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U.S. Nuclear Policies for a Safer World

SUMMARY

NTI Co-Chairs Ernest J. Moniz and Sam Nunn call on the United States to resume a position of global leadership to reduce the risks posed by nuclear weapons. Their recommendations—which are further elaborated and reinforced in seven related policy papers by NTI experts and former officials—include proposals for changes to U.S. nuclear policy and posture, reengagement with Russia on a range of strategic stability and arms control issues, sustained dialogue and nuclear risk reduction measures with China, and recommitment to multilateral efforts to strengthen the global nonproliferation regime.

Introduction by Ernest J. Moniz and Sam Nunn

Papers by Steve Andreasen, James McKeon, Mark Melamed, and Lynn Rusten

20 YEARS OF NTI BUILDING A SAFER WORLD

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Strengthening the Foundation for Nuclear Stability

Ernest J. Moniz and Sam Nunn

Fortunately, most Americans do not lie awake at night in fear of nuclear war; yet, the unsettling reality is that nuclear risks have been on the rise for years, and the risk of use of a nuclear weapon is higher today than at any time since the Cuban Missile Crisis. Reducing these risks will require U.S. leadership and renewed commitment to diplomacy and engagement, bold and creative policy choices, and unwavering focus.

The Biden administration took office in January 2021 faced with daunting challenges, domestic and foreign. Although the agenda is crowded, avoiding the cataclysmic risk of nuclear weapons use must be a top priority. The administration's review of U.S. nuclear policies and posture is taking place against the backdrop of increasing tensions among nuclear-armed states. In addition, the arms control framework that has been integral to managing nuclear competition for decades has eroded, and new technologies and evolving threats add complexity to the challenge of rebuilding it.

The essays in this report reflect the need for a multifaceted response, including (a) changes to U.S. nuclear policies and posture to reduce the role of nuclear weapons in U.S. security policy; (b) renewed engagement with Russia on strategic issues; (c) a deeper foundation of dialogue on nuclear issues with China; and (d) a recommitment to seeking multilateral solutions to strengthen the global non-proliferation regime and reduce nuclear risks. Also necessary is a renewed foundation of trust and cooperation with the invaluable network of U.S. allies and partners in Europe and the Asia-Pacific region, which is fundamental to U.S. national security and serves as a force multiplier for U.S. leadership and interests around the world.

It is crucial to build and sustain domestic support for nuclear security policies that will keep Americans safe. The administration and Congress should establish a new bipartisan liaison group—comprising House and Senate leaders and committee chairs working with senior administration officials—focused on Russia policy, nuclear risks, and NATO. Such a group would facilitate regular communication and greater coherence between the executive and legislative branches and help rebuild consensus in support of engagement and arms control as essential tools in advancing U.S. national security.

The Biden administration should also work to establish policies and processes to put guardrails around the president's "sole authority" to order the use of nuclear weapons to ensure that any such decision would be deliberative and based on appropriate planning and consultation, including with leaders in Congress. Implementation would be dependent on the particular circumstances that are causing consideration of nuclear use. These policies would improve confidence in how the U.S. government makes critically important decisions and policies related to nuclear use.

The essays in this report recommend additional steps President Biden and his team could take to adapt U.S. nuclear policy and posture to reduce the risk of use of nuclear weapons.

These steps include:

- Undertaking an internal "failsafe review" to ensure that U.S. nuclear weapons and command-and-control and warning systems are hardened against cyberattacks and to identify other steps that could increase decision time for leaders in a crisis and reduce the risk that a terrible miscalculation could lead to inadvertent nuclear conflict. This review should reexamine post-launch destruct devices on U.S. nuclear weapons and other measures to reduce the risk of nuclear war. Other states with nuclear weapons should be encouraged to conduct their own "failsafe reviews" to reduce the chances of a mistake, an accident, or a blunder leading to nuclear use.
- As part of a new nuclear posture review, adopting a new declaratory policy that narrows the range of scenarios in which the United States would consider the use of nuclear weapons, including by declaring that deterring a nuclear attack against the United States and its allies and partners is the "sole purpose" of U.S. nuclear weapons. This will require careful consultations with U.S. allies in Europe and the Asia-Pacific and reassurances of the U.S. commitment to—and capabilities for—their defense.

It also is imperative that the United States and Russia reengage to strengthen strategic stability and further reduce both countries' nuclear arsenals, while continuing to hold Moscow accountable for its violations of international law. As the two countries with the largest nuclear arsenals in the world, both have an obligation—despite their differences—to work to reduce the numbers of these weapons and the risks that they will ever be used. The extension of the New Strategic Arms Reduction Treaty (New START) was an essential first step, and Washington and Moscow must build on that agreement to make further reductions and to address growing challenges to strategic stability.

Recommendations include the following:

- In the near term, the United States and Russia should signal a new direction through unilateral, reciprocal commitments to modest nuclear warhead reductions below the level required by New START, underpinned by the treaty's binding limits and verification provisions.
- The two sides should immediately begin a strategic stability dialogue and initiate negotiations on a more ambitious follow-on set of agreements to
  - Limit all strategic-range delivery systems, including those not covered by New START.
  - Provide transparency and limits on the total nuclear warhead stockpile on each side.
  - Restore a verifiable ban on ground-based intermediate-range missiles west of the Urals, and when possible more broadly.
  - Encourage more stabilizing nuclear force postures with respect to both strategic forces and non-strategic forces in and near Europe.
- Negotiations should take place in the context of a broader dialogue covering the wide range of factors that affect strategic stability, including the long-standing issue of missile defense and new concerns like cyber. New ideas and flexible forms of agreement are needed to address such issues productively.

While the next round of arms reductions should remain a bilateral U.S.-Russia process, the Biden administration must simultaneously engage China on strategic issues, taking into account the broader regional context. Growing tensions in the U.S.-China relationship, particularly against a backdrop of China's continued expansion and modernization of its nuclear capabilities, are increasing the risk of conflict and possible escalation to the use of nuclear weapons in the Asia-Pacific.

Formal arms control agreements between the United States and China (or trilateral agreements among the United States, China, and Russia) are unlikely in the near term. Nonetheless, the United States and China should work to develop and sustain a regular dialogue on strategic issues, with a focus on (a) reducing the risk of use of nuclear weapons; (b) constraining the potential for an arms race; and (c) establishing a foundation of engagement that could lead to transparency and confidence-building measures and, over the longer term, potential arms control agreements. These issues cannot be isolated from the broader regional context of the threat posed by North Korea's nuclear and missile programs and U.S. security commitments to its allies in Asia.

Steps explored in this report include:

- Establishing regular, bilateral U.S.-China dialogues on key issues, including nuclear doctrine and policy, emerging technologies that could have a strategic impact, and the North Korean nuclear and missile threats and their implications for U.S. missile defense development. In the context of these dialogues, the two sides could pursue steps to increase predictability, such as exchanging information on each country's plans for nuclear modernization, as well as current and planned development and deployment of hypersonic systems and missile defense capabilities.
- Developing and strengthening bilateral crisis avoidance and management measures, including an agreement on advance notification of ballistic missile launches and the establishment of bilateral Nuclear Risk Reduction centers.

Lastly, the Biden administration should restore U.S. leadership of multilateral efforts to reduce nuclear risks. The Nuclear Non-Proliferation Treaty (NPT) remains the cornerstone of the global non-proliferation regime, and the United States should work with all parties—and in particular through the P5 process—to strengthen the treaty and advance multilateral non-proliferation and disarmament efforts. The United States should work with the rest of the P5 to affirm their commitment to preventing the use of nuclear weapons; expand and deepen dialogue on nuclear issues, including doctrine, risk reduction, and strategic stability; increase transparency on total warheads stockpiles; reaffirm and uphold moratoria on nuclear testing; and declare a moratorium on the production of fissile material for use in nuclear weapons or other nuclear explosive devices.

In today's world, it is understood that the United States will continue to possess and deploy nuclear weapons for its security and that of allies and partners for as long as is necessary. At the same time, for decades—dating back to the darkest days of the Cold War—the United States has worked to steadily reduce the role and number of these weapons in its security policy. The Biden administration has an opportunity and a responsibility to build on that important legacy, recommitting to the ultimate goal of a world without nuclear weapons and working to make that goal a reality.

Reducing the Risk of Nuclear Use by Increasing Leadership Decision Time

Steve Andreasen

Today, U.S. and Russian ballistic missiles armed with nuclear warheads deployed on prompt launch can be fired and hit their targets within minutes. Once fired, a nuclear ballistic missile cannot be recalled before it reaches its target. Leaders may have only minutes between warning of an attack and nuclear detonations on their territory aimed at eliminating their capacity to respond. This puts enormous pressure on leaders to maintain "launch on warning/launch under attack" options, which—when mutual tensions persist or in a crisis—increases the risk that a decision to use nuclear weapons will be made in haste after a false warning and multiplies the risk of an accidental, mistaken, or unauthorized launch, where millions could be killed in minutes.

Creating robust and accepted methods to increase decision time for leaders, especially during heightened tensions and extreme situations when leaders fear they may be under threat of attack, could be a goal that links both near- and long-term steps for reducing the risk of nuclear use.

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Increasing decision time for leaders as an organizing principle has the potential to drive government policy in a number of related security baskets involving nuclear-armed states. It is central to the U.S.-Russia relationship, but also central in the NATO-Russia context and in Washington's relations with other countries (e.g., China). It also can be used to engage other states with nuclear weapons (e.g., India, Pakistan). There are at least five steps that can and should be proposed now by the Biden administration to increase leadership decision time, working with Russia and other nations:

1. **Crisis Management Dialogue—**Leaders in the Euro-Atlantic region should direct their respective governments to renew dialogue on crisis management—both bilaterally and multilaterally, through, for example, the NATO-Russia Council or through a separate working group. The risks of mutual misunderstandings and unintended signals that stem from an absence of dialogue relating to crisis management are real. They could lead to a dangerous escalation, beginning on one end of the spectrum with the possibility of a conventional military incident leading to conventional war and, on the other, the potential for nuclear threats, or even nuclear use. Initiatives to restart crisis management dialogue between the United States, NATO, and Russia, including military commanders, would increase transparency and trust between militaries and increase decision time for leaders.[1]

2. **"Failsafe Reviews"—**With the United States out front, all states with nuclear weapons should commit to conduct internal reviews of their nuclear command-and-control systems, including "failsafe" steps to strengthen safeguards against cyber threats and unauthorized, inadvertent, or accidental use of a nuclear weapon. These reviews should also include options for increasing warning and decision time for leaders, both unilaterally and in concert.[2] The U.S. review should examine post-launch destruct devices on U.S. nuclear weapons and other measures to reduce the risk of nuclear war.

3. **Cyber "Rules of the Road"**—The Biden administration should launch a new dialogue leading to the establishment of cyber "rules of the road." The risk of any one incident or set of circumstances leading to nuclear escalation in a crisis is greatly exacerbated by new hybrid threats, such as cyber risks to early warning and command-and-control systems. Cyber threats can emerge at any point during a crisis and trigger misunderstandings and unintended signals—magnified by the difficulties in attribution and real-time attack assessment—that could precipitate war. Initiatives to establish rules of the road or redlines precluding cyberattacks on nuclear facilities, nuclear command-and-control structures, or early warning systems would reduce fears of being blinded in the early stages of a crisis or conflict and help increase leadership decision time.[3]

4. **Removing Nuclear Weapons from Prompt-Launch Status**—U.S. and Russian strategic nuclear forces remain postured to enable each side to promptly destroy the other. Even under the latest strategic nuclear arms accord, both countries maintain hundreds of land-based and sea-based ballistic missiles deployed with nuclear warheads ready for prompt launch and capable of hitting their targets in less than 30 minutes. Because their fixed location makes them vulnerable—requiring a decision within minutes whether to "use them or lose them" after receiving warning of an attack, real or false—land-based ICBMs in silos are particularly destabilizing (mobile warheads at sea and to a lesser extent on land are more likely to survive a surprise attack and thus be available for retaliation). The United States should work with other nuclear weapon states, beginning with Russia, to set the goal of removing all nuclear weapons from prompt-launch status globally over the next decade. Working first with Russia to take nuclear missiles off prompt-launch status—with a priority on silo-based ICBMs—would increase time for U.S. and Russian leaders to assess their options and make a more considered decision in response to a suspected or actual attack.[4] This change would significantly reduce the risk of an accidental, mistaken, or unauthorized launch of a nuclear ballistic missile, and it would set an example for all states with nuclear weapons. Ideally, this could be extended to China (which, according to the head of U.S. Strategic Command, is "developing a dedicated nuclear command-and-control capability that includes launch under warning and launch under attack"),[5] and then to India and Pakistan.[6]

5. **Intermediate-Range Missiles**—The United States, in consultation with its allies, and Russia should work together to return to a ban on the deployment of U.S. and Russian land-based intermediate-range missiles in the Euro-Atlantic region and, when possible, more broadly, given that the constraints of the Intermediate-Range Nuclear Forces (INF) Treaty— designed to prevent such deployments—are no longer binding. With the redeployment of INF-range missiles in Europe, leaders could once again become consumed with fears of a short-warning nuclear attack that could decapitate a nation's command and control, fears that would greatly reduce decision time and increase the risk of false warnings.

One of history's lessons is how quickly nations can move from peace to horrific conflict. In the aftermath, many have looked back and wondered how it could have happened and how it happened so quickly. A new strategy for reducing the risk of nuclear use by increasing decision time for leaders can reduce the chances of conflict and catastrophe.

Endnotes

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2 For a fuller discussion of failsafe reviews, see Ernest J. Moniz and Sam Nunn, "Sleepwalking toward the Nuclear Precipice," December 15, 2020. Available at: https://www.foreignaffairs.com/articles/united-states/2020-12-15/sleepwalking-toward-nuclear-precipice.

3 See the Statement by the Euro-Atlantic Security Leadership Group, "Support for Cooperation among Governments to Address Cyber Threats to Nuclear Weapons Systems," February 2019. Available at: https://media.nti.org/documents/EASLG_Statement_Cyber_Threats_FINAL.pdf.

4 To address Russian concerns that the United States would be left with an advantage if only ICBMs were removed from prompt-launch status, the United States and Russia could agree to a reciprocal confidence-building measure to commit to keeping ballistic missile submarines farther from their targets (either at the edge of their range or just outside it). Former U.S. Secretary of Defense William Perry has advocated retiring U.S. ICBMs, arguing they have "no logical role in a U.S. sole-purpose, deterrence-only policy." ("Whatever You Think Ails This Nation, a New Generation of ICBMs Is Not the Answer," *Washington Post*, November 17, 2020. Available at: https://www.washingtonpost.com/opinions/2020/11/17/how-biden-administration-could-create-win-win-situation-nuclear-policy/). See also Richard A. Clarke and Steve Andreasen, "Missiles and Warheads in Holes in the Ground Are No Way to Deter Nuclear War Now," *Los Angeles Times*, April 19, 2021. Available at: https://www.latimes.com/opinion/story/2021-04-19/nuclear-arsenal-icbm-triad-joe-biden-ground-based-missiles.

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Declaratory Policy: Advancing Sole Purpose

Steve Andreasen

Nuclear declaratory policy encompasses public statements by leaders and governments articulating the circumstances under which nuclear weapons might be used. Declaratory policy communicates to other governments and the public both at home and abroad the role of nuclear weapons in a nation's security policy, and it is tied to the acquisition and posture of a nation's nuclear forces.

United States

Since the first and only use of nuclear weapons in wartime by the United States, U.S. leaders have maintained a policy of strategic ambiguity with respect to the future use of nuclear weapons, refusing to rule out nuclear first use.

A strategy for moving toward sole purpose declaratory policy will have to clearly lay out the rationale and benefits, while reassuring U.S. allies about the enduring and reliable U.S. commitment to their security.

Obama-Era Policy

In its 2010 Nuclear Posture Review (NPR),[1] the Obama administration stated that "the fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners." The administration committed to "continue to strengthen conventional capabilities and reduce the role of nuclear weapons in deterring non-nuclear attacks, with the objective of making deterrence of a nuclear attack on the United States or our allies and partners the sole purpose of U.S. nuclear weapons." Although the Obama administration never formally adopted "sole purpose," then-Vice President Biden in early 2017 stated that he and President Obama believed that it should be U.S. policy.[2]

Also in the 2010 NPR, the Obama administration stated, "the United States is now prepared to strengthen its long-standing 'negative security assurance' by declaring that the United States will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the Nuclear Non-Proliferation Treaty (NPT) and in compliance with their nuclear non-proliferation obligations." In making this "strengthened" assurance, the administration also noted that, "Given the catastrophic potential of biological weapons and the rapid pace of bio-technology development, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat."

Trump-Era Policy

The 2018 NPR[3] states that a policy of no first use "is not justified today" in light of the contemporary threat environment, underscoring that, "It remains the policy of the United States to retain some ambiguity regarding the precise circumstances that might lead to a U.S. nuclear response." The Trump NPR is consistent with the administration's 2017 National Security Strategy,[4] which stated that America's nuclear arsenal is now "essential" to preventing not just a nuclear attack but also "non-nuclear strategic attacks, and large-scale conventional aggression." The 2018 NPR, by underscoring the role of nuclear weapons in deterring significant non-nuclear strategic attacks, explicitly rejects sole purpose. While it repeats the Obama-era negative security assurance (NSA), it broadens the exception to that policy, noting, "Given the potential of significant non-nuclear strategic attacks, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of non-nuclear strategic attack technologies and U.S. capabilities to counter that threat."

President Biden's Views

In January 2017—one week before leaving office—then-Vice President Biden stated:

> *"Given our non-nuclear capabilities and the nature of today's threats—it's hard to envision a plausible scenario in which the first use of nuclear weapons by the United States would be necessary. Or make sense. President Obama and I are confident we can deter—and defend ourselves and our Allies against—non-nuclear threats through other means. The next administration will put forward its own policies. But, seven years after the Nuclear Posture Review charge—the President and I strongly believe we have made enough progress that deterring—and if necessary, retaliating against—a nuclear attack should be the sole purpose of the U.S. nuclear arsenal."*

More recently, in a March/April 2020 essay in *Foreign Affairs*,[5] then-presidential candidate Biden underlined his commitment to sole purpose (reiterated in the 2020 Democratic Party Platform):

> *"As I said in 2017, I believe that the sole purpose of the U.S. nuclear arsenal should be deterring—and, if necessary, retaliating against—a nuclear attack. As president, I will work to put that belief into practice, in consultation with the U.S. military and U.S. allies."*

Russia

Russia's 2014 military doctrine[6] states that it would consider the use of nuclear weapons against any country in extreme self-defense situations:

> "*The Russian Federation shall reserve the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and/or its allies, as well as in the event of aggression against the Russian Federation with the use of conventional weapons when the very existence of the state is in jeopardy.*"

Most recently, in early June 2020, President Putin signed an official Russian policy paper, titled "Basic Principles of State Policy of the Russian Federation on Nuclear Deterrence,"[7] spelling out the principles of

Moscow's nuclear deterrence strategy. The paper repeats the formula quoted above from the 2014 Russian military doctrine, making clear that Russia "considers nuclear weapons exclusively as a means of deterrence, their use being an extreme and compelled measure."

The paper also states that "in the event of a military conflict, this Policy provides for the prevention of an escalation of military actions and their termination on conditions that are acceptable for the Russian Federation and/or its allies." This may be a reference to general nuclear capabilities and readiness, rather than an explicit endorsement of early nuclear use or "escalate to de-escalate."

The paper also makes clear that deployment of nuclear weapons delivery systems, ballistic missile defenses, INF systems (nuclear or conventional), and other advanced weapons in the territory of non-nuclear weapon states that consider Russia as a potential adversary would make them targets of Russian nuclear deterrence.

Finally, in addition to responding to reliable data on a launch of ballistic missiles or the use of nuclear weapons against Russia and/or its allies, the document provides for the possible use of nuclear weapons in response to an attack against the critical national infrastructure that is responsible for controlling and employing nuclear weapons (which many experts have suggested could include cyberattacks that can disable nuclear command-and-control systems).

China

Alone among the P5, China states that it maintains a "no first use" policy of nuclear weapons with no exceptions. Originally declared in 1964, this pledge has been reaffirmed by Chinese officials on numerous occasions. China has also shown interest in a universal, legally binding P5 negative security assurance toward non-nuclear weapon states.

France and the United Kingdom

Neither France nor the United Kingdom has adopted "sole purpose" or "no first use" policies.

In its 2017 Defense and National Security Strategic Review,[8] France stated that the "use of nuclear weapons would be conceivable only in extreme circumstances of legitimate self-defense." In February 2020, French President Macron, noting that the fundamental purpose of France's nuclear strategy is to prevent war and that French nuclear forces "strengthen the security of Europe through their very existence," reaffirmed that "France will never engage into a nuclear battle or any forms of graduated response," but "should there be any misunderstanding about France's determination to protect its vital interests, a unique and one-time-only nuclear warning could be issued to the aggressor State to clearly demonstrate that the nature of the conflict has changed to re-establish deterrence."[9]

In 2015, the United Kingdom stated that "We would use our nuclear weapons only in extreme circumstances of self-defence, including the defence of our NATO Allies. While our resolve and capability to do so if necessary is beyond doubt, we will remain ambiguous about precisely when, how and at what scale we would contemplate their use, in order not to simplify the calculations of any potential aggressor."[10] In 2021, the United Kingdom repeated almost verbatim this language in the "Integrated Review of Security, Defence,

Development and Foreign Policy," stating that "We would consider using our nuclear weapons only in extreme circumstances of self defence, including defence of our NATO Allies . . . we will remain deliberately ambiguous about precisely when, how and at what scale we would contemplate use of nuclear weapons."[11]

Both France and the United Kingdom also have adopted NSAs with respect to non-nuclear countries—the French with no caveats and the United Kingdom (in 2021) with caveats relating to chemical or biological capabilities, or emerging technologies with comparable impact (i.e., the United Kingdom leaves open the option to use nuclear weapons in response to chemical or biological attacks or emerging technologies with comparable impact).[12]

Political and Security Context

As the Biden administration reviews its nuclear policy and posture, the likely point of departure will be a review of Trump and Obama administration policies and President Biden's previously stated views on sole purpose, both as vice president and as a candidate for president.

Although President Biden has clearly and publicly stated his position, moving U.S. nuclear allies Britain and France to follow and other U.S. allies in NATO and the Asia-Pacific to support a change in U.S. declaratory policy will be challenging. Although U.S. and NATO defense budgets are unlikely to escape the COVID-19 pandemic without significant programmatic adjustments—including in missile defense and nuclear capabilities—the issue of declaratory policy may be insulated from a NATO defense review. The absence of substantial progress on Ukraine and other political and security issues relating to Russia may create resistance to changing declaratory policy, despite the slightly improved atmosphere for progress on nuclear threat reduction following the extension of New START. Such resistance to a fundamental change of NATO nuclear policy likely will come from many NATO member states.[13] Given the worsening political and security dynamic with China, there may be similar reservations among Asian allies to changes in U.S. declaratory policy. According to news accounts, both Japan and South Korea expressed concern about reports that the Obama administration was considering adopting a "no first use" policy in 2016, and the Biden administration is likely to encounter similar resistance to the somewhat different idea of a sole purpose declaration.

Advancing Sole Purpose

Given the potential for resistance, a strategy for moving toward sole purpose declaratory policy will have to clearly lay out the rationale and benefits, while reassuring U.S. allies about the enduring and reliable U.S. commitment to their security.

A new policy narrative—A change in declaratory policy, alone or along with other steps, would need to make clear that reducing the role of nuclear weapons in national security strategy is an urgent priority for the United States and would set a solid foundation for a new direction in U.S. nuclear policy. Importantly, it also would provide a basis for a new process of engagement with Russia and China, with the goal of encouraging and adopting safer policies on nuclear use. Announcing that the sole purpose of U.S. nuclear weapons is to deter nuclear attacks on the United States and its allies and partners—combined with restoring the Obama-era negative security assurance (i.e., the United States "will not use or threaten to use nuclear weapons

against non-nuclear weapon states that are party to the NPT and in compliance with their nuclear non-proliferation obligations")—would clearly signal a policy course change and renewed U.S. global leadership toward reduced reliance on nuclear weapons.

Advancing a new policy—An initiative to move toward a sole purpose policy will need to combine U.S. leadership with deft diplomacy involving U.S. allies in both Europe and Asia, as well as Russia and China. Such an initiative could include a "declaratory policy challenge" to other nuclear weapon states and involve the following three steps:

1. **Consultations and Reassurance**—Consultations with NATO and Asia-Pacific allies could take place in the context of an internal U.S. defense and nuclear policy review and/or as part of a NATO defense and nuclear policy review. The consultations would focus on reassuring allies of the continuing U.S. commitment to their defense against the full range of security threats and the continuing role U.S. nuclear weapons will play alongside enhanced conventional capabilities in their defense. It could include agreed measures to enhance conventional deterrence.

2. **Challenge—**After clearly articulating the U.S. intention to move toward a sole purpose policy, the United States could challenge other nuclear weapon states to make the same commitment. This would be a historic milestone in joint efforts to reduce the threat of nuclear use and advance nuclear disarmament obligations under the NPT. It will move the world one step closer to the day when the risk of nuclear use is eliminated.

3. **Diplomacy**—Washington would seek to coordinate policy statements with the United Kingdom and France, and with Russia and China, supporting sole purpose. These could be in the form of coordinated unilateral statements or joint statements.

Flexible implementation—In implementing this approach, a sole purpose declaration could be adopted unilaterally by the United States after consultations with allies, including on reassurance measures. Or, it could be coordinated with other nuclear weapon states. Coordinated unilateral or joint sole purpose statements could be implemented in stages (such as, United States-United Kingdom, United States-China, etc.) as a means of demonstrating progress and incentivizing other countries to act.

P5 Negative Security Assurances (NSAs) at a Glance

Country	Most Recent Declared NSA as of March 2021
United States	Will not use or threaten to use nuclear weapons against non-nuclear countries fulfilling NPT obligations, with caveat that "Given the potential of significant non-nuclear strategic attacks, the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of non-nuclear strategic attack technologies and U.S. capabilities to counter that threat."
Russia	Will not use or threaten to use nuclear weapons against non-nuclear countries party to the NPT, except in the case of an invasion or attack on Russia or allies by state acting in association with a nuclear weapon state, or "when the very existence of the state is in jeopardy."
China	No first use of nuclear weapons without caveats.
France	Will not use or threaten to use nuclear weapons against non-nuclear countries fulfilling NPT obligations, and would only use nuclear weapons in extreme situations of self-defense.
United Kingdom	Will not use or threaten to use nuclear weapons against non-nuclear countries fulfilling NPT obligations, with the right to review policy if the future threat of weapons of mass destruction, such as chemical or biological capabilities or emerging technologies with comparable impact, make it necessary.

Note: NPT is the Nuclear Non-Proliferation Treaty.

Endnotes

1 U.S. Department of Defense, "Nuclear Posture Review Report," April 2010. Available at: https://dod.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Review_Report.pdf.

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11 "Global Britain in a Competitive Age, The Integrated Review of Security, Defence, Development and Foreign Policy," March 2021. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975077/Global_Britain_in_a_Competitive_Age-_the_Integrated_Review_of_Security__Defence__Development_and_Foreign_Policy.pdf.

12 A summary of NSAs by the nuclear weapon states is provided in the table above.

13 See the November 25, 2020, report by the NATO secretary general's "Forward-Looking Reflection Process," which concluded that "Given the deterioration of the Cold War-era arms control framework, it is critical to sustain nuclear deterrence . . .in the 21st century as the bedrock of NATO security" and that "NATO should adapt its defence and deterrence posture in the post-INF setting to take into account the threat posed by Russia's existing and new military capabilities." Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/2020/12/pdf/201201-Reflection-Group-Final-Report-Uni.pdf.

Next Steps on Strategic Stability and Arms Control With Russia

Lynn Rusten

The United States and Russia must renew and deepen strategic stability dialogue to address the increasingly complex array of capabilities and technologies that could exacerbate military competition and raise the risk of nuclear use. This array includes not only nuclear capabilities but also dual-capable delivery vehicles and hypersonic technologies, conventional prompt-strike systems, missile defense and the offense-defense relationship, cyber capabilities, and military activities in outer space.

Reinvigorated dialogue should lead to new agreements, understandings, and practices to tamp down dangerous competition and enhance mutual security. This cannot be accomplished in a single treaty or agreement but will require comprehensive dialogue on strategic stability that addresses issues in different baskets in parallel. The United States and Russia must change the tone and direction of the bilateral nuclear relationship to signal a renewed commitment to reducing the role and number of nuclear weapons, ensuring a healthy nuclear non-proliferation regime, and reducing the risks of nuclear use bilaterally and globally.

To maintain mutual restraints and verification and achieve further reductions in U.S. and Russian nuclear forces in the future, it will be necessary to address a broader range of factors and military capabilities than has been the case to date.

Background: The Need for Purposeful Strategic Stability Dialogue

The deterioration in relations with Russia, absence of meaningful dialogue on avoiding crises and maintaining stability, erosion of arms control agreements, and the advance of new technologies have dramatically increased the risk of conflict and of unintended escalation to the use of a nuclear weapon. As the two countries with more than 90 percent of the world's nuclear weapons, the United States and Russia have a mutual obligation to manage and restrain their military competition and reduce the potential for a nuclear exchange.

Despite significant ongoing tensions, it is essential to build on the long history—dating back to the Cold War—of bilateral dialogue and agreements to reduce nuclear risks. For 50 years, the United States and Russia have judged it to be in their mutual interest to adopt legally binding verifiable treaties to limit and reduce their strategic nuclear forces. These agreements—from SALT I in 1969 to the New START Treaty today—put bounds on their competition in the most destructive nuclear forces, provide predictability, and help reduce the risk of nuclear war. These agreements have contained essential provisions for verification, including intrusive on-site inspections, to provide confidence that any militarily significant cheating would

not go undetected. While some believe that the era of such legally binding arms control treaties is over, I and others believe it is still both preferable and possible to negotiate and ratify legally binding verifiable agreements to limit and reduce U.S. and Russian nuclear forces, and, eventually, forces of other nuclear powers too.

Given today's escalating risks, it is essential to renew and deepen discussions to address the increasingly complex array of capabilities and technologies being pursued by each country that could exacerbate military competition and raise the risk of nuclear use by accident or blunder. Renewed dialogue should address nuclear capabilities as well as dual-capable delivery vehicles and hypersonic technologies, conventional prompt-strike systems, missile defense and the offense-defense relationship, cyber capabilities, and military activities in outer space. These topics must be included in a reinvigorated U.S.-Russia dialogue on strategic stability that ideally should lead to new agreements, understandings, and practices to tamp down dangerous competition and enhance mutual security. Such disparate challenges cannot all be addressed in a single treaty or agreement, but because they are interrelated—and likely to become more so over time—a comprehensive dialogue on strategic stability must begin to identify and chart a course toward addressing many of these key factors.

Since the New START Treaty was negotiated in 2010, the United States and Russia have identified issues and concerns they believe need to be addressed in future agreements. The United States points to Russia's numerical advantage in non-strategic nuclear weapons (NSNW) and its pursuit of new strategic-range nuclear delivery vehicles, some of which (e.g., the Poseidon nuclear-powered, nuclear-tipped torpedo and the Burevestnik nuclear-powered, nuclear-armed subsonic cruise missile) would not, if they are deployed, meet the definition of a "strategic offensive arm" under New START. In the context of the demise of the Intermediate-Range Nuclear Forces (INF) Treaty, the United States has expressed concerns about Russia's nuclear-capable intermediate-range land-based delivery systems. Russia, meanwhile, has for years stated that for it to consider reductions below the levels in New START, other factors affecting strategic stability should be taken into account, including missile defense, conventional prompt-strike capabilities, and militarization of space. Russia, and more recently the United States under the Trump administration, has at times argued that future reductions will require bringing other nuclear powers into the arms control process. There also is growing focus on both sides on hypersonic capabilities and cyber risks to nuclear command-and-control systems.

To maintain mutual restraints and verification and achieve further reductions in U.S. and Russian nuclear forces in the future, it will be necessary to address a broader range of factors and military capabilities than has been the case to date. This is unlikely to be accomplished in one comprehensive agreement, but more likely by agreeing to discuss the various issues in several different baskets in parallel. Any ensuing agreements likely will take different forms and proceed on different timelines.

The need for flexible approaches and forms of agreement in addition to treaties could result, for instance, in unilateral or reciprocal actions and commitments, norms or rules of the road, or transparency measures. In addition, because of the pace of technological change, it may be preferable for the time frame of agreements, whatever form they may take, to be more limited—perhaps five or 10 years in some cases—rather than the longer or unlimited duration of some previous agreements. To the extent possible, agreements should include mechanisms for updating to account for new technologies and changed circumstances.

As the countries with the largest nuclear arsenals by far, the United States and Russia should continue addressing many of these issues on a bilateral basis. It may be possible, however, to include China and other nuclear powers in discussions and potentially agreements pertaining to some of these issue baskets, such as those addressing new technologies, either simultaneously or after the United States and Russia have made some progress.

Even before any specific new measures or agreements are reached, there is an urgent need for the United States and Russia to change the tone and direction of the bilateral nuclear relationship to signal a renewed commitment to reducing the role and number of nuclear weapons, ensuring a healthy nuclear nonproliferation regime, and reducing the risks of nuclear use bilaterally and globally. The agreement in February 2021 to extend the New START Treaty for five years was a welcome first step in that direction.

Building on the Foundation of the New START Treaty

The New START Treaty, now extended to February 5, 2026, is the starting point and foundation for future arms control and other strategic stability measures with Russia. The treaty limits the number of U.S. and Russian deployed strategic nuclear warheads to 1,550 and their deployed delivery vehicles (referred to as "strategic offensive arms") to 700. It provides for robust verification, including extensive and regular exchanges of notifications regarding the status and location of strategic offensive arms, as well as 18 on-site inspections annually in each country.

By agreeing with Russia to extend the treaty—which otherwise would have expired on February 5, 2021—the United States ensured that Russia's new Avangard hypersonic delivery vehicles deployed on ICBMs and the Sarmat heavy ICBMs will be subject to the treaty when they are deployed. Two other novel long-range nuclear systems Russia is pursuing that do not fall under the definitions of the treaty—the Poseidon nuclear-powered, nuclear-tipped torpedo and the Burevestnik nuclear-powered, nuclear-armed subsonic cruise missile—are not likely to be deployed, and certainly not in militarily significant numbers, during the life span of New START. And while New START does not limit Russian (or U.S.) NSNW, the treaty's limits on strategic weapons and its verification provisions provide a critical foundation for the extremely difficult endeavor of negotiating an agreement with Russia to cover classes of weapons beyond what is included in New START.

Recommendations for Next Steps in Arms Control and Strategic Stability

For the purposes of this paper, the term "nuclear arms control" is used flexibly and is meant to encompass legally binding treaties and agreements and other forms of agreement through which the United States and Russia might reduce nuclear risks through mutually agreed actions or commitments. The extension of New START ensures continued limits and verification on the most destructive class of deployed nuclear weapons in the U.S. and Russian arsenals while the two countries begin to scope out and negotiate additional agreements and measures that can complement and endure beyond New START.

This paper does not address all the issues in the bilateral strategic stability basket. It focuses primarily on further nuclear reductions and a potential successor regime to New START that could include hypersonic, novel, and conventional prompt-strike capabilities; a ban on INF-range systems; and transparency and limits on non-strategic and non-deployed nuclear warheads. (Other important issues related to strategic stability, including the offense-defense relationship, are discussed in separate papers.)

The key recommendations for future arms control steps by the United States, discussed in greater detail below, include:

- Announce plans to deploy no more than 1,400 strategic warheads by the end of 2021.
- Negotiate a new bilateral treaty to further limit and reduce U.S. and Russian strategic systems.
- Agree with Russia not to base U.S. or Russian land-based intermediate and shorter-range ballistic and cruise missiles in Europe (west of the Urals).
- Negotiate agreements to address non-strategic and non-deployed nuclear warheads through transparency, numerical limits, and locational restrictions.

1. Announce Plans to Deploy No More Than 1,400 Strategic Warheads by the End of 2021

The United States should announce its intention to reduce its deployed strategic warheads to no more than 1,400 (fewer than the treaty's ceiling of 1,550) by the end of 2021 and invite Russia to take a reciprocal step. This would send an unmistakable signal of the U.S. commitment to build on the foundation of New START and provide an invitation to Russia to join in recommitting to constructive engagement on nuclear arms control and reducing nuclear risks. By the same token, it is a modest enough step that it would not adversely affect U.S. national security even if Russia does not reciprocate since New START's binding limits and verification remain in place. (For the past few years, both the United States and Russia have maintained deployed strategic nuclear forces at levels below the New START limits.) Finally, it would be a welcome and reassuring step in the eyes of the international community as nations prepare to participate in the 10th Nuclear Non-Proliferation Treaty (NPT) Review Conference and look to the nuclear weapons states—first and foremost the United States and Russia—to demonstrate their continued commitment to the disarmament process.

2. Negotiate a New Bilateral Treaty to Further Limit and Reduce U.S. and Russian Strategic Systems

The United States and Russia should begin now to negotiate a new treaty to supersede New START before it expires in 2026. This successor agreement should retain limits and verification on the ICBMs, submarine-launched ballistic missiles (SLBMs), and heavy bombers covered by New START and cover new strategic systems being pursued by both sides. This should include limiting or, in some cases, banning new or novel kinds of strategic-range nuclear delivery systems—such as Russia's Poseidon (a nuclear-powered, nuclear-tipped torpedo) and Burevestnik (a nuclear-powered, nuclear-armed subsonic cruise missile)—that do not meet New START's definition of a "strategic offensive arm," as well as other strategic-range systems, including hypersonic vehicles, whether or not they are deployed with nuclear weapons. The result would be that all so-called strategic-range "conventional prompt global strike systems" would be included in the treaty's limits.

New START and all previous strategic nuclear arms control treaties with Russia have limited and counted all warheads (or reentry vehicles) attributed to ICBMs and SLBMs as nuclear warheads, regardless of whether they actually are nuclear. Applying this counting rule to all strategic-range delivery systems that are subject to a new agreement would help to address the concern that even conventionally armed, strategic-range, fast-flying, highly accurate systems—such as ballistic or cruise missiles or new hypersonic vehicles—have strategic effect and should be limited because they put at risk the nuclear forces and command-and-control and warning systems of the other side.[1]

Counting Rules

The next treaty should employ more accurate counting rules for nuclear warheads attributed to heavy bombers so that the overall numerical limit on nuclear warheads better reflects the actual nuclear capability of each side. While New START precisely counts the warheads deployed on ICBMs and SLBMs, it uses an attribution rule for heavy bombers such that each bomber counts as having just one nuclear warhead. That is far from realistic because U.S. and Russian bombers can carry up to 12–16 nuclear bombs or cruise missiles.[2] Thus, even if the aggregate numerical limit on warheads in a new treaty is not significantly lower than that in New START, adopting more accurate counting rules would lead to a reduction in the actual numbers of warheads and ensure a more meaningful representation of the limit that is being placed on each side's nuclear delivery capacity.

This is particularly important given that the United States and Russia each are developing new air-launched, long-range nuclear cruise missiles and may pursue long-range, air-delivered hypersonic vehicles in the future. There are significant concerns that such capabilities will be destabilizing because they could pose a first-strike threat to certain key command-and-control facilities. Counting them accurately under an overall warhead limit (or banning them entirely) will be a means of imposing some restraint on these capabilities.

The limits of the next treaty should result in reductions in strategic nuclear capability below the levels permitted under New START. However, including additional kinds of delivery systems under those limits (including potentially strategic-range *conventional* delivery systems) and adopting more accurate counting rules for warheads attributed to heavy bombers make it difficult at this stage to make a precise recommendation for the limits of the next treaty. It would be an "apples to oranges" comparison with the New START limits. The point would be to more completely include and limit the actual strategic forces on each side and to ensure the numerical reduction of those forces and particularly of deployed strategic nuclear warheads. In addition, robust verification measures will be an essential element of the next agreement, just as they were with New START and previous agreements.

With the priority of reducing the risk of nuclear use, particularly in this age of new technologies including cyber and hypersonics, arms control agreements should be used to encourage each side to adopt more stabilizing nuclear force postures in addition to reducing and regulating the number of nuclear weapons and delivery vehicles.

Stability and Force Structure

With the priority of reducing the risk of nuclear use, particularly in this age of new technologies including cyber and hypersonics, arms control agreements should be used to encourage each side to adopt more stabilizing nuclear force postures in addition to reducing and regulating the number of nuclear weapons and delivery vehicles. Previous strategic arms control treaties have included provisions intended to encourage each side to adopt more stabilizing force postures. This was the rationale, for instance, behind the original START Treaty's ban on heavy ICBMs with multiple independently-targeted re-entry vehicles (MIRVs). By the time New START was negotiated, however, each side placed higher priority on preserving its own flexibility than on imposing force structure constraints on the other side. It is time to revisit this trade-off for the next agreement. A meaningful dialogue with Russia regarding how each perceives the impact on strategic stability of particular types of weapons systems would help identify areas where restraint could be mutually beneficial. This can be accomplished by symmetrical constraints, as well as through asymmetrical constraints that reflect trade-offs according to each side's security concerns, force structures, and preferences regarding how to distribute the permitted elements of its nuclear force posture.

For example, land-based ICBMs, particularly those in fixed silos, are uniquely vulnerable to a possible first strike and create extreme pressure on leaders to "use them or lose them" in a crisis or in the event an incoming attack is detected. This dynamic is exacerbated when it comes to MIRVed ICBMs given that they are "lucrative" targets with more warheads at risk in the event of a first strike. With the goal of improving stability and increasing decision time in a crisis, a new treaty could ban all silo-based ICBMs or, at a minimum, all MIRVed silo-based ICBMs. Because Russia relies more on its land leg than does the United States, Russia likely would seek to retain at least its mobile ICBM force. Recognizing this, a new agreement could require deMIRVing of all ICBMs, including mobiles, or at least limit the number of warheads permitted on mobile ICBMs to, for instance, no more than three. This would make mobile ICBMs less attractive targets and thus reduce the value in trying to locate and take them out in a crisis.

For other systems perceived as particularly destabilizing, the United States should seek to avert their deployment and ban them in the next agreement. This could include the new Russian Poseidon and Burevestnik systems—high-risk, doomsday systems prone to catastrophic accident or miscalculation. Such a ban would be similar to some of the prohibitions in the original START Treaty on deploying strategic nuclear systems undersea or using other exotic basing and delivery modes. Similarly, strategic-range hypersonic vehicles could be banned or permitted only for deployment on ICBMs. Russia may have its own list of concerns about U.S. systems under development. Short of bans, there could be sublimits on certain systems such as hypersonic weapons or air-launched cruise missiles within the overall treaty ceilings.

3. Agree Not to Base U.S. or Russian Land-Based Intermediate and Shorter-Range Ballistic and Cruise Missiles in Europe (West of the Urals)

With the termination of the INF Treaty in August 2019 following the U.S. determination (shared by the Obama and Trump administrations but denied by Russia) that Russia violated the treaty by deploying land-based intermediate-range (nuclear capable) cruise missiles (the 9M729) that exceeded the range permitted by the INF Treaty, the U.S.-Russian global ban on intermediate- and shorter-range (500–5,500 kilometer) land-based ballistic and cruise missiles has been eliminated and there now are no constraints on this class of missiles. After withdrawing from the INF Treaty, the Trump administration began the development of new missiles in this range for possible deployment in Europe or Asia, saying they would be conventionally

armed. No allies in Europe or the Asia-Pacific have indicated a willingness to host such missiles. Russia has proposed to the United States and NATO a moratorium on deploying this class of missiles in Europe and, while not conceding that the Russian 9M729 cruise missile is INF-range, has more recently offered to include the 9M729 missile in the moratorium.

The United States and Russia should stop this incipient arms race in its tracks by agreeing not to deploy this class of missiles in Europe west of the Urals and working out the terms of the agreement and appropriate verification and transparency measures to confirm mutual adherence. In doing so, the United States should consult closely with its NATO allies, including on potential transparency measures at the NATO missile defense sites in Romania and Poland to demonstrate to Russia that the United States has not deployed offensive missiles at those sites in place of missile defense interceptors (a concern Russia has raised). While a ban or moratorium would be the most immediate path toward reestablishing a prohibition on INF-range missiles in the Euro-Atlantic region, consideration also could be given to codifying a prohibition on this class of delivery vehicles in the next treaty limiting strategic offensive arms.

Reestablishing the prohibition on deployment in the Euro-Atlantic region is important because INF-range systems are particularly destabilizing owing to their short time of flight and the risk that they could be used to initiate a nuclear exchange or lead to nuclear escalation even if conventionally armed. They also raise concerns about miscalculation because they are dual-capable systems. For these reasons, it is not beneficial to the security of the United States or its NATO allies for this class of systems to remain unregulated. (Nor should the United States pursue deployment of land-based INF-range missiles on the territories of its allies in Asia, as discussed in a separate paper on strategic stability with China.)

4. Negotiate Agreements to Address Non-Strategic and Non-Deployed Nuclear Warheads through Transparency, Numerical Limits, and Locational Restrictions

Historically, nuclear arms control agreements between the United States and Russia have limited only deployed strategic nuclear warheads and delivery vehicles of strategic- and INF-range. Nuclear warheads intended for deployment on non-strategic delivery systems (NSNW) and other non-deployed nuclear warheads have not yet been subject to arms control agreements. Future arms control agreements should increasingly focus on all types of nuclear warheads to facilitate limits and reductions across the full range of nuclear capability, reduce breakout potential, and enhance verification, particularly as nuclear stockpiles are further reduced.

In the United States there is increasing interest in limiting Russia's NSNW in future arms control arrangements owing to Russia's larger stockpile of NSNW and the concerns of NATO allies about Russia's NSNW near Europe. The Senate resolution of ratification for New START called on the United States to seek negotiations with Russia on NSNW. The Obama administration endeavored to do so, but Russia showed no interest. While the Trump administration in its final months sought to leverage a proposed one-year extension of New START in exchange for Russian agreement to freeze total warhead stockpiles (with details, definitions, and verification to be worked out later), Russia did not agree to that proposal.

The main concern with respect to Russia's NSNW is their availability for use in the European theater on tactical (and now also on INF-range) systems where they can threaten U.S. allies and partners. Given their close proximity—and resulting very short delivery times—to allies' territory, these systems are viewed as particularly threatening to European allies with potential to be used early in a conflict and lead to escalation

to large-scale nuclear exchange. Similarly, U.S. forward-based nuclear weapons in Europe concern Russia because of the short time of flight from Europe to Russian territory. Those European bases where U.S. nuclear weapons are stored would be early targets in a conflict, risking nuclear escalation. Therefore, it would be stabilizing to mitigate these concerns through agreements that could enhance transparency, establish numerical limits, and provide verifiable locational restrictions on where Russian and U.S. NSNW may be stored.

Just as the United States has been concerned with Russia's numerical advantage in NSNW, which are not deployed on a day-to-day basis, Russia has at times expressed concern about the greater capacity of the United States to "upload" additional nuclear warheads on its strategic delivery systems. One mutually beneficial way of addressing U.S. and NATO concerns about NSNW and Russia's concerns about a perceived U.S. advantage in non-deployed strategic warheads could be to address in an agreement all non-deployed nuclear warheads, or the total warhead stockpile, of each side.

The next phase of nuclear arms control with Russia should begin to grapple with this challenge. Doing so will be difficult in part because the U.S. and Russian nuclear warhead stockpiles and operational practices are asymmetrical and because there are national security sensitivities related to the design, life cycle, and operational practices pertaining to nuclear warheads. Verification measures, if pursued, will be technically difficult to develop and raise important national security considerations. Moreover, the United States and Russia do not yet have shared objectives in this area, so finding common ground will not be easy. Progress on the U.S. objective of limiting Russian NSNW may require trade-offs across other issues in the strategic stability basket.

Below are two illustrative approaches to consider for increasing transparency and/or limiting non-strategic and non-deployed nuclear warheads. (A third approach regarding locational restrictions on U.S. and Russian NSNW in Europe west of the Urals is discussed in a separate paper.) These approaches are complementary—the two sides could pursue one or more of them and they could be advanced together or sequentially.

- **A transparency agreement on total nuclear warhead stockpiles**—As a precursor to more ambitious agreements to limit and verify warhead stockpiles, the United States and Russia could agree to increase transparency on warhead stockpiles through declarations. This can be done at varying levels of detail and specificity, for instance by providing some or all of the following information:
  - total number of active and reserve warheads and those awaiting dismantlement
  - numbers, types, and location of warheads associated with strategic systems
  - numbers, types, and location of warheads associated with non-strategic systems

  Such declarations could be made as unilateral, reciprocal confidence-building measures, or they could be incorporated into agreements that also include measures for transparency, confirmation, and verification as a first step toward, or in conjunction with, agreed numerical or geographic limits and restrictions.

- **An aggregate limit on total nuclear warhead stockpiles**—One way to address concerns about Russia's numerical advantage in non-strategic nuclear warheads would be to agree on an overall limit on aggregate nuclear warheads on each side. The United States in March 2018 publicly

declared its total nuclear stockpile to be 3,822 warheads. (This includes active deployed and non-deployed warheads and warheads in reserve but does not include warheads in the dismantlement queue.) Russia's total stockpile is estimated in unofficial unclassified sources to be about 4,300.[3] The aggregate numbers on each side are not so far off from each other. Thus, agreement on an aggregate limit with "freedom to mix" (i.e., Russia could maintain more NSNW than the United States, while the United States maintains more non-deployed strategic warheads than Russia) could be feasible, imposing a limit and forcing trade-offs between the categories of warheads. An alternative would be for both sides to agree to freeze their warhead stockpiles at the current level, as the Trump administration proposed. Under either approach—an agreed numerical limit or a freeze—it would be necessary to define precisely what will be counted under the agreement and to determine what if any verification procedures would be developed and implemented.

Conclusion

The ideas suggested in this paper for a) a potential successor regime to New START that would cover a more comprehensive array of strategic-range nuclear and conventional systems and new technologies; (b) a moratorium on INF-range missiles; and (c) transparency and limits on NSNW and non-deployed nuclear warheads represent an important but incomplete set of proposals to address key factors that are affecting strategic stability between the United States and Russia. Other important issues such as the offense-defense relationship and additional considerations regarding the risks of NSNW in Europe are discussed separately in this volume. Additionally, there are subjects including cyber risks to nuclear command-and-control and warning systems, implications of artificial intelligence, and military activities in space that, while not discussed in detail in this report, are critical issues for inclusion in a wide-ranging and in-depth strategic stability dialogue with Russia.

Endnotes

1 At the end of the New START negotiations, the United States made a unilateral statement (never agreed by Russia) that any long-range conventional-only (e.g., not dual-capable) prompt-strike weapons it deployed would not be subject to New START's limits. That statement was incorporated as a condition of the Senate resolution of ratification. The United States is no longer pursuing the system it had in mind for this exception. In a future agreement, it will be important to have a shared understanding of whether the covered delivery systems include those that are conventional-only as well as those that are nuclear or dual-capable. The preferable approach for strategic stability would be to count them all as covered strategic-range delivery systems, with the continued exception of conventional-only converted heavy bombers.

2 The discounted counting rule in part reflects that since the end of the Cold War, neither country keeps nuclear weapons loaded on its bombers on a day-to-day basis, and the bombers are also used for conventional missions. Previous treaties such the original START Treaty used attribution rules that more accurately reflected the actual nuclear loading capacity of each bomber type.

3 Federation of American Scientists, *Status of World Nuclear Forces*, September 2020. Available at: https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/.

Reducing U.S. and Russian Non-Strategic and Forward-Deployed Nuclear Weapons

Steve Andreasen

Both the United States and Russia have in their arsenals nuclear warheads intended for use on non-strategic delivery systems. The United States reportedly has approximately 100 non-strategic nuclear weapons (NSNW) stored at NATO bases in Europe and approximately 130 stored in the continental United States,[1] while Russia reportedly maintains nearly 2,000 NSNW for use on various delivery platforms throughout its territory.[2] These U.S. and Russian weapons are currently not covered by any nuclear arms control treaties or constraints; hence their numbers, storage and deployment locations, alert status, and security are shrouded in uncertainty, which fuels mutual suspicion and could generate concerns in a crisis. The shorter range and vulnerability of their delivery systems raises the specter of early use in a regional crisis and the potential for escalation to large-scale nuclear exchange.

These U.S. and Russian weapons are currently not covered by any nuclear arms control treaties or constraints; hence their numbers, storage and deployment locations, alert status, and security are shrouded in uncertainty, which fuels mutual suspicion and could generate concerns in a crisis.

Deployment and Programmatic Status

Nuclear weapons have played a key role in the collective defense policy of NATO since 1954 and are seen as the alliance's ultimate deterrent to aggression. The arsenal committed to NATO includes forward-deployed U.S. NSNW stored in Europe, U.S. strategic nuclear forces that compose the nuclear triad (i.e., land-, sea-, and air-based), and U.K. strategic nuclear weapons deployed at sea. As with most assets committed to NATO, the U.S. and U.K. nuclear forces are nationally owned and are under national command and control. In addition, France's independent strategic nuclear forces "have a deterrent role of their own" and "contribute to the overall deterrence and security of the Allies."[3]

According to published sources, today there are approximately 100 U.S. non-strategic gravity B61 warheads stored at six U.S. nuclear weapon facilities in five NATO countries: Belgium (10–20), Germany (10–20), Italy (40), Netherlands (10–20), and Turkey (20).[4] These weapons are for use on U.S. and allied dual-capable aircraft (DCA); the weapons are under U.S. control and may only be used following presidential authorization.[5] DCA currently deployed by the United States and NATO host countries include the F-15E Strike Eagle, F-16 Fighting Falcon, and Panavia PA-200 Tornado.

These capabilities and the accompanying supportive force structures, infrastructure, and exercises come under a long-established NATO nuclear consultation, planning, and decision-making framework. Although

the United States has a leading role, allied participation and burden-sharing remain central to the concept of NATO collective defense and nuclear deterrence.

Modernization

As part of a comprehensive plan to upgrade its nuclear forces, the United States has begun the process of modifying the existing B61 nuclear gravity bomb by consolidating all five current variants into a single weapon, the B61-12. Today, some current B61 variants can be delivered only by tactical DCA, whereas others can be delivered only by long-range strategic bombers. The new B61-12 (consisting of two components, the bomb assembly and the guided tail kit assembly that enables the bomb to be employed with greater accuracy than current gravity bombs) will be deliverable by both, increasing the weapon's flexibility and interoperability but potentially blurring the distinction between tactical and strategic missions. The first production unit of the new B61-12 will occur in fiscal year 2022 and will be completed in 2025.[6]

Concurrently, the inventories of DCA owned by NATO countries hosting the U.S. B61 are reaching the end of their original service lives. These countries therefore are making (or already have made) decisions regarding replacement aircraft and the investments necessary to retain the DCA mission. The Netherlands, Italy, and Belgium are planning to buy nuclear-capable F35-A Joint Strike Fighters from the United States, which will begin replacing existing NATO aircraft in 2024 (in 2019, the Trump administration halted delivery of F-35As to Turkey because of its plans to acquire the Russian S-400 air defense system). Germany is expected to extend the service life of its nuclear-capable PA-200 Tornado through the 2020s and purchase F-18 fighter jets to be used in part for the nuclear mission in later years.

Overall, the U.S. Congressional Budget Office estimates that over the 30-year period from 2017 to 2046, tactical nuclear forces will cost the United States $25 billion, or an average of nearly $1 billion per year.[7]

Nuclear Weapons in Russia

Today, Russia's nuclear arsenal of approximately 4,300 warheads is estimated to include approximately 1,870 so-called non-strategic or tactical nuclear weapons.[8] These weapons, as well as ongoing improvements in Russia's conventional capabilities, often are cited as a core justification for retaining NATO's current nuclear posture.

Russia is currently modernizing all aspects of its nuclear arsenal. As in its strategic weapons modernization program, Russia appears to be phasing out older Soviet-era weapons in favor of a smaller force of new systems. According to one comprehensive assessment of Russian nuclear forces, in the longer term, "the emergence of more advanced conventional weapons could potentially result in reduction or retirement of some existing nonstrategic nuclear weapons."[9]

The Russian Navy is fielding a new class of nuclear attack submarines, and a new dual-capable cruise missile has been demonstrated in ship- and submarine-launched strikes in Syria. The Russian Air Force also is fielding a new air-launched nuclear cruise missile. Another new system, the ground-launched 9M729 cruise missile, is the subject of U.S. accusations that Russia violated the Intermediate-Range Nuclear Forces Treaty by flight-testing and deploying a new ground-launched cruise missile in excess of the range limits on such capabilities.[10] The missile was reportedly deployed in early 2017.[11]

China

China has an estimated 320 nuclear warheads and, according to the head of the U.S. Strategic Command (Adm. Charles Richard), is undergoing an "unprecedented expansion" of its nuclear and strategic capabilities, driving to be a strategic peer by the end of the decade. This drive includes an increasing capability to produce plutonium for weapons with the intent of doubling China's stockpile, and changes in its nuclear posture to ensure a credible nuclear triad. According to Richard, "China is capable of executing any plausible nuclear employment strategy regionally now and will soon be able to do so at intercontinental ranges"—a factor in both U.S. and Russian nuclear planning and decision making (though both the United States and Russia still possess vastly larger arsenals, at around 4,000 warheads each, deployed and stockpiled).[12]

Concerns Over Security

Although the United States and NATO have undertaken considerable efforts to improve the physical security of nuclear weapons stored in Europe, it should be assumed that those weapons remain potential targets for terrorist attacks. Storing nuclear weapons at locations throughout Europe to reassure some allies or to use as leverage in a future arms control deal with Russia, therefore, comes with the increasing risk of vulnerability to an evolving and deadlier terrorist threat. (In contrast, nuclear weapons in the continental United States are secured in central storage facilities that are easier to protect than dispersed underground vaults inside aircraft shelters across multiple bases in Europe.) Russia's nuclear weapons may be similarly vulnerable, with an estimated 1,850 non-strategic nuclear weapons reportedly kept in storage facilities throughout the country, some located near operational bases.

Political and Security Context

The political and security context for any initiative to change NATO's nuclear posture in 2021—including consolidating forward-deployed nuclear weapons from NATO/Europe to the United States—will remain challenging.

Public opposition to nuclear weapons in most NATO countries has produced a preference by most governments to avoid public discussion of nuclear weapons policy. The preference for a low profile has been reinforced by the tendency of alliance members to rely on U.S. leadership. The consequence is a reluctance to consider alternative approaches or to fundamentally reassess whether the current nuclear posture still meets contemporary deterrence and defense requirements, as well as the risks and costs associated with sustaining the current posture.

In the absence of substantial progress on Ukraine and other political and security issues relating to Russia, the case that forward-deployed nuclear weapons are more of a security risk than an asset likely will encounter substantial resistance from some NATO member states, in particular those nearer to Russia. In addition, allied unease has been compounded by the decades-long decline in U.S. military personnel and infrastructure in Europe, including most recently the Trump administration's reductions in funding for the European Defense Initiative and proposed reductions in U.S. troops stationed in Germany. Despite the Biden administration's recent announcement that it will increase the U.S. military presence in Germany, the uncertainties generated by these actions make "reassurance"—an essential prerequisite for a change

in NATO's nuclear posture—even more difficult. The demise of the INF and Open Skies treaties has accentuated both unease and nuclear uncertainty in the Euro-Atlantic region.

However, recent instability along NATO's borders—and even within individual NATO countries—also highlights the continued and perhaps growing risks associated with the current posture. The COVID-19 pandemic will continue to inflict severe economic costs on the United States and NATO member states, perhaps for years to come. It is hard to see how U.S. and NATO defense budgets escape this pandemic without significant adjustments. The potential for widespread and perhaps long-standing cuts in U.S. and NATO defense spending will contribute to unease among NATO member states; however, it may also provide an incentive for a review of defense capabilities, including nuclear capabilities, in light of post-pandemic security and economic priorities. Resistance in NATO (and within the U.S. government) to changing NATO's nuclear status quo could also be reduced if accompanied by an arms control proposal to address Russia's forward-deployed nuclear weapons. Moreover, there is also the possibility of a change in government in at least one key NATO member state, Germany, where the Green Party (which has enshrined the goal of a nuclear-free Europe into their party platform and calls for a Germany without U.S. nuclear weapons) could emerge as a political power in Germany's post-September 2021 election government.

The rationale for maintaining U.S. and Russian forward-deployed nuclear weapons in Europe indefinitely is dangerously out of date, for both countries and for Europe.

Finally, even in the absence of a COVID-19–inspired review, a new U.S. administration will almost certainly conduct a defense policy review that would include nuclear policy and posture, and NATO. Indeed, a new Strategic Concept and/or Deterrence and Defense Policy Review might be a logical follow-on to the NATO secretary general's "forward-looking reflection process," which was charged with offering recommendations to reinforce alliance unity, increase political consultation and coordination between allies, and strengthen NATO's political role. The analysis and recommendations of the Reflection Group were made public in November 2020.[13]

Five Commitments

Allied perceptions regarding threats and responses will never completely overlap in an alliance with 30 member states; however, differences must not lead to alliance stagnation when it comes to reducing the risk of nuclear use.

The rationale for maintaining U.S. and Russian forward-deployed nuclear weapons in Europe indefinitely is dangerously out of date, for both countries and for Europe. Engaging political leaders on both sides of the Atlantic—and substantial dialogue with Russia—will be required to change the status quo to better match today's realities.

Any near-term initiative to eliminate forward-deployed nuclear weapons must proceed and succeed within the frame of the persistent negative political dynamic between NATO and Russia. Addressing issues related to reducing the risk of nuclear use, sharing nuclear risks and responsibilities, assuring allies, and defining a strategy for engaging Russia are and will remain central. In this context, any reduction in costs associated

with the nuclear mission could free up resources for NATO member countries to focus on other urgent tasks, including post-pandemic economic recovery, conventional reassurance, and cyber defense.

As part of a new nuclear and defense policy review in 2021, the United States and NATO should develop a set of commitments to provide a foundation for changing the nuclear status quo. An early focus should be to remove weapons from areas where there is a heightened risk of terrorism or political instability (recognizing how recent events underscore how quickly assumptions about the safety and security of U.S. nuclear weapons stored abroad can change).

Commitments

1. **Reaffirm the principle of collective defense as enshrined in Article 5 of the Washington Treaty.** This step underscores NATO unity and cohesion—and the U.S. commitment to the defense of NATO. U.S. leadership is the essential prerequisite to a reexamination of NATO nuclear policy, beginning with a compelling reaffirmation by the president of the principle of collective defense enshrined in Article 5 of the Washington Treaty. President Trump's questioning of America's commitment to defend all allies, in particular those who did not pay their "fair share" of defense, set a historic low bar. Less than one month into his term, President Biden did not hesitate to reaffirm America's commitment: "We'll keep faith with Article 5. It's a guarantee. An attack on one is an attack on all. That is our unshakable vow."[14]

2. **Strengthen extended deterrence.** NATO will seek to sustain nuclear burden-sharing and consultations within NATO so that NATO will have a safer, more secure, and more credible extended nuclear deterrent—with or without nuclear weapons stationed in Europe—and remain a nuclear alliance for as long as nuclear weapons exist. Such steps will not preclude the B61-12 life extension program (which also has a role in U.S.-based strategic forces) or plans by some NATO allies to purchase F-35 and F-18 aircraft. NATO should affirm that it will not base or provide the infrastructure to base nuclear weapons at locations where they are not currently present. The supreme guarantee of the security of the allies is provided by the strategic forces of the alliance.

3. **Bolster reassurance measures.** NATO will seek to adopt a diverse and robust set of reassurance measures—beyond those relating to adapting existing arrangements for nuclear sharing—that will tangibly enhance confidence in NATO's capabilities to defend against existing and emerging threats both conventional and nuclear, and institute a process for periodic review and adoption of new measures.

4. **Prioritize steps to reduce the risk of nuclear use.** Reducing the risk of nuclear use should be and must remain one of NATO's highest priorities and a guiding principle for further changes to NATO's nuclear posture. In this context, NATO is prepared to proceed with further reductions of U.S. forward-deployed nuclear weapons in Europe, with the goal of completing the consolidation of U.S. forward-deployed nuclear weapons to the United States, with the timing and pace to be determined by broad political and security developments between NATO and Russia.

5. **Pursue dialogue, confidence building, and arms control measures with Russia to address both sides' forward-deployed nuclear weapons.** As part of this dialogue, NATO and Russian political leaders should jointly recognize their mutual interest in the physical safety and security of forward-

deployed nuclear weapons in and near Europe, and in avoidance of their use. Steps to improve the security of forward-deployed nuclear weapons now should be a priority. Possible measures include the following:

- **Site visits to nuclear storage sites**—The U.S./NATO and Russia could conduct site visits to a NATO and Russian nuclear warhead storage site to demonstrate best security practices and build confidence.
- **Transparency and data exchanges**—The U.S./NATO and Russia could declare the exact number of non-strategic nuclear weapons located at or near NATO and Russian bases west of the Urals.
- **Reciprocal consolidation**—The United States and Russia would agree to consolidate Russian and U.S. nuclear warheads, respectively, at central storage sites away from operational bases in and near Europe (west of the Urals), reducing the risk of nuclear use and the problem of short-warning attacks using nuclear-capable systems with short times of flight to their presumed targets. In this concept:
  - Russia could agree to remove nuclear warheads from storage sites associated with operational bases near Russia's western border (including in Kaliningrad), and to consolidate those warheads at declared central storage sites in Russia's interior.
  - In return, the United States, in consultation with NATO allies, would agree to remove its forward-based nuclear weapons from NATO bases in Europe and consolidate them at central storage sites in the United States, while the DCA could remain forward-based if desired.
  - A verification regime would be designed to confirm on an ongoing basis the absence of nuclear weapons from each operational base and warhead storage area from which they had been removed.

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The Offense-Defense Relationship

Steve Andreasen

Since the late 1960s, missile defense has reliably been at the nexus of defense, foreign policy, and arms control for the United States and Russia. In the current state of strategic instability—including the withering of arms control agreements—where an accident or mishap could trigger a catastrophic chain of events, the stakes associated with finding a truly cooperative path forward on missile defense, and more broadly an agreed framework for managing the relationship between strategic defense and offense and reducing nuclear risks, have never been higher. In the absence of such cooperation, the cycle of competition between deployment of missile defenses and advances in offensive capabilities to defeat them will continue to fuel dangerous nuclear competition and pose an obstacle to reaching new agreements to limit and reduce nuclear weapons.

The stakes associated with finding a truly cooperative path forward on missile defense, and more broadly an agreed framework for managing the relationship between strategic defense and offense and reducing nuclear risks, have never been higher.

Further progress in improving U.S.-Russia relations and nuclear threat reduction depends in part on developing a cooperative approach to missile defense, beginning with the U.S./NATO and Russia. Unfortunately, the historic track record on U.S./NATO-Russia missile defense cooperation is not promising:

- Political follow-through has been lacking. While U.S. and Russian presidents have previously agreed in principle to pursue cooperation on missile defense, these agreements have rarely been followed by detailed accords. When agreements have been struck—such as the one by presidents Bill Clinton and Vladimir Putin in June 2000 to establish a jointly manned center in Moscow to exchange data from U.S. and Russian early warning systems[1]—they have not been implemented.
- Identifying technical areas for cooperation on missile defense has been difficult, involving extremely sensitive technologies.
- Missile defense has historically been linked to nuclear deterrence; whether one accepts or rejects such a linkage, failure to develop a durable post–Cold War understanding of the offense-defense relationship has set back cooperation across the board.
- There is a severe trust deficit, where each side suspects the other's motives: Moscow fears Washington cynically seeks to co-opt Russia so America can deploy unlimited defenses that will erode its deterrent; Washington believes Moscow only wants to derail U.S. missile defense programs.

Enter China—A further complication in the offense-defense relationship, in particular as it relates to missile defense, is China. Over the past 20 years, China has consistently objected to U.S. missile defense deployments, in particular U.S. "theater" missile defense deployments in the Asia-Pacific region. Going

forward, as the United States seeks to engage China more broadly on regional and global security and stability, including discussions relating to Chinese nuclear forces, the issue of missile defense is likely to play an even greater role.

While legally binding limits on missile defense are almost certainly politically infeasible in the United States at present, progress on improving U.S.-Russia—and to some degree U.S.-China—relations and reducing the risk of nuclear use will require the United States to review this matter with fresh eyes and develop a more cooperative approach to missile defense, one that will address at least some Russian and Chinese concerns about U.S. missile defense capabilities. Practical steps could be agreed to create a positive dynamic for discussions and further boost what will be a continuing effort in the years ahead to deepen cooperation in this area.

U.S. Policy and Programs

In the 2019 Missile Defense Review (MDR),[2] missile defense was identified as "an essential component of U.S. national security and defense strategies," contributing both to deterrence of adversary aggression and the assurance of allies and partners. The program is designed to "counter the expanding missile threats posed by rogue states and revisionist powers to us, our allies, and partners, including ballistic and cruise missiles, and hypersonic vehicles." Russia and China are explicitly named in the discussion of the evolving threat. North Korea, Iran, Russia, and China (which "can now potentially threaten the United States with about 125 nuclear missiles, some capable of employing multiple warheads") are identified as current or future threats to the U.S. homeland.

The MDR narrative goes on to state that the United States relies on deterrence to protect against large and technically sophisticated Russian and Chinese threats to the U.S. homeland: the purpose of U.S. missile defense is to "outpace" existing and potential rogue state (i.e., North Korea and Iran) offensive missile capabilities. These efforts "will require" the examination and possibly fielding of advanced technologies, including space-based sensors and boost-phase defense capabilities, and possibly adding capacity and capability to "surge" missile defense. For this reason, the MDR states "the United States will not accept any limitation or constraint on the development or deployment of missile defense capabilities needed to protect the homeland against rogue missile threats." The MDR also notes that, "As rogue state missile arsenals develop, the space-basing of interceptors may provide the opportunity to engage offensive missiles in their most vulnerable initial boost phase of flight."

Today, the United States deploys the Ground-based Mid-Course Defense (GMD) system to defend against a limited ICBM attack from "any source." Forty Ground-Based Interceptors (GBIs) are deployed at Fort Greely, Alaska, and four at Vandenberg Air Force Base, California. Congress appropriated an additional $1.3 billion in FY21 for missile defense above the administration's Missile Defense Agency (MDA) budget request of $9.13 billion.[3] The MDR states that DOD will increase the number of deployed GBIs, including a new GBI interceptor, from 44 to 64 beginning as early as 2023; and the Fort Greely site has the potential for up to an additional 40 interceptors. The MDR also references the possibility of a new GBI interceptor site in the continental United States.

Regional defenses include seven Terminal High Altitude Area Defense (THAAD) batteries, including one in Guam and one in South Korea. The United States is testing improved variants of both the Aegis SM-3 and

SM-6 missiles, for deployment at sea and ashore. An Aegis Ashore site in Romania is operational, armed with the SM-3 interceptor; an Aegis Ashore site in Poland is expected to be operational in 2022. Both Aegis Ashore sites are expected to be equipped with the SM-3 Blk IIA—capable of providing added protection against ICBM threats. The U.S. MDA tested the ship-based SM-3 Blk IIA against an ICBM-class target in November 2020. Patriot Advanced Capability-3 is now deployed with U.S., allied, and partner forces in multiple theaters to defend against short-range ballistic and cruise missiles.

Russian and Chinese Capabilities

The MDR states that Russia is maintaining and modernizing its anti-ballistic missile (ABM) system deployed to protect Moscow from nuclear attack, including 68 nuclear-armed interceptors, and multiple shorter-range systems throughout Russia. China is described as "aggressively pursuing a wide range of mobile air and missile defense capabilities," including testing a new mid-course missile defense system.

Perhaps more significant programmatically, both Russia and China are developing and deploying offensive nuclear, cyber, and space capabilities explicitly to defeat U.S. missile defenses. Thus, as has been true historically, improved U.S. missile defense capabilities are fueling the development and deployment of new, more sophisticated offensive capabilities by U.S. competitors and adversaries.

Political and Security Context

The domestic political and international security context for an initiative to engage on the "offense-defense" relationship and take concrete, specific steps relating to missile defense is fraught with challenges. Threading the political needle at home, and security and diplomatic needle with Russia and China, will be a challenge for any U.S. administration.

The domestic political and international security context for an initiative to engage on the "offense-defense" relationship and take concrete, specific steps relating to missile defense is fraught with challenges.

To begin, a core tenet of conservative orthodoxy for decades has been support for missile defense, unfettered by the ABM Treaty and any other constraint regimes. Moreover, lawmakers in both political parties support U.S. missile defense programs. Any initiative that appears to open the door to limitations or constraints, in particular legally binding constraints, will be strongly resisted.

Second, the Russian position for some time has been that not just constraints, but "legally binding" constraints, are necessary in the area of missile defense for there to be any additional constraints, including reductions, in U.S. and Russian nuclear forces.

Third, at least in the area of strategic stability and nuclear threat reduction including arms control, any improvement in U.S.-Russia relations and reduction of risk of nuclear use are likely to require the United States to engage on missile defense. A new U.S. administration almost certainly will conduct a defense policy review that would include missile defense, offering an opportunity to revisit the issue; however, domestic opposition, including in Congress, to constraints on missile defense will continue to be a significant factor.

Lastly, although missile defense and the offense-defense relationship in general may be more immediate and central to a review of U.S. policy vis-à-vis Russia, any decisions taken in this context also could significantly impact U.S.-China policy, including with respect to engaging China on regional stability and nuclear forces. At a minimum, a framework for engaging Russia in this area should be conscious of the potential impacts on U.S.-China policy; more proactively, the United States might seek to discuss some of the same issues with China, or even involve China in implementation.

Steps to Unlock the Offense-Defense Stalemate

The most realistic frame for engaging on missile defense in a U.S.-Russia context almost certainly includes NATO—in part owing to NATO deployments that concern Russia, but also to enhance trust and cooperation between Washington and Brussels.

Additionally, although the objective would be to develop practical steps that could be taken through politically binding arrangements, a frame that focuses first on specific steps that would not require new legally binding treaties is most realistic from the standpoint of U.S. domestic politics, recognizing that this may not be sufficient for Russia.

If it can be done, this approach could create a positive dynamic for discussions and further boost what will be a continuing effort in the years ahead to deepen cooperation in this area. Such an approach also could inform negotiation of any new legally binding treaties and improve prospects for their approval by legislatures and parliaments.

In this context, there are a number of steps that could ensure that the historic and persistent barriers to a truly cooperative approach to missile defense do not thwart future efforts. Political will and leadership from the most senior levels in Washington and Moscow will be needed to make progress; otherwise, they will get stuck in the usual bureaucratic ruts in both capitals.

Steps could include

- **Joint U.S./NATO-Russia analysis to develop a framework for cooperation**—The U.S./NATO and Russia could task the NATO-Russia Council to reengage on this issue, beginning with a new and comprehensive joint analysis of the future framework for missile defense cooperation. All parties should have realistic expectations and focus now on those activities that lend themselves to near-term success and broader cooperation down the road. Such a tasking would need to come from the highest levels within the U.S./NATO and Russia and involve senior officials in capitals—accompanied by a clear deadline.
- **Joint data exchange center**—The U.S./NATO and Russia could commit to updating the Clinton-Putin-era agreement to establish a joint data exchange center in Europe to include all of NATO (or alternatively, implement the center concept "virtually") to exchange information derived from missile launch warning systems on the launches of missiles and space launch vehicles. The new U.S./NATO-Russia center could be expanded over time to include other nations facing missile threats, including China, making it a truly global center for nuclear threat reduction.

The original rationale for establishing a joint data exchange center—to reduce the danger that ballistic missiles might be launched on the basis of false warning of an attack and to promote increased mutual confidence—persists. Today, these concerns are amplified by the threat of cyberattacks on nuclear facilities, nuclear command-and-control structures, or early warning systems. A clear benefit of the center would be to bring together U.S./NATO-Russia personnel in "day-to-day" operations on a dedicated joint activity. In the future, the center could also have potential for cooperation in other related areas, including cyber and space.

- **Maximize transparency**—There have been periodic bursts of exchanging information on ballistic missile threats and missile defense programs in the past. These activities should be reviewed and a future work plan agreed, with the goal of maximizing transparency with respect to all ballistic missile defense assets deployed from the Atlantic to the Urals.

  This effort could include the proposal made by Ernest J. Moniz and Sam Nunn in 2019 to negotiate soft guidelines on missile defense, including reciprocal transparency measures to reduce first-strike concerns and increase decision time. These could include exchanges of information about the missile defense deployments and plans of each side, on-site visits to monitor missile defense capabilities, and written understandings not to deploy missile defenses in ways or at levels that would threaten the other's nuclear deterrent.[4]

  In the context of underscoring that missile defense is not meant to threaten deterrence, as part of the written understanding not to deploy missile defenses in ways or levels that would threaten the other's nuclear deterrent (i.e., an implicit recognition of "mutual vulnerability"), the United States and Russia could commit not to deploy more than 100 strategic-range land-based interceptors (or freeze current deployments at existing levels for each side).

- **Technology exchange and joint research and development**—An element of technology exchange and joint research and development should be established to support mutual activities in the area of missile defense, including receiving and exchanging information from early warning systems to provide an enhanced understanding of, and ability to counter, missile threats. This does not mean designing and constructing from the ground up a missile defense architecture for Europe manned by joint U.S./NATO-Russia crews with multiple fingers on the button. But a series of joint pilot projects could help to establish and deepen cooperation. A permanent U.S./NATO-Russia government-industry missile defense council could be established, similar to what was done in initiating the U.S.-Russia nuclear lab-to-lab program years ago, to identify promising avenues for cooperation.

- **Ensure that missile defense cooperation is not rigidly linked with other issues**—U.S. and Russian strategic nuclear forces, forward-deployed nuclear weapons, conventional forces, long-range conventional weapons, and cyber and space all are vital, complex, and related topics at the core of building a peaceful and secure U.S./NATO-Russia relationship. Mindful of the interrelationships, leaders can and should take further steps in each of these areas to improve security for all nations, without rigid linkages to missile defense cooperation.

Endnotes

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Engaging China to Reduce Nuclear Risks

James McKeon and Mark Melamed

As the relationship between the United States and China becomes ever more central—and increasingly fraught—there is an urgent need for the two countries to better manage the strategic relationship and avoid blunders or miscalculations that could have potentially catastrophic implications for both countries and for the world at large. The mutual recriminations and attempts to assign blame for the COVID-19 pandemic and related economic downturn, combined with simmering commercial and geopolitical tensions, have produced an even more antagonistic relationship between the two countries, increasing the risk that bilateral tensions could result in a dangerous and unnecessary new Cold War.

The future of the U.S.-China relationship will necessarily require a balance between competition and cooperation—and as tensions rise, it will become ever more important to strengthen the latter where necessary to reduce nuclear risks. However, unlike the U.S.-Russia relationship where there is a long history of engagement on managing nuclear risks and engaging in arms control, the United States and China have almost no tradition of bilateral dialogue or negotiation on strategic issues.

The future of the U.S.-China relationship will necessarily require a balance between competition and cooperation—and as tensions rise, it will become ever more important to strengthen the latter where necessary to reduce nuclear risks.

Background

Over the course of multiple presidential administrations, the United States has sought to engage China on nuclear weapons and strategic security issues, mostly without success. The Trump administration's efforts focused on drawing China into a trilateral U.S.-Russia-China nuclear arms control process, an approach Beijing has rejected repeatedly, citing a major disparity in the size and composition of China's nuclear arsenal compared to the United States and Russia. For example, in July 2020, Foreign Ministry spokesperson Zhao Lijian stated, "China's objection to the so-called trilateral arms control negotiations is very clear, and the U.S. knows it very well."[1]

For reasons examined more fully later, an approach that prioritizes near-term trilateral arms control is unlikely to succeed. Instead, this paper offers an alternative strategy for engaging China that starts with a recognition that there is no shortcut from the historical absence of even a baseline level of dialogue to full-fledged arms control agreements. Given China's rising military power and considerable military investment—in its nuclear forces and other strategic capabilities, including conventional and dual-use missiles and hypersonic systems, cyber capabilities, and anti-satellite and other space capabilities—efforts to broaden and deepen bilateral engagement with China are essential. The initial focus of U.S.-China engagement to reduce the risk of nuclear conflict between the two countries should be to develop a foundation of dialogue and mutual

understanding, leading to transparency and confidence-building measures, and ultimately, as a longer-term goal, arms limitations and/or reductions.

Objectives for U.S.-China Strategic Engagement

Managing the strategic relationship between the United States and China, including building and maintaining strategic stability, avoiding crises that could escalate to the use of nuclear weapons, and managing crises that do emerge to ensure they do not escalate to nuclear use, is crucial. Just as it is imperative that the United States and Russia remain engaged on strategic issues, it is critical that the United States and China find ways to reduce the risk of use of nuclear weapons, notwithstanding broader bilateral tensions. The world narrowly survived the U.S.-Soviet nuclear brinksmanship of the Cold War; there is no guarantee it can survive another trip down that path between the United States and China.

With that in mind, engagement on strategic issues between the United States and China should be oriented around three key objectives:

1. **Reducing the risk of use of nuclear weapons as a result of blunder or miscalculation.** It is hard to imagine either the United States or China launching a "blue sky" nuclear attack. The real risk is of miscalculation or miscommunication—particularly in the context of a regional crisis—leading to nuclear use.

2. **Constraining the potential for a destabilizing arms race between the United States and China.** As both sides pursue nuclear modernization programs and develop capabilities—offensive and defensive—to address perceived security concerns, the risk of an arms race based on worst-case assumptions and planning is high and rising. Moreover, any arms competition between the United States and China would have broader—and dangerous—implications for the nuclear dynamic between the United States and Russia, as well as between Russia and China.

3. **Establishing a foundation of dialogue and engagement on strategic issues,** which could facilitate the development of transparency and confidence-building measures in the near term and, eventually, potential arms control agreements. Such dialogue and engagement would recognize the links between U.S.-China strategic relations and other regional issues, including U.S. extended deterrence commitments to Japan and South Korea, and the challenges posed by North Korea's nuclear and ballistic missile programs.

The U.S.-China Strategic Environment

Over the past decade and across administrations of both political parties, the U.S. government increasingly has viewed China as a great power competitor and potential adversary, often in the same vein as Russia. In making its case for trilateral arms control, the Trump administration rightly noted China's growing economic and military power, Beijing's considerable investment in modernizing its nuclear forces and increasing the number, types, and survivability of delivery systems, and China's growing regional and global influence. However, there are a number of reasons that bringing Beijing into traditional, limits-based nuclear arms control is likely to prove infeasible in the near term.

First and foremost, China's nuclear arsenal is dwarfed by the U.S. and Russian stockpiles, notwithstanding the considerable reductions by Washington and Moscow over several decades. While the precise size of China's arsenal is unknown, estimates generally center around 350 warheads, according to the Federation of American Scientists (FAS)—considerably fewer than even just the deployed stockpiles of the United States and Russia. At any one time, the United States deploys at least many hundreds of nuclear warheads that can potentially reach China, with low thousands in reserve. By contrast, FAS estimates that China has approximately 150 nuclear missiles that can potentially reach the United States (FAS estimates these 150 warheads could carry approximately 190 total nuclear warheads), and that—of those—about 90 missiles (carrying approximately 130 nuclear warheads) could reach the continental United States.[2]

Given this disparity, any limits in a trilateral agreement modeled on existing arms control frameworks would either have to be (a) set so high as to be effectively meaningless for China (or, perversely, even incentivize Beijing to *build up* its arsenal to the limit); (b) set so low as to require massive reductions in the U.S. and Russian stockpiles, which Washington and Moscow are unlikely to agree to; or (c) unequal (i.e., keeping China's stockpile where it is while allowing Russia and the United States to retain much larger stockpiles), which China would have little or no incentive to support. Perhaps primarily owing to this disparity, in addition to other factors, China has repeatedly made clear that it has no interest or intention at this stage in joining bilateral U.S.-Russia arms control efforts.

There are other impediments to negotiating arms control agreements with China in the near term. While the United States and Russia have built up years of experience with dialogue on nuclear issues, China has been—and remains—hesitant to engage in the kind of discussions and transparency that could lay a similar foundation in the U.S.-China—or U.S.-China-Russia trilateral—relationship. China has no experience with the on-the-ground inspection and intrusive verification regimes that have been an essential feature of most U.S.-Russia arms control agreements. China has traditionally been deeply skeptical of efforts to increase transparency on its nuclear capabilities, likely owing to its significantly smaller arsenal and its official "no first use" policy, which make Beijing especially wary of sharing information that could make China more vulnerable to a disarming first strike in the event of crisis or conflict.

While it may be infeasible to incentivize China to join a New START-like framework in the near term, the status quo cannot remain indefinitely. The modernization and expansion of China's nuclear arsenal—and the lack of visibility into Beijing's plans in this regard—will pose long-term risks to strategic stability. Indeed, it is important to engage China *now* on nuclear issues with the goal of reducing the risk of use of nuclear weapons at any point in the future. The question is how best to go about that in a way that has some prospect of getting Chinese buy-in and can reduce the considerable and increasing lack of trust in the strategic relationship. Understanding existing disputes and concerns is the first step toward crafting potential solutions.

Major Security Concerns

Beijing's modernization and expansion of its nuclear capabilities along with Washington's development of new nuclear systems and growing missile defense capabilities have further complicated matters. The Trump administration argued that China's nuclear modernization represents a marked shift in its historic "minimum deterrent" approach, reflecting its growing global ambitions. The Trump administration further assessed that China likely would "at least" double the size of its nuclear arsenal over the next decade.[3]

Evidence of China's potential doubling of its arsenal in the coming years has not been publicly presented, and some analysts outside of government are skeptical about this claim. Indeed, official U.S. predictions about the future size of China's nuclear arsenal have consistently proven to be overstated.[4] Nevertheless, while it is unknown whether China's nuclear warhead stockpile will increase as dramatically as some U.S. officials have claimed, China is clearly expanding the number and types of nuclear and/or dual-capable delivery systems. There is evidence that China is growing its capabilities by developing a multiple-warhead (MIRVed) road-mobile ICBM, expanding its ballistic missile submarine (SSBN) fleet, and developing a new nuclear bomber.

The initial focus of U.S.-China engagement to reduce the risk of nuclear conflict between the two countries should be to develop a foundation of dialogue and mutual understanding, leading to transparency and confidence-building measures, and ultimately, as a longer-term goal, arms limitations and/or reductions.

Another U.S. concern is China's growing intermediate-range missile capabilities. Then-Secretary of State Mike Pompeo specifically cited China's increasing capabilities in this regard as one justification for U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty in 2019 (China was never a party to the treaty).

After leaving the treaty following Russia's violation, the United States is now actively researching and developing these same capabilities. The first test of such a system in decades took place August 18, 2019, just two weeks after the U.S. withdrawal from the INF Treaty. Thus far, there is no indication the United States is considering deploying nuclear-armed ground-launched INF-range missile systems. However, some U.S. analysts believe that deploying ground-launched conventional—or potentially dual-capable—INF-range missile systems to the Asia-Pacific region would improve U.S. deterrence capabilities. Predictably, Beijing has reacted to this idea with alarm. Fu Cong, the director general of the Department of Arms Control in China's Foreign Ministry, told reporters in 2019, "If the U.S. deploys missiles in this part of the world, at the doorstep of China, China will be forced to take countermeasures."[5]

While the United States is not increasing the number of warheads in its nuclear arsenal, Chinese leaders focus on other U.S. military activities. For Beijing, the continued U.S. build-up of its missile defense capabilities is perceived as potentially threatening to China's strategic deterrent. Since the United States withdrew from the Anti-Ballistic Missile (ABM) Treaty in 2002, Washington has consistently stressed the importance of both theater and strategic missile defense programs. The 2019 U.S. Missile Defense Review (MDR) reemphasized long-standing policy that U.S. strategic missile defense systems are designed to address rogue state capabilities, not the Russian and Chinese ICBM threat to the U.S. homeland.[6] Yet at the same time, the MDR repeatedly cited Russian and Chinese missile advancements as serious threats and stressed the importance of regional missile defense "against all potential adversaries."[7]

Beijing believes that even a limited U.S. strategic missile defense system could pose a potential threat to its strategic deterrent, as it could leave China vulnerable to a U.S. first strike aimed at eliminating a large portion of China's nuclear deterrent, with U.S. missile defenses neutralizing any Chinese weapons that survive the initial attack. As Tong Zhao, a senior fellow at the Carnegie–Tsinghua Center for Global Policy, has explained, "From China's perspective, the most direct threat comes from U.S. strategic missile defense

systems, particularly the Ground-Based Midcourse Defense (GMD) system that, Beijing worries, could intercept Chinese intercontinental ballistic missiles (ICBMs) using U.S. interceptors based in Alaska and California."[8]

The November 16, 2020, U.S. test—reportedly successful—of its SM-3 Block IIA ship-based missile defense system against an ICBM-class target may exacerbate Beijing's concerns. China—like Russia—has long been suspicious of U.S. claims that the interceptor, originally intended for shorter-range targets, would pose no threat to China's strategic capabilities, and Beijing will likely see the test as confirmation of its suspicions and as further evidence of the need to modernize Chinese forces to ensure they can penetrate U.S. defensive capabilities. Notably, U.S. Missile Defense Agency's FY2021 budget submission indicates that procurement of the SM-3 Block IIA is expected to increase significantly beginning in FY2024.[9]

Further compounding Beijing's concerns about missile defense is uncertainty about whether the United States, in fact, seeks strategic stability and/or accepts mutual vulnerability with China. The 2010 Ballistic Missile Defense Review stated that "maintaining strategic stability in the U.S.-China relationship is as important to this Administration as maintaining strategic stability with other major powers,"[10] a statement that was reiterated in the 2010 Nuclear Posture Review (NPR).[11] Such language is notably absent from the 2018 NPR and 2019 MDR, and, as has been discussed elsewhere,[12] Japanese officials and experts (and potentially other U.S. allies in the region) have expressed concern that a U.S. embrace of "strategic stability" and/or acceptance of "mutual vulnerability" with China could be interpreted by China—correctly or incorrectly—as an indication that the United States might be unwilling to use nuclear weapons in defense of its allies in the event of a regional conflict.

Beijing also has cited Washington's push for new nuclear capabilities as a major concern. The 2018 NPR announced the development of a modified, low-yield submarine-launched ballistic missile (SLBM) warhead and a study to determine the efficacy and merits of developing and deploying a new nuclear-armed sea-launched cruise missile (SLCM). The latter is likely of considerable concern to China, as it would restore a nuclear capability particularly relevant to the Asia-Pacific region that the United States has not deployed since the early 1990s when President George H.W. Bush removed from deployment all sea-based nuclear weapons except those on SSBNs.

Declaratory Policy

Beijing and Washington each are concerned about the other's declaratory policy. Since 1964, China has routinely reiterated that the goal of its nuclear deterrent is purely defensive and has sought to demonstrate this by maintaining a "no first use" policy and a so-called "minimum deterrent," while also keeping its warheads in storage (e.g., not "deployed" by the standards of previous and existing U.S.-Russia arms control treaties, and not on so-called "high-alert").

A 2019 white paper released by China's State Council Information Office reiterated China's declared view of the purpose of its nuclear stockpile:[13]

> *"China is always committed to a nuclear policy of no first use of nuclear weapons at any time and under any circumstances, and not using or threatening to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones unconditionally [...] China does not engage in any nuclear arms race with any other country and keeps its nuclear capabilities at*

> *the minimum level required for national security. China pursues a nuclear strategy of self-defense, the goal of which is to maintain national strategic security by deterring other countries from using or threatening to use nuclear weapons against China.*"

However, Trump administration officials routinely argued that China's stated "no first use" policy is not credible given the expansion of its nuclear capabilities. Other experts also have questioned whether China's "no first use" policy is as firm as it once was, and whether China's new ICBM capabilities may push far beyond a "minimum deterrent" posture. The new capabilities also could push Beijing to a "launch-on-warning posture" with some warheads always deployed on their designated missile and the system reliant on early warning radars (similar to the United States and Russia), which would be a significant expansion of its "minimum deterrent" posture. According to Tong Zhao, there is interest within some corners of the Chinese military to make such a change.[14] Even if Chinese officials remain committed to "no first use" in principle, an increased reliance on early warning systems and silo-based ICBMs could introduce greater pressure to launch in response to warning of an incoming attack—with the attendant risk of a launch in response to a false alarm.[15]

For Beijing, U.S. declaratory policy offers no reassurance. The United States has never declared a "no first use" policy and has always left its options at least partially ambiguous. Compared to the 2010 NPR, the 2018 version expanded the scenarios where the United States would consider the employment of nuclear weapons. Various Chinese officials, newspaper articles, and experts criticized the NPR for this language and the document's harsh tone toward China in general. For example, Ren Guoqiang, a spokesman for China's National Defense Ministry, was quoted responding to the NPR, "We hope the U.S. side will discard its 'cold-war mentality.'"[16]

Hypersonic Weapons

As the United States and China both develop hypersonic glide vehicles, there is increasing mistrust on both sides about the intention of the other's programs. China revealed its medium-range DF-17 hypersonic glide vehicle to the world during a major military parade on October 1, 2019, and press reports indicate China had deployed the missile as of late 2020. Official Chinese sources have described the DF-17 as a conventional system, while unofficial sources have suggested it may be dual-capable,[17] and the commander of U.S. Strategic Command described it as a "strategic nuclear system."[18] While China—like Russia—likely views hypersonic capabilities as insurance against future development of U.S. missile defenses that Beijing fears could undermine China's nuclear deterrent, the United States fears that these capabilities could strengthen China's anti-access/area denial efforts and diminish Washington's ability to deter and defend against Chinese activities in the Western Pacific.

The United States is also researching and developing hypersonic systems, but unlike Russia and China, Washington is not developing a hypersonic system designed for a nuclear warhead. Nonetheless, China is concerned that even conventionally armed hypersonic missiles could be used by the United States against nuclear weapon targets, command-and-control centers, and other relevant facilities within China. In sum, even a conventional hypersonic weapon could pose a strategic threat.

There is an increasing risk that the United States and China, along with Russia, will enter further into a dangerous and destabilizing hypersonic weapon arms race. As these new systems develop, there will be

inevitable and likely necessary calls to constrain them through arms control or other measures. Hypersonic weapons are and will undoubtedly be a factor for U.S.-China strategic stability for decades to come.

Near-Term Engagement: Opportunities and Challenges

The decades-long history of U.S.-Russia engagement on nuclear weapons issues offers numerous lessons for expanded engagement with China, including this most basic one: serious engagement is a superior option to any alternative. Throughout even the toughest moments of the Cold War, leaders and policymakers in Washington and Moscow engaged in robust—and at times, heated—discussions with counterparts. The first major arms control agreements—SALT I and the ABM Treaty—were painstakingly negotiated as the Vietnam War continued to rage, and the INF Treaty was negotiated and brought into force against the backdrop of the Soviet occupation of Afghanistan. Despite numerous disagreements, expanding arsenals and doctrines, heated words, and repeated near-misses, sustained bilateral dialogue was seen by both parties as a necessity.

The most important near-term step the United States and China can take to improve stability, reduce risks, and avoid crises is to initiate a regular, all-weather, interagency dialogue on strategic issues, including capabilities, policies, and postures of concern to either side.

The same viewpoint should be applied to strategic stability discussions between the United States and China. Without a meaningful strategic stability dialogue, Washington and Beijing will only continue to increase mistrust and suspicion, potentially creating a worsening environment that increases the chances of a catastrophic military exchange. Beijing's modernizing and expanding nuclear capabilities and Washington's new nuclear and expanded missile defense capabilities are more reasons to begin discussions immediately.

Considering the disparity in the size and composition of their respective nuclear arsenals, Washington should make clear that the invitation to dialogue is not intended to pressure Beijing to join a trilateral arms control arrangement with Russia. Instead, the near-term focus of U.S.-China strategic talks should be to establish a foundation of dialogue and explore transparency, crisis management, and confidence-building measures that could increase strategic stability and lower the risk of catastrophic conflict and/or an arms race.

Of course, even simple dialogue between Washington and Beijing presents many challenges. Because China has little experience with joint confidence-building and transparency measures on nuclear weapons, just beginning the conversation will be difficult. U.S. policymakers should think creatively about how to incorporate issues of concern to Beijing, as well as how to use other channels to encourage Chinese engagement. This could include enlisting Russian interlocutors—who can speak firsthand to the value of dialogue—to persuade Chinese officials to engage, and/or expanding on existing work in the P5 format (this idea is explored in greater detail in a separate paper on multilateral engagement). U.S. officials also should consider how best to use existing or new Track 1.5 or Track 2 dialogues to build a foundation for Track 1 discussions without substituting for them.

On the U.S. side, this process also will require careful and ongoing consultation with U.S. allies and partners in the region, particularly those that rely on U.S. extended nuclear deterrence guarantees, especially as engagement with China advances to include more sensitive issues and potential transparency and/or confidence-building steps that could have implications for allies' security.

Specific Topics for Dialogue

The most important near-term step the United States and China can take to improve stability, reduce risks, and avoid crises is to initiate a regular, all-weather, interagency dialogue on strategic issues, including capabilities, policies, and postures of concern to either side. The current dynamic is being shaped by worst-case assumptions, which lead each side to policy and posture decisions that further fuel the other's concerns. The first step to break free from this dynamic is to build a foundation of engagement that can enhance mutual understanding of each other's perspectives and lay the groundwork for more substantive steps.[19]

- **The United States and China should establish a regular bilateral dialogue on nuclear doctrine and policy, as well as other technologies and capabilities that could have a strategic impact.** The most basic goal of this effort should be to establish an institutionalized structure for U.S. and Chinese officials—including military officials—to have such discussions on a continuing basis. This dialogue should include all issues of strategic concern to either side, including nuclear capabilities, the weaponization of outer space, anti-satellite capabilities, conventional missiles and hypersonic systems, offensive cyber capabilities, and the offense-defense relationship. Both sides should come prepared to explain the security concerns and perceptions that are influencing their respective choices on policy and capabilities development and to engage substantively on the concerns expressed by the other side. A near-term objective of these discussions could be to define "strategic stability" or a synonymous phrase in the U.S.-China context to better understand mutual concerns and lay a foundation for future progress.
- **Establish a dedicated bilateral dialogue on the North Korean nuclear and missile threat and the link between U.S. missile defense development and the evolution of the North Korean threat.** Given China's concerns about U.S. missile defense capabilities, and the role of North Korea's missile and nuclear programs in shaping U.S. thinking and development of missile defenses, the United States and China should initiate a dialogue on each country's perceptions of North Korea's capabilities—both present and future—and the corresponding threat, as well as the impact on each country's security policies, including with regard to the development of missile defenses.

Measures to Avoid and Manage Crises

While there is little experience of U.S.-China engagement on strategic stability and arms control issues, there is a modest track record of bilateral efforts to avoid and manage potential crises, including the Military Maritime Consultative Agreement[20] and the "Non-Targeting Agreement" from 1998;[21] there are also two non-binding memorandums of understanding (MOUs) from 2014 that commit the two sides to notify each other of major military activities and to follow an agreed code of conduct for encounters at sea. While it is unclear how effective or how frequently used these agreements are, they can nevertheless provide a

foundation for more effective bilateral measures the two sides could pursue. These measures could include the following:

- **Negotiate and implement an agreement for advance notification of ballistic missile launches.** Such an agreement could be modeled on the 1988 U.S.-Soviet Ballistic Missile Launch Notification Agreement, which committed each country to provide the other with at least 24 hours' notice regarding the planned date, launch area, and area of impact for any launch of a strategic ballistic missile, including ICBMs or SLBMs. Particularly at a moment when both the United States and China are in the process of modernizing their nuclear delivery systems, such an agreement could help mitigate the risk of misperception and inadvertent escalation. Notably, a missile launch notification agreement between China and Russia has been in effect since 2010, although its requirements and provisions reportedly are less comprehensive than the U.S.-Soviet/Russian agreement. Nevertheless, both the U.S.-Russian and Russian-Chinese agreements could provide useful starting points for discussions between Washington and Beijing on a comparable arrangement.
- **Establish a U.S.-China "Nuclear Risk Reduction Center" (NRRC) link.** The link, inspired by the U.S.-Russia NRRC as originally conceived in 1988, could be used initially as a quick and reliable means of communication on a range of strategic issues. The initial phase of operations could include a 24-hour watch by diplomatic and military personnel on events that could lead to a nuclear incident. Over time, the NRRC could potentially expand to supplement the voluntary exchanges of information and notifications called for under the 2014 U.S.-China MOUs on "Notification of Major Military Activities"[22] and on "Rules of Behavior for Safety of Air and Maritime Encounters."[23] Sending and receiving such notifications through an NRRC channel could help to regularize these types of exchanges (perhaps encouraging more consistent use of these provisions) and familiarize Chinese officials with the practice, potentially facilitating that aspect of future agreements. Such a link could also be put into practice in facilitating a missile launch notification agreement.

Transparency

China's military culture is notoriously secretive, perhaps motivated by its smaller arsenal and fear that increased transparency and confidence-building measures could leave the country vulnerable to a nuclear first strike. However, Wu Riqiang, an associate professor at Renmin University of China, notes that China's nuclear transparency is improving, potentially because "China's nuclear forces have become stronger." However, officials in the United States remain frustrated by China's lack of what they consider basic transparency. Professor Wu concedes that China is still not open to providing more granular transparency, comparable to the level of detail available about U.S. nuclear policy and posture:[24]

> *"There is a lack of specific operational-level principles for guiding China's nuclear-weapon development. For instance, what are the criteria for determining the scale of China's nuclear arsenal? Chinese experts usually give a very general response to such questions, as Xu Dongcheng and Liang Linlin did in saying that the country 'has always maintained its nuclear force at the minimum level required for national security.'"*

To overcome China's skepticism about transparency, initial proposals for bilateral U.S.-China transparency should not be overly complex (though they can be expanded over time if progress is made) and should consider capabilities of concern to both sides, looking beyond the two countries' nuclear programs. These could include:

- **Bilateral engagement and information exchanges on each country's nuclear modernization plans and the factors that could affect those plans moving forward.** The United States and China could agree to annual meetings and exchanges of information on their planned investments in nuclear modernization over, say, the coming 10-year period, with the information updated each year. This could help provide clarity on the trajectory of those plans and provide a forum for the two sides to explain the rationales motivating their planned investments and to express any concerns. The annual meetings to exchange data should include discussion among military planners and policymakers about the motivating factors behind each side's modernization plans, with a view to helping each side better understand the way the other perceives and reacts to the broader security environment.
- **Bilateral engagement and information exchanges on each country's plans for developing and deploying hypersonic delivery vehicles (whether nuclear, conventional, or dual-capable).** This is an area where each side has concerns about the other's activities, including whether such systems will be nuclear or conventionally armed and whether even conventionally armed systems could have implications for strategic stability. A regularized exchange of information along the lines envisioned above for nuclear programs could help provide clarity and avoid worst-case assumptions, while also providing a venue for more focused discussions about the potential stability and crisis management implications of hypersonic systems.
- **Information exchanges on planned deployments/capabilities of missile defense systems over a 10-year horizon, updated annually.** This exchange would be modeled on a proposal the United States reportedly made to Russia in 2013 to exchange annually specific information about missile defense deployments (including numbers of launchers and interceptors) and about projected deployments over the following decade. While neither side would be locked into those projections, the information could provide a benchmark for longer-term planning.

Confidence-Building Measures

Given the well-known concerns of each side about certain capabilities and/or systems, the United States and China could agree to a range of measures to enhance confidence and address concerns. These could take a variety of forms, including unilateral steps or voluntary political commitments. Some options include the following:

- **The United States could commit not to deploy ground-launched missiles (GLCMs or GLBMs), including hypersonic delivery vehicles, outside of the United States.** This commitment would be a modest show of restraint and could help ease fears that the United States intends to deploy INF-range nuclear systems in the Asia-Pacific region. There is no compelling strategic need to deploy INF-range systems in the region—particularly given U.S. air- and sea-based conventional assets in the region—and there is little indication that U.S. allies are eager to serve as basing locations for such systems.[25]

- **Agree not to conduct intercept tests against orbital objects.** While the United States and China have long been at odds on the issue of how to address the weaponization of space, a narrower agreement not to conduct kinetic intercept tests against orbital objects could more easily be defined and verified than broader prohibitions. The two countries also could seek to include India and Russia in such an agreement.

Given China's concern about the long-term trajectory of U.S. missile defense capabilities, a sustained improvement in the strategic relationship between the two countries will almost certainly require confidence-building steps related to missile defense and the broader offense-defense relationship. While U.S. domestic politics make formal limits on missile defense unlikely in the foreseeable future, there are relatively modest, practical measures the United States could offer as a step toward addressing Chinese concerns without diminishing U.S. security interests. The United States also should be prepared to discuss other issues emanating from the missile defense systems themselves, including Beijing's concern that the AN/TPY-2 radar system that supports Terminal High Altitude Area Defense (THAAD) could be used to track China's missile forces, potentially undermining its second-strike capability.

- **The United States could state explicitly that U.S. missile defenses are meant to defend against rogue state and regional ballistic missile threats, not to threaten China's strategic nuclear deterrence capabilities.** In addition, the United States could make clear that a reduction in the nuclear and missile threat posed by North Korea would reduce the need for U.S. missile defense capabilities. Such a clear linkage would not be unprecedented; President Obama made such a connection between Iran's nuclear and missile programs and U.S. missile defense capabilities in Europe during his 2009 Prague speech. However, such a statement would require careful coordination with U.S. allies in the region who have agreed to host U.S. missile defense capabilities, in particular Japan and South Korea.

Endnotes

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[12] See James L. Schoff and Li Bin, "A Precarious Triangle: U.S.-China Strategic Stability and Japan," Carnegie Endowment for International Peace, November 7, 2017. Available at: https://carnegieendowment.org/2017/11/07/precarious-triangle-u.s.-china-strategic-stability-and-japan-pub-74628.

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[17] Hans Kristensen and Matt Korda, "The Pentagon's 2020 China Report," Federation of American Scientists, September 1, 2020. Available at: https://fas.org/blogs/security/2020/09/the-pentagons-2020-china-report/.

[18] Charles A. Richard, "Statement of Charles A. Richard, Commander U.S. Strategic Command, Before the Senate Committee on Armed Services," February 13, 2020. Available at: https://www.armed-services.senate.gov/imo/media/doc/Richard_02-13-20.pdf.

[19] This engagement can—and should—include military participation from the United States and China. Existing U.S. law—as originally defined in the Fiscal Year 2000 National Defense Authorization Act (NDAA)—limits certain American-Chinese military-to-military contacts and exchanges, including those that cover the topics of "nuclear operations" and "military space operations," subjects that would inevitably be part of any strategic stability dialogue. While the law specifies that the prohibition is for exchanges or contacts that "would create a national security risk due to an inappropriate exposure" of the topics, and it can be argued that there is no such risk of exposure in a strategic stability dialogue, the legislation could still have a chilling effect that could prevent appropriate military-to-military dialogue. The U.S. Congress should reconsider this provision in future NDAAs to allow for dialogue that could strengthen transparency, stability, and security with China.

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[25] Congress could also play a role in advancing this step by reinstating the 2020 NDAA prohibition on the expenditure of any funds for procurement or deployment of ground-launched, INF-range missiles (conventional or nuclear).

Multilateral Steps to Reduce Nuclear Risks

Mark Melamed

While the U.S.-Russia and U.S.-China relationships remain the most likely—and most potentially dangerous—friction points among the five recognized nuclear weapon states, some aspects of global efforts to reduce the risk of use of nuclear weapons and make progress on arms control and non-proliferation require a multilateral approach.

Multilateral efforts among the five recognized nuclear weapon states (China, France, Russia, the United Kingdom, and the United States)—the so-called P5—cannot replace bilateral engagement between the United States and Russia and China, respectively, to reduce the risk of unintended escalation in those relationships. But the P5—and potentially other multilateral venues and approaches—can serve as a forum for dialogue, addressing issues that involve a broader range of states and advancing ideas for multilateral arms control and non-proliferation that will have to be a part of any long-term path toward nuclear disarmament.

The United States should seek to reenergize work in the P5 to strengthen the NPT and advance nuclear risk reduction and arms control objectives.

Although the results of the "P5 process" have been disappointing in some respects since its inception in 2009, the process has successfully broadened the discussion of nuclear issues beyond the traditional U.S.-Russia arms control process. China, in particular, has played an increasingly active role and sought to portray itself as a champion of the P5 process, the one setting where it is most willing to engage in discussions of nuclear policy and posture.

Additionally, there are key areas where multilateral nuclear risk reduction, non-proliferation, and arms control efforts have already proven productive, and others where, despite impediments, they remain the best path forward. In the former category are the Nuclear Non-Proliferation Treaty (NPT), as well as the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which, though not in force, has been signed by 185 states and ratified by 170 states and has contributed to the widely accepted norm against explosive nuclear testing. Efforts to negotiate a Fissile Material Cutoff Treaty (FMCT) fall in the second category. These efforts have not yet borne fruit, but a multilateral approach remains the only viable avenue for pursuing such an agreement.

Recommendations

The United States should seek to reenergize work in the P5 to strengthen the NPT and advance nuclear risk reduction and arms control objectives. This could include steps by the P5 to do the following:

- **Affirm their commitment to preventing the use of nuclear weapons.** This could be achieved through a joint declaration—or parallel unilateral declarations—reaffirming the Reagan-Gorbachev statement that "a nuclear war cannot be won and must never be fought." The P5 were reportedly

discussing a statement along these lines in early 2020; this effort should be continued, with the goal of adopting a clean reaffirmation of the Reagan-Gorbachev formulation. Such a statement would be more impactful if paired with sustained dialogue on reducing the risk of nuclear use, as described below.

- **Expand and deepen dialogue on nuclear issues.** Since 2016, the P5 have engaged in periodic exchanges on nuclear doctrine, and the group has made modest efforts on transparency, in particular through national reporting in the context of the NPT review process. Particularly given China's declared support for strengthening the P5 process, the P5 should seek to deepen established dialogues and initiate new discussions on key topics, including by these actions:
  - *Establishing a standing P5 working group dedicated to discussions of nuclear doctrine and posture.* Such a group should include interagency representation from all five P5 members and should agree on a workplan centered around regular discussions that would build on each other, rather than one-off annual events that generally fail to move beyond baseline talking points.
  - *Beginning a dedicated P5 dialogue on reducing the risk of use of nuclear weapons.* The P5 should lay out a risk reduction agenda that includes (a) surveying existing crisis prevention and crisis management mechanisms and procedures; (b) identifying gaps and shortcomings as well as potential pathways to conflict and escalation; and (c) developing ways to improve crisis management and reduce the risk of unintended escalation due to miscalculation and/or misperception. If successful, these efforts could serve as a foundation for discussions about possible P5 coordination in managing other potential crises, including from North Korea and/or the risk of a regional nuclear conflict in South Asia.
  - *Launching a P5 dialogue on strategic stability.* This work should be focused on establishing a baseline mutual understanding of each other's perceptions of strategic stability and the threats to building and maintaining such stability regionally and globally. This effort could build on the work the P5 have already done through their dialogue on doctrine as well as the P5 glossary of nuclear terms, which had a similar goal of establishing a shared foundation for further engagement. It will be important to define the scope and focus of this discussion to avoid duplicating bilateral discussions between the United States and Russia (and, eventually, the United States and China). But given the ways in which actions by any one of the P5 can affect the perceptions and thinking of other P5 states—particularly as new technologies introduce new uncertainty and complexity to the strategic landscape—a P5 discussion of strategic stability would be an important complement to bilateral efforts.
- **Increase transparency by publicly declaring their total warhead stockpiles and/or making unilateral political commitments not to exceed a specified numerical ceiling on total warhead numbers.** The P5 should commit to regular public declarations of their respective total warhead stockpiles, as the United States did as recently as 2018. An alternative or complementary step would be for the P5—including China, France, and the United Kingdom, which have significantly smaller stockpiles than the United States and Russia—to each publicly commit not to exceed specified numerical ceilings on their total warhead numbers (a step the United Kingdom has already taken). These would be unilateral or reciprocal political commitments, and the respective ceilings would differ for each country. All of these ceilings should be near or below each country's current numbers to discourage an arms build-up and facilitate further reductions by the United States and Russia.

- **Reaffirm their moratoria on nuclear testing and commit to work to bring the CTBT into force.** In addition to reaffirming the moratoria, the P5 should commit to consultations—and eventual transparency measures—aimed at addressing concerns about each other's activities related to nuclear testing. At some future date—and as appropriate—these efforts could be expanded to include other nuclear-armed states that also are observing moratoria on nuclear testing.
  - *In this context, China and the United States should establish a bilateral working group that would identify specific parallel, sequenced steps toward completing the CTBT ratification processes in Washington and Beijing.* Although CTBT entry-into-force is a multilateral challenge, the United States and China are the only two members of the P5 that have not ratified the treaty, and China has made clear that its ratification is tied to U.S. action on ratification. While this likely would be a long-term effort, given the need to build support for ratification in the U.S. Senate, bilateral engagement on sustaining the testing moratoria and building toward CTBT entry-into-force would help to build trust and lay out a path forward.
- **Declare a moratorium on the production of fissile material for use in nuclear weapons or other nuclear explosive devices.** Among the P5, only China has not yet declared such a moratorium. A P5 declaration along these lines would increase pressure on other key states—in particular, Pakistan—to follow suit and would be a critical step toward efforts to launch multilateral negotiations on a Fissile Material Cutoff Treaty (FMCT). It also could serve as the basis for returning to the "P5 plus" format (i.e., the P5 plus India and Pakistan), which was used in the early 2010s, primarily to discuss FMCT.

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About the Nuclear Threat Initiative

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