United States as its pacing threat. In this sense, China has been a beneficiary of the predictability provided by US-Russian nuclear arms control agreements. US-Russian nuclear interactions after New START could exacerbate the factors underlying China's nuclear expansion, though the precise impact is impossible to predict. These dynamics could drive further quantitative increases in China's theater and intercontinental-range delivery vehicles and nuclear warheads or qualitative changes in China's nuclear posture, such as longer ballistic missile submarine patrols, keeping a portion of mobile ballistic missiles on launch-ready status or dispersed, and adopting a Launch Under Attack option. While the United States might conclude these changes do not have a military impact, Japan might perceive them as undermining the US security commitment. Currently the United States and China have no cooperative framework for insulating their nuclear relationship from the end of New START and other developments in the global nuclear landscape.

OPTIONS FOR ARMS CONTROL WITHOUT A TREATY

Transparency without a Treaty

There are multiple ways the United States and Russia could cooperate to sustain a window of transparency between their strategic nuclear forces without a treaty, but they would be imperfect substitutes at best.

The United States and Russia could continue to provide biannual exchanges of aggregate numbers of deployed strategic delivery vehicles, nuclear warheads, and deployed and non-deployed launchers; the total number of each type of deployed strategic delivery vehicle and the total number of warheads deployed across it; and the number of deployed strategic delivery vehicles, warheads, and launchers at each declared base.

A modified version of New START's notification regime could underpin the biannual data exchanges. This regime would differ from New START's notification practices by requiring pre-notification for *all* changes in declared data. The purpose of this modification would be to augment US and Russian efforts to independently verify information they receive through the data exchanges and improve confidence in their assessments of the other's deployed nuclear forces. Some pre-notifications, such as changes to deployed strategic nuclear warheads, could create nuclear security risks and would require further study before being implemented.

Emulating onsite inspections through NTM could potentially help improve each side's respective confidence in deployed warhead data exchanges and notifications. Several times a year, each country could select a declared ICBM or SLBM base, and the other country would then provide a list of deployed

missiles at the site and the number of warheads deployed on each. The "inspecting" country would then select one missile from the list and inform the "inspected" country. The inspected country would prepare the system for remote inspection, removing the front section shroud and covering individual reentry vehicles. Rather than an "eyes on" examination, however, the inspecting country would view it via satellite imagery.

The United States and Russia could also carry forward the elimination and verification procedures for retired strategic nuclear systems. Under New START, there are specific measures for dismantling strategic delivery vehicles, their launchers, and bombers and positioning them so that the other country can observe them with NTM for 60 days. This practice will be important for both countries as they continue to retire old systems and field new ones. Transparency into elimination procedures would help each country avoid worst-case scenario assessments about the relative size of each other's forces during their respective recapitalization programs.

The United States and Russia could hold confidential briefings on new strategic systems that each country introduces into its arsenal. The briefings could include the type of technical information that each shares under New START and perhaps even an exchange of photographs. Neither country would have the independent verification that comes through the onsite exhibitions, where they can examine, measure, and draw the new system firsthand; however, they would have a body of data to compare with information collected through NTM.

The United States and Russia could agree to forgo sophisticated denial operations against the other's efforts to monitor its strategic nuclear forces. This would be a minor modification to New START's

provision on non-interference with the use of NTM for monitoring treaty compliance. The purpose of this pledge would be to acknowledge that both countries would be less secure if one dramatically misestimates the size and composition of the other's strategic nuclear forces.

Lastly, the United States and Russia could establish an expert-level working group to improve understanding of their respective strategies and concepts. The group would agree to an agenda of strategic topics, guiding concepts, and current and developmental weapon systems, with the understanding that both sides would have the opportunity to ask questions about topics on the list during working group sessions and would be expected to provide substantive answers. This forum would not be limited to strategic nuclear forces; it could also include discussion of theater-range nuclear weapons, missile defenses, and a host of other types of systems.

Restraints on Strategic Nuclear Forces without a Treaty

We identify one cooperative US-Russian option for restraining strategic nuclear force levels without a treaty and an alternative the United States could adopt if Russia is uninterested in mutual restraint.

The United States and Russia could pledge, in the form of parallel political commitments, to remain at or below New START's limits after the treaty expires. Each country's restraint would be contingent upon the other's reciprocation. There is an alignment of US and Russian interests in staying at New START levels. For Russia, refraining from uploading additional warheads onto its ballistic missiles would be a reasonable price to pay for the United States forgoing expansion of US delivery vehicles and warheads. For the United States, this arrangement would spare it the challenges and uncertainties of sustaining

parity with rising Russian warhead levels while the United States implements its modernization program under a constrained budget and uncertain political circumstances. Both countries could point to continued cooperation in managing their nuclear relationship.

If Russia is uninterested in mutual restraint without a treaty, US policymakers have an alternative option of staying at New START levels regardless of Russian strategic nuclear force structure decisions. Our analysis demonstrates the United States could meet its nuclear deterrence, extended deterrence, and assurance objectives at New START levels even if Russia exceeds them by hundreds of deployed strategic warheads. Additional Russian warheads would not improve Russia's ability to hold dispersed US ballistic missile-carrying submarines and nuclear bombers at risk; nor would they improve Russian defenses against limited US nuclear response options. Thus, US forces would remain sufficient for deterring both large-scale and limited nuclear attacks under these conditions. Importantly, this assessment is contingent upon the current composition of US strategic nuclear force; the US nuclear posture is resilient to increases in deployed Russian warheads because it is composed of a triad of strategic delivery vehicles.

Staying at New START levels might better position the United States to mitigate negative reactions within the NPT and disarmament constituencies in allied nations. It would enable the United States to avoid a quantitative arms competition it does not need to enter and could potentially lose. Russia has ample upload capacity on its missile force and can produce new nuclear warheads; the United States cannot currently produce new nuclear warheads and will actually reduce its ballistic missile force, and thus its warhead upload capacity, through its modernization program in the 2030s.

US-China Options

We identify two options for establishing a more predictable nuclear relationship with China if New START expires with no replacement.

The United States should acknowledge that China possesses a credible nuclear deterrent. The case for this change in US declaratory policy stems from the fact that vulnerability to Chinese nuclear weapons is an inescapable strategic reality for the United States. As a result, the US-Japan alliance would be better served by establishing that the United States does not need to be invulnerable to Chinese nuclear weapons to extend deterrence and that it is willing to accept nuclear risks on behalf of its ally. Acknowledging China's credible nuclear deterrent (i.e., mutual vulnerability with China) might elicit Chinese cooperation in putting the nuclear relationship on a more predictable path. This change in US declaratory policy is best thought of as a necessary, but not sufficient, condition for reducing uncertainty in US-China nuclear interactions.

The United States should also put forward a structured proposal for annual nuclear weapon information exchanges and dialogue with China. The information exchange would be reciprocal but asymmetric, acknowledging the United States and China have vastly different outlooks and experiences regarding cooperative transparency, and subsequently, each would have different obligations. The United States would provide China with detailed information about its deployed strategic nuclear force levels and composition, comparable to the information provided in New START's biannual data exchanges. In return, China would disclose, on a confidential basis, the aggregate size of its nuclear warhead stockpile, the aggregate number of nuclear-capable delivery vehicles in its force, and the breakdown by delivery vehicle type, including theater-range ballistic missiles.

The purpose of the annual dialogue would be to improve each other's understanding of how their actions are being perceived by the other side and the steps the other side might take in response. Both countries would provide briefings on new nuclear systems that they plan to introduce in the following year. They would also explain how they view developments in the other's strategic posture that they see as affecting their country's nuclear policy, posture, and planning. It would also establish a pattern of strategic engagement that has the potential to mature.

RECOMMENDATIONS FOR 2019

We explore a scenario—the end of US-Russian treaty-based arms control—that is plausible but has not yet come to pass as of early 2019. The United States still faces a near-term decision on New START extension; the longer-term decision about what, if any, follow-on treaty to pursue; and the larger challenge of how to sustain a balanced approach to nuclear risk reduction that integrates diplomatic and military tools in a changing international environment. Our scenario-based analysis of risks and policy options after New START has implications for each of these issues. Thus, the report concludes with several recommendations for US nuclear policy in 2019, while New START is in effect.

Extend New START

The United States should agree to extend New START until 2026. New START will continue to provide predictability with Russia, limiting its deployed strategic warheads and giving the United States a window into Russia's modernized arsenal for an additional 5 years. Extension will also support US non-proliferation and extended deterrence strategies. Finally, extension would give the United States more time to prepare for what comes after New START.

Prepare for the End of New START

Whether it's 2021, 2026, or sometime in between, New START will expire in the next decade, and the United States must prepare. This report's options provide a strategy for a world with no treaty-based arms control. The United States should also explore continuing New START's provisions beyond 2026 through a formal amendment to the treaty. This step would require both Russian agreement and

approval from the US Senate and Russian Duma. Although neither country would be fully satisfied with this arrangement, if policymakers perceive this study's options as inadequate for mitigating the risks of a world with no treaty, sustaining New START would be a preferable alternative. The United States should also explore a treaty with asymmetric limits on deployed strategic warheads. Our analysis of the United States staying at New START levels even if Russia exceeds them suggests that such a treaty would not compromise the United States' ability to meet its deterrence and extended deterrence objectives, provided it retains a triad of delivery vehicles.

Reinvigorate and Modernize Nuclear Risk Reduction

In several important areas, we identify trends that increase nuclear risks and would continue to grow even if New START remained in force in perpetuity. The end of treaty-based arms control would aggravate these challenges, but preserving New START practices would not solve them. For instance, US and Russian threat perceptions appear to be both intensifying and diverging with regard to each country's respective strategies and intentions, non-strategic or theater-range nuclear weapons, and non-nuclear capabilities. US uncertainties about the trajectory of China's nuclear posture, and the potential negative implications for the United States and Japan, are also likely to increase amid a more competitive US-China relationship.

As a result, the United States should reinvigorate and modernize its approach to nuclear risk reduction in two ways.

First, the United States should put forward precise, structured proposals for dialogue with Russia and China regardless of New START's status. The strategy, concepts, and systems working group framework we develop would facilitate better understanding between the United States and Russia as their strategic postures evolve and diversify. Pairing acknowledgement of China's credible nuclear deterrent with a proposal for a US-China information exchange and dialogue is the best option for reducing uncertainty in the nuclear component of the US-China relationship.

Second, the United States needs to broaden its approach to arms control beyond verifiable limits on nuclear weapons and explore how to apply new forms of arms control cooperation to contemporary threats. It should adopt a more elastic conception of arms control, beyond just treaties, that focuses on clarifying perceptions and expectations about nuclear and non-nuclear military operations and capabilities. This effort should start with the premise that the objectives of arms control are to reduce the risks of war, nuclear escalation, and arms competitions, not solely to reduce numbers of weapons.

Sustain and Explain the Balanced Approach

Integrating US military and diplomatic tools in a comprehensive strategy continues to provide the best means for reducing nuclear dangers. The United States must prepare to sustain support for this balanced approach even if Russia and China are uninterested in arms control cooperation. Persuading allies and partners that setbacks in arms control do not mean that the United States is giving up on using all elements of national power to manage the existential danger from nuclear weapons is essential. Explaining that all of US nuclear policy, including retaining credible nuclear forces, serves the same goals as arms control and functions in concert, not as counterweights, will help the United States make this case.

INTRODUCTION

The United States must prepare to compete with Russia without a treaty that verifiably constrains intercontinental-range nuclear weapons. This coming challenge stems from three changes in US-Russian relations.

First, the United States has officially transitioned from strategic partnership to strategic competition as the basis for its Russia policy. By acknowledging Russia's revisionist intentions, the 2018 National Defense Strategy codified an assessment that took root in the United States and many other North Atlantic Treaty Organization (NATO) states after Russia's invasion of Ukraine and has garnered more support every year. This assessment is accompanied by growing appreciation that Russia's political-military strategy poses a full-spectrum foreign and defense policy challenge for the United States. "Russia is challenging US and NATO interests below the threshold of armed conflict, while simultaneously fielding high-end forces to make the barrier to entry for war extremely costly and dangerous for the United States," explains a former US senior defense official.¹ In a major departure from the 1990s, 2000s, and part of the current decade, the United States is now developing a political-military strategy to counter Russia.

Second, in another change from the past 25 years, Russia is in the final stages of its nuclear modernization program. It fields a modern force of intercontinental-range, commonly described as "strategic," nuclear forces, and is capable of increasing its deployed arsenal. The United States is also modernizing its nuclear forces, albeit on a different schedule. Both countries are expanding

their strategic-military postures to include non-nuclear systems capable of achieving strategic effects. Strategic-military interactions between the United States and Russia in the next two decades will be markedly different than the previous two, with multiple acquisition, development, and deployment pathways available to both.

Third, the nuclear arms control treaty framework the United States and Russia have built and sustained over decades is on the precipice. The New Strategic Arms Reduction Treaty (START) will expire in the next decade. It will reach its 10-year duration in February 2021, though the United States and Russia have the option of extending it for up to 5 years. As of early 2019, the prospects for New START extension are uncertain. Regardless of when New START expires, there is a strong possibility that a follow-on treaty will not be forthcoming.

Recognizing these changing conditions, the report explores risks, uncertainties, and US policy options for a world in which there is significant competition between Washington and Moscow, but no bilateral strategic nuclear arms control treaty.

REASONS FOR THIS STUDY

Formidable obstacles currently block the path to another nuclear arms control treaty after New START. The United States is withdrawing from the Intermediate-Range Nuclear Forces (INF) Treaty. This move comes in response to Russia's material breach of the treaty's ban on ground-based missiles with a range of 500–5,500 kilometers and its persistent denial of the violation.² Russia also claims the United States is violating INF. Currently, the prospects for resolving the impasse through a Russian return to compliance or an amicable mutual withdraw are low. Animosity over this dispute could sap both countries' willingness to negotiate a New START follow-on.

The United States and Russia would also approach the next treaty negotiation with several different goals that could prove irreconcilable. Russia has previously tied further arms control agreements to limits on ballistic missile defenses, a position fundamentally at odds with current US policy. Whether ballistic missile defense would be a Russian deal breaker in a new negotiation is unclear, but it is a strong possibility. The United States has been adamant that the next treaty must limit theater-range, often referred to as “non-strategic,” nuclear forces; the US Senate might reject any treaty that fails to include these types of systems. Russia, however, has resisted verifiable constraints on non-strategic nuclear weapons, and there is no reason to suspect its position will change.

If New START expires without a replacement in tow, it would mark a profound change in nuclear policy for the United States and Russia. Dating back to the 1960s, nuclear arms control treaties have contributed to predictable interactions between US and Soviet/Russian strategic nuclear forces. As Figure 1 illustrates, the practice of nuclear arms control has

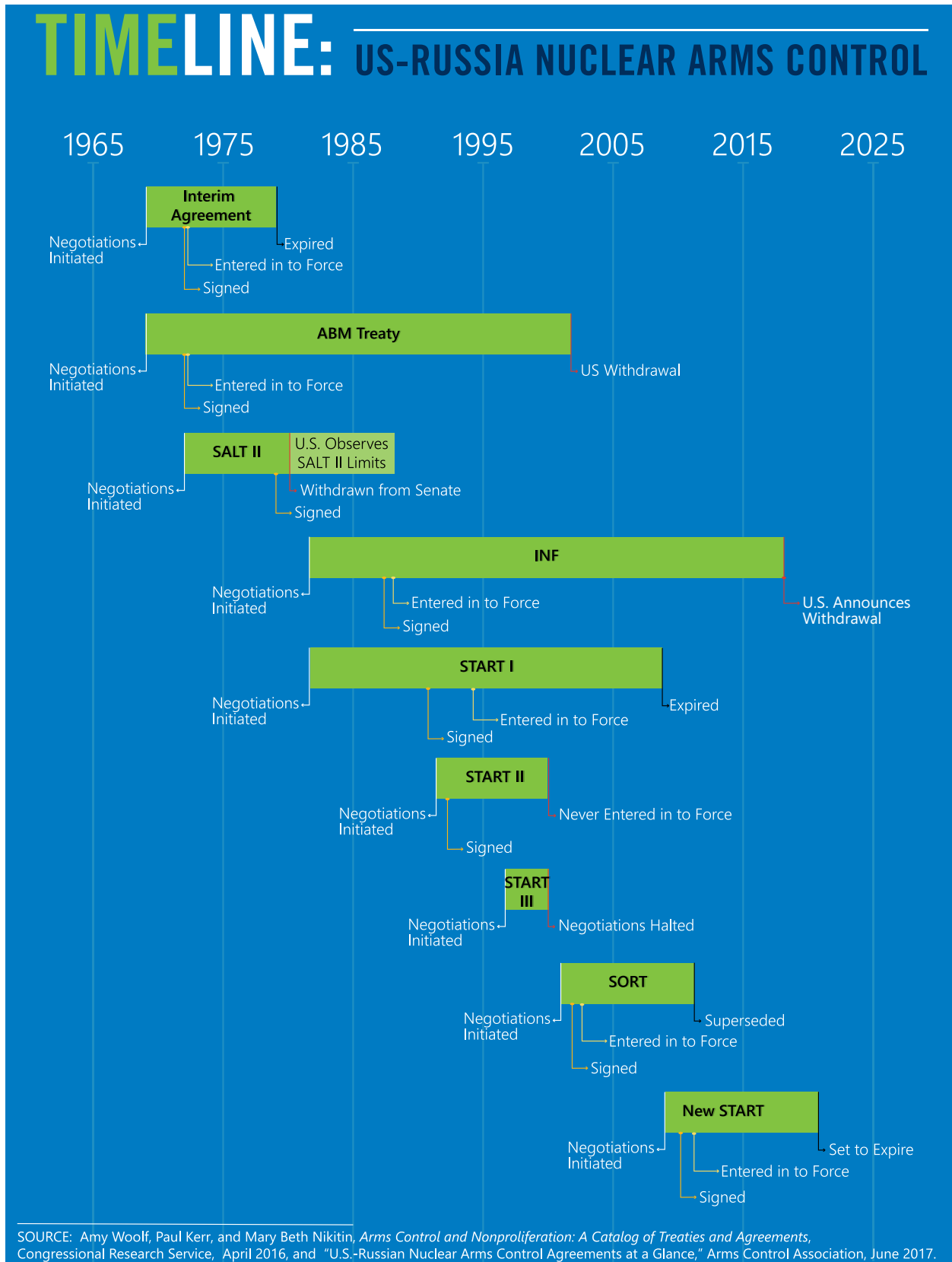
facilitated a nearly continuous dialogue on nuclear weapons between American and Russian experts and leaders. The national security establishments in both countries, along with many experts in the broader analytical communities, perceive predictability as a linchpin for reducing the risks of war and arms competitions.

Arms control treaties also play an important role in fulfilling both countries' obligations to work toward complete disarmament under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Nuclear arms control agreements with Russia also contribute the United States' ability to unite NATO in a shared security strategy.

There has been insufficient study of what, if anything, would take the place of New START for sustaining predictability with Russia, furthering US nuclear non-proliferation strategy, and contributing to solidarity among the United States and its allies. Following successful negotiation of New START in 2010, the analytical community focused its attention on designing a more ambitious agreement on further force reductions and limits on more types of nuclear weapons. Unfortunately, the changing context for US-Russian relations now requires an analysis based on a different planning assumption: that New START will expire with no replacement forthcoming (hereafter this scenario is simply referred to in shorthand as “after New START,” “when New START expires,” “the end of New START,” etc.).

Study of the risks and uncertainties after New START is also important because the consequences could ripple out through the global nuclear landscape. New START is a bilateral treaty, but its end could have multilateral implications.

Figure 1. Timeline: US-Russia Nuclear Arms Control



The potential impact on China would be particularly important. China postures its nuclear forces to provide an assured ability to retaliate after a nuclear attack, with the United States as its pacing threat. A renewed competition that catalyzes changes in US and Russian nuclear arsenals may prompt China to alter its strategic planning. In turn, changes in China's nuclear posture could fuel Japan's security concerns and have implications for US defense strategy.

Better understanding the bilateral and global challenges that the end of New START could trigger or exacerbate is the first step toward developing effective policy options for this scenario. Nuclear arms control treaties helped the United States and Russia avoid nuclear war and reduce their massive arsenals, and many in the United States anticipated more treaties and reductions after New START. Thus, it is tempting to view the potential end of treaty-based arms control as a regression to the nuclear dark ages. Yet Linton Brooks cautions that fatalism does not accomplish anything:

*The prospect of the demise of bilateral arms control is a gloomy one. But the problem will not be improved by ignoring it. The era of Russia-American strategic arms control is coming to an end. It may not be possible to prevent that, but thinking through the consequences can minimize the harm to US-Russian relations, to international stability, and to the cause of peace. That thinking should begin now.*³

As we examine this gloomy prospect, we must also remember that strategic nuclear arms control treaties are only one form of arms control. Nuclear arms control treaties have proven to be an extraordinarily valuable tool, but we do not have the luxury of viewing them as indispensable. The absence of a legally binding and verifiable treaty does not mean

that the United States and Russia lack shared interests in reducing nuclear risks and have no means for cooperating toward that end. Studying the value, limits, and risks of non-treaty options will aid policymakers in the United States, Russia, and other countries if they elect to practice arms control without a treaty.

For the United States, preparing for the end of New START and studying arms control without a treaty is an essential element of adapting its nuclear risk reduction strategy to a changing strategic context. In 2009, the Congressional Commission on the Strategic Posture of the United States crystalized US strategy:

*Throughout the nuclear era US policy has been shaped by the imperative to reduce nuclear dangers with a balanced approach involving both deterrence and political measures such as arms control and non-proliferation.*⁴

Integrating military and diplomatic tools in a balanced approach continues to provide the best means for reducing nuclear dangers. No other approach would be as effective across the multifaceted spectrum of relationships and threats that have a nuclear component, spanning major power competition, rogue states, bilateral and multilateral alliances and partnerships, and international regimes to stop the spread of nuclear weapons, especially to terrorist organizations.⁵

Today, the future of one pillar of the United States' balanced approach is in doubt. How can the United States put forward an effective and persuasive strategy for reducing nuclear dangers without a strategic nuclear arms control treaty with Russia?

Finally, this inquiry is also necessary to provide a frame of reference as the United States and Russia prepare for near-term decisions on New START's extension and, more importantly, on how to approach its eventual expiration. This study's premise is that agreement on a new treaty after New START is unlikely but not impossible. A sound analysis of the risks of a world without a treaty, as well as the value and limitations of non-treaty arms control options, can inform assessments of the tradeoffs both sides may need to make to reach agreement on a follow-on treaty.

STUDY OBJECTIVES

This study's primary objective is to identify the key risks and uncertainties the United States and Russia would face after New START, develop a portfolio of non-treaty options for mitigating them, and ultimately better prepare the United States to engage Russia on arms control without a treaty, should it need to do so.

It also has a secondary objective of identifying the impact US-Russian nuclear dynamics after New START may have on China's nuclear policy and posture and the subsequent implications for the United States, and exploring potential non-treaty options for the US-China relationship.


Lastly, by providing scenario-based analyses of risks and options after New START, this study strives to inform the forthcoming US and Russian decisions on New START extension, potential options for a follow-on treaty, and the United States' balanced approach to nuclear risk reduction. Subsequently, the study concludes with recommendations for US policy in 2019, while New START is still in effect.

In completing this study, we drew from a range of contemporary and historical official government sources and scholarly analysis on nuclear policy and arms control, including Russian and Chinese language sources. The data on US, Russian, and Chinese nuclear forces is from the Federation of American Scientists' annual nuclear notebook reports and official US government documents. We make several explicit extrapolations in developing illustrative US and Russian force structures after New START. To best capture China's perspective, we also commissioned Dr. Tong Zhao, a Fellow at the Nuclear Policy Program of the Carnegie Endowment for International Peace, to write an analytical essay that we draw from in Part IV and which is available as an appendix to this report.

ORGANIZATION OF THE REPORT

Part I reviews the objectives of arms control and the roles strategic nuclear arms control plays in US and Russian strategy. Our focus is on the enduring strategic objectives of arms control, in the sense of managing existential dangers of nuclear weapons, and the specific contribution of nuclear arms control treaties in US and Russian strategy for meeting these objectives. We devote significant space to exploring predictability through transparency and constraints on weapons as the primary role of strategic nuclear arms control. Where relevant, we also explore differences between US and Russian perspectives, such as Russian dissatisfaction with the absence of arms control limits on missile defenses.

Part II analyzes the risks and uncertainties that would arise if the United States and Russia lost New START as a means of filling the roles discussed in Part I. We examine the impact of losing New START's verification and transparency regime, while also identifying its limitations relative to emerging areas of concern for both countries. We then analyze the consequences of



losing New START's limits on strategic nuclear forces. As part of the discussion, we introduce illustrative US and Russian strategic nuclear force structures for the mid-to-late 2020s to analyze the extent to which each could exceed New START levels and how the other might interpret such a move. Finally, we explore, in less depth, the risks of losing New START within the context of the NPT, the Treaty on the Prohibition of Nuclear Weapons (TPNW), and potential domestic challenges to nuclear burden-sharing facing several NATO states.

Part III develops a set of options for cultivating both transparency and restraint without a treaty. We analyze the value, limitations, and risks of each option. The options include both bilateral measures as well as steps the United States might take unilaterally if Russia is uninterested in cooperation.

In Part IV, we step out of the bilateral context and look at China after New START. We analyze the potential impact US-Russian dynamics might have on China's nuclear posture and explore the potential implications for the United States. The security concerns of Japan, an ally to whom the United States extends a security commitment, feature prominently in this discussion. Part IV concludes with US-China options for increasing predictability, including an assessment of whether the time has come for the United States to acknowledge that China has a survivable and credible nuclear deterrent.

Finally, in the conclusion we return to the near-term policy decision on New START extension and longer-term decisions about what comes after New START, as well as the larger topic of the United States' balanced approach to nuclear risk reduction. The report ends with recommendations for US nuclear policy in 2019.





PART I: THE OBJECTIVES AND ROLES OF STRATEGIC NUCLEAR ARMS CONTROL

THE OBJECTIVES OF STRATEGIC NUCLEAR ARMS CONTROL

In Part I, we describe the enduring objectives of strategic nuclear arms control and the roles it plays in US strategy. This framework structured our analysis. It enabled us to examine how New START fulfills each arms control role in US strategy and identify risks posed by New START's expiration. It also guided our development of US policy options for managing these risks. The framework is US-centric; however, we identify where it overlaps with and diverges from Russia's approach to arms control.

Our conceptual starting point is Thomas Schelling and Morton Halperin's classic study, *Strategy and Arms Control*. Writing in the 1960s, Schelling and Halperin were among the first to articulate the impact of nuclear weapons on defense strategy and planning. They recognized that the speed with which a conflict could escalate had the potential to shorten the time for deliberation in crises. One country's misperceptions about the other's intentions could precipitate a conflict that destroyed them both in less than a day. A perceived military disadvantage, however fleeting, could be catastrophic, resulting in either capitulation to nuclear blackmail or a horrific war. There would be no time to develop new nuclear forces after a war started, thus creating the conditions for "competitive armaments" in peacetime on an unprecedented scale. As a result, one country's attempt to gain a military advantage or escape a disadvantage through a new technology could spur both to spend vast sums of money on new weapon systems.⁶

[A]rms control offered a means for aligning US and Soviet military postures with their respective policies and strategies.

In a retrospective interview in the 1990s, former Soviet General Andrian Danilevich described the Cold War arms competition in terms that match Schelling and Halperin's diagnosis:

[W]e had a competition—you were developing the Minuteman, Midgetman, and the Typhoon-Trident. And we were also developing various new strategic weapons... We both knew that if there were a breakthrough, it would take a certain amount of time to develop the means to counteract it, and that every such time lag gave a temporary technological superiority, and that technological superiority allowed political pressure to be brought to bear.⁷

Recognizing that these dynamics would emerge, Schelling and Halperin concluded that the United States and the Soviet Union had a shared interest in cooperating to stabilize the security dilemma. Attenuating a dangerous spiral between military technology and threat perceptions was a strategic imperative for both, and arms control was a tool that could help them do it.

In their view, the purpose of arms control was not to resolve the competing interests driving the Cold War. Nor would it always result in the reduction or elimination of weapons. Instead, arms control offered a means for aligning US and Soviet military postures with their respective policies and strategies, helping prevent unintended wars and arms competitions. Any cooperation in pursuit of these objectives was a type of arms control. Arms

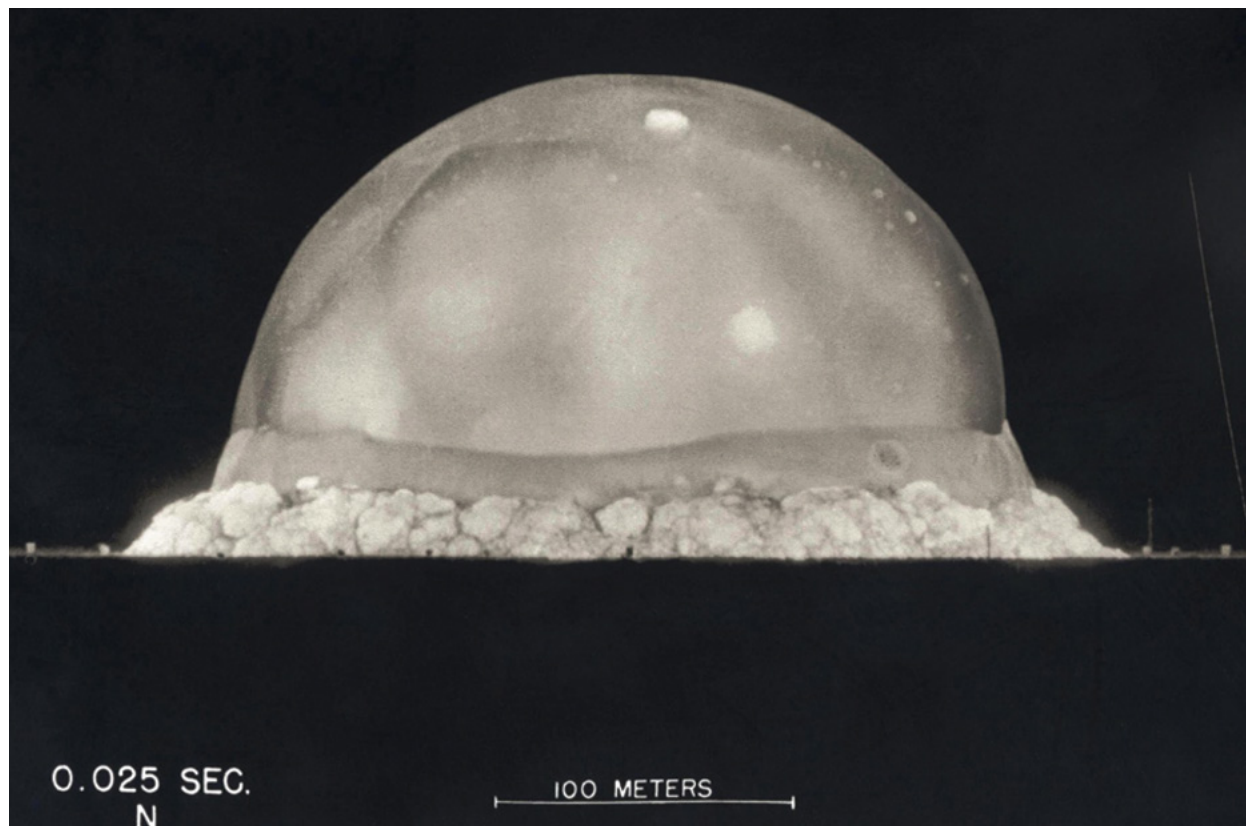
control could be tacit or explicit, formalized in a treaty or simply an established pattern of behavior. Importantly, from this perspective, arms control is not limited to treaties and can take many forms.

As with every aspect of US national security, bureaucratic, political, budgetary, and diplomatic factors have also shaped US arms control policy and agreements with the Soviet Union and Russia. But the impact of these additional factors does not diminish the relevance of Schelling and Halperin's conception of arms control's purpose. Avoiding war, limiting its severity and regulating the arms competition are consistently present in US, and to an extent Soviet/Russian, arms control objectives.⁸

The strategic competition between the United States and Russia today is not analogous to that of the Cold War rivalry, and the military postures and associated capabilities are also profoundly different,

despite the lasting role of nuclear weapons and ballistic missiles as foundational weapons for both countries. Yet the continued potential for conflict between the United States and Russia means that their shared interest in managing nuclear dangers endures.

Schelling and Halperin's conception of arms control continues to provide a useful framework for assessing the value of New START and the challenges that could arise after it expires. Similarly, this study's policy options are intended to reduce the risks of war and nuclear escalation and restrain arms competition. This is what we mean when we use the term "nuclear arms control without a treaty." We do not explore options for bilateral reductions in nuclear weapons outside of a treaty.



First Atomic Explosion on July 16, 1945, Alamogordo, New Mexico. (Shutterstock)

Achieving Arms Control Objectives

In practice, how does the United States use strategic nuclear arms control to further these objectives?

Although priorities and motivations in arms control negotiations have varied and expectations about the bilateral relationship have fluctuated, nuclear arms control with Russia consistently plays one primary role and two secondary roles in US strategy for managing the existential threat posed by the existence of nuclear weapons:

- Primary Role: Fostering a predictable nuclear relationship with Russia through transparency and binding constraints on nuclear forces.
- Secondary Roles: Strengthening US nuclear non-proliferation strategy and contributing to sustaining US extended deterrence and alliance solidarity.

We next review each role in more depth. The following section covers the primary role, predictability; after that, we dive into the secondary roles.

Strategic nuclear arms control fills the primary role in Russian strategy and the secondary role of furthering its nuclear non-proliferation strategy, albeit with several important differences that we highlight.

PRIMARY ROLE: PREDICTABILITY BETWEEN THE UNITED STATES AND RUSSIA

The 2009 Strategic Posture Commission Report, chaired by William Perry and James Schlesinger, concluded that arms control “may lend predictability to the future of the bilateral relationship, a benefit of value to the United States but also its friends and allies.”⁹ When testifying in support of New START, Secretary of Defense Robert Gates said the agreement “increases stability and predictability.”¹⁰ Eight years later, the 2018 Nuclear Posture Review echoed this perspective: “[Arms control] can foster transparency, understanding, and predictability in adversary relations, thereby reducing the risk of misunderstanding and miscalculation.”¹¹

Russian Ambassador Sergei Ryabkov also listed predictability as one of the core contributions of arms control to Russian national security in an August 2018 interview, suggesting that arms control fills this role in Russian strategy as well.¹²

How does predictability in the US-Russian relationship contribute to the arms control objectives outlined in the previous section?

A predictable nuclear balance helps policymakers in both countries understand how their current and planned forces compare to their potential adversary’s forces. It gives them confidence that their military postures are sufficient to meet their security objectives.

In a geopolitical crisis, this confidence can reduce both countries’ fears that the other might initiate a strategic attack, thereby improving the chances of avoiding war.¹³ From a longer-term perspective, predictability

can help two rival nations avoid a costly and dangerous arms competition. Building each country’s confidence that it is not at risk of being caught in a position of acute vulnerability in the future can help reduce the pressure to expand or enhance military capabilities in order to prevent the other from achieving an advantage. Finally, predictability can manifest in mutual confidence among leaders of rival nations that each understands the profound risks of nuclear war.

In practice, predictability stems from an arms control treaty’s verification regime, which establishes mutual transparency, and binding constraints on numbers and/or types of strategic nuclear forces. The verification regime functions as the circulatory system of a treaty, pumping information from each



Arms control is intended to instill confidence and reduce uncertainty. Like deterrence, it is about influencing perceptions. (Shutterstock)

country's secure military sites into the other's national security establishment. Without this transparency, the treaty's constraints would be less effective for fostering predictability because both countries would have less insight into whether the other is complying with the provisions. "Arms control allows you to build a box and then look inside it," according to one arms control expert.¹⁴

Although transparency and constraints function in concert, they are distinct and typically established in separate provisions in treaties. We explore the strategic value and history of each separately in order to better understand their unique contribution. This provides a sound framework for exploring the relevant New START provisions in Part II.

THE VALUE OF TRANSPARENCY

Strategic nuclear arms control obligates the United States and Russia to provide each other a window into their respective strategic nuclear forces. The fundamental purpose of this cooperative regime is to help US and Russian policymakers verify compliance with the treaty.¹⁵ It would be incomplete, however, to view transparency as a tool whose value lies only in supporting treaty verification. Nuclear transparency contributes to predictability in its own right. It reduces uncertainty about capabilities, strategy, threat perceptions, and intentions between competitors. Strategic nuclear arms control treaties have facilitated transparency into each country's nuclear forces and their underlying strategies and concepts.

Transparency Into Strategic Nuclear Forces

While both countries devote significant efforts to protecting sensitive information about their strategic nuclear forces, US policy has long operated on the premise that excessive opacity could undermine US security. Schelling and Halperin articulated the underlying logic of this premise:

Each side is guided by its estimate of what the other is doing. If each greatly exaggerates what the other is doing, the competition is exacerbated.... In the absence of reliable evidence of what the other is doing, each may feel obligated to err on the "safe" side—to impute an extreme capability and intention to the other.... The possibility exists, therefore, that the arms race might be dampened if each side possessed better information about what the other is doing.¹⁶

Thus, sharing information is, in and of itself, a type of arms control cooperation. "The more one side knows about what the other side is doing, the less room there is for surprise and miscalculation," President Reagan said as he made the case for including data exchanges in the START and INF treaties.¹⁷ Cooperation to establish and maintain mutual transparency can help overcome two challenges.

First, estimates of a competitor's arsenal and planned future force can overshoot the reality. US concerns in the late 1950s about a Soviet intercontinental ballistic missile (ICBM) advantage, the missile gap, is a useful example. The paucity of direct data on Russian missile programs resulted in a diverse spectrum of estimates in the United States. A small circle of policymakers with access to intelligence gathered by U-2 flights were confident the gap did not exist but were reluctant to share the information, and an entire body of analyses

about the vulnerability of US forces relied on estimates that predicted the Soviet Union would deploy more missiles than it actually did.¹⁸

Second, when confronted with a wide band of uncertainty about potential adversary capabilities, there are strong incentives to adopt the worst case as a planning assumption. Force structure decisions based on an assumption of adversary capabilities that prove to be overly optimistic risk leaving a country underprepared to meet its deterrence and warfighting objectives. It is easy to perceive overestimating an adversary's forces as a less risky basis for planning.

Transparency can reduce the band of uncertainty and enable planning based on more accurate estimates. During the debate over New START, seven former US commanders published a letter stating that the treaty's transparency would improve understanding of Russian forces, enabling the United States to make "better informed decisions" about its own posture.¹⁹ Similarly, General Chilton, the Commander of US Strategic Command at that time, testified that:

*Without New START, we would rapidly lose insight into Russian strategic nuclear force developments and activities, and our force modernization planning and hedging strategy would be more complex and more costly. Without such a regime, we would unfortunately be left to use worst case analyses regarding our own force requirements.*²⁰

Russian participation in transparency cooperation is particularly valuable for the United States. Whereas the Russian national security community can gain significant insights into US nuclear forces simply through public budget justifications, congressional testimony, speeches, and the work of open-source analysts, the body of official public material on

Russian nuclear strategy is smaller and less detailed. The United States is more reliant on treaty-based transparency than Russia.²¹

That said, the benefits of transparency cooperation are not entirely one-sided. For example, a former Soviet advisor on strategic arms policy recounted the Soviet tendency toward worst-case assessments and the defense industry's constant push for larger budgets:

*Intelligence assessments of the probable opponent were skewed in favor of the maximum threat when they were made available to the leadership. The principle was always that it is better to overestimate than to underestimate the opponent. Our retaliatory measures were always taken in response to the opponent's maximal capability.*²²



Under the leadership of Ronald Reagan, Mikhail Gorbachev, and George Bush, the INF and START treaties broke new ground on arms control verification and transparency. (White House/Alamy Stock Photo)

Greater insight into US nuclear strategy would have provided alternatives to gross overestimations. Contemporary Russian debate explicitly points to the value of arms control transparency in easing pressure to engage in worst-case estimates and enabling better defense planning.²³

Transparency Into Strategy and Concepts

The United States also more broadly values mutual transparency into strategy, operational concepts, and planning. Many US officials perceive this type of transparency as essential for lowering the risks of miscalculation and unintended escalation. In practice, this type of transparency arose as a byproduct of US-Soviet arms control negotiations. In a revealing quote, Secretary of Defense Robert Gates said that arms control negotiations functioned as a nearly 40-year dialogue on nuclear strategy:

I was involved with the strategic arms talks with the Soviet Union for many, many years. I'm not sure those talks ever actually reduced any arms, but the dialogue over a long period of time with great candor about nuclear capabilities, thinking about nuclear options, thinking about how each side looked at nuclear weapons and at their military modernizations, I think played a significant role in preventing miscalculations and mistakes during the Cold War.²⁴

Russian expert Alexey Arbatov echoes this point. He argues that the national security bureaucracies supporting the back and forth of treaty negotiations “accumulated a much better understanding of each other’s strategic thinking, operational concepts, arms programs and deployment practices,” and that the

Soviet Union’s conception of nuclear weapons as unique instruments for deterrence stemmed from engagement with the United States.²⁵

Contemporaneous accounts of arms control negotiations support these descriptions. For example, Strobe Talbott’s coverage of START and INF negotiations vividly portrays sophisticated discussions between delegations about the relationship among high-level strategic objectives, the roles of specific weapon systems, and the implications of proposed treaty provisions.²⁶

Establishing a causal link among engagement, transparency, and the absence of nuclear war is beyond the scope of this study, but history is strewn with incidents where misperceptions created profound risks of escalation. The recently declassified study of the Soviet war scare in the late 1970s and early 1980s is an excellent example: a mix of Soviet concerns about US hostile intentions and Soviet assessments of the military balance resulted in genuine concern at high levels of the government that a US attack was plausible. Subsequently, the Soviet Union took several steps to increase military readiness and reduce the vulnerability of Soviet nuclear forces during the US Able Archer exercise and in the months preceding and following it.²⁷ When his staff presented him with evidence of Soviet perceptions at the time, President Reagan was apparently incredulous that Soviet leadership would view the United States as threat.²⁸

Although improved understanding was more of an unintended consequence of treaty negotiations, the United States and the Soviet Union/Russia also reached a series of agreements to reduce the risks of unintended escalation by increasing operational transparency. The 1972 Incidents at Sea Agreement provides transparency into military operating

procedures. Recognizing the importance of reliable communication channels for communicating intent and clarifying actions, both sides established a crisis hotline and nuclear risk reduction centers, agreed upon a set of principles for reducing the risk of nuclear war, and committed to notifying each other of ballistic missile launches.²⁹

CONSTRAINTS ON STRATEGIC NUCLEAR FORCES

Constraints on strategic nuclear forces play a valuable role in fulfilling the objectives of arms control. A limit on strategic nuclear forces, underpinned by an effective verification regime, can give a nation confidence that reducing or limiting the size of its nuclear arsenal will not jeopardize its security. Treaty-based constraints thus can play a valuable role mitigating an arms competition. They can also play a role in reducing escalation risks by banning or capping specific types of weapons that one or both sides view as uniquely threatening.

Historically, both countries have sought to use treaty-based constraints to shape two features of the bilateral nuclear balance: approximate parity and survivable strategic nuclear forces. Despite important differences in their strategic outlooks, both countries value these features, and thus they are the most relevant ones for understanding US and Russian perspectives on the risks and challenges posed by the end of New START's limits on strategic nuclear forces.

To provide context for our subsequent analysis in Part II of parity and survivability after New START, we briefly review below each country's perspectives of the relationship between parity, survivability, and arms control.

US Perspectives on Parity

For all the attention the United States has devoted to strategic nuclear parity over the years, there is no consensus on the definition of the concept. Policymakers and analysts have defined it differently and with varying degrees of precision and complexity. To some, parity means mutual possession of secure but unequal strike-strike capabilities. To others, it means rough equality in ability to inflict societal damage. Others measure it as equality in numbers of weapons, and finally, to some it means equivalence in capacity to destroy nuclear forces and other military targets.³⁰

Ultimately, the United States embraced a conception of nuclear parity that acknowledges the importance of subjective perceptions and sees numeric equality as desirable because it is a simple and objective

reference point that affects perceptions. Due to this conception, the United States sees arms control as a valuable tool for guaranteeing nuclear parity by setting equal limits.

The US view that parity was an essential attribute of the nuclear balance coalesced in the 1970s. The United States no longer enjoyed nuclear superiority over the Soviet Union, and senior US officials and independent experts began to warn against the strategic risks of Soviet superiority. They feared that large quantitative or qualitative discrepancies in the Soviet's favor could foster dangerous misperceptions. Thus, parity became a measure of sufficiency.³¹

Secretary of Defense James Schlesinger described parity in terms of essential equivalence, and he explicitly linked objective metrics and subjective perceptions in the concept. He argued that Soviet perceptions of an advantage, even if misguided,

[T]he United States sees arms control as a valuable tool for guaranteeing nuclear parity by setting equal limits.

could drive them toward a fatal miscalculation, potentially triggering a war. Simple comparisons of “static” measures, such as numbers of warheads or missiles, could affect how US allies judge the Cold War competition and the credibility of extended deterrence. Thus, Schlesinger linked perceived equivalency with approximate numeric parity:

A more equitable and stable arrangement would be one in which both sides maintain survivable second-strike reserves, in which there is symmetry in the ability of each side to threaten the other and in which there is a perceived equality between the offensive forces of both sides.... In this sense, the sizing of our strategic arsenal, as distinct from our targeting doctrine, will depend on the outcome of SALT. In default of a satisfactory replacement for the Interim Agreement on strategic offensive forces, we will have to incorporate ‘static’ measures and balancing criteria into the planning of our strategic offensive forces.³²

This conception of parity is logical. Perceptions are indeed inseparable from deterrence and assurance. Many factors shape perceptions, including objective reference points, such as numbers of weapons. Additionally, the threat to use nuclear weapons first in a conventional war played a prominent role in the United States’ deterrence strategy in this period, and it is understandable how US officials worried that perceptions of inferiority would weaken extended deterrence.

But there have always been cogent counterpoints to Schlesinger’s conception of parity. For instance, from the vantage point of the late 1980s, McGeorge Bundy concluded that fluctuations in the balance between

US and Soviet nuclear forces never affected mutual deterrence and that the “record makes clear that the sturdiness of the balance does not rest on having as much of this or that system as the other side.”³³

Ultimately, however, parity, in the form of a perceived equivalency that rested in part on numeric equality, has remained an important metric, albeit one that the United States described with less precision since the end of the Cold War. The William J. Clinton administration retained rough parity with Russia despite the dramatic changes in the bilateral relationship.³⁴ The George W. Bush administration described its nuclear force-sizing construct as a departure from the Cold War practice of setting requirements based on nuclear strike plans and the size of Russia’s arsenal. Within this broader construct, however, approximate parity remained a key component of assuring allies and deterring foes: “Assurance of allies also requires that US nuclear forces are not perceived as inferior or at an overall disadvantage when compared to the capabilities of other nuclear powers.”³⁵ In 2009, the Congressional Commission on the Strategic Posture of the United States was explicit in reaffirming the enduring importance of parity:

As part of its strategy to assure its allies, the United States should not abandon strategic equivalency with Russia. Overall equivalence is important to many US allies in Europe. The United States should not cede to Russia a posture of superiority in the name of deemphasizing nuclear weapons in US military strategy.³⁶

This continuity extended into the Barack H. Obama administration. The 2010 Nuclear Posture Review stated that “strict numeric parity” between US and Russian forces was unnecessary but that “large disparities in nuclear capabilities could raise concerns on both sides and among US allies and partners...”³⁷ After issuing new nuclear employment guidance in 2013, President Obama announced that the United States could fulfill its targeting requirements with force levels one third below New START limits, adding that the United States would seek to do so through another treaty with Russia.³⁸ President Obama ultimately did not move forward with unilateral reductions when Russia refused to negotiate a follow-on treaty to New START, demonstrating that “static measures” such as rough numeric equality with Russia remained a key feature of sufficiency for the United States in 2016.

The Trump administration has thus far given no reason to suspect this policy will change. The 2018 Nuclear Posture Review warned that delays in US nuclear modernization programs could “challenge our ability to maintain rough parity with Russian strategic deployments.”³⁹

The centrality of rough equality in numbers of strategic nuclear weapons as a necessary condition of parity is unsurprising. Numbers are a simple and objective reference point everyone can understand. It is in this sense that strategic nuclear arms control treaties play a prominent role in underpinning US perceptions of parity with Russia. Arms control is a “diplomatic mechanism for defining and regulating parity.”⁴⁰ Equal limits lock in parity, while unequal limits risk the perception of inferiority. This was the animating spirit of Senator Henry M. Jackson’s 1972 amendment declaring that arms control treaties should not limit the United States to a lower level

of forces than the Soviet Union.⁴¹ Equal numeric limits have since become the norm in strategic nuclear arms control. SALT II, START, START II, the Moscow Treaty, and New START all have equal limits.

After the collapse of the Soviet Union, however, a treaty-based ceiling was unnecessary to keep Russia from deploying more nuclear weapons than the United States. The START treaty limits functioned more as a pinnacle Russia could barely reach rather than a ceiling preventing its strategic force levels from rising.⁴² When New START entered into force in 2011, Russia’s initial force-level declarations were under the treaty’s limits on strategic delivery vehicles and hundreds below the United States on deployed strategic warheads, delivery vehicles, and launchers (see Table 1).

Table 1. US and Russian Initial New START Declarations

Category	United States	Russia
Deployed Strategic Warheads	1,800	1,537
Deployed Strategic Delivery Vehicles	883	521
Deployed and Non-Deployed Strategic Launchers	1,124	865

Source: United States Department of State Fact Sheet, New START Aggregate Number of Strategic Offensive Arms (as drawn from the initial exchange of data), June 1, 2011

In 2019, the United States is now approaching a new period in which it cannot assume rough numeric parity with Russia. Russia has the capacity to significantly increase the size of its strategic nuclear arsenal, and it might not be under treaty-based constraints after New START.

US Perspectives On Survivable Second Strike

Unlike for parity, there is a widely accepted definition in the United States of survivable second-strike capability: a nuclear arsenal that is capable of delivering unacceptable damage upon an aggressor after weathering an attack. In the 1980s and 1990s, the United States attempted to use arms control as a tool for reinforcing both US and Russian survivable second-strike capabilities but has more recently delinked the two.

In an address early in the nuclear age, Senator, and future President, John F. Kennedy articulated the essence of a survivable second-strike capability:

*We must make invulnerable a nuclear retaliatory power second to none...we require a retaliatory capacity based on hidden, moving, or invulnerable weapons in such force as to deter any aggressor from threatening an attack he knows could not destroy enough of our force to prevent his own destruction.*⁴³

This definition remained constant throughout the years. Testifying in 2010, General Chilton, the Commander of US Strategic Command at the time, said deterrence of a large-scale Russian nuclear attack would hold unless Russia could “deny the United States the assured ability to respond against a substantial number of highly valued Russian targets following a Russian attempt at a disarming first strike.”⁴⁴

Key Term

Counterforce: An attack on an adversary’s nuclear forces before the adversary can use them in an attack.

One major point of continuity in US nuclear policy across every post-Cold War administration is ensuring a survivable strategic nuclear force through a triad of strategic nuclear delivery vehicles. US ballistic missile-carrying submarines (SSBNs) at sea are the most survivable leg of the triad because they are extraordinarily difficult to locate, track, and destroy. US bombers, once armed with weapons and dispersed, are also difficult to locate and destroy. And US ICBMs, though more vulnerable to counterforce strikes because they sit in fixed silos, would require an adversary to launch a massive ballistic missile attack to target all of them, thus depleting a large portion of its nuclear forces while destroying only one leg of the triad.⁴⁵

The result is that the United States would have ample forces with which to retaliate after a large-scale nuclear attack and a favorable balance of remaining weapons relative to its adversary. The 2018 Nuclear Posture Review reaffirmed that the United States continues to see a triad as the principle means of sustaining survivability.⁴⁶

Yet just as strategic parity exists in the eye of beholder, standards of sufficient survivability, the severity of potential counterforce threats, and the implications for deterrence have varied over the years. There were periods during the Cold War where many US policymakers and analysts perceived significant threats to survivability from the Soviet Union. These assessments typically fused operational concerns about nuclear capabilities with political concerns about Soviet intentions, and the United States looked to both force structure adjustments and arms control solutions.

Paul Nitze and the window of vulnerability offer a useful example. Nitze feared that the United States had placed too much faith in détente and would soon lack the requisite forces to deter Soviet aggression and

nuclear escalation in war. He assessed that by the early 1980s Soviet ICBMs would be capable of destroying all US ICBMs with a smaller number of Soviet missiles. This lopsided exchange ratio stemmed from assessed improvements in the accuracy of Soviet “heavy” ICBMs, which were large enough to carry 10 warheads on each missile. As a result, one Soviet ICBM that is armed with 10 warheads could potentially destroy 10 US ICBMs.

Key Term

Multiple Independently Targetable Reentry Vehicles (MIRV): Multiple nuclear warheads mounted on a single ballistic missile that can be employed against different targets.

This would, Nitze reasoned, leave a US president with the dismal option of retaliating with submarine-launched ballistic missiles (SLBMs) and bombers, which he assessed to be incapable in the early 1980s of destroying a meaningful portion of Soviet nuclear forces. Thus the US reprisal would only succeed in inviting a follow-on strike on US cities. Nitze concluded that the effect of this perceived imbalance in exchange ratios would be to convince Soviet leaders that they could wage an expansionist campaign throughout the globe and deter the United States from responding.⁴⁷

Nitze’s analysis was not universally accepted at the time.⁴⁸ Nevertheless, concerns about the vulnerability of US ICBMs to a Soviet ICBM strike resonated beyond the Committee on Present Danger and gained traction in the US government. There was extensive debate in the late 1970s and early 1980s on the MX ICBM and mobile basing concepts to enhance the survivability of US ICBMs.⁴⁹

Similarly, the Scowcroft Commission on strategic nuclear modernization reflected a growing view that stationary (i.e., fixed) ICBMs armed with many warheads posed both a threat to the survivability of US forces and a broader threat to the predictability of decisionmaking. Because these types of ICBMs could destroy many targets once launched, and were vulnerable to an attack prior to launch, both countries would have military incentives to strike first in a crisis. Perhaps more dangerously, both would also know the other had incentives to launch first. The Commission therefore recommended pursuing modernization and arms control initiatives that would encourage both countries to “enhance survivability” with “strategic deployments in which individual targets are of lower value.”⁵⁰ The notion that Soviet leadership’s sense of vulnerability could actually increase the nuclear danger facing the United States was not new, of course. But the lopsided exchange ratios engendered by Soviet ICBMs seemed to be the textbook case of weapons that would give both countries use-or-lose dynamics in a crisis.

The upshot was an effort by the United States to not just constrain aggregate numbers of weapons in arms control but also shape the qualitative dimensions of strategic forces, such as throw weight of missiles (i.e., the number of warheads a missile can carry) and the concentration of warheads on vulnerable systems.⁵¹ The START and START II treaties reflected this linkage of arms control and survivability through constraints that included sub-limits and counting rules. For example, START included sub-limits on heavy ICBMs and the total number of warheads on ballistic missiles, and START II included a provision banning multiple-warhead, or MIRV, ICBMs.⁵²

Again, the focus of the United States has changed since the Cold War. The Obama administration did not seek in the New START treaty to shape Russian strategic

nuclear forces by banning MIRVs on ICBMs. Indeed, during the New START ratification deliberations in the US Senate, the Department of Defense stated that the survivability of US strategic nuclear forces would be insensitive to Russian violations of New START. Additional Russian warheads would not enable Russia to effectively target SSBNs at sea and generated bombers, and ICBMs “would be affected only marginally by additional warheads provided by any Russian cheating or breakout scenario.”⁵³

In 2019, this assessment does not appear to have changed. Independent experts assess that new counterforce threats could emerge in the next 10–20 years and require hedging strategies but are extremely unlikely in the near term; moreover, these new threats would stem from non-nuclear systems that are not affected by New START, and such developments would enable Russia to disrupt nuclear command and control with space and cyber means or locate US SSBNs more effectively than is currently possible.⁵⁴

Soviet/Russian Perspectives on Parity

Like the United States, the prevailing Soviet/Russian perspective has been that nuclear inferiority is dangerous and arms control is a means for maintaining parity.

Declassified interviews with Soviet officials portray the Soviet Union as racing to achieve numeric nuclear parity with the United States in the 1960s and then intent on acquiring a quantitative advantage in the 1970s. The belief that nuclear competition was inherently dynamic motivated the Soviet Union’s attempted escape from parity. Soviet strategists worried that military advantages could translate into coercive leverage.⁵⁵ In contrast to the subjective US

conception of parity, the Soviet Union reportedly utilized a computer program to aggregate data on the correlation of forces and provide warning if the United States was on the cusp of achieving a decisive strategic advantage.⁵⁶ By the late 1970s, Soviet leadership saw strategic nuclear parity as in peril as a result of improvements in US nuclear capabilities, such as the Trident II SLBM and MX ICBMs.⁵⁷

Mikhail Gorbachev’s decision to transform the relationship with the United States and the eventual collapse of the Soviet Union overtook Soviet efforts to redress the perceived disparities.⁵⁸ Russia’s subsequent economic challenges curtailed strategic nuclear modernization and precipitated a dramatic decline in the overall nuclear enterprise.⁵⁹

During this period, nuclear parity with the United States remained important to Russia. Strategic nuclear arms control enabled Russia to limit the numeric gap, if not the qualitative one, between US and Russian strategic nuclear arsenals. In making the case for ratification of START II to the Duma in 2000, Putin described arms control’s value to Russian interests in this light:

If the START II Treaty is not ratified, by 2010 Russia will be behind the United States...in terms of the number of warheads delivered to enemy targets in retaliatory options.... Implementation of the START II Treaty will make it possible to bring the overall correlation between deterrent potentials of the United States and the Russian Federation to 3:1, and if the START III Treaty is concluded and implemented the correlation between deterrent potentials...will be 1:1.⁶⁰

Both US and Russian experts argue that New START served a similar leveling function for Russia.⁶¹

More broadly, nuclear parity and arms control serve a symbolic purpose, demonstrating to Russia, if not the rest of the world, that it still has equal standing with the United States.⁶² Putin's high-profile remarks in 2018 on new Russian strategic delivery vehicles underscored this sentiment. Although Putin focused on the technical issues associated with evading ballistic missile defenses, he framed the investments as Russia retaining its global status. Observing that Russia remained a nuclear power despite all the internal challenges it has faced, he declared that "nobody really wanted to talk to us about the core of the problem, and nobody wanted to listen to us. So listen now."⁶³

Russia continues to value nuclear parity with the United States. Russian experts cite the loss of parity as a key risk that Russia would face without New START.⁶⁴ Russia's reported willingness to extend New START until 2026 suggests that treaty-based limits on the United States, at least in the near term, continue to play a role in Russia's strategy for meeting this requirement.⁶⁵ However, as in the United States, some Russian experts argue that rough numeric parity is an antiquated metric.⁶⁶

Soviet/Russian Perspectives On Survivable Second Strike

As with nuclear parity, concerns about US superiority permeated Soviet thinking about survivable second-strike capabilities during the Cold War and continue to resonate today.

Declassified interviews with former Soviet officials reveal that the Soviet Union was slower than the United States to embrace survivable second strike as an essential component of deterrence, but Soviet policy eventually set the ability to retaliate after an attack

as the paramount force structure attribute.⁶⁷ Toward the end of the Cold War, the Soviet plans reportedly required the ability to strike 200 American targets following a US first strike.⁶⁸

Subsequent historical analyses have concluded that while Soviet policy prioritized a survivable second-strike capability, progress toward operationalizing this guidance was uneven. Soviet leadership's confidence in the ability to weather a US strike or launch its missiles upon confirmation of an incoming US attack was mixed. They were concerned about improvements in US counterforce capabilities and ballistic missile defenses, as well as shortcomings in Soviet nuclear command and control, mobile ICBMs, and early warning systems.⁶⁹ When combined with their assessments of US intentions, Soviet leadership feared that the United States might launch a successful strategic missile attack in the early 1980s.⁷⁰

Concerns about the survivability of Russian strategic nuclear forces persisted beyond the Cold War. Two additional factors exacerbated Russian threat perceptions. First, the United States withdrew from the Anti-Ballistic Missile (ABM) Treaty in 2002, thus lifting limitations on missile defenses. Second, the United States made profound improvements in its precision conventional strike systems, which Russian officials fear could be used to destroy Russian nuclear forces.⁷¹ A recently declassified CIA bulletin from the beginning of the new millennium assessed that:

Moscow continues to perceive US plans for even a limited missile defense system as undermining its strategic retaliatory capability... Moscow is concerned that its declining strategic nuclear forces could no longer survive a first strike with enough missiles left to overcome US missile defenses, undermining its ability to deter a US attack.⁷²

Despite significant progress in modernizing its strategic nuclear forces and fielding more mobile systems that are less vulnerable to attack, Russian concerns about survivability remain.

The 2014 Russian Military Doctrine lists missile defense and precision conventional strike, along with the potential for placing weapons in space, as key external threats that “violate the balance of forces in [the] nuclear-missile sphere.”⁷³ More recent analyses from Russian experts depict US missile defenses, the nuclear triad, and the supplemental nuclear systems called for in the 2018 Nuclear Posture Review—the low-yield SLBM and a revived nuclear-capable sea-launched cruise missile (SLCM)—as part of a suite of systems capable of destroying the bulk of Russia’s arsenal in a first strike and intercepting the remaining ones.⁷⁴

Russian leadership perceives the current arms control framework as incomplete and failing because it does not constrain threats to Russia’s second-strike capability. Russian official statements have been explicit on this point, especially on missile defense. Russia’s 2016 Foreign Policy Concept linked progress on further reductions to including missile defenses in future negotiations, and in 2018 Putin said that “all agreements signed within the framework of New START are now gradually being devaluated” by US missile defense policy.⁷⁵

[I]n light of the plans to build a global anti-ballistic missile system, which are still being carried out today, all agreements signed within the framework of New START are now gradually being devaluated
President Putin on March 1, 2018

Similarities and Differences

The United States and Russia have both sought to sustain parity because they view inferiority as dangerous, and both have historically valued strategic arms control treaties for this purpose, albeit for different reasons. For the United States, arms control limits offered a clear reference point for equality and enabled reductions without risking the perception of inferiority among allies or adversaries. For Russia, treaty-mandated reductions and limits bound the United States and helped Russia retain its status as an equal in the nuclear dimension of the relationship.

The United States and Russia now diverge on the connection between arms control and survivability. The United States sees survivability as dependent upon sustaining a credible nuclear triad and retaining the ability to adapt if new counterforce threats emerge. Arms control plays little or no role and, from the US perspective, should not limit defenses or conventional strike systems. Alternatively, from Russia’s perspective, the biggest shortcoming of strategic arms control is that the current regime constrains Russia’s arsenal but not the US systems that could undermine Russia’s second strike.

Each country’s views on parity and survivability will serve as the basis for exploring the implications of the end of New START’s constraints on strategic nuclear forces in Part II of the report.

SECONDARY ROLES OF STRATEGIC NUCLEAR ARMS CONTROL

This section explores the secondary roles of strategic nuclear arms control: strengthening nuclear non-nuclear proliferation strategy and sustaining US extended deterrence and alliance solidarity.

STRENGTHEN THE NUCLEAR NON-PROLIFERATION REGIME

Preventing the spread of nuclear weapons to additional states and to non-state actors is essential for reducing the risks of war and escalation, limiting the level of violence, and restraining arms competitions.⁷⁶

US-Russian arms control plays a role in both countries' strategies to prevent the spread of nuclear weapons.

The NPT is a key component of the United States' strategy for preventing additional states from acquiring nuclear weapons. The NPT is built on a compromise between the five permanent members of the United Nations (UN) Security Council, all of whom have nuclear weapons, and the other signatories to the treaty. The treaty recognizes the status of China, France, Russia, the United Kingdom, and the United States as nuclear weapon states under international law, while also outlawing pursuit of nuclear arsenals by the non-nuclear signatories. In exchange, the five nuclear weapon states agree to work toward complete nuclear disarmament under Article VI of the NPT.⁷⁷

US officials across Democratic and Republican administrations perceive a relationship between non-proliferation and arms control with Russia. Secretary of State Warren Christopher described this connection in his 1995 testimony on START II:

Ratification of START II...will send a strong signal to the non-nuclear weapon states that we are taking significant steps to live up to our obligations under Article VI of the non-proliferation treaty, an obligation we've taken together to reduce our arsenals. Prompt endorsement of START II by the Senate and by the Russian Duma will provide a powerful boost to our determination to get indefinite extension of the non-proliferation treaty at the review conference this spring.⁷⁸

Fifteen years later, Secretary of State Hillary Clinton described this linkage when she testified in support of New START ratification:

Now, I am not suggesting that this treaty alone will convince Iran or North Korea to change their behavior. But it does strengthen our hand as we seek to hold these governments accountable.... And it conveys to other nations that we are committed to real reductions, and to holding up our end of the bargain under the Non-Proliferation Treaty.⁷⁹

Similarly, the lead negotiator for New START, Rose Gottemoeller, testified that there was an indirect linkage, with the signing of New START bolstering US efforts to build consensus on an international strategy for preventing Iran from developing nuclear weapons.⁸⁰

To be sure, these policymakers had incentives to emphasize the additional foreign policy benefits of arms control beyond the US-Russian relationship. Yet during the New START hearings, former cabinet secretaries James Baker, James Schlesinger, and Henry Kissinger all connected non-proliferation cooperation, the credibility of US commitment to disarmament, and arms control.⁸¹ This consistency suggests that, in practice, other countries link non-proliferation, US-Russian arms control, and NPT Article VI commitments, at least in their interactions with senior US officials.

Russia also looks to arms control with the United States to fill a similar role in its nuclear non-proliferation policy. The New START treaty preamble states that both countries are “committed to the fulfillment of their obligations” under the NPT.⁸² More recent Russian analyses have concluded that the end of US-Russian nuclear arms control would imperil the NPT, suggesting that the linkage continues to resonate in Russian as well as US policy circles.⁸³

Assessing the Linkage

There are two levels to this role. The first is practical. Both countries herald arms control agreements as proof of their commitment to Article VI of the NPT. For example, during the 2000 NPT Review Conference, the five recognized nuclear weapon states agreed to 13 practical steps toward disarmament, one of which was securing agreement on a START III Treaty.⁸⁴

While neither country can claim that it has tried to fulfill every step, New START does give US and Russian diplomats an accomplishment to tout with NPT signatories.

The second level centers on non-proliferation outcomes. Does success or failure in US-Russia arms control ripple out into the non-proliferation regime, as US and Russian officials believe? If there is a linkage, what drives it and under what conditions does it function?

US and Russian policymakers will assess the nuclear proliferation risks posed by the end of New START in a realm of uncertainty, which is where most national security decisions are made.

In a thorough examination, Jeffrey Knopf explores multiple hypotheses that either support or disprove direct and indirect linkages and concludes that definitive claims in support of or against a linkage between progress on disarmament and preventing the spread of nuclear weapons are premature without more data and empirical studies across a body of cases.⁸⁵

Given that definitive evidence on this weighty issue is unlikely to emerge in the next decade, US and Russian policymakers will assess the nuclear proliferation risks posed by the end of New START in a realm of uncertainty, which is where most national security decisions are made. Yet some trends in the international disarmament landscape would clearly have implications for this role at the practical level and plausibly at the level of non-proliferation outcomes, a topic we explore in Part II.

SUSTAIN EXTENDED DETERRENCE AND ALLIANCE SOLIDARITY

Credible US security commitments to treaty allies in Europe and Asia reduce the likelihood of conflicts and arms competitions, including the acquisition of nuclear weapons by US allies. An enduring commitment to strategic nuclear arms control and risk reduction underpins US extended deterrence. This role of arms control only applies to the United States, and it manifests in two ways.

Shaping the Security Environment

First, arms control is an important element in the NATO alliance's security strategy. Just as the United States consistently pursues a balanced approach that utilizes both military and diplomatic means to address nuclear threats, so too do US allies. Dating back to the 1967 Harmel Report, arms control has been central to NATO's strategy for mitigating the threat from Russia.⁸⁶ US allies in Europe accept the premise

that cooperation with Russia can reduce nuclear dangers and the likelihood of war while unfettered competition could undermine their security. NATO's communiqués and declarations, which require agreement from all members, consistently emphasize the enduring value of arms control as a tool for advancing NATO's strategic objectives of preserving the security of each member.⁸⁷

This strategic viewpoint engenders allied expectations about US diplomacy. As former US Deputy Assistant Secretary of Defense Brad Roberts observed, US allies are “committed to the proposition that the United States should make every reasonable effort to use political and economic tools to try to reduce nuclear dangers—especially when threat reduction may pay local dividends in their region.”⁸⁸ In his memoir with President George H.W. Bush, Brent Scowcroft recounts how he and the president believed that an adroit arms control strategy would strengthen confidence in US leadership among NATO allies.⁸⁹



Consultations among NATO allies. (Shutterstock)

Alliance Solidarity

Second, and as a result of the importance of arms control to US allies, arms control helps build alliance cohesion. From a practical standpoint, it would be difficult for the United States to establish consensus within the alliance on a shared strategy that precludes arms control and nuclear risk reduction. This is particularly important because NATO is a nuclear alliance with a unique burden-sharing arrangement. US nuclear weapons are based in Europe and, upon direction of the President of the United States and a collective decision by NATO, would be delivered via aircraft operated by select non-US NATO members. Many NATO allies need to demonstrate their commitment to nuclear risk reduction to domestic constituents in order to sustain support for continued participation in NATO nuclear burden-sharing, which could entail sustaining nuclear-capable aircraft, participating in military operations that support nuclear platforms (e.g., air support), and hosting nuclear weapons on national territory.⁹⁰

New START illustrates these dynamics. The treaty ensured that the United States and Russia did not abandon arms control after START expired. In the 2010–2012 timeframe, this progress enhanced the palatability, among NATO members, of the alliance's preference for considering reductions in US non-strategic nuclear weapons in Europe “in the context of reciprocal steps by Russia.”⁹¹ The alliance agreed to this approach in the 2010 Strategic Concept and the 2012 Deterrence and Defence Review as an alternative to withdrawing these weapons from Europe independent of Russia, or to individual NATO members withdrawing from the nuclear mission, both of which were policy options that several NATO members were receptive to at the time.⁹²

NATO's collective perception of Russia evolved in the following years, especially after the Russian invasion of Ukraine, and the alliance adopted a series of measures to strengthen collective defense. In this new context, New START served as a lone bright spot of US-Russian cooperation on nuclear weapons despite the growing competitiveness in their relationship. It also symbolized continued US and NATO willingness to engage Russia on common interests. According to Robert Bell, the former defense advisor to the US Ambassador to NATO, agreement on the alliance's path forward for strengthening its deterrence strategy at the 2016 Warsaw Summit and the July 2018 Brussels Summit would not have been possible without continued US commitment to pursuing nuclear arms control with Russia.⁹³



PART II: RISKS AFTER NEW START

KEY PROVISIONS OF NEW START

We begin Part II with a brief review of New START’s key provisions.⁹⁴ This will ensure a coherent discussion of the benefits of specific New START provisions and risks after the treaty expires. In a sense, New START’s provisions are the specific means by which the treaty fulfills the roles of strategic nuclear arms control and contributes to objectives outlined in Part I.

New START constrains the number of deployed strategic delivery vehicles for nuclear weapons, the number of nuclear warheads deployed on them, and the number of deployed and non-deployed launchers of these systems. The United States and Russia had until February 2018 to bring their forces into compliance with these limits.

Table 2. New START’s Limits on Strategic Nuclear Forces

Category of System	Numeric Limit
Deployed Strategic Delivery Vehicles (ICBMs, SLBMs, Nuclear Bombers)	700
Deployed and Non-Deployed ICBM and SLBM Launchers and Nuclear Bombers	800
Deployed Strategic Nuclear Warheads	1,550

The strategic delivery vehicles are ICBMs, SLBMs, and nuclear-capable bombers. Under the treaty, the United States and Russia can deploy a total of 700 of these strategic delivery vehicles. New START also limits launchers for these systems, constraining each country to a total of 800 deployed and non-deployed ICBM and SLBM launchers and nuclear-capable bombers. The treaty does not limit strategic ballistic

missile submarines (SSBNs), only the number of SLBMs and SLBM launchers SSBNs carry. New START does not limit non-deployed ICBMs and SLBMs (i.e., ones that are not in a launcher).

New START limits each country to 1,550 deployed strategic nuclear warheads. A nuclear warhead is considered deployed under New START when it is mounted on an ICBM or SLBM.

In a break with START, New START counts actual deployed warheads on each treaty-accountable ballistic missile, whereas START counted the number of warheads attributed to each type of deployed ballistic missile. Thus, under START, if a particular type of ICBM/SLBM was accepted by both countries as capable of carrying a maximum of eight warheads, every deployed system of that type counted as eight deployed warheads regardless of whether it was actually loaded with fewer. Under New START, an SLBM carrying one warhead counts as one deployed warhead even if it has the capacity to carry more. This change is intended to provide the United States and Russia more flexibility in structuring their forces.⁹⁵

Each nuclear-capable bomber counts as one deployed strategic warhead under New START. The treaty does not count the gravity bombs and nuclear-armed air-launched cruise missiles (ALCM) that each country possesses and can load onto these bombers. Even when a bomber is armed with these weapons, it still counts as one deployed warhead. This provision stems from both countries’ practice of keeping their bombers unarmed on a day-to-day basis, and from sensitivities to onsite inspections of storage facilities for gravity



President Barack Obama and President Dmitry Medvedev of Russia sign the New START Treaty during a ceremony at Prague Castle in Prague, Czech Republic, April 8, 2010. (Official White House Photo by Chuck Kennedy)

bombs and cruise missiles. Thus, the actual number of nuclear warheads US and Russian strategic delivery vehicles can carry is larger than the 1,550 limit.

New START does not cover US and Russian stockpiles of non-deployed nuclear warheads. Nor does it limit either country's shorter-range nuclear-capable delivery vehicles, such as US F-15Es or Russian SS-26 ballistic missiles and SS-N-30 SLCMs. These systems are commonly referred to as non-strategic nuclear weapons because they are not accountable under current and previous strategic nuclear arms control treaties. Thus, the number and types of nuclear weapons that each country is capable of employing against the other exceed New START's limits.

Finally, New START has an extensive verification regime. We review New START's verification regime in the next section as the stepping stone into our analysis of risks and uncertainties.

PREDICTABILITY AFTER NEW START: TRANSPARENCY

Without a treaty, the existing regime that engenders transparency cooperation between the United States and Russia would end, with a few exceptions that we note below, because it would have no political and legal basis. In this section, we explore the consequences, risks, and challenges to fostering predictability in the US-Russian nuclear relationship that would emerge under these conditions. We review the cooperative transparency practices in New START and explain how each country has benefited from them. We then explore how the end of New START would affect mutual transparency into strategic nuclear forces and discuss the implications.

COOPERATIVE TRANSPARENCY IN NEW START

New START's verification provisions are the primary means by which the treaty establishes transparency between the United States and Russia. The verification regime is based on the START treaty verification regime, with several modifications to simplify procedures and reduce the implementation burden on both countries. It includes an extensive database cataloging strategic nuclear forces and facilities, notifications related to items in the database, and short-notice onsite inspections.⁹⁶

The verification regime is intended to deter cheating, improve each country's ability to detect violations before they result in a militarily significant threat, and facilitate cooperation. The data exchanges, notifications, and inspections create a tapestry that US and Russian analysts can crosswalk with information gathered independently through

national technical means (NTM), which then enables policymakers to assess whether the other is complying with the treaty.⁹⁷ Table 3 summarizes the key provisions.⁹⁸

The United States and Russia collectively provided 14,600 notifications, performed 14 data exchanges, conducted 252 onsite inspections, and completed 14 exhibitions in the 7 years after New START entered into force.⁹⁹ They have also reached a series of agreements, decisions, and statements on treaty implementation through the Bilateral Consultative Commission.¹⁰⁰

A review of how each country benefits from these practices reveals that the strategic value transcends the narrower purpose of deterring cheating and detecting violations.

The Window Into Russia Under 7 Years of New START

Soon after New START entered into force, the United States participated in an exhibition of the then-new type of Russian mobile ICBM, the SS-27 Mod 2.¹⁰¹ Russia was required to provide a photograph of the missile's distinguishing features, and US inspectors had an opportunity to inspect and measure the actual missile.¹⁰² During the following years, the United States has had the opportunity to observe how Russia operates the SS-27 Mod 2 and to inspect deployed systems.

From a macro perspective, this regime enables US analysts to understand the state of Russian strategic nuclear forces in a granular way. It gives the United States insight into not only how Russia distributes warheads between its ICBMs and

Table 3. New START's Verification and Transparency Regime

Category	Description
Onsite Inspections	10 inspections of deployed strategic nuclear weapon bases/facilities and 8 inspections of non-deployed system facilities per year.
Biannual Data Exchanges	Each country provides the other with a declaration of its deployed strategic delivery vehicles, launchers and warheads, including: a breakdown of warhead numbers deployed across the three types of delivery vehicles; a breakdown of how many strategic delivery vehicles and warheads are deployed at each declared base.
Warheads Loadings on Specific Strategic Delivery Vehicles	During inspections of deployed strategic weapon bases/facilities, each side must disclose how many warheads are on each delivery vehicle at the inspected base, and the inspecting country has the right to inspect the loading on one delivery vehicle to confirm the declaration is accurate.
Strategic Delivery Vehicle and Launcher Notifications	Rolling notifications regarding the status (i.e., deployed/non-deployed) and basing or facility assignment of all strategic delivery vehicles and launchers. Every delivery vehicle has a unique identifying code that is subject to confirmation during inspections. Notifications for dispersal of mobile ICBMs and SSBN patrols are not required.
New Types and Kinds of Treaty-Accountable Systems	Declaration and exhibition of new types and kinds of treaty-accountable systems that enter service. The system would then be subject to data declarations, notifications and inspections.
Notification of Additional Delivery Vehicles	48-hour notification before an additional treaty-accountable missile leaves the production facility.
Elimination and Conversion	Notification and inspections regarding elimination of treaty-accountable systems or conversion to non-nuclear or non-functional status. This includes specific procedures for elimination, such as exploding ICBMs, and leaving the eliminated system in view of NTM for 60 days.
Bilateral Consultative Commission	A standing body that meets upon request by either country to discuss treaty implementation and no less than twice per year.
Ballistic Missile Launches	Pre-launch notifications of treaty-accountable ballistic missiles (a practice that is also obligated under the 1988 Ballistic Missile Launch Notification Agreement).
Non-Interference with NTM	An obligation to forgo concealment and interference practices intended to prevent the other from using NTM to verify treaty compliance.

SLBMs, but also how it apportions them across its 12 Strategic Rocket Forces bases.¹⁰³ Comparing the declared mobile ICBMs associated with a base to the actual ICBMs at the base during inspections will over time yield insights into operational patterns. Even tracking the status of specific launchers over time would yield useful insights, such as whether some ICBM silos, mobile launchers, and SLBM tubes are deployed but decrepit and unarmed. Much like data

gathered from consumer purchases and social media, each individual piece of information is of limited value, but when aggregated they form an intimate portrait of Russian nuclear operations.

A speech delivered by President Putin in 2015 provides a useful example of the value of cooperative transparency for the United States. Putin boasted that Russia would field 40 additional ICBMs during the year.¹⁰⁴ Because of New START, the United States

had a significant body of information to judge the statement's veracity and, more importantly, how the additional Russian ICBMs fit into Russia's arsenal.

Russia was obligated to notify the United States 48 hours before each missile left its production facility, enabling the United States to pre-position NTM and observe it. Each new missile has a unique identification number. Russia had to declare which base or facility it was assigned to and whether/when it was loaded onto a launcher (i.e., deployed or non-deployed). The United States has had the opportunity to inspect a portion of these missiles and learn how many warheads they carried.

During the following years, US intelligence analysts have been able to make informed judgements about whether Russia's deployed strategic arsenal increased in size as a result of these new missiles because, if Russia retired older missiles as the new ones entered the force, it is obligated to provide notification when systems switch to non-deployed status or are eliminated. Additionally, notification of when the missiles are moved to maintenance facilities would also inform analytical judgements about their durability and lifecycles.

The Window into the US Under 7 Years of New START

The nature of US society and government already provides Russia with a large window into the US nuclear posture, but New START gives Russian policymakers additional data points and in-person access that it would not have otherwise.

For instance, the verification regime enabled Russia to use onsite inspections to confirm whether the United States reduced all ICBMs to single-warhead armaments. While essential for assessing US compliance with warhead limits, this transparency

serves the more basic function of enabling Russia to assess the striking power of the US ICBM force with greater precision. Without onsite inspections, Russian officials would not have direct data on whether US ICBMs carry multiple warheads, increasing the chances of a worst-case assessment that the ICBM force carries upwards of 800 rather than 400 nuclear warheads.

From a force-wide perspective, New START's transparency serves this function for the entire US strategic arsenal. To reduce to New START's limits during the first 7 years of the treaty, the United States also converted 56 SLBM launch tubes to non-functional status, reduced deployed SLBMs by 48, and converted 30 B-52H bombers to a conventional-only role.¹⁰⁵ The United States was obligated to brief Russia on its conversion methods for the SLBM launchers and bombers, and Russia has the opportunity to inspect the converted systems to confirm the United States implemented the procedures and has not reconverted them to operational status. Although Russia has raised concerns about US conversion methods, it has more insight into the United States' reduced force structure than it would without transparency measures.¹⁰⁶ The United States also has the capacity to upload additional warheads onto its deployed SLBMs.¹⁰⁷ Russia has had the opportunity to use onsite inspections to confirm that the United States is not tapping into this reserve.

Key Term

Upload: Mount additional nuclear warheads onto a MIRV-capable missile. To stay under New START limits, both the United States and Russia have deployed missiles that are loaded with fewer warheads than they are capable of carrying—i.e., upload capacity.

Lastly, Russia has the opportunity to inspect US nuclear-powered guided-missile submarines, which are converted SSBNs that carry cruise missiles, to confirm that the United States has not reconverted them to an SLBM platform.

TRANSPARENCY AFTER NEW START

Looking forward, what level of transparency will exist between the United States and Russia if New START expires without a follow-on treaty? We answer the question by exploring three categories: the United States' ability to offset the loss of New START's transparency measures through increased intelligence collection; the information gathered through New START that neither country can obtain through other means; and transparency into strategy and concepts.

Increased Intelligence Collection

To what extent can the United States gather information with other means in order to offset losing New START's window into Russian nuclear forces? Whereas arms control fosters cooperative transparency through information sharing, our focus here is on transparency into Russian forces generated without cooperation from Russia.

We only explore the US perspective on this issue because the United States relies more heavily on treaty-based transparency than Russia. Moreover, the US Director of National Intelligence described Russia as the leading counterintelligence challenge.¹⁰⁸ This statement suggests that Russian collection efforts, combined with publicly available information about US strategic nuclear forces, would partially offset the loss of cooperative transparency.

The United States would not be wholly without information about Russian forces after New START. Even within the context of treaty verification, cooperative transparency is intended to complement the information the United States gathers through intelligence collection, and the United States would continue to do this without a treaty.¹⁰⁹ Contemporary US intelligence-collection capabilities are orders of magnitude more potent than in the days of the missile gap debate and will likely continue improving.¹¹⁰ Thus, the United States would have an effective toolkit for monitoring Russia's arsenal.

Yet the level of effort required to gather and analyze information would increase, with implications beyond US policy on Russia. The mission of the US intelligence community is global in scope. Like any other organization with finite resources, its leadership faces resource constraints and priority tradeoffs. Information provided through New START helps the United States meet its collection requirements within these constraints.

For example, in 2010 General Chilton testified that without New START, the United States would be required "increasingly to focus low density/high demand intelligence collection and analysis assets on Russian nuclear forces."¹¹¹

This statement implies that New START frees up intelligence community resources for other missions. It is also important to note that the assets General Chilton references likely include collection platforms such as satellites, as well as analysts (i.e., people) with technical expertise required to assess and explain the raw data. Shifting the focus of these resources to offset the loss of New START's transparency measures would result in an opportunity cost.

Returning to the 2015 example of Putin declaring that 40 additional ICBMs would enter service, Table 4 compares the information Russia must provide under New START to the unilateral measures the United States would need to take in order to acquire the same information. It demonstrates that the United States would need near-persistent monitoring of a variety of locations.

A comprehensive assessment of how NTM could enable visibility and confidence comparable to all the New START transparency measures and the subsequent opportunity cost for other missions is impossible in an unclassified study. But the global demand for intelligence collection and analysis assets for monitoring ballistic missiles has probably increased since 2010. Collecting data related to North Korea’s development of ballistic missiles, their locations, bases, and operating patterns has likely increased in both importance and difficulty. China and Iran also have active ballistic missile programs. And many of these high-demand/low-density assets probably contribute to non-ballistic missile missions. The question is not whether increasing collection on Russian strategic nuclear forces would entail tradeoffs, but to what extent.

Information that is Unobtainable without Cooperation

New START’s cooperative transparency provides some information that is unlikely to be available through other means. The end of cooperative transparency will have a significant impact on both countries’ insights into deployed strategic warheads and new strategic nuclear systems.

DEPLOYED STRATEGIC WARHEADS

In addition to the aggregate number of deployed strategic warheads, New START’s biannual data exchanges specify how warheads are distributed across types of ballistic missiles (e.g., ICBMs and SLBMs) and how warheads are allocated across declared ICBM and SLBM bases. During inspections, each country must declare the number of warheads loaded on each ballistic missile at the base under inspection, and the inspection team then has the right to view one missile to verify if the declared number matches the actual number.

Table 4. Monitoring Russian ICBMs with and without Cooperative Transparency

Type of Information	With New START	Without Cooperative Transparency
Date and number of new missiles entering the force	Russia provides 48-hour notice before each missile leaves the production facility	Persistent NTM monitoring of identified production facilities
Basing location of new missiles	Russia provides notification of its associated base or facility	Persistent NTM tracking of new missiles after departure from production facilities or near-persistent tracking of potential destinations
Whether older missiles are retired/eliminated upon deployment of new missiles	Russia provides notification when existing missiles are pulled from deployment or eliminated, with verification procedures for elimination	Persistent NTM monitoring of Russian ICBM bases and storage/elimination facilities
Status change for new missiles	Russia provides notification when missiles become non-deployed and are sent to maintenance facilities	Persistent NTM monitoring of Russian ICBM bases and storage/elimination facilities

Gathering data through NTM alone is unlikely to match the level of insight and confidence as achieved by data exchanges paired with inspections. If pre-positioned at the right time, overhead surveillance would be able to track convoys carrying warheads to and from missile loading locations, but this imagery would only enable rough estimates about the numbers of warheads on each deployed missile, especially for mobile ICBMs and SLBMs that can be loaded in covered facilities. Even for fixed silos, pinpoint accuracy would be difficult. Convoys could also be carrying penetration aids, and both countries can take steps to conceal activity. Moreover, force-wide monitoring would be difficult because each country has hundreds of deployed ballistic missiles. Assumptions based on extrapolations are likely to fill the void of lost data and inspections.

In the late 2020s, Russia will have multiple types of ballistic missiles designed to carry multiple warheads: the SS-29 (like its predecessor the SS-18) can carry up to 10, the SS-27 Mod 2 can carry up to four, and the two types of SLBMs that will be in service can carry four and six.¹¹² This force gives it significant upload capacity to exceed New START limits (a topic we explore more in the next section). While the United States would be able to detect large-scale Russian uploading, the US ability to assess exact warhead levels will diminish without cooperative transparency, and US understanding of how Russia allocates warheads across its ballistic missile force will be less precise.

The impact on Russian insight into US deployed strategic warheads is also significant. The United States has the capacity to deploy upwards of 400 more warheads on its ICBMs, redeploy 50 ICBMs, add

48 SLBMs and launch tubes to its deployed SSBN force, and upload additional warheads onto its SLBMs, all of which would enable a large increase in deployed warheads (see the next section for more details). The United States would not be able to reverse its New START reductions in secret; the scope and scale of increases would be public knowledge, and the information would be available to Russian policymakers.

Yet Russia would have less information about warhead loadings on individual SLBMs and ICBMs. More importantly, Russia would not have independent confirmation if the United States only partially reversed its reductions. For example, the United States might announce restoration of 48 SLBMs and forgo adding more warheads to US ICBMs. Without data exchanges on SLBM loading and onsite inspections to confirm that ICBMs carry only one warhead, Russia would have less confidence in the veracity of US public declarations and would likely adopt worst-case assumptions.

Increased Russian uncertainty about SLBM loadouts also marginally affects US deterrence strategy. The United States is currently modifying a small portion of its W-76 warheads to provide a low-yield variant for its SLBMs. The strategic rationale of the change is to convey to Russian leadership that the United States possesses effective proportionate response options for responding to limited nuclear attacks in Europe. Adding a low-yield ballistic missile option ensures the United States' ability to promptly respond, reliably penetrate Russian defenses, and hold targets at risk throughout Russia.

Gathering data through NTM alone is unlikely to match the level of insight and confidence as achieved by data exchanges paired with inspections.

Operationally, low-yield SLBMs are likely to be deployed with only 1–2 warheads because they are intended for limited strike options. Sharing information with Russia about SLBM loadings and allowing Russian inspectors to confirm that a portion of US SLBMs carry 1–2 warheads reinforces the credibility of this strategy.¹¹³ Without cooperative transparency, Russian policymakers will lack independent confirmation of this attribute of US nuclear forces.

NEW STRATEGIC NUCLEAR SYSTEMS

As stated earlier, New START provides each country with an opportunity to participate in an exhibition to inspect and observe the distinguishing features of new types and kinds of treaty-accountable systems. The end of this cooperative practice after New START would result in both countries having less insight into the other’s new strategic nuclear systems. The precise impact would depend on whether New START expires in 2021 or 2026 and when the United States and Russia deploy the first unit of the new systems. Even if several of these new systems are deployed shortly before the end of New START, and thus an exhibition is held, both countries would still ultimately have less insight into how the other operates the new systems in the years following the treaty’s expiration.

Table 5 depicts the new US systems.¹¹⁴ The B-21 is scheduled to enter service within the lifespan of New START extension and its nuclear-capable

Table 5. New US Strategic Nuclear Systems

System	Deployment Date	Description
Columbia-class SSBN	2031	Replacement for Ohio-class SSBN
Ground-Based Strategic Deterrent	2029	Replacement for Minuteman III ICBM
B-21 Bomber	Mid-2020s	Next-generation bomber to replace B-52H and B-2 in conventional and nuclear missions

variant would count as a new type of bomber. The next-generation ICBM will enter service after New START expires but would be included in a follow-on treaty, as would the SLBM launchers on the Columbia-class SSBN. Thus, Russia would lose the opportunity for exhibitions of the entire modernized US triad if New START expires in 2021 or for the SSBN and ICBM legs if New START expires in 2026 with no follow-on. Losing inspection privileges for the Columbia-class SSBN would deny Russia firsthand confirmation that it has only 16 launch tubes for SLBMs, and Russian analysts and policymakers would undoubtedly prefer to inspect the B-21.

Table 6 depicts the new Russian systems. The first three systems in the table would likely count as new types of strategic delivery vehicles if Russia deployed them during New START. If Russia deploys the fourth system during New START, the Avangard, it would either count as an existing type of ICBM (if the glide

New Types vs. New Kinds: Under New START, new systems that meet the definitions of ICBMs, SLBMs, or bombers and are not existing types of such systems already counted against the treaty (e.g., Minuteman III ICBM) would count as new types of treaty-accountable systems. A new nuclear-armed system that does not meet the treaty definitions of an ICBM, SLBM, or bomber, but both countries formally agree should be captured under the treaty, would be considered a new kind of strategic offensive arm.

vehicle is atop an SS-19) or a new type or new kind of system if it is deployed in a way that does not meet the treaty definition of an ICBM. If Russia deploys any of these systems after New START, the United States would have less information about them.

The final two systems in the table would not match the treaty’s definitions of an ICBM, SLBM, or bomber.¹¹⁵ If deployed before New START expires, the United States would seek to include them under New START as new kinds of weapons. If Russia agreed, the United States would have an opportunity for an exhibition. The United States would almost certainly insist on their inclusion in any follow-on treaty as well. Thus it is reasonable to argue that the United States would have

Table 6. New Russian Strategic Nuclear Systems

System	Deployment Date	Description
SS-29 ICBM	Early to mid-2020s	10-warhead silo-based ICBM that will replace the SS-18
PAK-DA ^a Bomber	Mid-2020s	Next-generation strategic nuclear bomber
SS-X-28 ICBM ^b	No estimated date	Mobile ICBM, development was reportedly suspended in 2018
SS-19-X-Mod 4 (Avangard)	Early 2020s	Developmental intercontinental-range hypersonic boost-glide missile
Status-6	No estimated date	Developmental intercontinental-range torpedo
Nuclear-powered Cruise Missile	No estimated date	Developmental nuclear powered cruise missile with “unlimited range”

Sources:

- a. Kristensen and Norris, “Russian nuclear forces, 2018,” 190.
- b. Pavel Podvig, “By cancelling RS-26 Russia keeps its options open,” Russian strategic nuclear forces (blog), April 2, 2018; Russia reportedly declared and tested this system as a prototype ICBM under New START.

less insight into the technical attributes of these novel delivery vehicles without cooperative transparency. The United States would gather information through NTM, but NTM is unlikely to substitute for in-person observation and inspection of these new kinds of systems.

Additional Considerations for the United States

The United States faces a constraint and an uncertainty that would amplify the consequences of losing cooperative transparency.

First, the steady decline of Russian expertise in the United States would handicap US efforts to analyze Russian strategic nuclear forces. There are fewer professionals with relevant expertise than during the Cold War. The Deputy Director of Intelligence for the Central Intelligence Agency highlighted this trend in 1995:

The Intelligence Community has reduced its resources devoted to Russian military developments across the board and since 1993, when the Senate first considered the START II Treaty, we have witnessed a steady erosion of trained analysts on Russian strategic forces issues.¹¹⁶

The erosion continued during the intervening years. In 2015, General Breedlove, then-Commander of US European Command, struck a similar note:

Our nation’s community of Russia-area experts has shrunk considerably, and intelligence assets of all kinds have been shifted to the wars we’ve been fighting or to understand future threats. Russian military operations over the past year in Ukraine and the region more broadly have underscored that there are critical gaps in our collection and analysis.¹¹⁷

A recent assessment of Russian studies in academia and research institutions reached similar conclusions. The overall quality of Russian experts studying and teaching in the United States is high, but there are fewer students and faculty in the social sciences concentrating on Russian studies. A “disproportionate decline” in undergraduate students taking Russian language courses will have the downstream effect of fewer graduate students with the requisite linguistic skills to develop into subject matter experts.¹¹⁸

Not only would the United States need to increase collection resources and lose information about aspects of Russian forces that cannot be obtained through other means, it will face a paucity of Russia experts. These are analysts who understand Russian history, culture, politics, leadership, and military doctrine and strategy, and who collaborate with technical specialists in order to analyze and contextualize data. Additionally, the analysts that have been focused on Russian strategic forces the previous decades are accustomed to utilizing data from strategic arms control verification. Transitioning from this treaty-enriched baseline to raw NTM-collected data alone will be difficult.

Second, a key uncertainty for the United States is whether Russia would increase efforts to interfere with US monitoring of Russian nuclear forces with NTM after New START. Russian leadership may currently view denial operations as wasteful given all the information they provide through New START.

Whether this calculus would change if Russia was no longer obligated to open a window into nuclear forces is an open question. Several Russian experts have argued that adopting a more opaque nuclear posture is a potential Russian strategy for coping with the end of nuclear arms control.¹¹⁹ Denial operations could include interfering with US NTM through non-kinetic means, such as with counter-space or electronic warfare systems. They also include less provocative measures, such as concealing the assets and operations the United States is trying to observe in order to fool or evade US NTM. The effectiveness of Russian denial operations might be low initially but increase over time as US insight into Russian forces atrophies due to the loss of cooperative transparency.

Transparency into Strategy and Concepts

The United States and Russia have sought to have a broader dialogue on strategy and concepts in venues outside of the New START framework. But thus far these efforts have not materialized into a sustained dialogue. Thus, under current conditions, New START’s transparency into strategic nuclear forces would expire amid a dearth of strategic dialogue between Washington and Moscow. US and Russian officials, at least in public statements, evince differing views on their own and on the other’s respective strategy and intent, and both countries’ threat perceptions appear to be hardening.

Preexisting Transparency Agreements: After New START expiration, several of its transparency and confidence building measures would continue, with minor differences, because they are based on the 1988 Agreement on Notifications of Launches of ICBMs and SLBMs and the 1989 Agreement on Reciprocal Advance Notification of Major Strategic Exercises. These preexisting agreements are included in Sections III and IV of the New START Protocol. Neither agreement has an expiration date.



Marine Corps Gen. Joe Dunford, chairman of the Joint Chiefs of Staff, meets with Russian army Gen. Valery Gerasimov, chief of the general staff of the Russian armed forces, at Knoigstedt Manor in Helsinki, June, 8, 2018. (DoD photo by Navy Petty Officer 1st Class Dominique A. Pineiro)

Engagement in the Bilateral Consultative Commission focuses on technical issues of treaty implementation. It was not intended as a substitute for a candid dialogue on strategy. Following the signing of New START and completion of the Nuclear Posture Review in 2010, the Obama administration made a deliberate policy choice to pursue strategic talks outside the arms control framework. The administration reasoned that US-Russian strategic stability engagement should address a more diverse set of military capabilities, from ballistic missile defenses and conventional strike to space and cyber forces. The United States viewed many of these systems as un conducive to treaty-based constraints and instead proposed confidence-building measures paired with discussion on strategic principles. Thus, it sought to advance a narrow diplomatic track on further nuclear arms control and a broader dialogue on stability.¹²⁰

Unfortunately, there was scant progress in both tracks.

In the nuclear realm, Russia rejected US proposals for deeper and more comprehensive nuclear reductions. The downstream effect is that the rigorous, expert-level dialogue on nuclear strategy and forces that many view as essential for sustaining mutual understanding has not resumed.¹²¹

In the meantime, uncertainty in the United States regarding Russian nuclear strategy is increasing. At the level of intercontinental-range forces, some analysts view the novel, non-ballistic systems Putin unveiled at the beginning of 2018 and Russia's unwillingness to negotiate further reductions as hedging against US missile defenses; other analysts see them as indicators of a Russian drive for strategic advantage.¹²²

Similar uncertainty applies to Russian SLCMs, which have nuclear and conventional variants. These systems provide additional non-ballistic strike options, but Russia could also employ them in a precision attack against Washington from the Atlantic Ocean.¹²³ US officials and analysts are likely to have differing views on whether Russian SLCMs merely underpin its second-strike capability or constitute a unique means for holding national leadership at risk. Fundamentally, US disquiet centers on uncertainty about the role of the systems in Russian strategy rather than the existence of the capability.

At the theater level, the potential for Russian limited nuclear attack in Europe is now at the forefront of US deterrence strategy. The 2018 Nuclear Posture Review assessed that Russian leadership has mistakenly concluded that “coercive nuclear threats or limited first use could paralyze the United States and NATO.”¹²⁴ Russian information operations, apparently intended to cast an even darker shadow over US and NATO decisionmaking, bolsters this assessment.¹²⁵ Russia’s deployment of a ground-launched cruise missile in violation of the INF Treaty embodies the United States’ evolving perception of the nuclear threat from Russia. Not only does it enable Russia to strike targets throughout Europe from deep in Russian territory, it also raises doubts about whether Russia values predictability in the nuclear relationship. Currently, the United States is poised to withdraw from the INF Treaty with no indication that Russia will acknowledge its violation.

Russian officials continue to reject the US interpretation of its strategy and contend that the United States seeks to deter Russia from using nuclear weapons to protect the country from an existential assault:

*We have been accused of lowering the threshold for the first use of nuclear weapons and aggressive strategies. None of this has any connection with reality...[R]eadiness to use nuclear weapons to prevent Russia from using its nuclear arsenal, expressed in the Nuclear Posture Review, amounts to putting in question our right to defend ourselves against an aggression that threatens the country’s survival.*¹²⁶

As for a broader strategic dialogue, Russia rejected any cooperation on ballistic missile defense and conventional strike that did not include binding constraints, and by the end of 2016, strategic stability engagement was moribund. Two years into the Trump administration, not much has changed. The United States and Russia held one Strategic Stability Dialogue in 2017, with no indication of a cooperative vision. In 2018, the Chairman of the Joint Chiefs of Staff met with his Russian counterpart, a positive engagement, but one that does not appear to be enmeshed in a larger engagement plan.¹²⁷ As of early 2019, the July 2018 Helsinki Summit has yet to materialize into a working bilateral agenda.

Russian concerns about US missile defenses and conventional strike, described in Part I, have not abated. Simultaneously, US concerns about Russia’s non-nuclear strategic capabilities, from conventional strike to cyber and counter-space, and its associated strategy have become more severe since 2009–10. In particular, many in the US policy community

perceive that Russia's coercive military strategy includes an array of non-nuclear options that Russian leadership might employ early in a conflict against military or civilian targets in Europe and possibly the United States. Russia's goal would be to control escalation and end the conflict on favorable terms, while US strategists see escalation and heightened risk of nuclear conflict as the more likely result.¹²⁸

To clarify the risks of such a strategy, the United States adjusted declaratory policy in 2018 to convey that it would consider using nuclear weapons in response to non-nuclear strategic attacks, which "include but are not limited to, attacks on the US, allied, or partner civilian population or infrastructure, or on US or allied nuclear forces, their command and control, or warning and attack assessment capabilities."¹²⁹ Unsurprisingly, Russia's official response paints the US message as a dangerous lowering of the US nuclear threshold.¹³⁰

Several recent studies demonstrate how interactions between the emerging US and Russian postures in crises could trigger unwanted escalation and blur thresholds between conventional and nuclear conflict.¹³¹ Yet there appears to be little common ground for bilateral cooperation to identify and reduce risks.

FROM TRANSPARENCY TO OPACITY AND UNCERTAINTY

This section highlights two risks that would stem from the end of cooperative transparency between the United States and Russia.

First, both countries have a unique level of knowledge and confidence on deployed warhead levels and distribution across delivery vehicles that is not possible without cooperation. By the late 2020s, both countries will be capable of deploying warheads above New START's limits. Without New START's

verification regime or a comparable replacement, neither country will have the same degree of confidence in its ability to assess the other's precise warheads levels. Worst-case scenario planning is a strong possibility as a result.

Second, over the longer term, both countries are likely to face greater uncertainty about each other's strategic nuclear forces and operations. Understanding of day-to-day postures and movements of forces will diminish, and both will have less insight into the characteristics and operations of new strategic nuclear systems. Increased opacity will affect Russia less than the United States, but it will affect Russia nonetheless. Russian policymakers and analysts, naturally suspicious of the United States, will not be able to independently confirm data they gather through other sources. The United States can increase NTM collection; however, doing so would entail opportunity costs, and the drastic decline of Russian expertise in the national security community would limit the effectiveness of US efforts.

The full consequences of increased opacity are impossible to predict. The United States and Russia have maintained open windows into each other's strategic nuclear forces since START entered into force in 1994. The accumulated knowledge both countries have gained through more than 25 years of cooperation (by New START's expiration) will ensure that neither country's knowledgebase goes back to square one immediately. Yet that insight and confidence will dissipate over time.

The shift from transparency to opacity surrounding strategic nuclear forces would unfold against the backdrop of growing mistrust and diverging perceptions of strategy, intentions, non-strategic nuclear weapons, non-nuclear capabilities, and the strategic concepts guiding how each sees these systems fitting together.

PREDICTABILITY AFTER NEW START: STRATEGIC NUCLEAR FORCES

This section explores the uncertainties and risks the United States and Russia would face in the late 2020s without New START's treaty-based constraints. To do this, we posit several illustrative US and Russian strategic nuclear postures to reflect both countries' forces in the late 2020s, focusing on a key question: What impact would New START's expiration have on the United States' and Russia's ability to sustain approximate nuclear parity and a survivable second-strike capability? We pose these questions because, as discussed in Part I, these are two attributes that both countries value and could potentially be affected by the shift from a treaty-constrained to a treaty-unconstrained relationship.

ILLUSTRATIVE STRATEGIC NUCLEAR FORCES

We develop illustrative US and Russian forces at New START levels and above New START levels, hereafter referred to as constrained and unconstrained forces. We depict US and Russian forces at New START levels because both have the option of forgoing additional deployments after New START expires.

Comparisons of these illustrative forces represent snapshots of plausible US-Russian strategic nuclear balances after New START, not the entire universe of possible balances. They enable a more granular examination of how each country might assess challenges to parity and survivability in a post-New START environment.

Importantly, although the concept of nuclear parity includes both qualitative and quantitative factors, our comparison in this section focuses on numeric differences between US and Russian strategic nuclear

forces. We do this because, as discussed earlier, numbers of weapons are an objective reference point that historically have mattered to US, allied, and Russian officials. Therefore, any examination of nuclear parity after New START must include an estimate of the potential numeric differences between US and Russian forces that could plausibly emerge once the treaty's limits are no longer in effect. In Part III, we explore the more fundamental issue of the strategic significance of the difference in deployed strategic warheads between Russia's unconstrained force and the United States' constrained one and, subsequently, the implications for US options after New START.

Approach

The illustrative force structures draw from Hans M. Kristensen and Robert S. Norris's 2018 *Nuclear Notebooks* for the United States and Russia, with several explicit extrapolations to project into the late 2020s.¹³² Only New START-accountable systems are included. New kinds of Russian strategic-range nuclear forces are excluded because it is unlikely that Russia would deploy more than a small number by the end of next decade, and thus none of the systems would fundamentally alter our analysis of parity and survivability after New START.

We depict US and Russian forces under available day-to-day (DTD) and generated conditions. A system is available DTD if it is regularly postured to promptly execute a strike within hours or a day of receiving an order. Under generated conditions, additional nuclear forces beyond those available DTD have been loaded with weapons and postured for prompt launch. DTD represents each country's peacetime posture

and generated conditions reflect how each country could posture its forces in a crisis. This construct provides a more precise portrait of potential strategic nuclear balances.

The number of available US strategic nuclear weapons increases significantly from DTD to generated conditions because the latter includes additional SSBNs at sea and armed bombers on alert.¹³³ Russia's force levels also vary between DTD and generated status. We assume that both countries arm their bombers and prepare them for prompt takeoff only under generated conditions. We count actual deployed weapons on bombers when tallying total warheads under generated conditions rather than using the New START bomber counting rule. The assumptions underlying each country's DTD and generated ICBMs and SLBMs are explained in more detail below.

The illustrative force structures include survivable warheads as a subset of available warheads. We consider mobile systems survivable because, when dispersed, an adversary would need to devote significant resources to locate, track, and destroy them and, even then, it is unlikely to have high confidence in its ability to hold a large portion of a major power's mobile systems at risk. Mobile systems are not invulnerable and technological developments could increase their vulnerability in the future; however, US and Russian investments in mobile systems suggest that both are confident they can manage counterforce challenges that could plausibly emerge.¹³⁴ Assumptions regarding each country's survivable systems DTD and under generated conditions are also detailed below.

US Strategic Nuclear Forces in the Late 2020s

We make four assumptions about US strategic nuclear forces and operational posture in the late 2020s that apply to both the constrained and unconstrained force.

First, the United States has five survivable SSBNs at sea in designated patrol areas DTD; operational SSBNs at naval bases are not available DTD and not survivable.¹³⁵ Under generated conditions, the United States has 12 SSBNs plus its bomber force.

Second, the United States loads an average of 4.5 warheads per deployed SLBM.¹³⁶ We keep this loadout average constant even in the unconstrained force. The United States can reportedly deploy as many as eight warheads on its SLBMs, but a higher average would reduce the SSBN force's range and targeting flexibility, a tradeoff we assume the United States would not make.¹³⁷

Third, the illustrative force structures include 12 *Ohio*-class SSBNs. We explore the implications of the transition to the *Columbia*-class SSBN in the point of departure section.

Fourth, the United States does not increase the number of operational nuclear weapons available for deployment beyond Kristensen and Norris's 2018 estimate. The United States does not have the capacity to produce additional nuclear warheads quickly and its nuclear enterprise's capacity will be nearly maxed out on life extension programs in the 2020s and 2030s.¹³⁸

Table 7 depicts the constrained force in the late 2020s. Its composition of strategic delivery vehicles is the same as the official New START force structure.¹³⁹ For the generated bomber force, we assume the United States arms each of the 19 B-2A bombers with 12 B-61 gravity bombs and each of the 41 B-52H bombers with 12 ALCMs. Kristensen and Norris estimate that the United States has an inventory of 528 ALCMs and 452 gravity bombs, but we assume the United States would not load the full inventory of weapons onto its aircraft because it would reduce their range and, subsequently, US targeting flexibility. We also assume that any nuclear-capable next-generation

Table 7. US Constrained Force

Category	DTD	Generated
ICBM Warheads	400	400
Fixed ICBMs	400	400
Mobile ICBMs	0	0
SLBM Warheads	450	1,080
SLBMs	100	240
ALCMs/Gravity Bombs	0	720
Bombers	0	60
Total Warheads	850	2,200
Total Delivery Vehicles	500	700
Survivable Warheads	450	1,800

strategic bombers (e.g., B-21) that enter the force would be paired with retirement or conversion of nuclear-capable B-52Hs on a one-for-one basis.

Table 8 depicts the unconstrained force that exceeds New START levels. We assume the United States reverses four changes it made to meet New START’s limits. First, the United States redeploys ICBMs back into the 50 empty ICBM silos that it left vacant. Second, the United States redeploys multiple warheads onto its ICBMs, which had previously been reduced to one warhead per ICBM. The United States is reported to have 400 W78 warheads available for redeployment, enabling it to deploy a total of 800 warheads (600 W78s and 200 W87s) across 450 ICBMs.¹⁴⁰ Third, the United States reverses the deactivation of four launch tubes on each *Ohio*-class SSBN, adding 48 deployed SLBMs to the force. Fourth, the United States reconfigures 30 B-52H strategic bombers for nuclear missions that it converted to conventional-only status.¹⁴¹ Each B-2A continues to carry 12 gravity bombs and each B-52H now carries seven ALCMs.

Table 8. US Unconstrained Force

Category	DTD	Generated
ICBM Warheads	800	800
Fixed ICBMs	450	450
Mobile ICBMs	0	0
SLBM Warheads	540	1,296
SLBMs	120	288
ALCMs/Gravity Bombs	0	725
Bombers	0	90
Total Warheads	1,340	2,821
Total Delivery Vehicles	570	828
Survivable Warheads	540	2,021

Table 9 depicts the increases from the constrained to the unconstrained force for DTD and generated conditions.

Table 9. Increase in US Nuclear Forces from Constrained to Unconstrained

Category	Increase in Numbers
W-DTD	490
SDV-DTD	70
SW-DTD	90
W-G	621
SDV-G	128
SW-G	221

W= warheads; SDV= strategic delivery vehicles; SW= survivable weapons; DTD= day-to-day; G= generated

Russian Strategic Nuclear Forces in the Late 2020s

Russia’s constrained and unconstrained forces are nearly identical to Kristensen and Norris’s 2018 estimate of Russian nuclear forces, with four changes to reflect Russian modernization investments by the late 2020s. Unlike the United States, Russia

does not publicly disclose its exact strategic nuclear modernization plans, and so what follows are assumptions about both Russia’s fully modernized force structure numbers and its composition.

First, Russia replaces its 72 remaining one-warhead SS-25 ICBMs with 50 mobile SS-27 Mod 2 ICBMs, each of which can carry up to four warheads. Second, Russia also replaces its 20 SS-19s with 20 additional silo-based SS-27 Mod 2 ICBMs.¹⁴² Third, Russia retires the SS-18 and fields the SS-29 as a replacement during this period on a one-for-one basis and, as per Kristensen and Norris, the SS-29 also carries 10 warheads. Fourth, Russia has a total SSBN force of two Delta IIIs, four Delta IVs, and six Borei-class submarines, the newest class of SSBN. The Borei SSBN will carry the six-warhead SS-N-32 SLBM, as opposed to the three- and four-warhead SLBMs for older class SSBNs.¹⁴³

We assume all Russian mobile ICBMs are available DTD because Russian storage hangers are reported to have retractable roofs to enable prompt launch of non-dispersed mobile missiles.¹⁴⁴ Similarly, Russian SSBNs are also reported to be capable of pier-side launches and thus need not be at sea to execute a strike

order.¹⁴⁵ Thus, both the constrained and unconstrained Russian forces include a DTD SSBN force of one Delta III, one Delta IV, and two Borei-class in some combination of pier-side and at-sea capacity, while the generated SSBN force includes one Delta III, three Delta IVs, and five Borei-class SSBNs in a combination of pier-side and at-sea capacity.

For the number of survivable warheads in Russia’s DTD force, we assume that 25 percent of its mobile ICBMs are dispersed and one Borei-class SSBN is at sea. Russia’s generated force includes 75 percent of its mobile ICBM force, three Borei-class and one Delta IV SSBN at sea, plus its bombers. These assumptions are constant across both its constrained and unconstrained force.

Table 10 depicts Russia’s constrained force in the late 2020s. In order to stay below the deployed strategic warhead limit, many of Russia’s ICBMs and SLBMs are deployed with fewer warheads than they are capable of carrying, and the Delta III SSBN is deployed with 10 rather than 16 SLBMs.

Table 11 depicts Russia’s unconstrained force that exceeds New START limits. The key difference is that we assume Russia’s ballistic missile force is armed to its

Table 10. Russian Constrained Force

Category	DTD	Generated
ICBM Warheads	930	930
Fixed ICBMs	138	138
Mobile ICBMs	158	158
SLBM Warheads	206	502
SLBMs	58	138
ALCMs/Gravity Bombs	0	616
Bombers	0	68
Total Warheads	1,136	2,048
Total Delivery Vehicles	354	502
Survivable Warheads	158	1,184

Table 11. Russian Unconstrained Force

Category	DTD	Generated
ICBM Warheads	1,226	1,226
Fixed ICBMs	138	138
Mobile ICBMs	158	158
SLBM Warheads	304	720
SLBMs	64	144
ALCMs/Gravity Bombs	0	616
Bombers	0	68
Total Warheads	1,530	2,562
Total Delivery Vehicles	360	508
Survivable Warheads	229	1,413

maximum warhead delivery capacity (i.e., if a specific type of ICBM is designed to carry 10 warheads, we count it as 10 warheads).

There are two reasons for this assumption. First, the 2018 Nuclear Posture Review noted that Russia has a vibrant nuclear weapons production capacity, suggesting that it could build and deploy the maximum number of warheads on its strategic delivery vehicles.¹⁴⁶ Second, as discussed in the previous section, without New START, the United States would likely over time revert to the worst-case assumptions about deployed Russian warheads because it would lack more precise information.

Table 12 depicts the increases from the constrained to unconstrained force for DTD and generated conditions.

COMPARING US AND RUSSIAN FORCES

We compare the illustrative US and Russian forces under four scenarios: Both countries stay at the New START limits; the United States stays at the limits and Russia exceeds them; the United States exceeds the limits while Russia does not; and both countries

Table 12. Increase in Russian Nuclear Forces from Constrained to Unconstrained

Category	Increase in Numbers
W-DTD	394
SDV-DTD	6
SW-DTD	71
W-G	514
SDV-G	6
SW-G	229

W= warheads; SDV=strategic delivery vehicles;
SW=survivable weapons; DTD=day-to-day;
G=generated

exceed the limits. Both countries are likely to examine these scenarios when they assess the near-term risks of an unconstrained relationship and potential near-term force structure adjustments. Figure 2 illustrates these comparisons.

Strategic Warheads

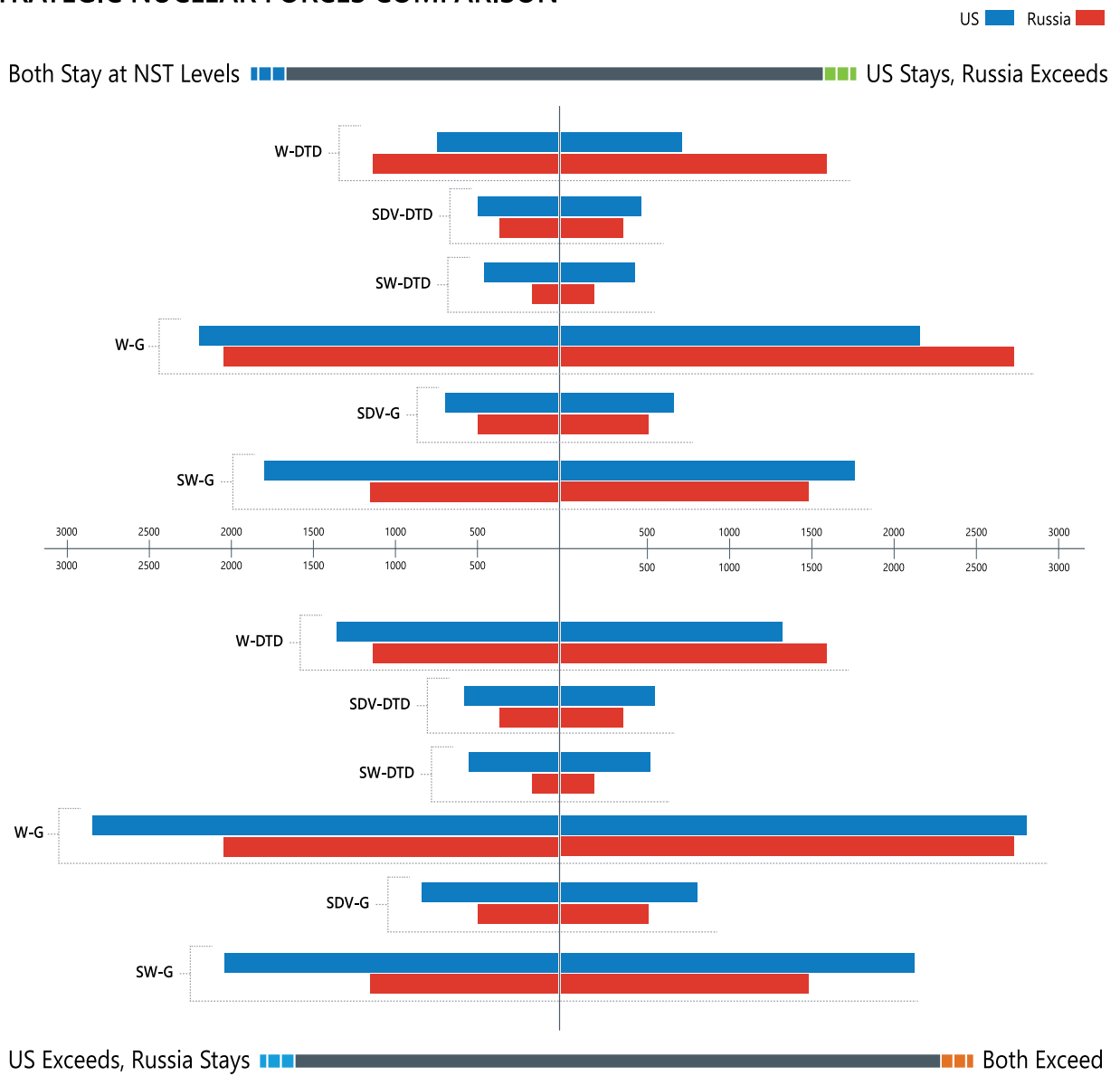
Russia has more available warheads DTD in every scenario except when only the United States exceeds New START limits. The United States has more generated warheads available in every scenario except when only Russia exceeds New START limits. This difference is unsurprising. The majority of Russian warheads reside in ICBMs that are available DTD; the majority of US warheads are in SLBMs and bombers that are not all available DTD. The largest disparities are in DTD warheads when only Russia exceeds New START limits and in generated warheads when only the United States exceeds New START limits, resulting in differences of 680 and 773, respectively. The change in the warhead balance from constrained to unconstrained when both countries exceed the limits is marginal: the numeric gap between Russian and US warheads DTD narrows by nearly 100 while the US lead in generated warheads grows by roughly 100.

Strategic Delivery Vehicles

The United States has more strategic delivery vehicles under DTD and generated conditions in every scenario. Russia would increase its available warheads primarily through uploading and would still be under the New START limit for strategic delivery vehicles by nearly 200 in its unconstrained force. Alternatively, when the United States exceeds New START limits, it increases its strategic delivery vehicles in absolute terms and relative to Russia. Compared to the scenario

Figure 2.

STRATEGIC NUCLEAR FORCES COMPARISON



W=warheads | SDV=strategic delivery vehicles | SW=survivable weapons | DTD=day-to-day | G=generated

where both countries stay at New START limits, when both countries exceed New START limits the US advantage in delivery vehicles grows by 64 DTD and by 122 under generated conditions.

Survivable Weapons

The absolute number of survivable warheads both countries possess is robust across all scenarios. Under generated conditions, Russia has 1,184 in its constrained force and 1,413 in its unconstrained force, and the United States has 1,800 and 2,021, respectively. The United States has more survivable warheads across all scenarios under DTD and generated conditions. When both countries exceed New START limits compared to when they do not, the gap between US and Russian survivable systems DTD increases marginally, while this gap narrows marginally under generated conditions. The only scenario where the United States has close to 1,000 more survivable weapons is under generated conditions when only the United States exceeds New START levels.

KEY POINT OF DEPARTURE AND UNCERTAINTY FOR THE UNITED STATES

The United States faces an important point of departure and two uncertainties that could affect its ability to sustain rough numeric parity with Russia.

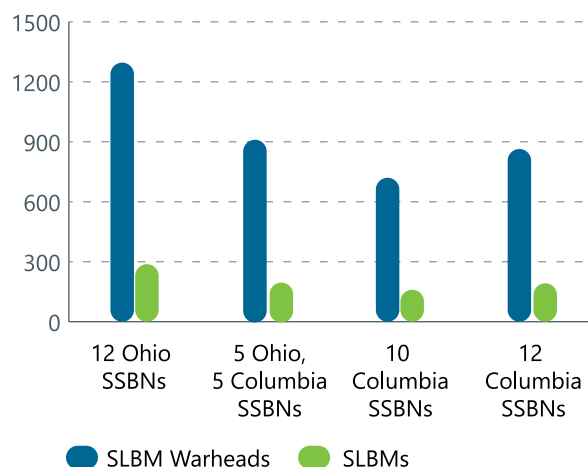
Transition to *Columbia*-class SSBN

In the early 2030s the United States is scheduled to begin deploying *Columbia*-class SSBNs at a rate of roughly one per year to replace retiring *Ohio*-class SSBNs. *Columbia*-class SSBNs will have 16 missile tubes, as compared to the 24 (or 20 under New START) on *Ohio*-class submarines. During the

transition from *Ohio* to *Columbia*, the United States is scheduled to drop to 10 operational SSBNs in the mid-2030s, with a mix of old and new submarines.¹⁴⁷

This change will reduce US SLBMs and SLBM warheads, assuming a constant average of 4.5 warheads per SLBM. For example, when the United States has five *Columbia*-class and five *Ohio*-class SSBNs, the SSBN portion of the unconstrained force under generated conditions would decrease from 12 submarines carrying 288 SLBMs and 1,296 warheads to 10 submarines carrying 200 SLBMs and 900 warheads. During the remainder of the transition to *Columbia*-class SSBNs, the United States will continue to lose roughly eight SLBMs and 36 warheads per year (assuming New START reductions have been reversed). On this schedule, the SSBN force would hit its nadir in around 2040, when the United States has 10 *Columbia*-class SSBNs, and then reach the new steady-state level in 2042, when the twelfth boat enters service (see Figure 3).

Figure 3. SLBM Warheads Capacity from *Ohio* to *Columbia*



The Size of Russia’s Arsenal

Growth in Russia’s strategic nuclear forces is a key uncertainty that accompanies this point of departure. By the 2030s, Russia could deploy more weapons than this study’s illustrative unconstrained force. For the sake of example, assume that in the mid-2030s Russia has deployed an additional 50 SS-27 Mod 2 mobile ICBMs, 50 SS-28 ICBMs (a stalled developmental system in 2019), and an SSBN force of 12 Borei-class SSBNs. Table 13 compares Russian forces under these assumptions to the US force when it has five *Ohio*-class and five *Columbia*-class SSBNs in service, with middle columns depicting absolute numbers and the column on the far right depicting the relative disparity.

US Nuclear Modernization Schedule

The US nuclear modernization schedule is another key uncertainty. Delays in any of the replacement systems for the SSBN, ICBM, or ALCM, or unexpected early retirement of existing systems, would decrease available US strategic delivery vehicles and warheads (i.e., new systems would not be available when existing systems age out of service).¹⁴⁸ Such disruptions could be technological, programmatic, or political. In a post-New START world, collapse of the bipartisan support and funding for US nuclear modernization is a risk.¹⁴⁹

Continued growth in Russian strategic nuclear forces combined with additional decreases in US forces beyond the SSBN point of departure is a worst-case scenario for the United States, *at least if numeric parity remains a US force-sizing metric*, because the disparities in available warheads depicted in Table 13 would increase. If the additional force reductions occurred in the next-generation ALCM or the SSBNs, the number of US survivable weapons would decline as well, though the absolute number of generated survivable systems would remain near or above 1,000 unless the United States lost the entire SSBN force.

KEY POINTS OF UNCERTAINTY FOR RUSSIA

Russia does not face a comparable point of departure with its nuclear modernization program. It is fielding next-generation systems and has open production lines. But Russia does face two key uncertainties that would affect survivability and, to a lesser extent, parity.

US Counterforce

Russian officials face uncertainty about the strategic impact of the forces the United States would deploy in excess of New START limits.

Table 13. Mid-to-Late 2030’s Excursion: Russian Arsenal Expands, US Contracts

Category	United States	Russia	Disparity
W-DTD	1,232	2,010	RF: 778
SDV-DTD	546	460	US: 86
SW-DTD	432	325	US: 107
W-G	2,425	3,106	RF: 681
SDV-G	740	608	US: 132
SW-G	1,625	1,745	RF: 120

Note: Assumes the United States has 2 *Ohio*-class and 3 *Columbia*-class SSBNs at sea DTD.

In absolute terms, the unconstrained US force, prior to the *Ohio/Columbia* SSBN transition, provides the United States with 616 more ballistic missile warheads, 98 more ballistic missiles, and 30 more bombers to carry ALCMs. Assuming Russia fields strategic nuclear forces comparable to the illustrative one in this report, these US increases do not drastically alter the numeric differences between US and Russian forces.

From a Russian perspective, however, the additional warheads and delivery vehicles could enable the United States to more effectively target its mobile missiles, the mainstay of Russia's survivable second-strike capability, through barrage attacks. A barrage attack is a tactic for attacking targets whose exact location cannot be pinpointed. A successful barrage attack would cover a designated area with enough nuclear weapons to create sufficient overpressure to destroy or disable any mobile missiles.¹⁵⁰ Unlike Russia's unconstrained force, substantial increases in both warheads and delivery vehicles would increase the effectiveness of US barrage attacks.

Fundamentally, the core challenge for a barrage attack would be to narrow down the operating areas of Russian mobile ICBMs. The United States is investing in intelligence, surveillance, reconnaissance (ISR), and data analytic capabilities that would improve counterforce operations against North Korean mobile missiles,¹⁵¹ and Russian strategists are likely to see these efforts as applicable to, if not secretly directed at, Russian forces. Such concerns are not unwarranted. Historical analyses of declassified materials demonstrate that the US efforts to locate mobile Soviet systems were more sophisticated and effective than commonly realized in the US strategic studies community.¹⁵²

Although the planned reductions in the *Columbia*-class SSBNs would attenuate US capacity for barrage attacks during the 2030s, the United States could compensate somewhat by adding more warheads onto its remaining SLBMs. Although in this study we assume the United States would not increase SLBM loadouts, Russian analysts might reach a different conclusion. Without cooperative transparency, they will not have insight into how the United States arms its SLBMs.

Similarly, Russia might perceive continued US efforts to improve its missile defenses as jeopardizing the effectiveness of the ballistic missiles that survive a barrage attack. The United States will continue to improve its homeland missile defense capabilities, fueled also by the North Korean missile threat, by expanding the number of interceptors in the Ground-Based Midcourse Defense system, fielding the long-range discriminating radar, and developing a multiple object kill vehicle. Official US analysis of space-based missile defense interceptors, mandated by Congress, will punctuate Russian apprehension about the defenses its ballistic missiles must overcome in the future.¹⁵³

In this sense, uncertainty about US strategic nuclear forces would feed into Russian concerns about the United States' comprehensive suite of systems for negating mobile ballistic missiles.

US Quest for Nuclear Dominance

How the United States reacts in a competition unconstrained by arms control limits is a second uncertainty for Russia: Would the United States strive for superiority?

Currently, the United States cannot produce new warheads in the near term, and as a matter of politics and policy it is not seeking advantage over Russia in the nuclear realm (in the way that it is with conventional forces). Yet the United States' attitude toward nuclear competition could change. President Trump's instinct to "let it be an arms race" and climb to the "top of the pack" in nuclear weapons could evolve into actual policies.

There is no bipartisan support for such a policy, and major changes in US strategic nuclear forces would require sustained funding and take years. But the parameters for US national security policy are not static. There are voices calling for the United States to strive for "nuclear dominance," and they could gain traction if the policymakers in the executive and congressional branches are convinced the country is in a no-holds-barred competition.¹⁵⁴ A continued deterioration in US-Russian relations, coupled with alarm over unconstrained Russian nuclear modernization, could precipitate this sea change. The uncertain trajectory of US policy over the long term without treaty-based constraints creates a risk for Russia. Russia has prioritized funding for nuclear forces, but it probably does not have the economic wherewithal for a massive arms buildup.



Vladimir Putin, President of Russian Federation. (Shutterstock)

PARITY AND SURVIVABILITY WITHOUT CONSTRAINTS

The situation in the 2020s and 2030s will be fundamentally different than the previous three decades. Russia will not be as dependent upon arms control to maintain numeric parity with the United States and can considerably increase its deployed strategic warheads in the absence of arms control limits. Within this new context, both countries can increase their available warheads by hundreds, but neither has the capacity to significantly alter the relative balance if the other chooses to surpass New START's limits.

Yet this does not mean that the United States and Russia would choose to stay at New START levels. US concerns about sustaining parity and Russian concerns about sustaining a survivable second strike could create pressure for each to move toward the unconstrained force levels depicted in this section.

Without cooperative transparency and legally binding numeric limits, rising Russian warhead levels could motivate the United States to reverse its New START reductions. From Russia's vantage point, increases in both US delivery vehicles and warheads would improve the United States' counterforce capacity. Uploading more Russian warheads would be a near-term hedging measure because it would increase the striking capacity of every missile that evades US offensive operations and penetrates US defenses.

Compounding uncertainties cloud assessments about an unconstrained US-Russian nuclear relationship over an extended period of time.

The longer-term picture is murkier. The United States must consider the reductions built into its modernization program in contrast to Russia's capacity to build and upload new weapons, and the United States cannot rule out unplanned reductions due to its tight modernization schedule. Russia must consider unconstrained US strategic nuclear forces within the context of all the non-nuclear dimensions of US military power that it views as threatening. It must also recognize that the United States can be mercurial. US strategic nuclear restraint could give way to a quest for advantage. Compounding uncertainties cloud assessments about an unconstrained US-Russian nuclear relationship over an extended period of time.

NON-PROLIFERATION AND EXTENDED DETERRENCE AFTER NEW START

In this section, we examine the nuclear disarmament landscape that would form the backdrop to New START's expiration, especially the fledgling movement to ban nuclear weapons. We conclude with a discussion of the implications for US non-proliferation and extended deterrence.

THE CHANGING DISARMAMENT LANDSCAPE

The nuclear disarmament landscape has changed since New START entered into force in 2011. These emerging conditions set the context in which we must assess the impact New START's expiration would have on US non-proliferation and extended deterrence.

Treaty on the Prohibition of Nuclear Weapons

A number of developments have brought nuclear deterrence closer to the forefront of US strategy and international security. At the same time, however, non-nuclear weapon states within the NPT have registered their disappointment with progress toward nuclear disarmament among the nuclear weapon states. They perceive that the nuclear weapon states are shirking their NPT obligations on several fronts: the lack of progress on the Fissile Material Cutoff Treaty and the Comprehensive Nuclear Test Ban Treaty; the absence of negotiations on a more ambitious follow-on to New START; and nuclear modernization programs in the United States, Russia, and China.¹⁵⁵

This frustration created an opening for a movement to ban nuclear weapons under international law. Rooted in the incontrovertible position that nuclear war would be a humanitarian catastrophe, with environmental,

economic, and psychological consequences spanning generations, the movement rallied an international coalition of states, non-governmental organizations (NGOs), and civil society. Advocates and observers of the treaty agree that discussing nuclear weapons in humanitarian terms galvanized the movement. Analyses on the horrific effects of nuclear detonations and assessments from the International Committee of the Red Cross regarding its inability to provide effective assistance to victims after a nuclear exchange was more compelling than the clinical language of diplomacy and deterrence.¹⁵⁶

Despite opposition from all the nuclear weapon states and many US allies, the UN adopted the Treaty on the Prohibition of Nuclear Weapons (TPNW) and opened it for signature in September 2017.¹⁵⁷

The ban treaty prohibits possessing, receiving, stationing, using, and threatening to use nuclear weapons, as well as encouraging any state to undertake any of these actions. While the treaty envisions these provisions as applying universally throughout the world, the movement supporting the treaty has focused on stigmatizing nuclear deterrence within democratic countries. This discriminatory approach poses a challenge for US extended deterrence, in that the treaty would not affect the nuclear weapon states, such as Russia, that the United States and its allies seek to deter.¹⁵⁸ The International Campaign to Abolish Nuclear Weapons (ICAN), the lead NGO supporting TPNW, is campaigning to rally public opinion in Belgium, Germany, and the Netherlands in support of the treaty and removal of US nuclear weapons from Europe. In this sense, the TPNW movement is deliberately trying to splinter NATO on nuclear burden sharing.¹⁵⁹

As of spring 2019, no NATO member has signed the treaty. The Netherlands participated in the UN TPNW negotiations but did not sign because the treaty is irreconcilable with its NATO obligations.¹⁶⁰ NATO's collective statement on TPNW declared that it risks undermining international stability by sowing "division and divergences at a time when a unified approach to proliferation and security threats is required more than ever."¹⁶¹

As to be expected with a large multilateral alliance of democracies, a range of perspectives lie underneath NATO's unanimous front, some of which are more sympathetic to TPNW. In June 2018, for example, ICAN commissioned surveys on attitudes in Belgium, Germany, Italy, and the Netherlands toward NATO's nuclear posture. Although the framing of the questions likely influenced the results, the survey does suggest some domestic support for the TPNW. Of those surveyed, 66 percent in Belgium, 66 percent in the Netherlands, 71 percent in Germany, and 72 percent

in Italy said their country should sign the treaty.¹⁶² These results dovetail with previous statements from politicians in Belgium, Germany, and the Netherlands expressing support for withdrawing US nuclear weapons from Europe, positions that their respective governments have yet to adopt.¹⁶³ Thus, even though NATO remains united on the importance of nuclear burden sharing at the official level, several member states are balancing alliance commitments with domestic disarmament pressures.

The United States has responded to the TPNW by arguing that the international community should focus on addressing the underlying security concerns of nuclear and non-nuclear states. It has further sought to foster a dialogue on creating the conditions that would give nuclear weapon states and allies confidence that disarming would enhance rather than compromise their security. The US position is that building consensus on a long-term, comprehensive approach to nuclear disarmament would be more constructive



US officials at the 2018 Nuclear Non-Proliferation Treaty Preparatory Committee. (US Mission Geneva)

and effective than creating a legal mechanism banning nuclear weapons.¹⁶⁴ Whether this alternative approach to the TPNW resonates within the NPT is an open question.

US Withdrawal from the Iran Nuclear Agreement

President Trump's decision to withdraw the United States from the Joint Comprehensive Plan of Action (JCPOA) is another important development in the international disarmament landscape. Thus far, evidence suggests that the move will damage the US credibility within the NPT and has alienated US allies. Results from a spring 2017 Pew Survey on global attitudes toward a potential US withdrawal indicated public disapproval in non-nuclear NPT states. For example, survey participants disapproved at a rate of 45 percent in Italy, 47 percent in Brazil, 56 percent in Kenya, 58 percent in Mexico, 60 percent in Canada, 68 percent in the Netherlands, and 71 percent in Germany.¹⁶⁵ Official reactions from US allies and NPT members were uniformly negative in May 2018 when President Trump followed through on his withdrawal pledge. Australia, Canada, China, France, Germany, Ireland, Japan, the Netherlands, Norway, Russia, South Africa, Sweden, Turkey, and the United Kingdom all released statements criticizing President Trump's actions.¹⁶⁶

US Withdrawal from the INF Treaty

In February 2019, the United States suspended its obligations under the INF Treaty and provided formal notice that it would withdraw from the treaty in 6 months.¹⁶⁷ As of early 2019, it is too early to assess the impact this decision will have on the nuclear non-proliferation regime and US influence in the NPT. It appears that US allies, however, view the impending end of INF as a negative development but largely

support the US decision and share the United States' assessment of Russia's violation. NATO's formal statement on the matter says that "Allies strongly supported the finding of the United States that Russia is in material breach of its obligations under the INF Treaty..." and "fully support" US withdrawal.¹⁶⁸

RISKS AFTER NEW START

The non-nuclear weapon states in the NPT would undoubtedly view the end of US-Russia treaty-based arms control as a regression, another step backwards on the path to disarmament after US withdrawal from the JCPOA.

As of early 2019, dissatisfaction within the NPT with US nuclear policy is evident. In a 2018 NPT working paper, several non-nuclear weapon states in the NPT portrayed US nuclear modernization and extended deterrence as inconsistent with Article VI of the NPT:

The Group of Non-Aligned States Parties to the Treaty also remains deeply concerned by the strategic concept for the defense and security of the members of the North Atlantic Treaty Organization, which justifies the use or threat of use of nuclear weapons and maintains, unjustifiably, the concept of security based on nuclear military alliances and nuclear deterrence policies...improvements in existing nuclear weapons and the development of new types of nuclear weapons, as provided for in the military doctrines of some nuclear-weapon states, including the Nuclear Posture Review of the United States, violate those States' legal obligations on nuclear disarmament....¹⁶⁹

The criticism of the 2018 Nuclear Posture Review and failure to mention Russian nuclear conduct reflects a clear bias on the part of the working paper authors and raises questions about their level of knowledge on the issue. It is also striking that they characterize US nuclear modernization solely as a violation of the NPT regime rather than underpinning efforts to prevent nuclear war and proliferation. In light of such views from some NPT members, it is understandable to question whether New START's expiration would affect their calculus at all.

Nevertheless, the growing rift in the NPT and the potential for the TPNW to mature into an alternative forum poses real risks. It could undermine international cooperation on effective measures for preventing the spread of nuclear weapons in favor of a symbolic campaign to stigmatize nuclear weapon states.¹⁷⁰ The United States and its allies already face a formidable challenge in reestablishing support within the NPT for a conditions-based approach to managing nuclear threats. The end of US-Russian arms control would make this diplomatic endeavor more challenging. On garnering support for specific measures related to strengthening safeguards against proliferation, both the United States and Russia might wield less influence as a result, though the precise impact would be difficult to discern. While the continuation of US-Russian strategic nuclear arms control is unlikely to alleviate frustration within the NPT about the pace of nuclear disarmament, its absence could make the situation worse.

The longer-term cumulative impact on the NPT regime could be worse, and this is where the humanitarian origins of TPNW are relevant. Generic security interests in reducing the risks of nuclear war, coupled with the perception that nuclear weapon states' progress on risk reduction is insufficient, could

motivate states to withhold NPT cooperation to gain bargaining leverage.¹⁷¹ It is unclear whether TPNW signatories would support the treaty as an alternative to the NPT in a calculated negotiating strategy or simply due to a sincere belief that NPT regime is ineffective, but the outcome would be roughly the same.

The potential psychological linkage between disarmament and non-proliferation could also be relevant.¹⁷² The symbolism of the United States and Russia abandoning arms control after 50 years could have a seismic psychological impact, one that is more consequential than the military implications in the year after New START expires. The disconnect between the United States and Russia reversing what many in the NPT saw as a linear path toward disarmament, on the one hand, and expecting non-proliferation cooperation from non-nuclear states, on the other, would be jarring. In turn, the symbolic value of leaving or devaluing the NPT and elevating a toothless but morally satisfying ban treaty could appeal to many countries.

These sentiments could resonate most strongly with NATO countries. The United States designs its nuclear policy with their security in mind, and they are active participants in the United States' nuclear posture through NATO. The TPNW movement would depict US allies as abetting two rogue superpowers careening toward a nuclear war. If this narrative gains traction in Belgium, Germany, Italy, and the Netherlands, it could intensify domestic opposition to NATO nuclear policy or undermine alliance solidarity more broadly. Discord within NATO could complicate US efforts to build consensus on additional alliance initiatives to strengthen deterrence. It could also create opportunities for Russian information operations to widen disagreements between member states.

CONTEXTUAL VARIABLES FOR THE UNITED STATES

Three contextual variables would affect these risks, making them more or less acute.

First, the circumstances surrounding the end of US-Russian arms control and how countries interpret them—i.e., who is to blame? If the United States chooses not to extend New START, refuses to enter follow-on negotiations, or is perceived to have negotiated in bad faith, or if the US Senate rejects a signed replacement treaty, the impact on US credibility and leadership might be more severe.

Second, if the end of treaty-based arms control is accompanied by an intensification of the US-Russian competition in the nuclear realm, US leadership on nuclear risk reduction writ large would take a hit, with potential reverberations within NATO. On this issue, perception would be reality. Increases in

deployed strategic nuclear forces, of the type discussed in the previous section, would resonate with many audiences within the NPT, in allied nations, and in the United States as a renewed arms race.

Third, the United States might mitigate the negative impact if it has a serious policy agenda for nuclear cooperation with Russia to substitute for the treaty model, one that US allies and NPT members perceive as lowering the risks of nuclear competition and conflict. Any such initiative, however, would probably be unpersuasive if the international community sees the United States as predominantly responsible for arms control's demise and the relationship with Russia continues to deteriorate. Alternatively, Russian cooperation on a shared strategy for risk reduction outside a treaty context would provide evidence in support of US efforts.



French President Emmanuel Macron and German Chancellor Angela Merkel, leaders of two NATO member states. (Shutterstock)

For all three factors, deliberate strategic communications campaigns from a variety of actors would influence perceptions throughout the globe. The United States would be a player in the contest of narratives and can prioritize who it tries to persuade, though it would not be the only voice. The nuclear ban movement and Russia would likely posit their own narratives.

TAKING STOCK

Table 14 summarizes the risks and uncertainties for each country.

Table 14. Risks and Uncertainties after New START

Arms Control Role	After New START	Affected Country
Transparency into Nuclear Forces	Opportunity cost of compensating for loss of NST data with NTM	US
	No data/inspections for deployed strategic warheads	US and Russia
	No exhibition/less insight into new strategic nuclear systems	US and Russia
	Potential for denial campaign to prevent NTM from monitoring strategic nuclear forces	US
	Loss of expertise and analytical capacity	US
Transparency into Strategy and Concepts	Increased uncertainty and suspicion regardless of arms control but exacerbated by increased opacity	US and Russia
Constraints on Strategic Nuclear Forces	Pressure to exceed NST levels in order to sustain numeric parity	US and Russia
	Unilateral force reductions due to planned SSBN replacement and potential unplanned delays in modernization	US
	Continued growth in Russian strategic nuclear forces	US
	Increased vulnerability to counterforce barrage attack	Russia
	Unconstrained nuclear competition against a country with economic superiority and less predictable strategic culture	Russia
NST in Support of NPT Article VI	Risks of less credibility with disarmament community, less cooperation on non-proliferation, fueling Treaty on the Prohibition of Nuclear Weapons	US and Russia
Alliance Solidarity and Extended Deterrence	Risk of growing cleavages within NATO due to perceived absences of leadership on arms control and increased threat of nuclear conflict	US



PART III: US POLICY OPTIONS FOR ARMS CONTROL WITHOUT A TREATY

NO CONSTRAINTS DOES NOT EQUAL NO RESTRAINT

In Part III, we explore cooperative options for arms control without a legally binding treaty. We focus specifically on cooperative measures for sustaining transparency between US and Russian strategic nuclear forces and establishing mutual restraint. They are intended as US policy options, and because cooperative options depend on an alignment of interests, we assess Russian perspectives and interests where relevant. We also identify some steps the United States could implement unilaterally if Russia is uninterested in cooperation.

Because US-Russian cooperation to improve predictability underpins the secondary roles of arms control, strengthening the NPT and sustaining solidarity among US allies, it is our hope that these measures mitigate the blowback that would ensue after New START expires. If the United States and Russia are cooperating on transparency and restraining their force levels despite the absence of limits, then this regime of arms control without a treaty might function as imperfect substitutes for an arms control treaty in fulfilling the secondary roles.

There is one macro-counterargument that we need to address before moving forward: If both sides agree on any of these cooperative measures, then a new treaty would be more effective and it would also likely be feasible because both have the political will to reach a new agreement. If they cannot agree on an arms control treaty, on the other hand, then of course

they would reject all of these cooperative options. In other words, arms control without a treaty is a solution looking for a problem.

This perspective, however, does not account for the fluid and uncertain military, technological, and political dynamics both countries face, and it mistakes US-Russian inability to secure a new nuclear arms control treaty with an inability to cooperate on nuclear arms control.

Russia could reject constraints on strategic nuclear forces due to concerns about US missile defenses, but that does not mean it would reject all forms of cooperative restraint. The United States might conclude that a new treaty only serves its interests if it captures non-strategic nuclear weapons, and in the wake of the INF withdrawal and US political polarization, Senate ratification for any new treaty is uncertain; however, US interests in regulating nuclear competition with Russia still endure.

There is no reason to create a false choice between a binding treaty and no-holds-barred competition.

The roles of arms control outlined in Part I will not disappear after New START. There is no reason to create a false choice between a binding treaty and no-holds-barred competition. Arms control is a tool.

Sometimes when conditions change, we need to adapt how we use our tools or even modify their basic design so that they continue to function.

TRANSPARENCY WITHOUT A TREATY

In this section, we develop several mutually reinforcing options for sustaining transparency between US and Russian nuclear forces and for improving transparency into each country's respective strategy and guiding concepts.

TRANSPARENCY INTO NUCLEAR FORCES

The following options are intended to substitute for New START's verification and transparency measures.

In developing these options, we assume that Russia would not agree to onsite inspections without a legally binding treaty granting inspectors the protection under the Vienna Convention on Diplomatic Relations. Although other forms of agreement could provide these protections to US and Russian inspectors, Russian experts were adamant in discussions with the CNA Study Team that Russia would never permit inspections of strategic nuclear forces outside the traditional treaty framework. Moreover, developing a regime without onsite

inspections is a useful exercise for identifying the possibilities and limits associated with the minimum means of transparency cooperation after New START. Agreement to continue onsite inspections would be an improvement upon the baseline presented in this section.

Data Exchanges

In this hypothetical regime, the United States and Russia would continue to provide biannual exchanges of the information shown in Table 15.

At a minimum, these exchanges would cover all systems that meet the New START definitions of deployed strategic delivery vehicles, deployed strategic warheads, and deployed and non-deployed launchers.

The data exchanges could also include intercontinental hypersonic boost-glide missiles, such as Russia's Avangard (which as noted earlier would count as an existing type of ICBM under New START if deployed on an SS-19), when each country deploys them. It appears that Russia's system will carry nuclear

Legal Issue: The practices in New START that involve sharing classified information are permissible under US law because they are provisions in a Senate-approved, presidentially-ratified treaty. Continuing practices that involve sharing classified information about the number and locations of nuclear warheads outside of a treaty framework would likely require amending the Atomic Energy Act. Other practices, such as sharing the total number of a specific type of delivery vehicle and the deployment status and location of specific delivery vehicles could be continued by the President as a matter of policy, provided the Executive Branch could demonstrate that Russia would afford the confidential information the same level of protection as the United States. Ultimately, all transparency options in this section require further legal analysis.

Table 15. Data Exchange

Category	Description
Aggregate numbers	The total number of deployed strategic nuclear warheads, strategic delivery vehicles, and deployed and non-deployed launchers.
Number of strategic delivery vehicles and associated warheads	The total number of deployed ICBMs and warheads deployed on ICBMs, the total number of SLBMs and warheads deployed on SLBMs, and the total number of deployed nuclear-capable bombers.
Deployed weapons at declared bases	The number of deployed strategic warheads, delivery vehicles, and launchers at each declared base, with agreement to include any new bases for deployed strategic systems. This information would be protected as confidential by both countries.

weapons, while the United States currently plans to deploy conventional-only boost-glide missiles. Including both conventional and nuclear systems in the data exchange would provide transparency on systems that concern each country, and it is also consistent with New START’s acknowledgement, in the preamble, of the strategic impact of long-range non-nuclear missiles.

Some in the United States might object to including non-nuclear US systems, arguing that it would be a unilateral concession. It might be a worthwhile tradeoff, however, if the upshot is greater transparency into Russian deployments of boost-glide missiles.

The United States and Russia could also expand the data exchange to include systems that were not captured under New START. For example, this regime could include data exchanges on the number of deployed nuclear-armed SLCMs and the types of naval platforms equipped to carry them. Nuclear SLCM declarations could take effect once the United States

deploys these types of systems, making the exchange reciprocal, or Russia could provide this information about its nuclear SLCMs, with the United States agreeing to do the same once its nuclear SLCM becomes operational. There is a historical precedent for cooperative transparency on nuclear SLCMs. Both countries provided each other with this type of information under a political commitment made alongside the START treaty, with some data protected as confidential between the two countries.¹⁷³

Pre-Notification Regime

A modified version of New START’s notification regime would underpin the biannual data exchanges. As with New START, these notifications would be kept confidential by both countries.

This regime would differ from New START’s notification practices in an important way: it would require pre-notification for changes in declared data. Only some of New START’s notifications occur ahead of time, while each country is only obligated to notify the other of many changes within 5 days after they occur. For some categories of data under New START, such as the total number of warheads deployed across all delivery vehicles at a declared base, notifications of changes only occur in the biannual data exchanges.

The purpose of these modifications would be to augment US and Russian efforts to independently verify information they receive through the data exchanges and improve confidence in their assessments of the other’s deployed nuclear forces. The pre-notification window would be calibrated to enable both countries to position NTM, if they choose to do so, to observe the impending change.

Table 16 summarizes several types of notifications that could be included in this regime. Pre-notifications of changes in these categories would be particularly valuable in helping each country track the other's force levels.

While some notifications would be the same as the New START practices, such as pre-notification before missiles leave production facilities, pre-notification of changes in deployed warheads, missiles, and launchers would be a departure.

The rationale for this change would be that informing each other before adding or decreasing the warheads, delivery vehicles, and launchers deployed at specific bases would modestly improve US and Russian ability to track force levels. The strategic effect would be twofold: For Russia, it would be to better inform its assessment of whether the United States is reversing its New START reductions by adding warheads to its ICBMs and redeploying an additional four SLBMs onto its *Ohio*-class SSBNs; for the United States, it would be to better inform assessments of Russian warhead uploading.

For example, if Russia is adding additional warheads to several ballistic missiles at a declared base, there may be some activity associated with this operation that the United States could independently observe with NTM. Similarly, Russia might not be able to observe restoration of the functionality of deactivated launch tubes on US SSBNs, but there could potentially be observable activity associated with redeploying additional SLBMs back into the submarines. Although imprecise, each side could incorporate this observable activity into the larger pool of data that its experts use in their analyses. It would give each some confidence that the notifications of deployment changes, and thus the information in the biannual data exchanges, are valid.

To be sure, this approach to transparency is an imperfect substitute for confirming the validity of declared warhead data through onsite inspections of deployed systems. It is less precise, given the likely limitations of observing and calculating warhead loadout numbers through activity that is observable to NTM. It would probably be more effective for tracking changes in missile and launcher numbers because movement of these systems is more easily observable.

Table 16. Pre-Notification Examples

Category	Description	Comparison to New START
Additional delivery vehicles	48-hour notification before additional ICBMs and SLBMs leave the production facility	No change
Changes to strategic delivery and launcher status	Pre-notification before missiles and launchers change status and are transferred to new facilities, excluding mobile ICBM and SSBN patrols	Switch from post-notification under New START to pre-notification
Changes to deployed warheads	Pre-notification of changes to the total number of deployed warheads across all ICBMs and SLBMs and the total number of deployed warheads deployed at each declared ICBM/SLBM base	Switch from notification of changes only in biannual data exchanges to pre-notification

Pre-notification of changes to warhead deployments might also entail an operational nuclear security risk. Information exchanged between the United States and Russia on this issue would of course be confidential; however, notifying a larger circle of organizations about the planned movement of nuclear warheads would increase the potential for compromises to mission security, and subsequently, of interference or attack from third parties while warheads are in transit. Policymakers in both countries would need to analyze these operational risks and potential mitigation measures, and then weigh them against the benefits of this aspect of the regime.

Remote Emulation of Onsite Inspections

Emulating onsite inspections through NTM could potentially help improve each side's respective confidence in deployed warhead data exchanges and notifications. Remote inspections would entail several steps that each country would be obligated to complete in a specified timeframe.

First, several times a year, each country could select a declared ICBM or SLBM base. As with New START's inspections, the other country would then provide a list of deployed missiles at the site and the number of warheads deployed on each. They could transmit the lists through the same mechanisms they use to transmit data declarations and notifications.

Second, the "inspecting" country would then select one missile from the list and inform the "inspected" country. The inspected country would prepare the system for remote inspection, removing the front section shroud and covering individual reentry vehicles. Rather than an "eyes on" examination, however, the inspecting country would view it via satellite imagery.

In the past, remote sensing would not have been capable of detecting the number of covered reentry vehicles on a missile, but modern optical sensing from spy satellites, reportedly capable of imaging objects smaller than 4 inches, might suffice.¹⁷⁴

The United States and Russia would need to address several procedural and technical issues for this concept to be workable, and it would nevertheless suffer from limitations.

Positioning the front end of the designated missile in a way that NTM can view it would not be a problem. The inspected country could expose the front section of the missile in its launcher, remove the front section of the missile, or remove the entire missile, as are the options under New START inspections.

This process would take time, however, and would be more vulnerable to cheating than onsite inspections. Under New START, the inspecting country has near-continuous visibility of the designated missile's front end and an intrusive series of safeguards to ensure that it is not tampered with or switched with a different front end. These safeguards include the right to inspect any vehicles that transport the front end during the inspection, any concealment structures and enclosed spaces the inspected country uses to prepare it for inspection, and the right to seal the area where the inspection occurs.¹⁷⁵ These measures would not be possible in a remote inspection. The increased potential for cheating is a major drawback of this concept relative to onsite inspection.

Treatment of non-nuclear objects, such as decoys, on the missiles would also be a challenge. Under New START, non-nuclear objects are covered, and the inspecting country has the right to confirm they are non-nuclear with radiation detection equipment. Remote emulation inspections would lack this means

of verification. The United States and Russia would have less confidence in the accuracy of each other's warhead declarations, though the visual image of the total number of covered objects on the front section would at least bound the uncertainty.

If the United States and Russia agree on some form of remote emulation, it could perhaps also function for verifying non-deployed launchers, such as empty silos and mobile ICBM launchers

Eliminated Systems

The United States and Russia could also carry forward the elimination and verification procedures for retired strategic nuclear systems. Under New START, there are specific measures for dismantling ICBMs, SLBMs, their launchers, and bombers and positioning them so that the other country can observe them with NTM for 60 days.

This practice will be important for both countries as they continue to retire old systems and field new ones. Transparency into elimination procedures would help each country avoid worst-case scenario assessments about the relative size of each other's forces during their respective recapitalization programs. It would give the United States added confidence that Russia pulls SS-18s, SS-19s, and SS-25s from its force and is not trying to extend their service lives. It will also be valuable for Russia toward the end of next decade and into the 2030s as the United States begins retiring ICBMs, SSBNs, and bombers, and the regime could include display of eliminated *Ohio*-class SSBNs and launchers for NTM.

Briefings on New Types and Kinds of Delivery Vehicles

As noted in Part II, both countries are scheduled to introduce new systems after 2021 and 2026. Without onsite inspections, in-person exhibitions of new types and new kinds of systems would be impossible. As an imperfect substitute, the United States and Russia could hold confidential briefings on new strategic systems that each country introduces into its arsenal. The briefings could include the type of technical information that each shares under New START and perhaps even exchange of photographs. Neither country would have the independent verification that comes through the onsite exhibition, where they can examine, measure, and draw the new system firsthand; however, they would have a body of data to compare with information collected through NTM.

One modification of this practice is worth consideration. The *Columbia*-class SSBN is planned to have 16 rather than 24 launch tubes. In the interest of avoiding Russian planning based on an inflated estimate of US force levels, the United States could make the launch tubes on the first operational *Columbia*-class SSBN visible to NTM for a specified period of time, enabling Russia to confirm the number. In reciprocation, Russia could provide telemetry from the SS-29 ICBM tests, enabling the United States to assess its throw weight, and thus, the number of warheads it could plausibly carry. If the SS-29 enters the force before New START expires, and thus the United States participates in an exhibition of the system, there might be other types of information with which Russia could provide to the United States in reciprocation for confirmation of the new US SSBN's SLBM capacity.

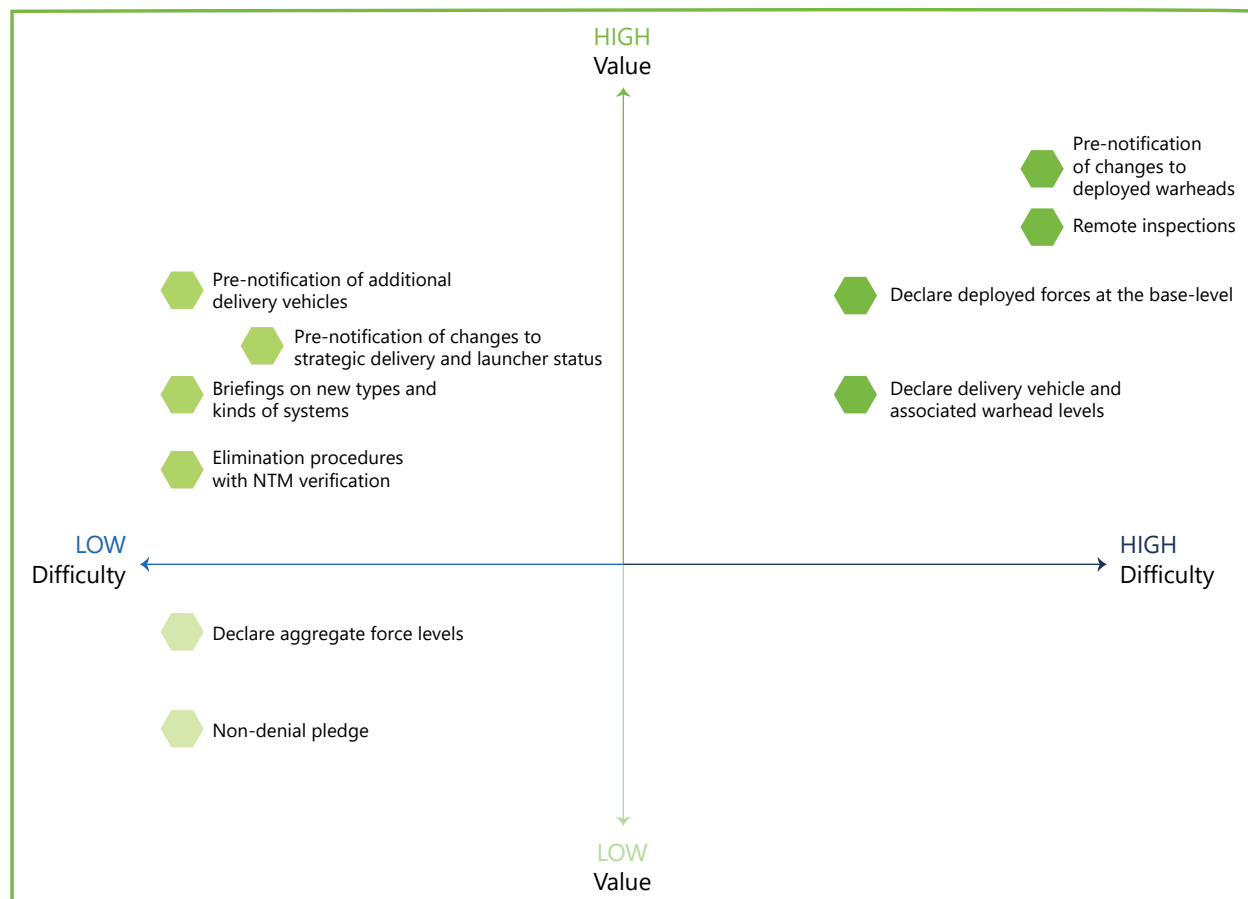
A Non-Denial Pledge

One final measure would be an agreement to forgo sophisticated denial operations. This pledge would not preclude the standard concealment measures at ICBM bases permitted under New START. Its purpose would be to acknowledge that both countries would be less secure if one dramatically misestimates the size and composition of the other's strategic nuclear forces. The pledge would codify mutual restraint in operations intended to challenge each side's ability to accurately monitor and assess the other's strategic nuclear forces. It would reflect a minor modification of New START's provision on non-interference with the use of NTM for monitoring treaty compliance.

Taking Stock: Value and Difficulty of Options

Figure 4 provides a qualitative assessment of the transparency options according to their value and level of difficulty. The value of each option stems from the extent to which it would provide information that augments each country's NTM collection operations and enables a more precise understanding of strategic nuclear forces and operations than would be possible otherwise. The difficulty of each option hinges on whether it would likely require congressional action to change the Atomic Energy Act (as opposed to an executive order), necessitate development of complicated new procedures between US and Russian officials, and potentially create new nuclear security risks.

Figure 4. Value and Difficulty of Options



The options related to sharing classified information about strategic nuclear warheads would all be highly valuable because of the insight they would provide and also quite difficult because they would likely require US legislative action. Pre-notification of changes in deployed warheads might also entail new nuclear security risks, while remote emulation of onsite inspections would require bilateral agreement on new procedures. Thus, these options would require more time and senior-level engagement to implement.

Pre-notification of additional delivery vehicles leaving production facilities and changes to the status of strategic delivery vehicles would also have high value because they augment NTM operations and enable more precise windows into nuclear force levels and operations. But these practices would be less difficult to implement because legislative action would likely be unnecessary, as the president could authorize sharing this information as a matter of policy because it is about delivery vehicles, not warheads. Continuation of elimination procedures and briefings on new types and kinds of systems would also fall into the high value/low difficulty category because legislative action is not required and the procedures already exist.

Limitations, But Compared to What?

The overarching limitation of all of these options is that one or both countries could provide false data, choose not to provide notifications, and attempt to deceive the other with doctored systems or operations. However, neither country would rely solely on the other's honesty or these cooperative practices for developing its intelligence estimates. Cheating would also have a self-defeating quality—once one side determines that cooperation does not serve its interests because the other is renegeing, it can terminate the cooperative practices, depriving the cheater of a valuable stream of data.

Of course, none of the options are as effective as the cooperative transparency measures under New START. For the purpose of this study, however, the relevant point of comparison is a scenario where the United States and Russia do not cooperate at all. In comparison, these modest measures do provide more transparency than either country would have otherwise.

Unilateral US Transparency In Nuclear Forces

If Russia balks at these measures, the United States could continue to publicly declare its aggregate strategic deployed warhead, delivery vehicle, and launcher levels. It could consider also publicly declaring the distribution of total deployed warheads across types of delivery vehicles in addition to declaring total numbers of deployed ICBMs, SLBMs, and bombers. It could also publicly announce the retirement of strategic nuclear systems and provide some form of confirmation that it has pulled these systems from its deployed force and disabled them. This openness would set a global example for nuclear transparency and perhaps modestly contribute to the prevention of Russian worst-case planning, which is not in US interests. Unilaterally providing the more detailed data and operational notifications without Russian reciprocation, however, would allow Russia to see the show without buying a ticket, giving it little reason to ever return to transparency cooperation. Additionally, given the asymmetry of information in the public domain, unreciprocated US transparency would create an unequitable situation. The United States would rely solely on independent intelligence operations to observe Russian forces, while Russia would have a much bigger window in the United States.

Table 17 summarizes the preceding options. It specifies which ones the United States could undertake unilaterally if Russia does not cooperate.

Table 17. Summary of Transparency Options

Category	Only if Reciprocated / Unilateral if Russia Rejects
Declare aggregate force levels	Declare publicly regardless of Russian reciprocation
Declare delivery vehicle and associated warhead levels	Declare publicly regardless of Russian reciprocation
Declare deployed forces at the base-level	Only if reciprocated
Pre-notification of additional delivery vehicles	Only if reciprocated
Pre-notification of changes to strategic delivery and launcher status	Only if reciprocated
Pre-notification of changes to deployed warheads	Only if reciprocated
Remote inspections	Only if reciprocated
Elimination procedures with NTM verification	Publicly announced with modified public confirmation
Briefings on new types and kinds of systems	Only if reciprocated
Non-denial pledge	Only if reciprocated

TRANSPARENCY INTO STRATEGY AND CONCEPTS

Circling back to the primary role of arms control, transparency undergirds predictability. This is true for force structure as well as strategic thinking, which is why the current state of US-Russian dialogue is alarming. A renewed competition is taking shape amid a paucity of dialogue combined with modernization and diversification of each country's posture. The end of treaty-based arms control would make a difficult situation worse.

The United States and Russia could develop a path forward on improving understanding of their respective strategies and concepts. Increased transparency is not guaranteed to improve relations and reduce threat perceptions; it is plausible that tensions increase as both countries come to better understand each other and see irreconcilable interests and threatening strategies. But improved understanding offers the promise of reducing the risks that the United States and Russia stumble into war and an arms competition through miscalculations based on flawed assessments of each other's strategy, intentions, redlines, and postures. While both countries have expressed intermittent interest in a strategic dialogue while New START is in effect, this type of engagement would have the potential to strengthen predictability in US-Russian interactions after New START expires as well.

What follows in the remainder of this section is a discussion of how the United States could prepare for and structure such a dialogue.

Preparing for a Strategic Dialogue

The US-Russian Strategic Stability Dialogue construct, proposed by President Obama and, initially, continued under President Trump, is a useful model for increasing predictability. US and Russian concerns center on both capabilities and intent and span strategic and theater-range nuclear weapons, missile defenses, and a host of other types of systems. A treaty negotiation is too rigid a venue to address this set of issues, and both countries want to discuss systems that the other is not ready to limit in a treaty.

Gathering in a room, however, is not sufficient for progress. At a minimum, an effective strategic dialogue requires that the United States have a clear set of objectives and a structured process for pursuing them. Meeting these minimum standards requires overcoming two obstacles in the US interagency policy process.

The first is what Michèle Flournoy describes as the tyranny of consensus. Agreement “has become an end in itself in too many areas....Getting the concurrence of a broad range of stakeholders on a given course of action too often takes precedence over framing and assessing a compelling set of options.”¹⁷⁶ Flournoy levels her critique at US strategy and policy writ large, and it certainly applies to interagency preparation for bilateral engagement. The Office of the Secretary of Defense for Policy, the Chairman of the Joint Chiefs of Staff, the Department of State, and the National Security Council staff all have parallel functional and regional offices, staffed with employees with widely varying levels of expertise. If tasked with nothing more specific than reaching internal consensus on how to reduce misperception and miscalculation, interagency coordination is unlikely to produce a coherent set of goals for the dialogue, let alone a plan for meeting them.

The first obstacle is compounded by the second: the lack of tangible stakes. The arms control negotiations that Secretary Gates and others saw as valuable were consequential, with the potential to shape force structure, procurement, and alliance diplomacy for decades. Senior stakeholders in the United States could not afford to take a backseat in development of negotiating positions. Participants in the actual negotiations needed expert knowledge of their and the other side’s positions.

This is not the case for a strategic dialogue divorced from a treaty negotiation. The US mid- or senior-level officials are unlikely to have engaged in months of preparation and internal debate before a US-Russian Strategic Stability Dialogue. The delegation is thus less likely to have a common understanding of the range of issues on the agenda and goals for the dialogue. The stovepiping of strategic capabilities into different offices also conditions practitioners to think about nuclear weapons, conventional forces, space, and cyber operations in a segregated way rather than viewing the issues holistically.

These are the ingredients for a delegation that is prepared to communicate existing policy positions on regional and functional matters but little else.

Working Group on Strategy, Concepts, and Systems

Fortunately, a clear vision from the senior-most levels of the government and a structured approach to the dialogue can go a long way. We now put forward a vision and approach with the goal of shifting debate from whether the United States and Russia should have a strategic dialogue to how they can structure a dialogue to improve transparency.

Within the broader goal of increasing transparency to enhance predictability, US goals for the Strategic Stability Dialogue should be threefold:

First, explain US thinking on areas where Russian misperceptions endanger US and allied security. For example, the current position of the United States, as articulated in the Nuclear Posture Review, is that Russian leadership is at risk of badly miscalculating how the United States would respond to a limited nuclear attack in Europe. A dialogue is an opportunity to address potential misperceptions directly. If there is any doubt as to whether Russian leadership appreciates the dangers of nuclear brinkmanship and is committed to avoiding nuclear conflict, a dialogue is an important tool for changing its perspective.

Second, gain better understanding of aspects of Russian thinking that are either unclear to the United States or where Russia contends that the United States' interpretation of Russian policy is wrong. Returning to the example of Russian nuclear strategy, a dialogue is an opportunity for Russia to provide an expert-level briefing on the roles nuclear weapons play in its strategy and how Russia sees the different elements of its arsenal synchronizing to fill these roles.

Third, begin discussions about new types of weapon systems, such as hypersonic boost-glide vehicles, in order to better understand how each views these capabilities and how they see them fitting into their postures, and eventually explore cooperative measures for avoiding outcomes that leave both countries less secure.

Describing these goals is far easier than achieving them. The United States and Russia need to have the right subject matter experts in the room, and each country will need to reach across their policymaking stovepipes to establish internal consensus, at least on strategic principles, before engaging in discussions.

One approach would be to establish an expert-level working group that would function as the operational arm of the Strategic Stability Dialogue. The group would agree to a specific set of strategic topics, guiding concepts, and current and developmental systems, with the understanding that both sides would have the opportunity to ask questions about items on the list during working group sessions and would be expected to provide substantive answers.

Identifying the list of topics and committing to discuss them would force both countries to prepare. They would need to have a set of messages to deliver about each topic and formulate questions to pose to the other side. A serious interagency dialogue would need to precede the bilateral dialogue. This type of strategic-level homework needs to occur anyway. The working group would be a useful mechanism for bringing together experts from within the interagency and the relevant combatant commands and services.

At each session, the United States and Russia would have the opportunity to ask the other to address two topics. Russia would select a topic, the United States would then explain its understanding of the issue in a 10–15-minute briefing, followed by roughly 60 minutes of discussion. This format would enable discussion of four topics over the course of 2–3 days. If desired, the working group could convene the first session on strategic topics, the next on guiding concepts, and the final one on weapon systems. Or each side could have the freedom to select its issue from any of the categories.

Four additional points about this approach are noteworthy.

First, while there is a natural tendency to focus on current and developmental weapon systems, the strategic topics and guiding concepts are just as

Table 18. Notional Working Group Agenda Items for Discussion

Strategic Topics	Guiding Concepts	Weapon Systems
<ul style="list-style-type: none"> ▣ National Military Strategy ▣ Assessment of the Regional and Global Security Environment ▣ Relationship Between Threat Perceptions, Uncertainty and Strategic Planning ▣ Third-Party Actors That Affect US-Russian Relations 	<ul style="list-style-type: none"> ▣ Nuclear and Non-Nuclear Deterrence ▣ Escalation and De-Escalation ▣ Deliberate and Unintended Escalation ▣ Nuclear First-use ▣ Offensive Cyber Operations ▣ Conventional and Nuclear Entanglement 	<ul style="list-style-type: none"> ▣ US Homeland and Regional Ballistic Missile Defenses ▣ Types of Russian Non-Strategic Nuclear Forces ▣ Russian Staus-6 Autonomous Torpedo ▣ US and Russian Hypersonic Glide Systems ▣ US and Russian Nuclear SLCMS

important. A constructive discussion should illuminate how each side is operationalizing abstract concepts in a strategy to meet national objectives.

Second, some topics of concern might be best discussed at the conceptual level rather than in terms of specific weapon systems. Offensive cyber operations and conventional and nuclear entanglement are two good examples. Both countries might be reluctant to discuss actual cyber capabilities or nuclear command and control, yet given the emerging escalation risk related to these issues, improved understanding of threat perceptions and risks is necessary. Broaching sensitive topics in an abstract way lends itself to a more fruitful exchange of views.

Third, an immediate counterargument to this approach is that the dialogue will not be valuable. This objection is a self-fulfilling prophecy. If one side is not prepared to go beyond talking points, the venue will not add any value. But if both sides are serious in their preparation, regularize the meetings, and

establish some trust among participants, progress is possible. Ultimately, there is marginal risk in trying. If the dialogue fizzles out, neither country is likely to continue agreeing to meet.

**A
constructive
discussion should
illuminate how each side
is operationalizing abstract
concepts in a strategy to
meet national objectives.**

Fourth, this working group should evolve as the dialogue matures. As both sides improve understanding and refine their own thinking, they may find sufficient convergence on some issues, building capital for new forms of arms control, defined broadly, for the more diverse set of capabilities both are fielding. Some of these initiatives might focus more on clarifying rules of the road rather than limiting capabilities. For example, they could develop an updated set of practices for crisis management and codify escalation thresholds. Thus, while this mechanism is not intended as a body for negotiating arms control treaties in the traditional sense, if successful, it could lay the groundwork for revitalizing and modernizing the US-Russian arms control framework.

RESTRAINTS ON STRATEGIC NUCLEAR FORCES WITHOUT A TREATY

We now turn to options for restraining strategic nuclear force levels without a treaty. We explore one cooperative option and an option the United States could adopt if Russia is uninterested in mutual restraint.

A MUTUAL RESTRAINT PLEDGE

An obvious option is for the United States and Russia to pledge to remain at or below New START's limits. Each country's restraint would be contingent upon the other's reciprocation. This pledge could take the form of political commitments from the President of the United States and the President of Russia. Each country's pledge could apply to intercontinental-range delivery vehicles and their associated warheads. It would not include nuclear SLCMs and other non-strategic nuclear weapons, because such systems do not count against New START's limits.

The Rationale for Mutual Restraint

To review the conclusion from Part II, the United States and Russia both face uncertainties and risks in an unconstrained relationship.

Russia could see an increased counterforce threat if the United States reverses its New START reductions. It must also consider a future where economic challenges constrain its development of strategic forces and the United States embraces nuclear competition.

The United States must consider Russia's near-term advantage in warhead production capacity, while its own modernization plan reduces SLBMs and could result in further reduction if other replacement

programs are delayed. If the United States chooses to exceed New START levels in the near term, it also faces the political risk of congressional support and funding for modernization evaporating. These conditions create the possibility of numeric disparities in both strategic and theater-range nuclear weapons. The United States may also face a diplomatic challenge in maintaining solidarity within NATO.

Finally, the United States and Russia have a shared interest in preventing the arms race narrative from gaining ground and weakening support for the NPT. Fueling the TPNW is a risk for both as well, though more so for the United States.

Thus, there is an alignment of US and Russian interests in staying at New START levels. For Russia, refraining from uploading additional warheads onto its ballistic missile force would be a reasonable price to pay for the United States forgoing expansion of US delivery vehicles and warheads. Likewise, this pledge spares the United States the challenges and uncertainties of sustaining parity with rising

There is an alignment of US and Russian interests in staying at New START levels.

Legal Issue: Statute 2573 of the Arms Control and Disarmament Act of 1961 prohibits the United States from entering into agreements on reductions and limitations of US armed forces outside of a treaty or enacted legislation. A non-binding political declaration by the President stating that the United States will stay at New START levels, however, would be legal.

Russian warhead levels. Both countries could point to continued cooperation in managing their nuclear relationship. NPT signatories are unlikely to embrace this pledge as meaningful progress toward disarmament, though they are likely to see it as preferable to zero US-Russian cooperation.

Interim Restraint and SALT II

A political commitment outside of a treaty has precedent in the Reagan administration's policy of interim restraint. The United States signed but never ratified SALT II and yet adhered to the treaty throughout most of Reagan's presidency. To stay below SALT II limits, the United States retired several *Poseidon*-class SSBNs, using the agreed-upon elimination procedures, as new *Ohio*-class submarines entered service. The administration explained that its policy was intended to "avoid undercutting" negotiations on new agreements that would stabilize the nuclear relationship, and it emphasized that the United States planned to retire these aging submarines regardless of arms control considerations.¹⁷⁷

To be sure, the differences between that situation and the post-New START period outnumber the similarities: SALT II was a signed treaty and the Reagan administration was in talks with the Soviet Union on START and INF. In contrast, we are considering staying at New START levels beyond its expiration date without the promise of other agreements in the near term.

Despite the contextual differences, the strategic reasoning underlying the interim restraint policy provides useful lessons for today.

When weighing US policy on SALT II, policymakers analyzed the second- and third-order consequences of an unmitigated arms competition: "if the US were to selectively or completely abandon restraints... we would offer the Soviets a pretext to substantially

increase their own forces, while the US would take the blame—here and with the Allies—for destroying arms control."¹⁷⁸ Even as the United States prepared to exceed SALT II levels after the unratified treaty expired, President Reagan emphasized meeting US force requirements in a way that would "minimize incentives for continuing Soviet offensive force growth," and pledged to forgo deploying more strategic delivery vehicles and ballistic missile warheads than the Soviet Union as long as the threat did not increase.¹⁷⁹ President Reagan further directed a study, which remains classified today, on provisions for a short-term mutual restraint regime with limits, notifications, and weapon dismantlement procedures until a new treaty was in force.¹⁸⁰

Because the United States and Russia have essentially been treaty-bound since 1994, with only a 13-month interruption while New START was finalized, many in the US policy community assume that an arms race is inevitable in the absence of a treaty. But the interim restraint policy reminds us that treaties are only one form of arms control. Similarly, the Reagan administration's sensitivity to the negative reactions from US allies and sustained interest in avoiding steps that could contribute to a Soviet build-up illuminate that sometimes restraint is the best option for furthering US interests.

The Verification Challenge

Verifying adherence to the mutual restraint pledge would be a challenge. Even if paired with the transparency regime described in the previous section, the United States would face uncertainty regarding the number of deployed strategic warheads, the only category where Russia can rapidly exceed New START limits in the near term. US policymakers would need to be clear that they would not have high confidence that Russia was at or below the 1,550-warhead limit.

However, as discussed in Part II, the inability to determine precise levels does not preclude detection of large-scale Russian uploading. The real uncertainty band for the United States would be whether Russia has marginally exceeded the deployed warhead limit, not that Russia has surpassed it by hundreds without detection. Thus, the operative question for this option is: What are the risks posed by a failure to detect marginal Russian cheating on a mutual restraint pledge?

In the military realm, the force structure comparisons from Part II demonstrate that the United States will retain a large number of survivable nuclear systems regardless of the size of Russia's arsenal, particularly under generated conditions. Thus, a marginal Russian increase above New START's deployed warhead limit would have no military impact on the US second-strike capability. Similarly, a marginal increase in Russian warheads above New START limits would not affect the flexibility and diversity of US nuclear forces, which is integral to deterring limited nuclear attacks (a topic we explore more in the next option).

This is not to excuse any potential Russian cheating. Rather, the point is that the military risks of failing to detect marginal Russian cheating are low and do not outweigh the benefits of an arrangement that inhibits Russia from moving closer to the unconstrained force outlined in Part II.

On the issue of approximate parity, which as discussed earlier is a subjective concept that could be influenced by objective factors such as numeric disparities, marginal Russian cheating is also unlikely to have an impact. If Russia has chosen to exceed 1,550 by a small amount, in order to avoid US detection, nobody outside a small circle of Russian officials would know about it (which raises the question of why Russia

would do this in the first place). Thus, even if one accepts the premise that numeric parity could confer strategic leverage (an issue we explore in the next option), Russia cannot by definition achieve this leverage through surreptitious uploading.

Diplomatic and Political Risks

This option carries several diplomatic risks for the United States that are redolent of US difficulties in responding to Russia's INF violation.

First, Russia might accuse the United States of cheating. Russia could declare the United States has exceeded the limits. This accusation would put US policymakers in the difficult position of disproving the claim and provide Russia a pretext for exceeding New START levels while blaming the United States. Outside of the transparency options in the previous section, the United States would not have other attractive means for demonstrating that it is honoring its political commitment.

Second, the United States may detect large-scale Russian uploading but struggle to convince its allies, some members of Congress, and the international community that Russia is exceeding New START levels. Thus any US decision to jettison the political commitment and reverse its New START reductions could be divisive and engender the diplomatic challenges mutual restraint is intended to prevent.

Yet Russian interests in mutual restraint make cheating and false accusations a risky strategy. It may be difficult for the United States to disprove Russian cheating accusations and prove Russian cheating in the court of global opinion, but the United States is unlikely to accept politically imposed constraints indefinitely if Russia is acting in bad faith and

not honoring its commitment. The forthcoming US withdrawal from INF demonstrates that the United States does not treat arms control as an end unto itself and is willing to walk away from an agreement that is no longer serving its purpose. Thus, if Russian leadership's goal is to avoid an unrestrained strategic nuclear arms competition with the United States, they have strong incentives to avoid chicanery.

Finally, we must consider these risks in the context of what the United States is likely to encounter if it has no vision for cooperating with Russia after New START. Discord over US nuclear policy within the Congress, NATO, and the NPT are guaranteed under that scenario. The mutual restraint pledge, alternatively, offers some chance of dampening this blowback while avoiding a large increase in the number of deployed Russian nuclear weapons.

ESCAPE FROM PARITY AS A FORCE-SIZING METRIC

As discussed previously, in the prevailing US conception of parity, approximate numeric parity in strategic nuclear forces is a necessary component. Thus, without binding constraints on Russian strategic nuclear forces, the United States could face pressure to reverse its New START reductions for the sake of maintaining nuclear parity with Russia. The previous option would ease this pressure by codifying reciprocal restraint. But if Russia is uninterested in mutual restraint, the United States could consider staying at New START levels regardless of whether Russia exceeds them.

This course of action would certainly better position the United States to mitigate negative reactions within the NPT and disarmament constituencies in allied nations because US officials would have a clear

message of restraint to deliver: despite the absence of binding limits, the United States is not increasing its number of strategic nuclear weapons in its deployed force.

But what are the risks of breaking with this longstanding US policy? To explore this option, we examine the impact that the plausible numeric disparity between Russian and US strategic nuclear forces could have on deterrence, extended deterrence, and assurance.

According to the concept of nuclear superiority, abandoning nuclear parity would undermine US deterrence and extended deterrence, and as a result, reassurance of allies. Yet our analysis demonstrates the United States could meet its strategic objectives at New START levels even if Russia exceeds them by hundreds of deployed strategic warheads. It also suggests that keeping nuclear parity as a force-sizing metric without treaty-based constraints on Russian nuclear forces entails several risks that the United States might be able to avoid by staying at New START levels.

Illustrative US and Russian Nuclear Forces

Table 19 illustrates the numeric differences between US and Russian forces if Russia exceeds New START levels and the United States does not. These figures are from the illustrative unconstrained Russian force and the constrained US force from Part II.

Under these conditions, Russia would have a quantitative advantage in deployed warheads under DTD and generated conditions. As a reminder, Russia's unconstrained force levels reflect the worst-case assumption that it has deployed the maximum number of warheads its ballistic missiles can carry.

Table 19. US Stays at NST Levels, Russia Exceeds

Category	United States	Russia
W-DTD	850	1,530
SDV-DTD	500	360
SW-DTD	450	229
W-G	2,200	2,562
SDV-G	700	508
SW-G	1,800	1,413

W= warheads; SDV= strategic delivery vehicles; SW= survivable weapons; DTD= day-to-day; G= generated; see Part II for the explanation and assumptions for these illustrative forces.

Deterrence

For deterring Russia from attacking the United States with nuclear weapons, relative parity is far less important than a robust second-strike capability. Russia’s numeric warhead advantage does not have an impact on the number of survivable US systems— i.e., the nuclear systems for which Russia would lack confidence in its ability to destroy in attack. Deploying 450 survivable weapons DTD and 1,800 under generated conditions would enable the United States to decimate Russia, exacting a cost on Russia that would outweigh whatever it hoped to achieve in the attack.

A back of the envelope calculation demonstrates that even in an extraordinarily worst-case scenario for the United States, Russia would be unable to prevent the United States from ending it as a functioning society and, just as importantly, *would be unlikely to have confidence in its ability to deter the United States from responding to a first strike.*

Russia could employ its DTD force in a surprise first strike against the DTD US force, using roughly 1,230 warheads against 400 US ICBMs (3 warheads per

silo) and several other important military targets, such as bases for non-dispersed SSBNs and bombers. Russia would have roughly 300 DTD warheads remaining after executing this attack (Russia would be unable to covertly generate its full strategic nuclear force prior to launching its initial strike). Even if Russia began generating additional SSBNs and bombers while the attack was underway, it would be vulnerable to 450 warheads spread across 100 SLBMs and five SSBNs at sea. After launching a massive attack against the US homeland, which would be the most destructive attack in human history, the threat of an additional 300 Russian nuclear weapons is unlikely to deter the United States from responding with these remaining weapons.

Even in the 2030s, when the number of survivable warheads in the SSBN force decreases with *Columbia*-class SSBNs, this fundamental balance would not change. Russia would still need to use over 1,000 warheads to destroy US ICBMs, and the United States would have 432 survivable weapons DTD and 1,625 under generated conditions (see Table 13 in Part II).

Thus, staying at New START levels is unlikely to undermine deterrence of the most devastating type of Russian nuclear attack against the United States.

Extended Deterrence

Extended nuclear deterrence poses a unique challenge because it requires convincing Russia that the United States is willing to step into its nuclear crosshairs on behalf of allies.

The extended nuclear deterrence challenge for the United States has evolved since the Cold War. No longer is the threat of US and NATO nuclear first-use central to deterring Russian conventional aggression. Instead, the United States faces the altogether different

challenge of deterring Russian nuclear escalation and coercion in a conventional conflict. This is the threat the United States was most concerned with in the 2018 Nuclear Posture Review.

Any Russian strategy for employing nuclear weapons in a limited way would necessarily include a theory for convincing the United States to negotiate an end to the conflict after the attack. Russia would attempt to establish advantageous limits on the conflict that enable it to use or threaten to use its non-strategic nuclear weapons to force a favorable post-war settlement, while conveying to the United States that contesting Russian objectives within the boundaries of the conflict would fail and that US escalation entails a huge risk of uncontrolled nuclear war.¹⁸¹

Although US strategic thinking on this contemporary challenge is nascent, we can assess whether the numeric disparity between the constrained US force and the unconstrained Russian force would put the United States at a disadvantage.

A core tenet of US nuclear strategy is that relying solely on massive nuclear retaliation to deter limited nuclear strikes on US allies and US forces fighting abroad would lack credibility, particularly against Russia. As a result, US policy has required limited nuclear response options since the Kennedy administration.¹⁸² Such options enable the United States to respond against a range of military targets in a way that would be proportionate to US political-military objectives and roughly commensurate with the adversary's limited attack.

The United States could employ these forces in a way that contributes to its military campaign, but their strategic function is to deter nuclear use in the first place. They meet this purpose by convincing Russian leadership that they cannot confidently control escalation and win the war via threats or employment of calibrated nuclear attacks. Perhaps best thought of as a counter-limited nuclear war strategy, limited options are a means of conveying that the risks of crossing the nuclear threshold are truly incalculable: “The idea that escalation may credibly elicit an effective countermove leaves the adversary asking, ‘If I ratchet the conflict up, then what happens next, and where will it end?’”¹⁸³

From a force structure perspective, the United States has focused on ensuring its limited options remain credible as its nuclear delivery vehicles age and adversary air defenses improve. The United States is developing the next-generation air-launched cruise missile, penetrating bomber, lowering the yield on a portion of its SLBMs, and restoring its nuclear SLCM capability. This suite of systems will provide capabilities that enable the United States to threaten limited response options of varying size against targets throughout Russia and, if needed, against deployed Russian forces.

Thus, militarily, a Russian numeric advantage in warheads would not impact the effectiveness of US limited response options and, therefore, it would not undermine US capabilities for deterring nuclear attacks on allies. For extended deterrence, retaining lower-yield warheads on different types of

Key Term

Limited Nuclear Option: A nuclear option that only employs a small portion of a country's nuclear arsenal. In contemporary discussions, the term implies a nuclear strike option that includes only one or several delivery vehicles and warheads, typically of low explosive yield.

operationally effective delivery vehicles is far more important than the relative balance of deployed strategic warheads.

The Nuclear Superiority Counterargument

A counterargument to this option is that a gap in hundreds of deployed strategic warheads will sap US leadership's resolve in confrontations with Russia.

The concept of nuclear superiority undergirds this proposition. According to the concept, a country has nuclear superiority if its "expected cost of nuclear war is less than the expected cost of nuclear war for its adversary," with the "cost" of nuclear war measured by the number of warheads that would be delivered against one's territory.¹⁸⁴ In confrontations, states with nuclear superiority are willing to accept greater risk of conflict in pursuit of their goals because they would *suffer less relative damage than their adversary in a full-scale nuclear war*.¹⁸⁵

At first glance, this concept suggests that US policymakers should be wary of forfeiting a numeric advantage to Russia. After all, Russia would have more deployed strategic warheads if it increased to the unconstrained force and the United States did not, and "[w]hen a state possesses more nuclear warheads than its opponent, then, almost always, its expected costs of war will be lower than the expected costs of nuclear war for the opponent."¹⁸⁶ US leaders would then be more reluctant to intervene on behalf of allies under these conditions. The United States' extended deterrence commitments would be less credible because Russia would be capable of striking the US homeland with more warheads than the United States could launch back.

Upon closer examination, however, nuclear superiority's prediction is not persuasive in this case.

The ability to significantly reduce the other side's ability to deliver nuclear strikes would be profoundly important in a war and probably would influence decisions in a crisis. This is why the United States seeks to counter North Korea's ability to strike the United States with ICBMs; it can plausibly drive down the number of nuclear weapons that detonate over America to single digits, maybe to zero.¹⁸⁷

But Russia gains no comparable ability if it unilaterally exceeds New START levels. As highlighted earlier, Russian increases in deployed warheads stem primarily from uploading more weapons onto its ballistic missile force. This modification does not enhance Russia's ability to significantly limit the damage it would face from US strategic nuclear forces, because it does not translate into a greater ability to locate and destroy dispersed SSBNs and bombers. Thus, under nuclear superiority's criteria, Russia does not lower its expected cost of nuclear war.

Nor does the United States lose capacity to lower its expected cost of nuclear war by staying at New START levels. Whatever ability the United States possesses to limit damage by striking Russian nuclear forces would not decrease as a result of Russian warhead uploading, because the number of targets, Russian ballistic missiles, would stay roughly the same.

Some might still argue that the United States would be in a weaker position if it stays at New START levels and Russia does not. Under generated conditions, Russia would have 514 more deployed warheads with its unconstrained forces than its constrained force, and relative to the United States, it would have 680 more warheads DTD and 362 more under generated conditions. Thus, according to nuclear

superiority's precepts, Russia should be in a stronger position to challenge the United States and NATO because the United States' expected cost of nuclear war will be higher.

Yet the concept of nuclear superiority does not explain why a marginal difference in prospective damage would have a decisive impact on resolve and decisionmaking if the costs of nuclear war would be catastrophic regardless of the difference.

After decades of contemplating nuclear deterrence, McGeorge Bundy concluded that in a nuclear war "each side must be vastly more distressed by the warheads it receives than pleased by the warheads it delivers."¹⁸⁸ His hypothesis offers a compelling explanation for how US and Russian leadership would navigate an acute military crisis, where thousands of nuclear weapons cast an inescapable shadow over both countries. The United States and Russia might be willing to risk nuclear escalation over vital interests, but the devastation of hundreds or even dozens of nuclear weapons detonating over US and Russian soil would outstrip the political-military stakes for either country. Avoiding strategic nuclear war would be a paramount objective for both countries in a confrontation. There is no reason to conclude that this will change due to minor shifts in absolute or relative damage inflicted or suffered. Why then, should policymakers on either side see a discrepancy of 362, 680, or even 1,000 deployed warheads as a game changer?

The risks of a deployed warhead gap with Russia are low precisely because US nuclear forces are spread across multiple types of delivery vehicles.

An Illustrative Example of a Dangerous Disparity

The risks of a deployed warhead gap with Russia are low precisely because US nuclear forces are spread across multiple types of delivery vehicles. It would force Russia to mount a massive attack against US ICBMs that depletes Russia's DTD warheads but fails to destroy dispersed US submarines. Major changes to the composition of US nuclear forces would alter this strategic balance.

For example, if the United States eliminated its ICBMs, the US strategic posture would have 400 fewer targets. Russia could destroy ungenerated SSBNs, bombers, and other important nuclear sites in the United States with roughly 30 warheads. Under DTD conditions, Russia would then still have over 1,000 warheads available after launching a first strike, compared to the 450 survivable systems in the DTD US force. This would be the situation Paul Nitze feared: Russia could hit most of the key targets in the US nuclear force in a relatively small attack that avoids major US cities, and then threaten to unleash thousands more if the United States responds.

If the United States retaliated, the 450 remaining US nuclear warheads would be no less devastating to Russia under these circumstances than if the United States retained its ICBMs. But the nuclear exchange ratio would be fundamentally different, with profound implications for Russia's risk calculus. No reasonable person would expect US restraint after 1,200+ warheads detonate over North America; however, *a Russian leader in desperate circumstances might conclude that an attack with 30 nuclear warheads on military targets outside major cities, backstopped by the threat of thousands more, would deter the United States from responding.*

Table 20 summarizes the differences between the constrained US force under New START and a US force that has been reduced to a dyad of bombers and SSBNs.

Against the dyad posture, Russia could reduce the US arsenal to 450 warheads at sea with 2 percent of Russian DTD warheads by striking before the United States generates additional forces. If Russia waits, the United States can triple its number of survivable nuclear warheads by dispersing SSBNs and alerting its bombers. Thus, in a crisis, Russia would have a fleeting window of opportunity to gain a profound strategic advantage and destroy a large portion of the US arsenal.

This excursion demonstrates that the risks of cutting a leg of the triad are severe. Alternatively, the strategic risk of remaining at New START levels, irrespective of Russian restraint, is low as long as the United States retains the overall composition of its strategic nuclear arsenal.

Hedging after New START

As we observed in Part II, without an arms control treaty to cap Russian forces, the United States faces dual uncertainties about the future size of Russia’s arsenal and unplanned decreases in US forces, combined with the planned reductions in *Columbia*-class SSBNs, which ultimately decrease US upload capacity. Reversing New START reductions

for the sake of parity commits the United States to a competition it does not need to enter and that it could potentially lose. From this perspective, changing the terms of reference and explaining why the United States does not need to match Russia in deployed warheads mitigates several of the risks and uncertainties after New START. Such a decision is consistent with the hedging strategy in the 2018 Nuclear Posture Review.

Assurance of Allies


The corollary of the preceding discussion is that the United States would have a compelling argument for reassuring allies under these conditions. The United States could explain why rough numeric parity is unimportant and that other force structure attributes, such as survivability, distribution of warheads across many aim points, and flexibility in warhead yields, are the better measures of sufficiency. Essentially, a more precise vocabulary for assessing whether US nuclear forces are fit for purpose could replace the concept of parity.

This would be an eminently manageable diplomatic endeavor, albeit one that requires a break with the longstanding perceptual linkage the United States has drawn between allied confidence in the United States and parity. This linkage has received less attention in transatlantic discussions in recent years, but the end of treaty-based constraints on Russian nuclear forces would likely reactivate its saliency.

Table 20. Unconstrained Russian Force First-Strike Against Triad vs. Dyad

US Strategic Nuclear Force	Fixed US Nuclear Targets	DTD Russian Warheads Used In Strike Against Fixed Targets	DTD Russian Warheads Remaining After Strike
US Constrained Force, Triad	~410	~1,230	~300
US Dyad, No ICBMS	~10	~30	~1,500

Note: Assumes 3 Russian warheads per target.



Fortunately, the United States has laid the groundwork for this discussion over the last decade through its expert-level extended deterrence consultations with allies. US allies are more than capable of engaging the United States in a sophisticated back and forth on the relationship between strategic nuclear forces and extended deterrence.

THE HYBRID OPTION

The two options in this section are not mutually exclusive. The United States could declare that it will not exceed New START levels and propose that Russia reciprocate. The first option in this section proposes reciprocal restraint, and relies in part on Russian concerns about increases in US nuclear forces to deter Russia from uploading (i.e., if Russia uploads, the United States will reverse its New START reductions). Alternatively, the hybrid option would commit the United States to forgo a post-New START jump regardless of Russian actions but invite Russia to follow suit. Which approach stands a better chance of convincing Russia to stay at New START levels is an open question.





PART IV: THE UNITED STATES AND CHINA

CHINA AFTER NEW START

China's nuclear posture is fundamentally different from those of the United States and Russia. Whereas the United States and the Soviet Union/Russia built tens of thousands of nuclear weapons and relied on arms control agreements to facilitate mutual restraint, China has chosen to deploy a smaller arsenal than its resources permit. According to the 2018 Federation of American Scientists' nuclear notebook, over 50 years after becoming a nuclear weapon state, China has a stockpile of roughly 280 nuclear warheads.¹⁸⁹ The US Department of Defense assesses that China deploys roughly 75–100 ICBMs and a smaller number of nuclear-capable theater-range ballistic missiles, and it only recently began operationalizing an SSBN force and taking steps to develop a bomber component of its nuclear arsenal.¹⁹⁰ China's restrained force structure stems from a nuclear policy starkly different than the United States' and Russia's, one that eschews parity and exhibits less stringent standards for a credible retaliatory capability.

Despite these quantitative and qualitative differences, China's nuclear posture is sensitive to developments in the US-Russian nuclear relationship. In particular, the US strategic-military posture, including its nuclear forces, ballistic missile defenses, precision conventional strike, and ISR systems, is a key driver of China's nuclear force structure requirements. Although North Korea is the pacing threat for US missile defenses and US precision conventional strike is not intended to target China's nuclear forces, China is customizing its nuclear modernization program to offset these capabilities because it perceives them as a threat.

This interaction illustrates that bilateral strategic competitions unfold within a larger constellation of relationships, where they affect and are affected by other countries. "Changes in the United States' strategic posture can have the effect of turning a cog in a complex system of gears, all the



A collapse of the US-Russian nuclear arms control framework would be akin to turning several large cogs. (Shutterstock)

other components will eventually move as well,” according to former Deputy Assistant Secretary of Defense M. Elaine Bunn.¹⁹¹

A collapse of the US-Russian nuclear arms control framework would be akin to turning several large cogs. China has been an unintended beneficiary of the predictability US-Russian treaties engender. The INF Treaty, for several decades, prohibited the United States and Russia from fielding intermediate-range land-based missiles within striking distance of China. By February 2021, START and New START will have constrained US and Russian strategic nuclear forces for over 25 years. The end of this predictability would alter China’s strategic context at the very time when the United States has formally identified military competition with China as a key driver of its defense strategy.¹⁹²

The end of treaty-based nuclear arms control would be a stress test of sorts for US and Chinese policies. Can China hedge its nuclear posture against a less predictable US-Russian relationship while continuing its tradition of nuclear restraint? Will continued evolution of China’s nuclear arsenal create challenges for the US-Japan alliance or pressure for the United States to alter its nuclear posture?

In this section, we assess how the dynamics identified in Part II might impact China’s nuclear policy and posture and explore the implications for the United States. To establish a baseline for this discussion, the section begins with a brief review of China’s nuclear policy and posture and China’s efforts to sustain a credible force amid changes in its strategic environment. We also review US efforts to address some of China’s strategic concerns, as well as the nuclear dimensions of the nascent US-China competition.

We draw from several American studies of China’s nuclear posture as well as commentary on New START’s expiration by Chinese scholars and commentators in recent Chinese language publications. As part of our research, we commissioned Dr. Tong Zhao, a Fellow at the Nuclear Policy Program of the Carnegie Endowment for International Peace, to write an analytical essay on China after New START, which we draw from in this discussion. His full essay is available as an appendix to this report.

KEY PRECEPTS OF CHINA’S NUCLEAR POSTURE

No First Use, No Arms Races

China’s nuclear declaratory policy has always stated that China will never use nuclear weapons first in a war, it will never use nuclear weapons against a non-nuclear weapon state, and it will never engage in an arms race. Official Chinese statements on nuclear policy have consistently reiterated these precepts, messaging China’s restraint in the nuclear realm and, in China’s view, the purely defensive character of its policy. An official 2011 People’s Republic of China White Paper states:

[China] has adhered to the policy of no-first-use of nuclear weapons at any time and in any circumstances, and made the unequivocal commitment that under no circumstances will it use or threaten to use nuclear weapons against non-nuclear-weapon states or nuclear-weapons-free zones. China... has never participated in any form of nuclear arms race, nor will it ever do so. It will limit its nuclear capabilities to the minimum level required for national security.¹⁹³

China's declaratory policy is tightly tied to its historical experiences with the United States in the early stages of the nuclear era, when Chinese leadership perceived the United States as trying to coerce China through nuclear threats. Its no-first-use policy is a means of conveying that China's possession of nuclear weapons is for the purpose of resisting nuclear coercion or blackmail, not to impose its will upon others.¹⁹⁴

Lean and Effective Force, Assured Retaliation

China's nuclear force structure is consistent with a policy of no-first-use and no arms racing, at least in the sense that China chooses to deploy an arsenal that provides no option for a counterforce first strike against either the United States or Russia. The US Department of Defense assessment is that China sizes and postures its forces "to survive a first strike and to respond with sufficient strength to inflict unacceptable damage on an enemy."¹⁹⁵

This approach to nuclear weapons reflects a major point of departure from US and Soviet/Russian choices. China does not seek to target large portions of potential adversary nuclear forces, nor does it see rough numeric nuclear parity as valuable for deterrence. This policy framework is conducive to a modestly-sized nuclear arsenal.

Several studies by US scholars that analyzed official and unofficial Chinese writings on nuclear strategy demonstrate that while China's policy is less demanding in terms of raw numbers of weapons, it translates into sophisticated force structure and operational requirements. As described in official Chinese policy documents, China strives to maintain a "lean and effective nuclear force" that relies on mobility and concealment to ensure the necessary number of retaliatory weapons survive a disarming attack. Despite the small size of its arsenal, China

likely has response options for graduated strikes against civilian, industrial, or unhardened and stationary military targets in Asia and the continental United States. These reports argue that, in addition to a massive retaliation strike, Chinese plans likely include discrete counterstrikes for the purpose of compelling its adversary to stop fighting, and options that reserve some nuclear weapons for additional attacks if the adversary persists. Thus, to meet its policy requirements, China needs to adapt the size and composition of its force in response to potential improvements in US counterforce capabilities. "Lean and effective" is a dynamic force structure construct, with China's standard of effectiveness apparently including nuclear forces that would survive both a first strike and subsequent attacks, and have the capability to deliver limited and large-scale counterstrikes.¹⁹⁶

The number of survivable weapons Chinese civilian and military leaders deem sufficient to fulfill this policy is unknown to US analysts and practitioners. While China's answer to the question of "how many nuclear weapons are enough" is not fixed, it remains significantly smaller than the US and Russian conceptions of sufficiency.

The Necessity of Opacity

China's views on nuclear transparency also differ from those of the United States and Russia. In China's policy, opacity makes a major contribution to the survivability of its smaller nuclear force. Chinese policy statements often assert that the United States, as the stronger power, has an obligation to be transparent about its capability, while China is entitled to opacity because disclosing more detailed information about the size, composition, geographic locations, and planned trajectory of its nuclear posture would create operational vulnerabilities.¹⁹⁷ Additionally, China's strategy relies on denial and deceptions operations and

deliberate ambiguity about China's nuclear capabilities, potentially including displays of decoy capabilities to NTM, to offset the asymmetries of forces with the United States and achieve deterrence effects.¹⁹⁸

US admonishments about nuclear opacity breeding worst-case scenario planning and arms competitions do not resonate with the Chinese strategic community. Instead, they typically interpret US calls for a more transparent nuclear relationship as an attempt to lure China into an agreement that undermines the effectiveness and credibility of its nuclear deterrence strategy.¹⁹⁹

Importantly, Chinese policy holds that transparency of intentions is more important than transparency into military capabilities. Chinese experts argue the no-first-use declaratory policy is a window into the defensive intent of China's nuclear weapons and the United States' refusal to adopt no-first-use proves US intent to coerce China with nuclear threats.²⁰⁰

Nuclear Arms Control

Given China's vastly different nuclear policy and posture, it is unsurprising that China sees strategic nuclear arms control as a mechanism for drawing down US and Russian nuclear arsenals, not a tool China needs to meet its nuclear policy objectives. China's longstanding policy is that it will join the process once Washington and Moscow have completed deep and irreversible reductions and foresworn the right to use nuclear weapons first.²⁰¹ China has not specified the precise conditions in which it would be prepared to accept constraints on its nuclear forces or participate in the transparency practices the United States and Russia deem necessary for effective verification. Had the United States and Russia successfully negotiated additional one-third reductions below New START levels, China would still

have probably concluded these conditions did not yet exist. For instance, while Chinese experts generally described New START as a positive development, some scholars expressed concern that further US-Russia progress in arms control would create pressure on China to join the process before it could safely do so.²⁰²

CHINA'S CONSISTENT POLICY, CHANGING POSTURE

China's core nuclear policy has remained remarkably consistent since it became a nuclear weapon state, while its nuclear posture has evolved. Today China fields nuclear forces that are more sophisticated than 20 years ago, and the overall size of its arsenal has increased. To some extent, nuclear modernization was probably inevitable as part of China's comprehensive modernization of its military. But China is not modernizing in a vacuum. Chinese leadership has tailored this program to what they view as US challenges to the credibility of China's deterrence strategy. China is a case study of how continuity in policy can require changes in capabilities.

According to the US Department of Defense, China explains that improvements in nuclear posture are "intended to ensure the viability of its strategic deterrent in the face of continued advances in US and, to a lesser extent, Russian strategic ISR, precision strike, and missile defense capabilities."²⁰³

The majority of western studies of China's nuclear posture conclude that Chinese concerns about US non-nuclear capabilities are genuine. To summarize, Chinese leadership suspects that while the United States seeks to coerce China with nuclear threats, it is simultaneously developing the capacity to destroy Chinese nuclear weapons with precision conventional strikes and defeat China's retaliatory

strikes with ballistic missile defenses. A disarming US strike with non-nuclear means is more credible than a nuclear one, and the United States is seeking to enhance its capacity to negate China's nuclear deterrent, thereby allowing the United States to dominate global affairs with no regard for Chinese interests.²⁰⁴

China's assessment of the US strategic intent and emerging capabilities is similar to Russia's, yet because of its different force structures and policies, China's challenge is more acute. China is responding to the United States within a policy framework of a lean nuclear force and strives to project nuclear restraint and responsibility to the world. To China's credit, it has succeeded in developing a formidable nuclear force at low numbers compared to what it could field given its economic resources.

Thus far, the primary element of China's adaptation is the introduction of mobile systems that would be far less vulnerable to counterforce attacks. Kirstensen and Norris estimate that China currently deploys approximately 56 DF-31 road-mobile ICBMs, most of which are an upgraded variant that can reach the United States.²⁰⁵ China is also developing another mobile ICBM, the DF-41, and operationalizing its SSBN force, with four SSBNs capable of carrying 12 SLBMs each, with plans for a next-generation SSBN. China upgraded its nuclear-capable mobile medium-range ballistic missile and added a new mobile nuclear-armed intermediate ballistic missile to its force.²⁰⁶ Kristensen and Norris estimate that China has roughly 56 mobile nuclear-capable theater-range ballistic missiles.²⁰⁷

The changes in China's posture are not, however, limited to mobility. China has added multiple warheads (e.g., MIRVs) to some of its silo-based ICBMs and the DF-41 will reportedly carry MIRVs

as well. MIRVs increase the striking power of surviving Chinese ballistic missiles and improve the likelihood that some reentry vehicles will penetrate US missile defenses. Additionally, the US Department of Defense assesses that China is moving toward fielding a triad of strategic delivery vehicles with the development of a nuclear-capable air-launched ballistic missile for its bomber force and may field a nuclear-capable hypersonic-glide vehicle to overcome missile defenses.²⁰⁸

There is also evidence, in the form of Chinese military writings and its improving satellite capabilities, that China might develop a launch under attack (LUA) option—providing its leadership the option of launching ICBMs before they are destroyed by an incoming missile strike.²⁰⁹ Such an option is consistent with a no-first-use policy, but it would require a portion of China's ballistic missiles to be armed with warheads and ready for launch on a DTD basis, which would be a new operational practice for China.²¹⁰

In addition to China's evolving capabilities, China's leadership has considered nuclear policy changes. For example, Chinese military writings reflect debate regarding the precise actions that would constitute "nuclear first-use" under its declaratory policy. Some argue that China could threaten a nuclear response to conventional attacks against China's nuclear forces or officially change its nuclear threshold if the country is losing a war.²¹¹ Despite this debate, however, China has not changed its declaratory policy.

These posture adjustments and debates illuminate the dynamism of China's lean and effective force construct. China's nuclear policy imposes restraints on its arsenal but also permits adaptation to overcome military threats to the effectiveness of its nuclear forces. Prominent Chinese nuclear expert Li Bin crystallizes

the degree to which China's assessment of whether its nuclear posture is sufficient to meet deterrence objectives is contingent upon US capabilities:

[I]f the United States continues to develop missile defense systems with strategic capabilities, China would worry about its own nuclear retaliatory capability being weakened. China's response would be to strengthen its own relevant counter-measures, which include the option of deploying more offensive missiles....China's promise to not get involved in arms races does not rule out this sort of response to security dilemmas.²¹²

The security dilemma Li Bin describes shows no signs of abating and may actually accelerate. As previously discussed, the United States is expanding its homeland missile defense system and investing in a series of qualitative steps to increase its effectiveness. As with Russia, US development of space-based missile defense interceptors would likely cross a threshold in Chinese threat perceptions. The cogs driving China's nuclear posture changes continue to move.

US ENGAGEMENT WITH CHINA ON NUCLEAR WEAPONS

The Clinton, George W. Bush, and Obama administrations all pursued nuclear dialogues with China. During these successive administrations, the improvements in China's nuclear posture, described above, were taking shape, but US concerns were focused not so much on China's nuclear modernization but on the lack of transparency surrounding it. Secretary Robert Gates' statement on the value of transparency in US-Soviet interactions, quoted in Part I, was given in the context of explaining why the United States wanted to a more "routine, in-depth dialogue about our strategic intentions and planning" with China.²¹³ Learning from its experiences with the

Soviet Union during the Cold War, the United States wants to prevent a nuclear competition before it takes root and to cultivate shared understandings of strategy, concepts and capabilities before the United States and China encounter a military crisis.

US officials did not describe these overtures as arms control, because the United States was not proposing a verifiable treaty limiting Chinese nuclear weapons, yet their goals were to reduce the risks of conflict and arms competition by cultivating predictability with China. Thus, US engagement with China on nuclear issues is an example of an attempt at arms control without a treaty, tailored to the unique strategic context of the US-China relationship.

The Obama administration's overture to China is the most substantive effort the United States has made thus far. The 2010 Nuclear Posture Review declared US intent to strengthen "strategic stability" with China, and it issued an invitation to exchange views on nuclear weapons "strategies, policies, and programs" in order to "enhance confidence, improve transparency, and reduce mistrust."²¹⁴ The 2010 Ballistic Missile Defense Review was more precise, offering an explicit reassurance that the United States would scale its homeland missile defenses to missile threats from North Korea and Iran, and that the system "does not have the capacity to cope with large-scale Russian or Chinese missile attacks, and is not intended to affect the strategic balance with those countries."²¹⁵

As mentioned previously, the United States was not prepared to accept treaty-based limits on missile defense capabilities; rather, it clarified the threats against which it was intended to defend and pledged to restrain its purpose. Finding means of assuaging China's concerns about US missile defenses that both countries could accept would presumably have been on the agenda in the dialogue the United States proposed.

Beyond this invitation and assurance, the Obama administration did not articulate its conception of strategic stability with China, instead aspiring to develop a shared vision with China over the course of an institutionalized nuclear dialogue. In adopting this approach, it chose not to articulate US policy on the underlying question of whether the United States would acknowledge vulnerability to China's intercontinental-range nuclear forces.²¹⁶

In a US-China context, the concept of mutual vulnerability is perhaps best understood in symbolic terms. By acknowledging that an inescapable risk of nuclear attacks on the US homeland is an inherent condition of any war with China, the United States would confer upon China a comparable status that it confers upon Russia, that of a nuclear peer with a credible nuclear deterrent. In practical terms, this recognition would mean the United States accepts that it would be impossible to structure US forces in a way that effectively denies China the ability to hold the US homeland at risk with nuclear weapons, and subsequently, that US security is better served if China has confidence in the effectiveness of its intercontinental-range nuclear forces.

The United States has, of course, long accepted Russia's nuclear peer status and publicly acknowledged the implications. For instance, in a 2013 report on its nuclear employment strategy, the United States declared that it "seeks to improve strategic stability by demonstrating that it is not our intent to negate Russia's strategic nuclear deterrent, or to destabilize the strategic military relationship with Russia."²¹⁷ The United States also explicitly rejects vulnerability to North Korea's nascent nuclear-armed missile force and is tailoring both offensive strike and missile defenses to protect US territory, forces, and allies from North Korean nuclear weapons.²¹⁸

The Obama administration's outreach to China was not paired with any comparable statement of intent. It left unanswered the question of whether the United States would develop offensive capabilities designed to destroy Chinese nuclear forces, with the strategic goal of undermining Chinese confidence in its deterrent and thus its willingness to contest the United States. The administration did not explain its policy choice on this issue. In all likelihood, it probably wanted to avoid alarming Japan and dividing the alliance, and perhaps it concluded that acknowledging vulnerability would embolden China.²¹⁹ Given the Obama administration's interest in strategic stability, it clearly did not envision tailoring the US strategic posture to the mission of protecting the United States from China's nuclear weapons.

We will return to the mutual vulnerability topic in our discussion of options for improving predictability in the nuclear component of the US-China relationship, including the potential benefits and drawbacks of US acknowledgement of it. For now, the key point is that the United States seeks to improve predictability in US-China nuclear interactions, but it also projects an ambiguous message regarding the terms of the relationship.

China never accepted the invitation to a sustained dialogue on nuclear weapons. While the United States and China did engage in a series of bilateral exchanges on foreign and defense policy topics during the Obama years, dialogue on nuclear weapons and strategic stability did not mature. China never deviated from its position that the United States, as the stronger power, had an obligation to be transparent in the nuclear realm while China, as the weaker party, had a security requirement to remain opaque. The United States never articulated its vision for the relationship beyond the high-level messages in its public policy documents.

The United States and China did make progress in other areas of their military-to-military relationship during the Obama presidency. Most notably, in 2014 they signed agreements on codes of conduct for air and maritime encounters and notifications of major military activities. But on nuclear issues, their dialogue on nuclear weapons was roughly the same at the end of 2016 as it was at the beginning of 2009.

NUCLEAR DIMENSIONS TO US-CHINA COMPETITION

By the final years of the Obama administration, the United States was increasingly describing China as a military competitor. Senior defense officials set out to mobilize the Department of Defense to experiment with cutting-edge technologies and operational concepts in order to retain a military advantage over China, with the expectation that China will field a modern military force capable of contesting US military operations in Asia. US concerns largely centered on China's non-nuclear or conventional military capabilities, and subsequently, the Department of Defense's strategic response centered on sustaining conventional deterrence.²²⁰

This assessment of and response to China continued into the Trump administration. The 2018 National Defense Strategy describes China as "leveraging military modernization, influence operations, and predatory economics to coerce neighboring countries to reorder the Indo-Pacific region" and calls for the United States to reorient its defense strategy for long-term competition.²²¹

Though not the centerpiece of this nascent competition, nuclear weapons are an increasingly prominent, if not widely appreciated, factor.

The United States is deliberately signaling that China's use of its robust conventional ballistic and cruise missiles, and counter-space and cyber capabilities against the United States or its allies could elicit a nuclear response. As we highlight in Part II, the 2018 Nuclear Posture Review includes an adjustment to US declaratory policy clarifying the escalation risks of "non-nuclear strategic attacks." And the document is laden with references to Chinese capabilities that could deny US access to the Indo-Pacific region, undercut US conventional military operations, and degrade US command, control, and communications, including nuclear command and control.²²² US warnings on this issue are motivated not just by China's suite of non-nuclear capabilities but by evidence of an emerging Chinese strategic concept for using integrated conventional, counter-space, and cyberattacks to achieve decisive coercive and operational effects.²²³

More broadly, a growing body of scholarship points to risks of unintended nuclear escalation in a US-China conflict.²²⁴ These studies explore technological, doctrinal, political, and geographic factors that could propel a US-China conflict toward the nuclear threshold more quickly than leaders on either side anticipate. A common theme across these analyses is that a lack of strategic empathy on both sides could lead US and Chinese leadership to authorize military operations based on inaccurate understanding of how the other might perceive them. The United States, for its part, acknowledges the absence of common understandings with China and remains open to dialogue because it sees a need for cooperative risk reduction.

US views on China's nuclear posture are also changing, roughly at the same modest pace of China's nuclear modernization program.

In comparison to the nuclear threats the United States sees from Russia and North Korea, nuclear weapons remain far more recessed in US assessments of the military challenge from China. China's nuclear conduct even drew a compliment from Secretary of Defense Ash Carter in 2016, when he said China "conducts itself professionally in the nuclear arena, despite growing its arsenal in both quality and quantity."²²⁵ Opacity about China's nuclear posture remains the primary US concern. The 2018 Nuclear Posture Review did not carry forward the previous administration's aspiration of strategic stability with China, but it did renew the call for dialogue and transparency.²²⁶

The 2018 Nuclear Posture Review also reflected subtle changes in US assessments of China's nuclear strategy. While analysts have been exploring how China might leverage nuclear threats against the United States for years, in 2018 the United States broke new ground by formally issuing a tailored deterrence message to China. The Nuclear Posture Review declared that the United States must "prevent Beijing from mistakenly concluding that it could secure an advantage through the limited use of its theater nuclear capabilities or that any use of nuclear weapons, however limited, is acceptable."²²⁷

This message demonstrates increasing US awareness of Chinese nuclear modernization. The subtext is that China's enhanced nuclear posture is creating new strategic options for China, regardless of its intended purpose. China could employ its theater-range nuclear missiles in limited strikes against targets in the region and rely on its increasingly survivable intercontinental-range nuclear forces to inhibit the US response. This force structure capacity could support a strategy of threatening limited nuclear first-use in Asia to deter US intervention in a regional conflict and/or coerce the United States into constraining its objectives and military operations in a conventional war.

Unsurprisingly, China rejects these concerns.

Following the release of the Nuclear Posture Review in February 2018, statements by the People's Republic National Ministry of Defense and Ministry of Foreign Affairs accused the United States of exaggerating China's nuclear capabilities and mischaracterizing its policy; they also described the United States as lowering its nuclear threshold and shirking its unique nuclear disarmament responsibilities.²²⁸

Thus, today the United States sees China as a military competitor, not a nuclear competitor. But both Chinese nuclear forces and US assessments of them are dynamic, with the latter trending toward a more pessimistic view. Just as the United States continues to invest in the very capabilities that China sees as challenges to its nuclear forces, there is no reason to conclude that China will curtail the qualitative and quantitative improvements underway in its nuclear posture. Unfortunately, the United States has been unsuccessful in its attempt to establish a more predictable basis for the US-China nuclear relationship. These are the complex circumstances in which China would assess US-Russian nuclear interactions after New START.

THE END OF NEW START AND CHINA'S NUCLEAR POSTURE

China has taken notice of the potential collapse of US-Russian nuclear arms control, and its expert community has started studying the implications for China. Chinese language sources surveyed for this study reflect an acknowledgement that the end of New START, coupled with the collapse of the INF Treaty, would require continued adaptation of China's nuclear posture, but they also reflect confidence that it should not lead to changes in the fundamentals of China's nuclear policy. Ultimately, however, Chinese strategic thinking on this issue is nascent (as is US thinking). As stated previously,



President Donald J. Trump participates in a bilateral meeting with President Xi Jinping at the Great Hall of the People, Thursday, November 9, 2017, in Beijing, People's Republic of China. (Official White House Photo by Shealah Craighead)

to inform this study's analysis, we commissioned Dr. Tong Zhao to analyze how the US-Russia dynamics identified in Part II could affect China's nuclear posture. The following discussion draws from Zhao's contribution, "China in a World with No US-Russia Treaty-Based Constraints," which is available in full in the appendix, as well as from publicly available commentaries by other Chinese scholars.

Zhao's analysis suggests China is poised to manage spillover from the end of New START in a manner consistent with China's policy framework of no-first-use, sustaining a lean and effective force, and eschewing arms racing; however, he and other scholars also highlights several key factors that could pull China toward larger increases in numbers of nuclear weapons and potentially an expansion of the roles nuclear weapons play in China's strategy.

Chinese Perceptions of and Responses to Improved US Counterforce

Zhao argues that the reversal of US New START reductions would have a modest effect on Chinese threat perceptions, at least among experts, because "China perceives the United States as already possessing a formidable nuclear counterforce capability today." Other Chinese scholars who have recently analyzed the implications of the US Nuclear Posture Review and potential end of New START reflect Zhao's characterization; they argue that China should continue improving its nuclear capabilities in response to the hostile intent and military capabilities of the United States.²²⁹ Thus, the near-term increases in US deployed strategic nuclear forces are unlikely to fundamentally change China's nuclear planning calculus.

But this does not mean that China would perceive the impact of these developments as insignificant. Zhao observes that the unconstrained US strategic nuclear force could result in increased Chinese concerns about the effectiveness and credibility of its survivable strike capability. In particular, he assesses that the United States could operate its unconstrained force in a way that heightens its counterforce capabilities. For example, according to Zhao, the reconversion of 30 B-52H bombers to a nuclear role would give the United States more nuclear platforms to position near China, such as in Guam. This operational practice would, from China's perspective, shorten the timeline for US bomber/ALCM strikes against China's nuclear forces.

Furthermore, according to Zhao, increases in US nuclear forces would occur simultaneously with, from China's perspective, other qualitative improvements in US capabilities, such as ISR, missile accuracy, yield flexibility, and missile defenses that could also increase Chinese threat perceptions of US counterforce capabilities.²³⁰ Similarly, Zhao also notes that US deployment of non-nuclear and/or nuclear intermediate ground-based missiles to Asia would likely exacerbate Chinese concerns about the vulnerability of its nuclear forces to US counterforce operations.

If Chinese leadership concludes that further adjustments in China's nuclear posture are necessary to offset a heightened counterforce threat from the United States, what steps might China take? While dramatic increases in the overall size of China's nuclear arsenal is certainly an option, qualitative adjustments that increase the survivability of Chinese forces would be more consistent with China's longstanding policy of maintaining a lean and effective force while avoiding arms races. It would also meet China's goal of projecting an image of nuclear restraint to the international community.²³¹

Zhao identifies two Chinese posture adjustments it might implement to offset these perceived challenges. First, China could shift resources from its other systems to its SSBN modernization program. The purpose of increasing investments in SSBNs would be to improve their ability to evade US detection during patrols and enable China to keep its submarines at sea for longer periods of time, thus achieving the platform's potential as a more survivable system than land-based missile forces.

Second, Zhao suggests that China might increase the operational readiness of its mobile ICBM forces and nuclear-armed bombers (when China deploys an operational nuclear bomber force). Zhao describes this operational adjustment in the context of Chinese adoption of LUA, which, as noted earlier in the section, is a posture change that might be under consideration in China already. However, maintaining mobile forces in an armed and potentially dispersed posture DTD can reduce vulnerability to attack by making it harder for an adversary to locate them. Thus, while increasing operational readiness of Chinese nuclear forces is essential for developing an LUA option, it does not automatically entail increasing reliance on LUA or even conclusively demonstrate Chinese adoption of an LUA option.

Chinese Nuclear Policy Debate after New START

Compounding uncertainties make it difficult to assess how China's nuclear policy might evolve over the long term if US and Russian strategic nuclear forces are unconstrained and nuclear competition between the United States and Russia intensifies. Zhao and others describe several factors that, in the absence of a US-Russia nuclear arms control regime, could create pressure within China for a larger nuclear force and increased prominence for nuclear weapons in Chinese strategy.

Without legally binding treaty limits reinforced by a verification regime, the Chinese policy community could view US and Russian public statements about their force levels with suspicion and overestimate the size of the United States' and Russia's arsenals. Zhao qualifies this point, noting that Chinese technical experts are likely to understand the internal constraints, such as limited infrastructure capacity, that would inhibit massive US and Russian buildups. Yet these analyses might not gain traction within the larger nuclear and defense policy community in China, and Zhao cites China's alarm over US missile defenses in South Korea as an instance where "Chinese policy experts embraced much higher-level threat perceptions...than many Chinese technical experts did." Thus, China might base nuclear posture decisions on inflated estimates of US and Russian forces, and the widespread Chinese view that hostile intent toward China motivates US nuclear policy decisions could prime Chinese leadership toward more pessimism about US nuclear forces.²³²

Interestingly, this is an example of how cooperative transparency between US and Russian arsenals engenders Chinese confidence. Presumably, the United States and Russia would not silently countenance each other's violations, providing China with evidence about both countries' force levels.

Zhao also argues that US and Russian dynamics after New START could bolster the voices within China calling for a larger nuclear arsenal. He explains that some Chinese commentators perceive a large nuclear arsenal in symbolic terms, as a source of prestige and leverage in interactions with other major powers. They interpret US policies that are contrary to China's preferences as an indication of arrogance stemming from the United States' nuclear advantage. According to Zhao, these arguments did not resonate with previous Chinese leaders, but may gain greater traction

if both the United States and Russia increase their deployed forces after New START. Thus, China might increase the overall size of its nuclear arsenal, not to hedge against a military threat, but to increase China's international prestige.

Third, by the same logic, the end of New START might function as a windfall for People's Liberation Army factions that are prone to advocate for more nuclear weapons. Zhao argues that China has more resources available than in the past to invest in military capabilities, thus setting the conditions for these types of bureaucratic dynamics to create upward pressure on China's nuclear arsenal. Several US analysts recently concluded that the establishment of the People's Liberation Army Rocket Force as an independent service responsible for China's nuclear and conventional land-based ballistic missiles, the operationalization of Chinese SSBNs within the navy, and the expansion of the nuclear mission into the air force could each strengthen the advocacy base for nuclear weapons in China.²³³ Perceptions of a renewed US-Russia arms competition and a more severe US nuclear threat could provide nuclear weapons advocates additional heft in bureaucratic debates.

Arms Control and Opacity

Finally, Zhao assesses that an abrupt end to US-Russia nuclear arms control could ultimately reaffirm Chinese perceptions regarding the strategic necessity of opacity and instill doubt about its eventual participation in nuclear arms control.

Zhao's conclusion probably represents the most likely outcome after New START, but it is not the only possible outcome. Chinese scholars readily acknowledge that nuclear arms control treaties between the United States and Russia have a positive impact on international stability and China's security.²³⁴ Because the collapse of the US-Russian

nuclear arms control framework would be a significant and negative change in China's security environment, Chinese leadership might be more receptive to new approaches for increasing predictability with the United States if the alternative is unmitigated competition with a competitor that is no longer under any treaty constraints.

IMPLICATIONS FOR THE UNITED STATES

Continued evolution in China's nuclear posture is likely after New START, and it could take several forms. China might alter its operational posture to reduce vulnerability to US counterforce, shift resources to its SSBN force, and make modest or larger-scale quantitative increases in its deployed nuclear warheads and delivery vehicles. All of these developments are plausible regardless of the status of US-Russian arms control. But the absence of a strategic nuclear arms control treaty would exacerbate the concerns driving the modernization of its nuclear posture and could result in China carrying these posture changes further forward than it would otherwise.

The implications for the United States are uncertain. There are sound reasons to anticipate that the actual impact on US foreign policy interests would be modest, and there are reasons supporting more pessimistic forecasts. As the ensuing discussion demonstrates, it would depend on perceptions and actions in Washington and Beijing. The perspectives of Japan, the US treaty ally who perceives China as an emerging threat and relies on US extended deterrence, would also affect US perceptions.

Perceptions of China's Intercontinental-Range Nuclear Forces

There is a strong case that expanded enhancements in China's intercontinental-range nuclear weapons would only have a modest strategic impact.

Provided the United States maintains its nuclear force structure and modernization program into 2030s, China will not have strategically viable counterforce options against US nuclear forces (and it is not striving for such a capability). Assuming a practice of assigning 2–3 warheads per US ICBM, for example, China would need approximately 800–1,200 warheads deployed on its ICBM and SLBM force to threaten 400 ICBMs. This would constitute a massive buildup in warheads and ballistic missiles, and yet it would not translate into effective options against US dispersed SSBNs and bombers. Thus, Chinese nuclear hedging to increase survivability, or even a more ambitious Chinese build-up of long-range systems, would not compromise the survivability of US nuclear forces.

An increase in the operational readiness of China's nuclear posture DTD, such as longer SSBN patrols, keeping a portion of mobile ICBMs on launch/dispersal ready status, and an LUA option, would be important developments that the United States would need to factor into its planning and crisis management strategies; however, the strategic impact would be to increase the survivability of Chinese nuclear forces, and many US analysts and senior officials already assume that China has a credible ability to target the US homeland with nuclear weapons. For instance, in 2015 Deputy Secretary of Defense Robert Work publicly described China, alongside Russia, as a major power with the ability to challenge the United States in a conventional war and “possessing a nuclear deterrent that could survive a first strike against it.”²³⁵ Although

the United States did not describe Work's statement as an acknowledgement of mutual vulnerability, that is essentially what it was.

On the other hand, there are plausible pathways through which the United States would perceive these changes as creating new strategic threats.

The United States wildly overestimating the size of China's arsenal and its rate of expansions, and then basing US policy and posture decisions on these inflated assessments, is one such pathway. Although the official US estimates of China's restrained nuclear posture have been consistent, as demonstrated by the Department of Defense's annual assessments of Chinese military power, a small group of analysts suspect that China is waging a massive deception campaign and is amassing a large nuclear-armed missile force.²³⁶

While the possibility of this school of thought driving US policy is farfetched, under conditions of Chinese nuclear opacity, continued quantitative and qualitative improvements to its posture, and US-China strategic competition, it is certainly plausible. The United States might interpret China's unwillingness to significantly widen the window of transparency into its nuclear forces after New START as evidence of deceptive intent, particularly if all signs indicate that China's nuclear force is becoming more capable by the year.

A second pathway would be for the United States to conclude that the United States' ability to protect US and allied interests in confrontations with China diminishes as China's intercontinental-range force grows.

This perception resonates somewhat in Japan. Sugio Takahashi, for instance, argues that Chinese confidence in its ability to threaten the US homeland with nuclear weapons could embolden China to exploit its increasingly formidable conventional forces in Asia

for revisionist purposes, banking on the fear of nuclear escalation to moderate the United States' response or deter it entirely.²³⁷ Ambassador Yukio Satoh argues that the Japanese public might lose confidence in US security commitments if the combination of China's and Russia's intercontinental-range nuclear weapons outnumber US nuclear force levels.²³⁸

US officials would certainly factor Japanese concerns into their assessments.²³⁹ We explore the merits of these arguments in our discussion of US policy options; at this point we are simply noting that they could shape US policy in the future.

Perceptions of China's Theater-Range Nuclear Forces

As described earlier in this section, China's nuclear planning likely includes a menu of limited retaliatory options that Chinese forces would execute under combat conditions. If China perceives an increased counterforce threat after New START, and as a result of US withdrawal from the INF Treaty, accelerated enhancements in China's theater-range nuclear forces is also possible. This could take the form of numeric increases in the number of nuclear-capable medium-and intermediate-range ballistic missiles China fields. China's SSBNs and, when deployed, nuclear-capable bombers could provide theater strike options as well.

From one perspective, a larger theater-range nuclear force would not be strategically significant. US forces in the region are already vulnerable to Chinese nuclear weapons, as is Japan.

A shift in Chinese strategy to increase reliance on limited nuclear options for coercing the United States and Japan in conventional conflicts, however, would reflect a qualitative change in the regional security situation, with implications for both US conventional

military planning and nuclear deterrence strategy. The 2018 Nuclear Posture Review's reference to deterring limited Chinese nuclear use demonstrates that the United States is already wary of a potential change in Chinese strategy. A key challenge for US threat

Chinese capabilities, planning, and exercises for limited retaliatory, or second-use, options would also provide China with limited first-use options.

assessments is that Chinese capabilities, planning, and exercises for limited retaliatory, or second-use, options would also provide China with limited first-use options.

Thus, heightened US and Japanese concerns about the strategic intent underlying China's theater-range nuclear forces is also plausible. Here too, continued Chinese opacity could fuel US suspicions.

Japanese Perceptions of US Leadership

Growth in China's nuclear arsenal following the end of New START and the INF Treaty could also lead to an erosion of Japanese confidence in US leadership. As discussed in Part II, the collapse of the US-Russian arms control framework would have a symbolic impact on the world stage and the global arms race narrative could gain traction. Regardless of the motivation behind Chinese actions and their military implications, Japanese public and elite opinion might blame the United States for an abdication of global leadership on nuclear risk reduction. Although Japan has taken an increasing role in security cooperation with United States, its attitude might swing back in the opposite direction if the United States is perceived as intensifying rather than reducing nuclear dangers. Fears of a nuclear arms competition in Asia could activate Japan's domestic opposition to US extended nuclear deterrence, creating a rift in the alliance.²⁴⁰

Strategic Uncertainty Abounds

We can envision a future in which China's nuclear posture expands, giving China greater confidence in its nuclear forces without negative consequences for the United States. We can also envision a future in which nuclear weapons have greater salience in US and Japanese threat perceptions of China. Whether and how the United States would alter its nuclear posture under the latter circumstances is an open question.

Japan's security concerns would likely play a pivotal role in any US posture changes. It is not guaranteed, however, that Japan would see its interests as aligning with the United States' in a US-China nuclear competition. It might instead conclude that US mismanagement of nuclear policy is undermining Japanese security.

The key policy takeaway of this discussion is that the United States and China have no cooperative strategy for reducing uncertainty in the nuclear dimension of their relationship. As a result, they have no mechanism for avoiding a security dilemma as both countries adapt to changes in the security environment, whether it is North Korea's ICBM program or the end of US-Russian nuclear arms control. Both countries are taking actions that affect the other's nuclear calculus, within the context of a bilateral relationship that is on track to grow more competitive. Although neither country appears interested in bringing nuclear weapons to the center of this competition, neither has a viable plan to keep them in the background.

[T]he United States and China have no cooperative strategy for reducing uncertainty in the nuclear dimension of their relationship.

US-CHINA ARMS CONTROL WITHOUT A TREATY?

We conclude Part IV with a discussion of options for establishing a more predictable nuclear relationship, reducing both countries' uncertainty about the other's nuclear postures and, if possible, intentions. These options would also demonstrate US commitment to nuclear risk reduction to the international community. Our focus is on options for bilateral, government-to-government cooperation. We do not explore options for multilateral venues or unofficial dialogues involving academics and former US and Chinese officials, though both forms of engagement remain valuable.

We begin with one step the United States could take to improve predictability with China independent of Chinese cooperation. We then provide a framework for a modest US-China predictability regime. Ultimately, the following options are intended to function as a single proposal. If put forward in the wake of New START's expiration, it could present Chinese leadership with an alternative to unmitigated competition with the United States.

ACKNOWLEDGE CHINA'S CREDIBLE NUCLEAR DETERRENT

The United States is not currently striving to deny China a credible nuclear deterrent. As cited earlier in this section, US officials have in a few instances publicly described China as fielding a formidable second-strike capability. Under this option, the United States would formally acknowledge this reality.

The current policy of remaining silent on whether the United States views some degree of vulnerability to China's nuclear weapons as an inescapable condition is defensible, especially in light of Japan's security

concerns that such an acknowledgement might weaken deterrence, but it also has had downsides. One thorough study, conducted in 2010, of Chinese reactions to the Obama administration's strategic stability initiative concluded that this omission stoked doubt within China about US intentions.²⁴¹ A common Chinese interpretation of US silence on mutual vulnerability is that, similar to US refusals to adopt a no-first-use policy, the United States wants to maintain nuclear supremacy over China.²⁴²

The case for a policy change in 2019 rests on three related premises.

First, US vulnerability to Chinese nuclear weapons is a military reality which the United States is incapable of escaping. Put differently, rejecting mutual vulnerability is not a viable option because China will not acquiesce to it. China can overcome US strategic defenses by deploying ballistic missiles that cost less than missile defense systems and are more technologically reliable.²⁴³ It can also hedge by fielding boost-glide missiles that will be able to evade ballistic missile defenses. To counter US nuclear and conventional strike options, China can deploy more mobile land, sea, and air-based delivery vehicles and increase the DTD operational readiness of a portion of these systems to improve survivability. Lastly, China can degrade the United States' missile defenses and ability to locate and track mobile systems by attacking ISR and command and control assets with counter-space, conventional, and cyber means.

If the United States tries to escape vulnerability to China's nuclear weapons, the absolute number of Chinese nuclear weapons threatening the United States and Japan *would likely* increase. If one accepts the

premise that a disparity between US and Chinese nuclear forces is valuable for the US-Japan alliance, rejecting mutual vulnerability is counterproductive. It would spur an expanded Chinese build-up that narrows the gap.

Second, the US-Japan alliance would be better served by establishing that the United States does not need to be invulnerable to extend deterrence to Japan and that it is willing to accept nuclear risks on behalf of its ally. Refusing to acknowledge that China has a credible nuclear deterrent does not make the United States invulnerable, and it sends the message that China can essentially buy out the US commitment to Japan by building more ICBMs.²⁴⁴ As China's nuclear expansion continues and US vulnerability increases, the stark contrast between the military reality and US declaratory policy will make it more difficult for the United States to side-step with a non-answer to a simple question: Is vulnerability to Chinese nuclear weapons mutually exclusive with a credible commitment to Japan?

US policy across the Obama and Trump administrations reveals that internal debate over this question is settled and the answer is no. The guiding US objective for military competition with China is to sustain the ability to defend US interests and allies and prevail in a limited war, through conventional means, while deterring nuclear escalation. Nullifying China's nuclear deterrent to reinforce US deterrence strategy has not emerged as a military requirement because the consensus in the United States is that it would be technologically infeasible, financially unaffordable, and is ultimately unnecessary.

This is probably why Robert Work's public acknowledgement of China's second-strike capability in 2015 did not receive much attention in US defense circles. He was framing the military challenge China poses, and it would have been disconcerting if he did not acknowledge China's nuclear weapons. Had he said that the United States cannot meet its security objectives in the Indo-Pacific region as long as China can reliably deliver nuclear warheads against North America, policymakers in Washington and Tokyo would likely have been alarmed because they understand that it would be profoundly difficult for the United States to negate China's intercontinental-range strike capability.

This argument is not intended to deny the strategic impact of China's nuclear posture or dismiss Japanese concerns. But addressing the latter requires understanding what the existence of the former does and does not mean.

A survivable Chinese nuclear arsenal changes how the United States should conceptualize and plan for a potential conflict with China, with important implications for US extended deterrence. It requires a political-military strategy to convince China and Japan that the United States has the willingness and capacity to use force in a restrained manner to protect US and Japanese vital interests. This is a topic that requires more study, particularly how to wage effective conventional military operations while conveying a credible diplomatic off-ramp to Chinese leadership.

But the core nuclear deterrence challenge is clear: to persuade China that the threat of nuclear use does not enable Chinese coercion and conventional military aggression. The basic force structure requirement for this role is a survivable second-strike capability paired with a range of effective limited options

for deterring limited Chinese nuclear attacks.

The United States does not need to meaningfully reduce China's ability to deliver retaliatory nuclear strikes against the US homeland in order to deter Chinese nuclear-backed adventurism.

Fundamentally, a nuclear-armed China requires that the United States and Japan craft their alliance strategy to reduce the likelihood of war and nuclear escalation without compromising their interests. It is impossible to do this without acknowledging vulnerability to China's nuclear weapons.

Third, acknowledging mutual vulnerability with China might elicit Chinese cooperation in putting the nuclear relationship on a more predictable path. This change in US declaratory policy is a necessary but not sufficient condition for reducing uncertainty in US-China nuclear interactions. The United States' overtures to China on nuclear engagement are less credible as a result of its ambiguity on this issue. To acknowledge vulnerability to Russian nuclear weapons as an immutable fact of life on the one hand, and declare that the United States rejects vulnerability to North Korean nuclear weapons on the other, illuminates that the distinction does have major implications for US policy. If the United States assesses that nuclear predictability with China serves its national security interests, it must be willing to clarify its policy. If not, the United States is essentially telling China to break with its policy of nuclear opacity without giving it the confidence that predictability is intended to provide.

There are, of course, risks to this option.

The United States does not need to meaningfully reduce China's ability to deliver retaliatory nuclear strikes against the US homeland in order to deter Chinese nuclear-backed adventurism.

First, acknowledging mutual vulnerability might embolden China to more brazenly challenge the United States and US allies and partners. Yet China's documented philosophy on nuclear weapons and the scope of its force structure investments cut in the opposite direction, suggesting an ingrained view that nuclear weapons are principally for deterring nuclear attack and resisting coercion. More importantly, the political-military strategy the United States is putting in place, which is admittedly in its early stages, is designed to dissuade China from acting on the mistaken belief that its modernized military forces translate into coercive leverage.

Second, this policy change might fail to change China's behavior or perceptions. It certainly will not eliminate Chinese concerns about the US strategic posture or satiate its preference for the United States to give up missile defenses. Chinese officials might continue to argue that the disparities between the two countries require more US restraint and transparency and continued Chinese opacity. This is a plausible outcome. Rather than discourage the United States from acknowledging China's credible nuclear deterrent, however, it underscores the need to pair the overture with a proposal for a structured and reciprocal confidence-building regime, which we explore next.

A US-CHINA PREDICTABILITY REGIME

The United States could put forward a structured proposal for annual nuclear weapon information exchanges and dialogue. The basis for the regime would be that the United States and China are inescapably vulnerable to each other's nuclear weapons and have shared interests in reducing each other's respective uncertainties about capabilities and intentions. The United States could argue that mutual vulnerability, not military symmetry, is the precondition for transparency cooperation.

Delivering a proposal that specifies exactly what the United States intends to do and expects from China in return would mark a change from the United States' consistently vague invitation for dialogue. Setting clear boundaries on the interaction might ease Chinese concerns about what the United States is after, while clarifying US obligations would create tangible cost for China if it says no.

This notional regime draws from the US-Russian transparency measures described in Part III but is less invasive. It would be reciprocal while also acknowledging the United States and China have vastly different outlooks and experiences regarding cooperative transparency, and subsequently, each would have different obligations.

Both countries would commit, most likely through executive agreement, to participate in the regime for 10 years, and it would consist of two components: an annual data exchange and an annual expert-level dialogue.

In the data exchange, the United States would provide China with the aggregate number of deployed ICBMs, SLBMs, nuclear-capable bombers, and warheads deployed on these systems, using

New START counting rules. On a confidential basis, the United States would also include a breakdown of how warheads are apportioned across types of strategic ballistic missiles and, when they are deployed, the aggregate number of deployed nuclear SLCMs. Finally, as in New START, the United States could disclose the number of missiles and associated warheads for each of its ICBM and SLBM bases and the number of nuclear-capable bombers at each base.

In return, China would disclose on a confidential basis the aggregate size of its nuclear warhead stockpile, the aggregate number of nuclear-capable delivery vehicles in its force, and the breakdown by delivery vehicle type—i.e., ICBMs, SLBMs, bombers, and theater-range ballistic missiles.

These declarations would function as political commitments, or estimates, for its nuclear force levels for the ensuing 12 months. Neither country would be legally bound by their declarations.

In the annual dialogue, both countries would provide briefings on new nuclear systems that they plan to introduce in the following year. These briefings would include the basic system attributes, such as whether they are capable of carrying MIRVs, and their underlying strategic rationale. As the country with the larger nuclear force, the United States would also agree to provide briefings on aging systems that it eliminated during the previous year. These briefings would include a description of any steps the United States took to functionally disable the system and some form of substantiating evidence.

Finally, the dialogue would include a discussion of each country's assessment of the nuclear relationship. Both countries would provide their views on developments in the other's strategic posture that they see as affecting their nuclear policy, posture, and planning, as well as steps they are taking in response

to third parties, such as North Korea. As a result, discussions would broaden to include non-nuclear capabilities that affect nuclear planning and escalation risks. China would thus have a venue to discuss missile defenses, and the United States could, as examples, raise concerns about Chinese conventional ballistic missiles and counter-space weapons. The purpose of these discussions would not be to resolve disagreements, but rather to improve each other's understanding of how its actions are being perceived by the other side and the steps the other side might take in response. For example, if the United States continues to expand and improve its homeland missile defense architecture, this type of dialogue would provide it with a more granular understanding of how China might adapt.

Over the course of 10 years, this regime would provide the United States and China with a better understanding of how each other's nuclear forces are evolving and why, giving each more information to judge whether the other's posture tracks with its declared policy. To be sure, there are many important issues that would not be included in this regime, and it would only partially address concerns about strategy, new nuclear and non-nuclear capabilities, and intentions. But it would provide Washington and Beijing with more predictability than either country has now. It would also establish a pattern of strategic engagement that has the potential to mature in the longer term. Perhaps over time this bilateral engagement could draw from several of the more ambitious initiatives that US and Chinese participants have put forward in non-governmental dialogues.²⁴⁵

Table 21. US-China Information Exchange and Dialogue

	United States	China
Annual Declarations	Aggregate force structure numbers; number of types of strategic delivery vehicles and associated warheads; deployed weapons at declared bases; and the number of deployed nuclear SLCMs.	Aggregate stockpile size; aggregate number of deployed nuclear-capable delivery vehicles and breakdown by delivery type.
Dialogue	Briefings on new types and kinds of systems entering each country's deployed nuclear force, combined with substantive discussion of the nuclear relationship and the factors affecting it.	

CONCLUSION AND RECOMMENDATIONS

This study set out to identify the risks and uncertainties that would follow the end of US-Russian treaty-based arms control and to develop arms control options that do not require a treaty. The findings detailed in this report demonstrate that failing to replace New START after it expires would heighten global nuclear dangers and make it more difficult for the United States, Russia, and others to mitigate them. But a combination of policy measures can make the situation less dangerous than it would be otherwise. Nuclear crises and arms competitions are not inevitable if there is no replacement in sight when New START ends.

The abrupt end to cooperative transparency after New START would pose the biggest challenge for the United States. The US intelligence community would likely devote more resources to monitoring Russian strategic nuclear forces but have less insight and less confidence in its analytical judgement. US policymakers would then make decisions within a larger band of uncertainty. The impact on Russia would be less acute, but Russian defense officials would also navigate increased uncertainty. We identify cooperative options for sustaining a window of transparency between US and Russian strategic nuclear forces, but without a treaty, the window will be smaller and the view hazier.

The loss of legally binding constraints on US and Russian strategic nuclear forces would also confront each country with near- and long-term risks and uncertainties. Both countries will have the capacity to exceed New START limits, in different ways. Based on their existing policies, each country would have logical reasons to increase strategic nuclear force levels as a precautionary measure. But due to the compounding

risks and uncertainties of an unconstrained nuclear relationship, the United States and Russia have shared interests in a mutual restraint pledge to stay at New START levels.

The United States also has the option of remaining within New START's limits irrespective of Russia. Our analysis suggests the United States could do this without compromising nuclear deterrence and extended deterrence. The US nuclear posture is resilient to increases in deployed Russian warheads because it is composed of a triad of strategic delivery vehicles. This risk assessment would change if the United States altered the composition of its force structure.

The end of New START also has implications for the secondary roles of nuclear arms control. Washington and Moscow would face heightened credibility challenges within the NPT and would no longer have their bilateral arms control framework as a tangible example of cooperation under their Article VI obligations. The narrative of a renewed arms race could fuel discontent within the NPT and elevate alternative mechanisms that would be ineffective and outright counterproductive, such as the TPNW. For the United States, the consequences of an arms race narrative could also undermine extended deterrence. Some NATO states might see a domestic backlash against nuclear burden sharing, and the United States could struggle to unify NATO allies in support of further improvements to the alliance's defense and deterrence posture. The arms control options we put forward might help mitigate these non-proliferation and alliance management challenges by preventing a more intense US-Russian nuclear arms competition and demonstrating continued US-Russian cooperation.

US-Russian nuclear dynamics after New START could also exacerbate the factors underlying China's nuclear expansion, but the ultimate scope and implications for the United States are uncertain. Currently the United States and China have no cooperative framework for insulating their nuclear relationship from the end of New START and other developments in the global nuclear landscape. Acknowledging that China has a credible nuclear deterrent and putting forward a precise proposal for improving predictability could help the United States manage the nuclear component of its competition with China after New START, thereby mitigating potential challenges to the US-Japan alliance.

In several important areas, we identified trends that increase nuclear risks and would continue to grow even if New START remained in place in perpetuity. The end of treaty-based arms control would aggravate these challenges, but preserving New START practices would not solve them.

US and Russian threat perceptions appear to be both intensifying and diverging with regard to each country's respective strategies and intentions, non-strategic or theater-range nuclear weapons, and non-nuclear capabilities. Some in the United States are also concerned about Russia's apparent new kinds of delivery vehicles for nuclear weapons. US uncertainties about the trajectory of China's nuclear posture, and the potential implications for the United States and Japan, are also likely to increase amid a more competitive US-China relationship. Disillusionment within the NPT and in some NATO member states with a lack of progress on nuclear disarmament is also festering. The apparent belief that US nuclear modernization is increasing rather than mitigating nuclear risks suggests a disconnect between the goals underlying US policy and how others perceive them.

Thus, this study reveals a number of challenges for US nuclear policy after New START that would be manageable but certainly more severe without a treaty, as well as challenges whose solutions lie outside the current US-Russian arms control framework. What does this all mean for the future of nuclear arms control and the US balanced approach to nuclear risk reduction? What are the implications for the near-term US decision on New START extension, the longer-term decision about what, if any, follow-on treaty to pursue, and the larger challenge of how to integrate diplomatic and military tools in a changing international environment?

In our view, five recommendations for US nuclear policy in 2019, while New START is still in effect, flow from this report.

EXTEND NEW START

First, the United States should agree to extend New START until 2026. As difficult as it will be to replace New START, extension only requires agreement between Presidents Trump and Putin. New START will continue to provide predictability with Russia, limiting its deployed strategic warheads and giving the United States a window into Russia's modernized arsenal for an additional 5 years. Extension will also support US nuclear non-proliferation and extended deterrence strategies.

PREPARE FOR THE END OF NEW START

Second, the United States should use the additional time it gains under an extension to study what comes after New START. This report's options provide a starting point for a strategy if there is no follow-on treaty. The United States should also consider continuing New START's provisions beyond 2026 through a formal amendment to the treaty. This step would require both Russian agreement and approval from the US Senate and Russian Duma. US ballistic missile defenses and Russian non-strategic nuclear weapons would remain unconstrained, and thus, neither country would be fully satisfied with this arrangement. But if policymakers perceive this study's options as inadequate for mitigating the risks of a world with no treaty, sustaining New START would be a preferable alternative.

Finally, the United States should explore alternative treaty models. The analysis in Part III of the United States staying at New START levels even if Russia exceeds them suggests that a treaty with asymmetric limits on deployed strategic warheads would not compromise the United States' ability to meet its deterrence and extended deterrence objectives, provided it retains a triad of delivery vehicles. An unequal limit on deployed warheads might create opportunities for new arms control concepts, such as adaptive treaty limits.²⁴⁶ The United States should give the concept further study.

REINVIGORATE AND MODERNIZE NUCLEAR RISK REDUCTION

Third, the United States should put forward precise, structured proposals for dialogue with Russia and China regardless of New START's status. The strategy, concepts, and systems working group framework we develop in Part III would facilitate better understanding between the United States and Russia as their strategic postures evolve and diversify. The options for US-China arms control without a treaty might not find a willing partner in Beijing, but if they do, the United States, China, and Japan would all be better off and the risks of trying to make progress are manageable. Similarly, the time has come for the United States to acknowledge the credibility of China's nuclear deterrent.

Fourth, verifiable limits on strategic nuclear weapons remain valuable, but the spectrum of threats and nuclear and non-nuclear capabilities that could affect US, Russian, and Chinese nuclear forces, strategy, planning, and even employment decisions is also expanding. Thus, the United States needs to broaden its approach to arms control and explore its application to the emerging nuclear landscape. It should adopt a more elastic conception of arms control, as originally articulated by Schelling and Halperin, that explores additional forms of cooperation beyond just treaties and focuses on clarifying perceptions and expectations about nuclear and non-nuclear military operations and capabilities. This effort will only succeed if it has clarity of purpose, starting with the premise that the objectives of arms control are to reduce the risks of war, nuclear escalation, and arms competitions, not solely to reduce numbers of weapons.

SUSTAIN AND EXPLAIN THE BALANCED APPROACH

Fifth, the United States must also prepare to sustain support for a balanced approach to nuclear risk reduction, even if Russia and China are uninterested in arms control cooperation. Persuading allies and partners that setbacks in arms control do not mean that the United States is giving up on using all elements of national power to manage the existential danger from nuclear weapons is essential. Explaining more clearly that all of US nuclear policy, including retaining credible nuclear forces, serves the same goals as arms control and function in concert, not as counterweights, will help the United States make this case. Continued US development of serious arms control proposals would be important as well and would set an example of responsible nuclear conduct and lay the groundwork for progress when Russia and China are willing to engage.

APPENDIX

CHINA IN A WORLD WITH NO US-RUSSIA TREATY-BASED ARMS CONTROL

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This essay analyzes what it means for China if the United States and Russia fail to replace or renew the New START. For the first time in many decades, China would no longer enjoy the security benefits of the existing US-Russia bilateral nuclear arms control regime. If the New START transparency and verification measures cease to exist, or worse, if the United States and/or Russia start to reverse their nuclear reductions, what would be the impact on China's strategic nuclear deterrent and China's nuclear thinking? How would China respond? These are important issues for US and Russian leaders to consider, before they make changes to the existing bilateral nuclear arms control institutions.

IMPACT OF NUMERICAL GROWTH OF US/RUSSIAN STRATEGIC NUCLEAR WEAPONS ON CHINA'S STRATEGIC NUCLEAR DETERRENT

With the possible demise of the US-Russia bilateral nuclear arms control regime, China's most immediate concern would be how this might affect China's strategic nuclear deterrent. For decades, the concern about the credibility of its second-strike capabilities has been the primary driving force of China's nuclear modernization efforts. Today, after significant investments into building and fielding more survivable nuclear forces, there is still a considerable uncertainty over how confident Chinese decision-makers should feel about China's capacity to execute an effective retaliatory strike after absorbing a disarming first

strike and bring about an unacceptable damage to the United States. In the public domain, some Chinese scholars evaluate China's second-strike capability to be far from being 100-percent assured.²⁴⁷ Such a view that China needs to further strengthen its strategic nuclear deterrent capabilities is widely shared within the Chinese nuclear expert community. In the unconstrained US and Russian force structures of a post-New START world (as illustrated in Part II of the main report), the numerical increase in the US and Russian strategic nuclear weapon arsenals could exacerbate China's concern about the credibility of its nuclear second-strike capabilities.

Near-Term Impact

Some US scholars have pointed out that existing US ICBMs and SLBMs have become much more capable of executing counterforce strikes against certain elements of Chinese land-based missiles and other strategic nuclear targets.²⁴⁸ In the case of the US SLBMs, for example, the deployment of the new MC4700 burst-height compensating super-fuze on the W76-1/Mk4A warhead since 2009 has significantly increased the accuracy and then the hard target kill capability of such missiles.²⁴⁹ Looking into the future, in the unconstrained scenario, by the late 2020s the United States could deploy 50 more ICBMs, 400 more ICBM warheads, 48 more SLBMs, and 216 more SLBM warheads under generated conditions (Table 8 of the main report). For China, this would represent a considerable additional counterforce strike potential

of the United States. Moreover, some US scholars conclude that US strategic bombers that carry nuclear gravity bombs and air launched cruise missiles are also highly lethal counterforce weapons against some Chinese nuclear forces. In a 2007 article, Keir A. Lieber and Daryl G. Press calculated that three B-2 bombers, each armed with 16 variable-yield nuclear gravity bombs, would be enough to destroy 20 DF-5 silo-based ICBMs—the backbone of China’s strategic deterrent forces before road-mobile ICBMs became fully operational.²⁵⁰ By the late 2020s, the United States could increase the number of its nuclear-capable strategic bombers from 60 to 90 under generated conditions if it reversed the New START bomber conversions to conventional-only capacity. From the Chinese perspective, this would be another important increase of the US counterforce capabilities.

With that said, the impact of the numerical growth of the US nuclear forces on China’s future nuclear modernization is uncertain. One important reason is that China perceives the United States as already possessing a formidable nuclear counterforce capability today. With the current US nuclear arsenal, if the United States wanted to pursue a disarming first strike against China, it probably would not need to employ all its nuclear weapons. In other words, more of the same weapons would not significantly increase the chances of a successful US disarming strike on China, whereas a qualitative improvement in some aspects of the US capabilities could have a much greater impact on the US counterforce potential against China, such as a more advanced intelligence, surveillance, and reconnaissance (ISR) capability to identify China’s hidden ICBM silos or to track China’s road-mobile ICBM vehicles. Therefore, the credibility of China’s second strike is not very sensitive to a relatively moderate numerical growth of US strategic nuclear weapons.

In all likelihood, according to Table 8, the potential growth of US strategic nuclear weapons by late 2020s would be moderate. Under generated conditions, the numerical growth of US strategic delivery vehicles projected in the study would be 18.3 percent, compared with the constrained scenario. Similarly, the projected numerical growth of US warheads would be 22.0 percent. Such a relatively moderate increase in the near-term future would not make US counterforce strike potential against China much greater than the current situation.

Long-Term Impact

For the long-term future scenario that extends far beyond the late 2020s, the United States could significantly increase its strategic nuclear stockpile beyond the current level. It is probable that Chinese leaders would view a much larger US strategic nuclear arsenal as representing a much greater threat to China that would deserve forceful countermeasures. But even under those circumstances, China would still have options to enhance its nuclear deterrent capabilities in areas that the growth of US strategic nuclear weapons would not significantly affect.

For example, the numerical growth of the US strategic nuclear weapons would not seriously affect the survivability of China’s strategic nuclear submarines (SSBNs), once they are at sea. Therefore, China would have the option of raising the relative importance of SSBNs within its nuclear triad by allocating more resources from other programs to its SSBN modernization program. The objectives would be to increase the quietness and reliability of its SSBN fleet and to adopt an operational strategy that reduces the time of SSBNs staying in port (when the SSBNs are more vulnerable).

More generally, the vulnerability of China's nuclear forces is and probably will continue to be more dependent on the capabilities of the US ISR systems than the quantitative or qualitative evolution of the US nuclear forces. If the United States can locate and keep track of all Chinese nuclear weapons with high confidence, then the United States should have more than enough options to strike and destroy them. China's efforts in recent decades to focus on developing mobile nuclear weapons delivery systems can make it more difficult for the United States to ensure the effectiveness of its ISR systems. The ISR challenge may continue to impose the greatest constraint on the US counterforce capabilities against China.

Furthermore, to reduce their vulnerabilities, China could choose to put its nuclear weapons on higher alert during peacetime (by means such as keeping the warheads mated to the missiles and keeping the nuclear-armed missiles dispersed) and even shift its nuclear posture from retaliation after absorbing a first strike to launch under attack (LUA). Although China's silo-based liquid-fueled DF-5 ICBMs may be technically difficult to maintain a high alert status during peacetime, China could take measures to put its road-mobile ICBMs on higher alert. After China's new DF-41 road-mobile ICBMs become fully operational, these missiles, together with the existing DF-31As (and their variants) would constitute the backbone of China's land-based ICBM forces. Additionally, China is on path to fielding a new long-range strategic bomber and could choose to put such bombers armed with nuclear gravity bombs and/or cruise missiles on high alert during peacetime. All of these measures would require China to possess a capable strategic early warning system, which China is reportedly already developing. *The Science of Military Strategy*, a textbook authored by some Chinese military academics and published by the PLA Academy of Military Science in 2013 also considers the LUA posture as a potentially

useful measure to ensure China's nuclear deterrent.²⁵¹ Shifting to a LUA posture and relying on its untested early warning system for making decisions on nuclear use would introduce unprecedented risks of false warning. From the perspective of crisis stability, this would be a more serious consequence than for China to build up its SSBN forces.

Transparency and Possible Chinese Interpretation of US/Russian Numerical Growth

In case of the demise of the New START in the future, a lack of transparency and verification measures could have two effects. First, it could increase Chinese uncertainty about the sizes of US and Russian strategic nuclear arsenals and so exacerbate China's concerns about their numerical growth. Second, a lack of transparency would lead the US and Russian arsenals to grow faster than they otherwise would, and lead China to attribute such growth to more aggressive intentions of the two big nuclear powers.

Since the establishment of formal nuclear arms control mechanisms between the two leading nuclear powers, China seems to have been reassured by the transparency and verification measures built into the US-Russia bilateral arms control agreements. Although China cannot officially and independently verify the implementation of US and Russian nuclear reductions, Chinese experts rarely challenge the numerical figures of the US and Russian nuclear arsenals, as claimed and verified by US-Russia bilateral mechanisms. Whether that confidence would remain, after the US-Russian bilateral transparency and verification measures end, is highly uncertain.

It is a question how China's decision-makers would evaluate the degree of possible US and Russian nuclear growth in the unconstrained scenario. It is likely that Chinese technical experts who conduct in-depth research and who closely follow the US and Russian

nuclear development and arms control agreements would know that even in the worst-case scenario the growth of the US and Russian strategic nuclear weapons by the late 2020s would be moderate, as their growth would have been limited by their lack of technical and financial capabilities to mass produce new warheads and delivery vehicles. But whether such an understanding would become the mainstream understanding within the Chinese nuclear policy community is uncertain. Chinese policy experts, especially those who do not have in-depth knowledge on technical issues, might overestimate how much the US and Russian arsenals would grow. In the recent history, there are ample examples in which Chinese policy experts embraced much higher-level threat perceptions toward certain US military development and deployment, than many Chinese technical experts did.²⁵² In those cases, the perception gap between mainstream Chinese policy experts and mainstream US experts was significant. When it comes to China's decision-making, the influence of the Chinese policy experts can be very important.

As the US-China relationship becomes increasingly competitive and even hostile, the chances for Chinese policy experts and decision-makers to overestimate the aggressiveness of the US and Russian intentions would be considerable. As pointed out in Part II of the main report, the end of transparency and verification measures could generate mutual worst-case thinking and planning in the United States and Russia on strategic nuclear weapons. Watching an intensified US-Russian nuclear competition from the side, it is likely that China would not see this as a result of unfortunate US-Russian security dilemma generated by mutual worst-case thinking. Instead, China would probably conclude that both the United States and Russia are driven by aggressive goals to expand their nuclear capabilities. As a result of China's deep suspicion toward the United States, China might especially attribute the new nuclear growth to a

renewed US ambition to seek nuclear primacy (first-strike capability). Even worse, China might see itself, rather than Russia, as the real target of such a US nuclear growth. For decades, China has had concerns that the United States is interested in obtaining nuclear primacy over China; it has also believed that the United States is much closer to achieving nuclear primacy over itself than over Russia and therefore may be particularly motivated to aim its nuclear growth at China as it sees China as its most important long-term competitor. If China concludes that the US nuclear growth is a result of the US pursuing nuclear primacy against China, Beijing could make even greater efforts on its own nuclear modernization.

IMPACT OF NON-NUMERICAL FACTORS ON CHINA'S NUCLEAR MODERNIZATION

Non-Numerical Factors That Affect China's Second-Strike Capability

In addition to the numerical growth of the US and Russian strategic nuclear capabilities, other qualitative and structural changes in the US and Russian strategic nuclear systems could have an equal or even greater impact on China's perception of its second-strike capability. And due to China's much greater concern against the United States than against Russia, it would be particularly sensitive to any such US changes.

By the late 2020s, the numerical growth of the US and Russian strategic nuclear weapons would be moderate, but the two countries could take measures to change how such weapons are deployed, which could increase China's threat perception. For example, in the unconstrained scenario, if the United States reconverted 30 B-52H strategic bombers for nuclear missions that it previously converted to conventional-only status, it would have the option of deploying more of such nuclear-capable bombers to places

near China such as Guam. Such deployment could exacerbate China's threat perception of the US preemptive use of nuclear weapons, as the relatively short distance from China from such places would leave Chinese decision-makers less time to respond. Nuclear-capable bombers deployed near China in the Asia Pacific region could be viewed by Beijing as a greater counterforce threat than US ICBMs deployed in its homeland.

Similarly, today the United States has 14 *Ohio*-class SSBNs. Among them, eight are assessed by Hans Kristensen and Robert Norris to operate in the Pacific Ocean from their base near Bangor, Washington, and six operate in the Atlantic Ocean from their base at Kings Bay, Georgia.²⁵³ In the unconstrained scenario post-New START, the United States in theory would have the option of reactivating four SLBM launch tubes on each of the SSBN operating in the Pacific Ocean, and keeping deactivated four launch tubes on each of the SSBN operating in the Atlantic Ocean unchanged. Such a policy would bring a total of 32 additional deployed SLBMs that could be used to target China, whereas no additional deployed SLBMs would target Russia. This would demonstrate a further shift of strategic military focus from Russia toward China and could cause far greater threat perception in China than the moderate growth of the number of weapons. In practice, the chances for the United States to adopt such a policy are low. If the United States wanted to reverse the New START reductions, it probably would want the deactivated SLBM tubes on all of its SSBNs (regardless of where they are deployed) to be available. However, the point of this hypothetical example is that internal adjustment/re-allocation of deployed capabilities in the future, including their geographical deployment areas, could greatly affect China's threat perception, in addition to the numerical growth of the overall US arsenal.

Furthermore, what type of nuclear weapons the United States would deploy on its strategic systems by the late 2020s also matters more than the number of weapons to be deployed. If the United States continues to focus on weapons of improved accuracy, flexible yields, greater rapid missile retargeting capability, and less radioactive fallout and thus less collateral damage to civilians, as some US scholars believe has been the recent trend of US weapon development,²⁵⁴ China's concern about the United States shifting toward acquiring more effective counterforce capabilities and thus leaning more heavily on counterforce strategies would grow.

Existing US-Russia nuclear arms control agreements have not captured such issues related to specific deployment strategy and qualitative improvement of strategic nuclear weapons. At the end of the day, however, these issues play the most important role in shaping China's interpretation of why the United States (and Russia) in the future might choose to increase its strategic nuclear arsenal. If China believes the United States would shift toward seeking nuclear primacy over China, through building up its counterforce capabilities and adopting nuclear warfighting postures, it could take radical measures to enhance its second-strike capability even if the numerical growth of US strategic nuclear weapons would be moderate in the near-term future.

Perception of Prestige and Diplomatic Leverage

China's concern about the credibility of its second-strike capability has been the primary driving force of its nuclear modernization efforts. However, other non-military factors seem to increasingly affect China's thinking about the need to modernize its nuclear forces. The possible demise of US-Russian arms control agreements could further raise the importance of such non-military factors.

For example, some Chinese analysts and commentators have started to adopt the view that nuclear capabilities can translate into international prestige and diplomatic leverage. They believe a bigger nuclear arsenal is necessary to convince the other major powers—and especially the United States—of China’s military strength and thus would make them really listen to China’s views on important foreign policy issues and would ultimately make them treat China equally and fairly. They attribute the US “strategic arrogance” toward China mainly to its “absolute nuclear superiority” over China and believe that if China had had a bigger nuclear arsenal, the United States would not have interfered in the South China Sea and over the Taiwan Strait. Therefore, they worry that continued US “nuclear superiority” would keep fueling dangerous US “military provocations” toward China.²⁵⁵ This view that a bigger nuclear arsenal would win China greater international respect and bigger diplomatic leverage did not seem to be embraced by China’s first- and second-generation paramount leaders such as Mao Zedong, Zhou Enlai, and Deng Xiaoping.²⁵⁶ However, whether China’s current paramount leader rejects such a view is unknown.

The Nuclear Posture Review report of the Trump administration states that the US nuclear deterrent “ensur[es] that our diplomats continue to speak from a position of strength on matters of war and peace.”²⁵⁷ This implicit endorsement of the belief that nuclear weapons translate into diplomatic leverage, together with President Trump’s doctrine of “peace through strength,” helps reinforce the view within certain quarters of the Chinese expert community that it is a universal maxim, endorsed by others including the United States, that a bigger nuclear arsenal delivers greater political benefits. Under such circumstances, if the United States and Russia start to build up their nuclear forces after the demise of the New START, the nationalist voices in China would be further

strengthened to argue that the size of the nuclear arsenal does matter and that China needs to expand its nuclear capabilities too, in order to compensate for the growth of the US arsenal and to build a Chinese nuclear force that is “commensurate to” China’s international status in the world.²⁵⁸ At the minimum, the reversal of the US and Russian nuclear reductions could motivate China to consider raising the role of nuclear weapons in its national security strategy, which might lead to even higher-level investments into its nuclear modernization programs than over the past years.

Resource Availability and Arms Competition

Since its first nuclear explosion in 1964, China has so far kept its nuclear arsenal at a relatively small size and avoided building a large arsenal. This was partly due to the belief of China’s first- and second-generation paramount leaders that a small nuclear arsenal would be enough for the purpose of strategic deterrence. At the same time, the lack of sufficient economic and technological resources might have also contributed to China’s small nuclear arsenal. As a result, even though China’s second-strike capability has never been fully “assured,” China had to prioritize and allocated resources to those weapon systems that could most effectively enhance the survivability and credibility of its strategic deterrent. In recent years, however, with the rapid economic development, the resources constraint on China’s nuclear programs gradually disappeared. Accordingly, there have been signs that some of China’s nuclear modernization programs seem to be gradually driven by resource availability.

China’s development of new nuclear-capable systems that are not particularly reliable and survivable if not kept on high alert includes systems such as silo-based liquid-fueled ICBMs with multiple independently targetable reentry vehicles, a new

long-range strategic bomber, and a reported new air-launched ballistic missile.²⁵⁹ As the military gets access to increasingly available resources, parochial and bureaucratic interests may have a growing influence over China's nuclear modernization decision-making. As the Rocket Force manages China's land-based nuclear missiles, the Navy runs the nuclear strategic submarines, the Air Force operates the strategic bomber fleet, and the Strategic Support Force contributes to the command, control, and communication capabilities, all these services have inherent interests to protect and grow their nuclear profile. Against this background, US and Russian decisions to increase their strategic nuclear weapons would play more effectively into those voices of parochial and bureaucratic interests within China.

At this moment, most Chinese experts are very confident about China's economic potential to sustain high-level investments into China's overall military modernization programs for the foreseeable future. With that said, China's economic growth is slowing down and its economic system has accumulated chronic structural problems over the past period of rapid growth. With the additional pressure from the ongoing US-China trade war, the sustainability of China's high economic growth rate in both the near- and long-term future looks increasingly uncertain. In case of a major economic downturn, the existing resources available to the military would be undercut. If this happened, the future sustainability of China's nuclear modernization programs could be put into questions. The degree of that impact, however, is very hard to predict.

ASYMMETRIC TRILATERAL NUCLEAR ARMS COMPETITION AND CHINA'S PARTICIPATION IN ARMS CONTROL

According to the above analysis, in a post-New START world, if the United States and Russia start to build up their strategic nuclear arsenals, China would very likely follow suit and redouble efforts to modernize its nuclear weapons. With regard to the geopolitical relationships among the three countries, although Russia and China share a common concern against the United States and have engaged in increasingly closer cooperation in some strategic security areas such as missile defense, Russia and China have not built deep enough strategic trust to enable them to join forces in countering the perceived US nuclear threat. In the nuclear domain, Russia and China would probably remain independent players in planning and developing their nuclear forces and they would likely continue to maintain some deterrent capabilities and postures against each other as well. To some extent, Russia and China are in a competition to make each other the main target of the US strategic concern and therefore to relieve themselves from the burden and pressure of engaging in an all-out strategic competition with the United States. For such reasons, a post-New START world would likely witness an asymmetric trilateral nuclear competition in which all players seek to deter and hedge against each other and the US-Russian and US-Chinese competitions are particularly intense. Such a complex trilateral relationship can be highly volatile, as everyone responds to the change of capability and/or posture of everyone else.

In practice, the trilateral competition would be even more intense and complex than discussed above, because non-strategic nuclear weapons and non-nuclear strategic weapons could play an

even greater role in creating threat perceptions and in contributing to security dilemmas among the three countries. For instance, both Russia and China see US missile defense as posing the most serious threat to their nuclear second strike capabilities. Their concerns about missile defense appear to have been the greatest incentive behind their development of new nuclear capabilities. All three countries have also clearly entered a negative action-reaction cycle in a competition to develop new strategic weapon systems such as hypersonic boost-gliders. Whether conventionally-armed hypersonic weapons will be massively deployed and thus threaten nuclear weapon systems and whether hypersonic weapons will become nuclear-capable or dual-capable systems can also seriously affect the nuclear relationship of the three countries. Last but not least, the possible end of the INF Treaty could create conditions for a new competition over medium- and intermediate-range land-based weapon systems. For example, if the United States starts to develop ground-based intermediate-range missiles and to deploy them near China in the Asia-Pacific region, China could become much more worried about the survivability of its nuclear weapon systems, even if the US ground-based intermediate-range missiles are all conventionally armed.

Faced with this challenging landscape, would China be interested in pursuing arms control measures to limit the scale and scope of the competition? In theory, the withdrawal by the United States and Russia from existing arms control institutions would provide China with an opportunity to fill the gap in the leadership role vacated by the nuclear superpowers. A more open and proactive attitude toward arms control would bring China not only security and economic benefits in the process of promoting cooperative security and avoiding a costly arms race but also international reputation and diplomatic prestige by enhancing its

image of a pacifist rising power. Some shape or form of a trilateral or multilateral nuclear arms control agreement would also create the image of China being an equal partner with the United States and Russia at the center stage of international strategic security issues.

In reality, however, there is still a long way before China would join an arms control effort. If the United States and Russia start to increase their nuclear arsenals post-New START, a growing fear in China about the credibility of its second-strike capability would likely make China less willing to be transparent about its own nuclear capabilities and future development and deployment plans. The lack of willingness to be more transparent would make any arms control effort a non-starter. The collapsing of a decades-long process of US-Russia arms control efforts in the end would also work to convince China that the practice of arms control between big powers is a failed exercise and is not worth it for China to try. As of today, all leaders in the three countries seem to believe in the principle of negotiating from a position of strength. In the Chinese case, this would mean that China is unlikely to seriously consider arms control until it has possessed a capability somewhat similar or equal to the others in order to ensure that it would not be in a disadvantaged position in an arms control negotiation. There are no easy ways to change these deeply held views anytime soon.

Given such possible consequences of a post-New START world, the top priority for the international community should be making every effort to preserve the existing arms control regime. If that effort does not succeed, the international community would face an unprecedented challenge in managing a complex trilateral nuclear arms competition, with no easy solution to set up new arms control institutions.

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