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The Future of U.S.-Russia Nuclear Arms Control

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Abstract: Nuclear arms control has long made contributions to U.S.-Soviet and U.S.-Russian security, but the current regime is at risk. The 1987 Intermediate-range Nuclear Forces Treaty may be headed for collapse. Both the United States and Russia are modernizing their strategic forces, and the fate of the 2010 New Strategic Arms Reduction Treaty is unclear. In the unlikely case that the sides are prepared to go beyond New START, there are ways to address further reductions and related issues. A collapse of the arms control regime, on the other hand, would mean the end of constraints on U.S. and Russian nuclear forces, a significant loss of transparency, and potential costs to U.S. security.

INTRODUCTION

Nuclear arms control has long made significant contributions to security and stability between the United States and Soviet Union, and later between the United States and Russia. Those contributions date back to the 1960s, when Washington and Moscow launched the first Strategic Arms Limitation Talks (SALT). The specific treaties and agreements resulting from the negotiations were valuable, as was the dialogue itself, which helped the sides come to a common understanding of terms such as strategic stability (a situation in which the sides do not have incentives to use nuclear weapons first in a crisis).

Unfortunately, the bilateral nuclear arms control is now at risk. After briefly recounting the history of nuclear arms control negotiations between Washington and Moscow, this paper examines the challenges to the regime, describes steps to preserve it, outlines measures that could build on the regime to achieve further reductions in nuclear weapons, and notes the potential costs to U.S. security should the regime collapse.

A SHORT HISTORY OF U.S.-RUSSIA NUCLEAR ARMS CONTROL

The SALT negotiations, launched in the late 1960s, produced two agreements in 1972. The Anti-Ballistic Missile (ABM) Treaty banned nationwide missile defenses and limited the United States and Soviet Union each to two ABM deployment sites, each with no more than 100 missile interceptor launchers (a 1974 protocol limited each side to a single deployment site of no more than 100 launchers). The second agreement, the Interim Offensive Agreement, limited each side to the number of intercontinental ballistic missile (ICBM) silos existing as of July 1, 1972 and limited each side to the number of submarine-launched ballistic missile (SLBM) launch tubes on ballistic missile submarines existing or under construction as of May 26, 1972.

As a result of the Interim Offensive Agreement, the Soviet Union was permitted a larger number of ICBM and SLBM launchers. This was offset by the fact that the United States had begun the process of putting multiple-independently targetable reentry vehicles (MIRVs) on its missiles, so that the Minuteman III ICBM, for example, could carry three warheads instead of one. The Interim Offensive Agreement also did not constrain strategic bombers, an area of American advantage.

Negotiations began soon thereafter on a SALT II Treaty. They concluded in 1979, producing a treaty that limited each side to no more than 2,250 strategic nuclear delivery vehicles, defined as ICBM launchers, SLBM launchers and strategic bombers. Sublimits constrained the number of MIRVed ballistic missile launchers.

The Interim Offensive Agreement and the SALT II Treaty limited the numbers of launchers (with SALT II including strategic bombers), but neither agreement constrained warheads. Over the course of the 1970s and 1980s,

both sides significantly increased the numbers of their strategic nuclear weapons by placing MIRVs on their ICBMs and SLBMs and placing air-launched cruise missiles (ALCMs) on their strategic bombers.

TABLE 1: Operational U.S. and Soviet Strategic Offensive Forces, 1974¹

Type of forces	U.S.	USSR
ICBM launchers	1,054	1,575
SLBM launchers	656	660
Intercontinental bombers	496	140

TABLE 2: U.S. and Soviet Strategic Offensive Launchers, 1979²

Type of forces	U.S.	USSR
ICBM launchers	1,054	1,398
MIRVed ICBM launchers	550	608
SLBM launchers	656	950
MIRVed SLBM launchers	496	144
Heavy bombers	573	156
Heavy bombers equipped to carry ALCMs	3	0

SALT II never entered into force. The Carter administration withdrew it from consideration after the discovery of a Soviet combat brigade in Cuba and the Soviet invasion of Afghanistan led to a downturn in U.S.-Soviet relations. President Reagan took office in 1981 having called SALT II “fatally flawed,” but his administration pursued a policy of not undercutting the SALT II limits until 1986.

The period 1987-1992 saw major breakthroughs on nuclear arms reductions. Following the U.S. deployment in Europe of Pershing II ballistic missiles and ground-launched cruise missiles (GLCMs) to counter the Soviet SS-20 MIRVed ballistic missile, the United States and Soviet Union concluded the Intermediate-range Nuclear Forces (INF) Treaty in 1987. That treaty banned all U.S. and Soviet ground-launched ballistic and cruise missiles with ranges between 500 and 5,500 kilometers, including the Pershing IIs, GLCMs and SS-20s. By 1991, the two countries had destroyed some 2,700 missiles pursuant to the treaty.

Washington and Moscow concluded the Strategic Arms Reduction Treaty (START, later referred to as START I) in 1991. That treaty limited each side to no more than 6,000 accountable warheads on no more than 1,600 ICBM launchers, SLBM launchers and strategic bombers. START I required both sides to reduce both strategic nuclear delivery vehicles and total accountable warheads (each side was estimated to have about 10,000 strategic warheads at the end of the 1980s). Following the collapse of the Soviet Union at the end of 1991, Russia, Belarus, Kazakhstan and Ukraine agreed in the May 1992 Lisbon Protocol to take on the Soviet START I obligations. The latter three also agreed to eliminate all of the nuclear weapons on their territory, leaving Russia as the only nuclear weapons state in the post-Soviet space.

TABLE 3: U.S. and Soviet Strategic Offensive Forces, 1990³

Type of forces	U.S.	USSR
Deployed ICBM launchers	1,000	1,398
Warheads attributed to ICBM launchers	2,450	6,612
Deployed SLBM launchers	672	940
Warheads attributed to SLBM launchers	5,760	2,804
Deployed heavy bombers	574	162
Warheads attributed to heavy bombers	2,353	855
Total launchers and bombers	2,246	2,500
Total warheads attributed to launchers and bombers	10,563	10,271

In addition to formal agreements, the United States, Soviet Union and, in 1992, Russia undertook unilateral measures—referred to as the presidential nuclear initiatives—to reduce nuclear arms. Those initiatives reduced thousands of nuclear weapons, particularly non-strategic nuclear weapons not covered by START I or the INF Treaty.

The United States and Russia concluded the START II Treaty in early 1993. That agreement limited each side to no more than 3,000-3,500 accountable strategic warheads and banned heavy ICBMs and MIRVed ICBMs. The treaty, however, became entangled in U.S.-Russian differences over issues such as missile defense and NATO military action against Serbia in 1999. It never entered into force.

The George W. Bush administration took office in 2001 with a different approach to arms control. Wanting to deploy a national missile defense in a manner that would not be consistent with the ABM Treaty, the administration withdrew from the treaty in 2002. Although the Bush administration had little interest in formal limitations on strategic offensive forces, the president acceded to a request from Russian President Putin, and, following a short negotiation, the United States and Russia concluded the Strategic Offensive Reductions Treaty (SORT) in May 2002. The treaty limited each side to no more than 1,700-2,200 operationally deployed strategic warheads, but it contained no agreed definitions, counting rules or verification measures; as a result, it was unclear whether the two sides even counted the same weapons under the limit. (The START I Treaty, however, was still in effect until December 2009.)

TABLE 4: U.S. and Russian Strategic Offensive Forces, July 2009⁴

Type of forces	U.S.	Russia
Deployed ICBM launchers	550	465
Warheads attributed to ICBM launchers	1,600	2,001
Deployed SLBM launchers	432	268
Warheads attributed to SLBM launchers	3,264	1,288
Deployed heavy bombers	206	76
Warheads attributed to heavy bombers	1,052	608
Total launchers and bombers	1,188	796
Total warheads attributed to launchers and bombers	5,916	3,897

President Obama sought to accelerate nuclear arms reductions and, in 2009, laid out a vision for a world without nuclear weapons. He also made clear that much had to happen first and that, as long as nuclear weapons existed, the United States would maintain a safe, secure and effective nuclear deterrent. In May 2010, the United States and Russia concluded the New START Treaty (sometimes referred to as START III in Russia). That treaty limits the United States and Russia each to no more than 1,550 deployed strategic warheads on no more than 700 deployed strategic delivery vehicles. A deployed warhead is a warhead on a deployed ICBM or SLBM; each deployed strategic bomber is accounted as one deployed warhead. (Deployed ICBMs and SLBMs are ballistic missiles in silos or submarine launch tubes or on mobile ICBM launchers.) The treaty also constrains each side to no more than 800 deployed and non-deployed ICBM and SLBM launchers and strategic bombers (non-deployed ICBM and SLBM launchers are launchers that contain no missiles). New START entered into force in February 2011. Its limits take full effect in February 2018, and it has a term of ten years—that is, until February 2021. The treaty can be extended by up to five years by agreement by the sides.

TABLE 5: U.S. and Russian Strategic Forces under New START, March 2017⁵

Type of forces	U.S.	Russia
Deployed ICBMs, deployed SLBMs and deployed heavy bombers	673	523
Warheads on deployed ICBMs and SLBMs, and warheads counted for deployed heavy bombers	1,411	1,765
Deployed and non-deployed launchers of ICBMs and SLBMs, and deployed and non-deployed heavy bombers	820	816

TABLE 6: Planned U.S. Strategic Forces, 2018

Type of system	Deployed Strategic Delivery Vehicles	Deployed & Non-Deployed Launchers & Bombers
Minuteman III ICBMs	400	454
Trident II D-5 SLBMs	240	280
B-2/B-52H bombers	60	66

The two agreements currently governing U.S. and Russian nuclear weapons are the INF Treaty and New START. The Obama administration sought to go beyond New START and achieve further reductions, proposing a new round of U.S.-Russian negotiations that would include not just deployed strategic warheads but also non-strategic nuclear weapons and reserve strategic warheads, opening a possibility that the two countries might discuss their entire nuclear stockpiles. Russia, however, declined to negotiate on further reductions, raising instead its concerns about issues such as U.S. missile defense (particularly in Europe), advanced conventional strike weapons and third-country nuclear forces. Whether these issues are genuine concerns or a Russian pretext not to engage in further nuclear arms cuts is unclear; it is probably a mixture of both.

THE INF TREATY IN PERIL

By 2017, the overall U.S.-Russian relationship had fallen to its lowest point since the end of the Cold War. The countries differed sharply over issues such as Russia's aggression against Ukraine and the conflict in Syria. Moscow has adopted a more threatening rhetoric, including nuclear saber-rattling, and the number of encounters between NATO and Russian military aircraft and warships has increased dramatically. Moreover, many quarters in the United States remain unhappy about Russian interference in the 2016 presidential election. Arms control is possible when political relations are strained, but it is difficult.

An urgent question is the fate of the INF Treaty. Russia assumed the Soviet INF Treaty obligations following the collapse of the USSR in 1991 (as did Belarus, Kazakhstan and Ukraine). In 2007, senior Russian officials began to express concern about the treaty, noting that it banned the United States and Russia from having intermediate-range missiles, while third countries were beginning to acquire them in significant numbers. Those countries included China, North Korea, India, Pakistan, Iran and Israel—all closer to Russia than the United States.

Given the large number of Russian strategic forces and other nuclear weapons not constrained by the INF Treaty, it was unclear why Moscow needed intermediate-range missiles to counter third countries. In late 2007, the Russians proposed to multilateralize the treaty, an idea briefly endorsed by the United States, but the idea gained no traction with third countries.

In 2014, the Obama administration charged Russia with violating the treaty by developing a prohibited ground-launched cruise missile (press reports indicated that the Russians had tested the missile). The administration sought to bring Moscow back into full compliance with the treaty but reported no progress. In early 2017, press reports alleged that Russia had begun deploying the intermediate-range GLCM. In March, the vice chairman of the Joint Chiefs of Staff confirmed that.

The charge apparently concerns an extended range version of the SSC-7 (Iskander K) cruise missile. (The Iskander K has a range of less than 500 kilometers and thus is unconstrained by treaty.) The extended range missile is reportedly called the SSC-8.

Moscow consistently denies any violation of the INF Treaty. The Russians claim that U.S. officials have not provided specific information to back up the American charge. U.S. officials state that the Russians have received enough information so that they could understand the charge. (Apparently due to concerns about protecting sources and methods, Washington has not released all of the information that it has collected regarding the violation.)

For its part, Moscow levels three charges regarding U.S. violations of the INF Treaty, some of which date back many years. First, the Russians assert that ballistic missiles used as targets in U.S. missile defense tests are intermediate-range ballistic missiles prohibited by the treaty. Second, they claim that armed, unmanned aerial vehicles (drones) are in effect GLCMs banned by the treaty. Third, the Russians charge that the Mk-41 vertical launch system used for the "Aegis Ashore" SM-3 missile interceptor site in Romania (and to be made operational in Poland in 2018) could launch intermediate-range cruise missiles as well as SM-3 interceptor missiles.

Obama administration officials rejected the Russian charges. They allowed, however, that, if Moscow were to address the Russian violation in a serious manner, the U.S. government would be prepared to consider measures to assuage Russian concerns, such as transparency visits to the SM-3 interceptor site.

The Trump administration is reviewing the INF Treaty issues. One question for it to consider is whether to continue to seek to bring Russia back into compliance, a more difficult challenge now that Russia has moved from testing to deploying its GLCM. That may not be possible, but maintaining the treaty would appear to be in the U.S. interest, particularly as the Pentagon has no formal requirement for an intermediate-range missile and no plans to build one. In any case, it would be unwise for the United States to withdraw at this point. Given the limited information available on the Russian violation, Washington could end up getting the blame for the treaty's demise, while Moscow would be free to deploy intermediate-range missiles, perhaps adding a ballistic missile in the 500-5,500 kilometer range band.

Bringing Russia back into compliance requires that the United States develop some leverage with Moscow. This could consist of military and/or diplomatic steps.

Certain military steps make sense in any case. The Pentagon needs to explore what measures can be taken to defend against cruise missiles. Even if Russia reverses its deployment of the intermediate-range GLCM, it is beginning to replicate U.S. deployments of conventionally-armed air- and sea-launched cruise missiles. Third countries are also beginning to develop cruise missile capabilities.

Some—including members of Congress—have suggested that the United States develop its own intermediate-range missiles as a counter to the Russian GLCM. The prospect of a U.S. Pershing III or new GLCM in Europe could give the Kremlin pause and remind the Russians how much they did not like American intermediate-range missiles in Europe in the 1980s.

Before proceeding down this path, however, the administration and Congress should consider two questions. First, can the Pentagon budget, already facing many competing demands, afford new intermediate-range missiles? Second, if the missiles were built, would NATO agree to deploy them? NATO fell into crisis over deploying U.S. missiles in 1983, and there is no reason to think that today's alliance would be any more unified on the question. Intermediate-range missiles in the United States pose no threat to Russia.

A second option would be to position in the European area conventionally-armed weapons systems that are not prohibited by the INF Treaty. For example, the U.S. Air Force could deploy conventional B-52 or B-1 bombers periodically to Fairford Air Base in Britain and stockpile Joint Air-to-Surface Standoff Missiles (JASSMs) there for potential use by the bombers. The U.S. Navy could increase the cruises of surface ships and submarines carrying sea-launched cruise missiles in the northern European area. Calls by the USS Florida or USS Georgia—converted Trident submarines each capable of carrying up to 154 sea-launched cruise missiles—in ports around the North Sea would get the Kremlin's attention. The U.S. Navy might even consider home-porting warships with sea-launched cruise missiles in Europe.

These measures, since they do not contravene the INF Treaty, would likely be more acceptable in Europe. They would be cheaper and could be taken more quickly than building new intermediate-range missiles. The measures could be reversed if Russia ceased its violation of the treaty.

Washington should also consider diplomatic steps. The Russian violation is a treaty issue between Washington and Moscow, but Russian intermediate-range GLCMs cannot reach the United States (Alaska might be at some risk, but only if the Russian military deployed missiles where it has not done so in the past). As with the SS-20 in the 1970s and 1980s, the direct threat is to the countries of Europe and Asia.

The U.S. government should engage its allies in NATO and in the Far East, friends such as Sweden and Finland, and other countries such as China, inform them about the details of the Russian violation, and point out that they are potential targets of the new missile. The goal should be to multilateralize the problem—that is, to increase pressure on Moscow from third countries who should not want to see a new threat to their security. Would this suffice to change the Kremlin's calculation? That is an unknown. But having countries other than just the United States complain to Russia about the violation—preferably at senior levels—would increase the prospects that Moscow might reconsider.

If there were political decisions in Washington and Moscow to address the other side's concerns in a serious way and preserve the INF Treaty, solutions could be found to the violations that each has charged, restoring full compliance with the treaty.

The Special Verification Commission (SVC) was established by the treaty to handle, among other things, concerns about compliance. That is the forum for technical-level talks that could work out solutions to the compliance concerns. Although the SVC includes Belarus, Kazakhstan and Ukraine (also successor states to the Soviet Union as regards the INF Treaty), their presence should not hinder the main work between U.S. and Russian experts.

A starting point for addressing the U.S. charge that Russia has deployed an intermediate-range ground-launched cruise missile would be for the SVC to work out the procedures for an exhibition of the SSC-8 to U.S. experts and a briefing regarding the missile's characteristics and capabilities, especially its range. A particular issue would be the capacity of the missile's fuel tanks. One possibility is that the U.S. experts would be satisfied that the missile was not a treaty violation. (This has an antecedent: in the 1980s, the U.S. government charged the Soviet Union with violating the Threshold Test Ban Treaty by conducting nuclear tests with yields in excess of 150 kilotons. The sides conducted a joint verification experiment in 1988, which entailed on-site monitoring of a Soviet nuclear test. That led to a revision of U.S. algorithms and the conclusion that earlier Soviet tests had not exceeded the 150-kiloton limit.)

If the exhibition did not resolve the question, the issue could be returned to the SVC. U.S. and Russian experts there could consider further steps. Of course, if the exhibition (or subsequent agreed measures) showed that the

SSC-8 had a range of between 500 kilometers and 5,500 kilometers, Russia would have to destroy all missiles and their associated launchers. The INF Treaty spelled out measures to accomplish this, though the SVC might have to review and consider whether those measures needed adaptation.

The SVC likewise would work out procedures for addressing Russian concerns about U.S. compliance. The INF Treaty has a provision that, in effect, allows ballistic missiles that might be of intermediate range to be used as targets in missile defense tests. Presumably, this would be of interest to the Russian military, which may want to test its missile defenses against targets that might otherwise be regarded as prohibited intermediate-range ballistic missiles. Experts in the SVC could craft language that would make clear the distinction between permitted target missiles and prohibited intermediate-range missiles. Additional measures might limit the number of target missiles each side had at any one time and/or constrain them to declared sites associated with missile defense tests.

The difference between a cruise missile, which flies from point A to point B and detonates on the target, and an armed unmanned aerial vehicle, which flies from point A to point B, where it releases a weapon before returning to point A or flying on to point C, seems obvious. However, experts in the SVC could develop language to clarify the difference between prohibited ground-launched cruise missiles and permitted armed unmanned aerial vehicles.

Of the three Russian charges of U.S. violations, the charge concerning the Aegis Ashore appears to have the most substance. Aegis Ashore utilizes the Mk-41 vertical launch system to launch SM-3 missile interceptors. The Russians argue that Mk-41 vertical launch systems on U.S. Navy warships can launch other weapons, including sea-launched cruise missiles and the SM-6, an air defense missile that is being given a secondary surface-to-surface mission.

One way to address the Russian concern would be to modify the Mk-41 vertical launch systems on land so that they were observably different from those on warships; ideally, this would be a functionally-related observable difference rather than a cosmetic one. A second way to address the concern would be for the SVC to work out procedures—which would then require the approval of Romania and Poland—under which Russian experts could periodically visit the Aegis Ashore sites and randomly specify one or two of the 24 Mk-41 launch tubes to be opened to confirm that they held SM-3 missile interceptors, not missiles of some other type.

Working out the procedures and language to resolve the sides' compliance concerns would not be easy and would require political guidance from capitals to SVC experts to find workable solutions. That said, these solutions offer a way to preserve the treaty—provide there are political decisions to do so in Moscow and Washington.

STRATEGIC MODERNIZATION PROGRAMS AND NEW START

Another potential challenge to the U.S.-Russian nuclear arms control regime is that both countries are conducting or on the verge of conducting major programs to modernize all three legs of their respective strategic triads.

Russia is well along in its program. Among other things, it is building the new Borey-class ballistic missile submarine, the Bulava SLBM and the SS-27 ICBM. The Russians are developing a new heavy ICBM—the Sarmat—as a successor the SS-18 and plan to reopen the production line for the Tu-160 Blackjack bomber.

While the Russian strategic modernization program is substantial, much of what the Russians are doing is replacing old weapons with new weapons. Due to the economic contraction that followed the collapse of the Soviet Union in 1991, Russian strategic forces received only limited funding in the 1990s and early 2000s. Had funds been available, Russia likely would have replaced some of its older systems earlier. The current Russian modernization program, moreover, appears sized to fit within the limits of the New START Treaty.

The more worrisome aspects of Russian nuclear policy have to do with the modernization of non-strategic nuclear arms and nuclear doctrine. Russia still maintains a panoply of ground-, air- and sea-based non-strategic nuclear weapons, while the U.S. non-strategic nuclear arsenal contains only the B61 gravity bomb. The modernization of its non-strategic nuclear arsenal, doctrinal questions and loose talk about nuclear weapons by Russian officials have raised concern in the West that Russia may be lowering its threshold for nuclear use.

The U.S. strategic modernization program will accelerate in the 2020s and, like the Russian program, largely consists of replacing old weapons with new. In the next decade, the Pentagon plans to be building the Columbia-class ballistic missile submarine, a new ICBM (referred to as the ground-based strategic deterrent), the B-21 strategic bomber and the long-range standoff option (LRSO—a new nuclear-armed air-launched cruise missile). In addition, the U.S. Navy will continue its life extension program for the Trident II SLBM.

The U.S. program appears sized to fit within the limits established by New START. The B61 gravity bomb is going through a life extension and modernization program, which will result in a single variant for use by strategic

bombers and dual-capable aircraft such as the F-35 (dual-capable aircraft can carry nuclear weapons or conventional ordnance).

Some have questioned the size of the planned U.S. program, asking whether the United States needs and can afford to build 12 Columbia-class ballistic missile submarines and a force of 400 deployed ICBMs. The U.S. military plans to have a force of 700 deployed SLBMs, ICBMs and bombers under New START, where a lower number could—at some cost in flexibility—still carry 1,550 deployed strategic warheads and result in significant cost savings.

Particular questions have arisen about the LRSO. The U.S. Air Force developed nuclear-armed air-launched cruise missiles in the 1970s because of concern that the B-52 could not penetrate advanced Soviet air defenses. The B-21, however, supposedly will have advanced stealth and electronic warfare capabilities that should allow it to defeat sophisticated air defenses, which would appear to weaken the case for the LRSO.

The Trump administration's view on these issues is not yet known. Secretary of Defense Mattis has expressed support for new ballistic missile submarines and ICBMs as well as for the B-21 bomber, but he has said that he wants to review the requirement for the LRSO. The Trump administration has launched a nuclear posture review and a ballistic missile defense review, which may be completed by the end of 2017. The likelihood that the administration will choose to reduce the planned modernization program appears to be low absent a new arms reduction agreement or major budget problems for the Department of Defense. While some non-governmental experts have called for eliminating the ICBM leg of the triad, the nuclear posture review almost certainly will reaffirm that the three legs should be maintained.

Each leg of the triad has its advantages. SLBMs on board ballistic missile submarines at sea are the most survivable leg, and they carry the largest portion of U.S. deployed strategic warheads. ICBMs provide a hedge against an anti-submarine warfare breakthrough and confront a potential adversary with the fact that attacking the ICBMs would require pouring hundreds of nuclear warheads into the American heartland, guaranteeing a U.S. nuclear response. Bombers can be used in conventional operations and can be used for signaling purposes, e.g., the overflight of strategic bombers over South Korea sends a message to Pyongyang.

President Trump's late January phone call with President Putin raised concern about the status of New START; Mr. Trump reportedly did not know what the treaty was and then dismissed it as a bad deal. Just a few weeks later, however, the commander of Strategic Command and vice chairman of the Joint Chiefs of Staff made clear that the U.S. military supports and wants to preserve New START. (In addition to the caps on Russian strategic forces, the U.S. military appreciates the information that New START provides in semi-annual data exchanges, notifications and the right to conduct up to 18 inspections per year in Russia.)

A White House official in June said the United States is on track to meet the New START limits by the February 2018 deadline and assessed that Russia likewise will be within the limits by that date. As for the question of extending New START by up to five years after its 2021 expiration date, the U.S. government likely will consider that question after completion of the nuclear posture review.

The U.S. military likely will favor extension, and Moscow traditionally prefers to have some cap on U.S. strategic nuclear forces. The extension question thus may turn on views elsewhere in the Trump administration. Congress may also have a view, though Congressional approval is not required for extension. Should there continue to be questions regarding Russian compliance with the INF Treaty, or if that treaty has collapsed, that could decrease the likelihood of New START extension.

GOING BEYOND NEW START?

While it may appear unlikely that the Trump administration would seek to negotiate reductions going below New START levels, the possibility should not be totally discounted. Further nuclear reductions, properly structured, could have advantages for the United States.

Reductions would reduce nuclear risk and the number of nuclear weapons that might be targeted at the United States. A well-designed agreement could result in force structures that were more stabilizing. Reductions could result in substantial cost savings. They would demonstrate U.S. commitment to disarmament and the Non-Proliferation Treaty—an important point for non-nuclear weapons states.

It should be noted, however, that resolution of compliance concerns related to the INF Treaty would almost certainly be a precondition for any negotiation of further reductions.

Secretary of State Tillerson and Russian Foreign Minister Lavrov have agreed in principle on resuming strategic stability talks, though the details remain to be worked out. Ideally, those talks will be wide-ranging. They may have

value even if they do not produce negotiations aimed at specific agreements, in that they can help the sides better understand the other's concerns and motivations.

If the U.S. government were interested in seeking further nuclear reductions, including non-strategic nuclear weapons and reserve strategic warheads, one approach would seek to negotiate a single aggregate limit that would cover all U.S. and Russian nuclear weapons (with the possible exception of those in the elimination queue, which could be covered by a different regime).

For example, the sides might agree that each could have no more than 2,200 total nuclear weapons—approximately half of what each side is believed to have at present. Within that aggregate limit of 2,200, there could be a sublimit of no more than 1,000 deployed strategic warheads. Above the 1,000 sublimit, each side would be free to choose its mix of non-strategic nuclear weapons and reserve strategic warheads within the overall limit of 2,200.

As for limits on delivery vehicles, the sides could seek to reduce the limit on deployed strategic delivery vehicles from New START's 700 to no more than 500. Given that most delivery vehicles for non-strategic nuclear arms are dual-capable, it would be best not to try to constrain such systems.

Such a treaty would require more intrusive verification measures than New START, in particular for monitoring the number of nuclear weapons not on deployed strategic delivery vehicles, e.g., at storage sites. Negotiating such measures would prove difficult but perhaps not insurmountable, if all non-deployed nuclear weapons were restricted to declared storage sites.

Such a regime might hold some interest for the Russians. First, it does not appear that they will deploy 700 strategic delivery vehicles as allowed by New START; many projections suggest they will be at 500-550. Reducing the limit on deployed strategic delivery vehicles down to 500 thus would eliminate a U.S. numerical advantage. Second, the lower number of permitted deployed strategic delivery vehicles would reduce the current U.S. advantage in "upload" potential. Most U.S. SLBMs and ICBMs have been "downloaded" so that they carry fewer warheads than they are capable of carrying. Since the United States maintains a large number of reserve strategic warheads, if New START broke down or if there was a major crisis, the U.S. military could upload warheads on to its SLBMs and ICBMs, significantly increasing the total number of deployed strategic warheads.

However, these points alone might not be sufficient for the Russian side. If—and it very much remains an "if"—question—the Trump administration desired to seek further nuclear arms reductions, it would likely need to address at least some Russian concerns on issues such as missile defense and precision-guided conventional strike.

Missile defense has long been a problematic issue on the U.S.-Russia agenda. Curiously, Moscow seems to be more concerned about the deployment in Europe of U.S. SM-3 missile interceptors, which lack the velocity and are ill placed to defend against Russian strategic ballistic missile warheads, than about the ground-based mid-course defense, which deploys ground-based interceptors in Alaska and California designed to defend against strategic ballistic missile warheads.

In any event, were the Trump administration to want to pursue a negotiation with Russia on additional nuclear reductions beyond those required by New START, it likely would have to take some steps in the area of missile defense.

One step might be to reiterate the U.S. offer, made in 2013, of an executive agreement on transparency regarding missile defense. The Obama administration proposed that the United States and Russia annually exchange data that, for key elements of missile defenses (e.g., missiles, launchers and radars) would specify the current number and the number projected for each year for the succeeding ten years. The idea underlying this proposal was to share sufficient information so that each side could understand whether the other's missile defenses posed a threat to its strategic offensive forces. If it saw such a threat emerging, it would have sufficient time to take compensatory measures.

A second step might entail a cap on the number of SM-3 interceptors to be deployed in Europe. Right now, the European phased adaptive approach is open-ended as to numbers, though the current plan is for 24 interceptors each in Romania and Poland, in addition to those on U.S. warships operating in European waters. The U.S. government could consider, after consultation with NATO, articulating to the Russians the maximum number of SM-3 interceptors it would deploy in the European area. It could, of course, add a caveat: the level might have to change if there were a dramatic change in the missile threat to Europe.

Another step to consider is altering the European phased adaptive approach. The Joint Comprehensive Plan of Action limits Iranian nuclear capabilities, not its ballistic missile program. However, an Iranian ballistic missile with a conventional warhead poses a significantly lesser threat than one with a nuclear warhead. The U.S. government could consider, after consultation with NATO and, in particular, with Poland, completing work on the SM-3 site in Poland but not deploying SM-3 interceptors there, again provided that there was no dramatic change in the missile threat to Europe. (The United States in that case should consider deploying some other military capability in Poland with at least the same number of personnel.)

These three steps could move in the direction of addressing Russia's expressed concern about missile defense in Europe. That said, it is difficult to see the Trump administration embracing such ideas and, if it did, Congressional Republicans might express concern.

If there were a serious discussion of missile defense, Moscow would have to give up its demand for legally-binding limits—that is, a treaty. The current political reality in Washington is that no treaty that limited U.S. missile defenses—even if the limits did not affect U.S. programs in any meaningful way—would have a chance of receiving consent to ratification in the Senate.

A second area that would likely have to be addressed in the context of additional reductions of nuclear arms would be precision-guided conventional strike weapons. The Russians have expressed concern about such systems, with some analysts fearing that the United States might be tempted in a crisis to strike Russian strategic targets with conventional weapons, hoping that it could do so without risking nuclear retaliation.

Were the United States (or Russia, for that matter) to decide to place conventional warheads on ICBMs or SLBMs, those warheads would be captured by New START's limit of 1,550 deployed strategic warheads. That limit makes no distinction between nuclear and conventional warheads.

Both the United States and Russia are working on hypersonic glide vehicles (HGVs). These are launched by a ballistic missile but do not fly a ballistic trajectory and hence are not captured by New START's definitions and limits. HGVs instead dive back down and "glide" at high speeds along the upper reaches of the atmosphere. If successfully developed, HGVs would prove to be expensive means for delivering conventional weapons to long-range targets; indeed, the Obama administration described such weapons as filling a "niche" need. Small numbers might make long-range HGVs susceptible to limitation in the context of a new agreement reducing nuclear arms. U.S. and Russian officials have a chance to discuss possible constraints on these systems before they are fully developed or deployed.

The tougher near-term challenge will be conventionally-armed air- and sea-launched cruise missiles. The United States deploys these in large numbers, and Russia now deploys comparable systems. Both militaries likely regard these weapons as key elements of their power projection capabilities, and they would be very difficult to limit. However, as a starting point, U.S. and Russian officials might begin a dialogue on conventionally-armed air- and sea-launched cruise missiles and their impact on the nuclear balance between the two countries.

Russian officials have also called for the inclusion of third-country nuclear forces in any future nuclear arms reduction agreement. This would prove difficult. Just starting with Britain, France and China, the disparity in nuclear weapons numbers between those countries and the United States and Russia is so large as to make negotiation of equal limits an impossible task. That may be why Russian officials, who call for a multilateral negotiation, have never offered a proposal for how such a multilateral nuclear arms control agreement would be structured.

A more plausible way to address this issue would be for the United States and Russia, in the context of a new bilateral nuclear arms reduction agreement, one that ideally would include all their nuclear weapons, to ask Britain, France and China to undertake unilateral, politically-binding commitments. In those commitments, each of the three countries would undertake not to increase the total number of its nuclear weapons so long as the United States and Russia were implementing their agreement on nuclear reductions. Such an approach would begin to bring Britain, France and China into the nuclear arms limitation process while pushing off the day of a difficult multilateral negotiating attempt. The U.S.-Russian agreement might also contain a provision allowing an opt-out of further reductions were a third-country to dramatically increase its nuclear weapons numbers in a manner that endangered U.S. or Russian security.

These kinds of ideas on missile defense, precision-guided conventional strike weapons and third-country nuclear forces could offer a means to bridge the differences between stated U.S. and Russian positions if Washington were to seek to negotiate further nuclear reductions. The main question, of course, is whether these ideas would prove of interest to the Trump administration or to the Kremlin.

COMPREHENSIVE TEST BAN TREATY

A related area that the U.S. government could move on is ratification of the 1996 Comprehensive Test Ban Treaty (CTBT), which bans all nuclear testing. The Senate failed to give consent to ratification in 1999, due to two major concerns: the U.S. ability to maintain a reliable nuclear stockpile absent nuclear testing, and questions about whether the United States could be sure that other countries were not cheating.

There are very good answers to these questions today. The Stockpile Stewardship Program, launched in the mid-1990s, has developed techniques that have allowed the directors of the national nuclear labs and the commander

of Strategic Command to certify that the stockpile is reliable. Testing is not needed. In fact, using some of the new technologies, the labs have learned things about how nuclear weapons work that they did not understand when conducting a nuclear testing program.

As for verification, there have been improvements in U.S. national technical means, and the CTBT Organization has established a global monitoring system, comprising some 300 stations with sensors to detect nuclear tests in the atmosphere, in the ocean or underground. It is believed that that system can detect underground tests down to one kiloton and, in some geologies, down to .1-.2 kilotons. All of the North Korean nuclear tests were detected and quickly reported to the CTBT Organization by multiple stations.

Other reasons argue for the United States to ratify the CTBT. First, for political reasons, it is very difficult to see a resumption of nuclear testing at the Nevada National Security Site (formerly the Nevada Test Site). Nevada fought strongly against the storage of nuclear waste at the site, and the city of Las Vegas—located about 60 miles south—has almost three times the population now as it had in 1992, when the last nuclear test was conducted.

Second, the United States has conducted more nuclear tests than the rest of the world combined and gained a great deal of knowledge from those tests. It now has the most sophisticated system for ensuring the reliability of its nuclear weapons without having to test. In these circumstances, freezing the ability of others to test, to gain new knowledge about nuclear weapons, and perhaps to build more advanced nuclear weapons would lock in a U.S. advantage.

All that said, Senate Republicans have shown no enthusiasm for the CTBT, and the chances that the Trump administration would pursue ratification appear slim.

COSTS OF A COLLAPSE OF THE NUCLEAR ARMS CONTROL REGIME

As noted above, steps could be taken to improve upon the nuclear arms control regime. However, prospects for significant new progress do not appear high. Preservation of the existing arms control regime—primarily the INF and New START treaties—may be the best that can be hoped for until there is a substantial change in the political atmospherics between Washington and Moscow. Just maintaining the existing regime, particularly the INF Treaty, may not be easy.

As it thinks through how it plans to handle nuclear arms control and related issues, the U.S. government should consider what would happen were the nuclear arms control regime to break down, that is, if the INF Treaty collapsed and New START not extended beyond 2021. That would mean that, for the first time in nearly 50 years, there would be no negotiated agreements governing the nuclear relationship between the United States and Soviet Union/Russia. That could raise significant costs and risks for U.S. security.

The end of New START would mean the end of the transparency measures contained in that treaty—the semi-annual data exchanges, notifications and inspection opportunities. Replacing the information gained through those measures would cost many billions of dollars, and it might not be possible to gain some kinds of information—such as the number of warheads on individual Russian ICBMs and SLBMs—through U.S. national technical means. The U.S. government would have to go back to worst-case assumptions regarding Russian nuclear forces, which invariably would lead to more expensive decisions about how to equip and operate U.S. nuclear forces.

Moreover, the United States would lose the caps that constrain the overall level of Russian strategic nuclear forces. That might not automatically trigger a new arms race; cost considerations, for example, could be a factor for both. However, the end of New START would mean that the sides' militaries no longer were bound by the treaty's limits. Likewise, the end of the INF Treaty would allow the Russians to deploy unlimited numbers of intermediate-range GLCMs and ballistic missiles against American allies and friends in Europe and Asia and against U.S. forces in those areas. A new arms race could be possible.

A new arms race could raise several questions. As numbers grew, there would also be greater uncertainty. Would U.S. allies support a U.S. build-up, and, for that matter, would Democrats in Congress support funding for a larger nuclear arsenal?

The Russians would not face these kinds of questions and likely could add nuclear weapons more cheaply than could the United States. Indeed, engaging in a nuclear arms race might mean competing in an area where Russia has a comparative advantage, as opposed to other areas, such as advanced conventional strike weapons, where the comparative advantage lies with the United States.

The end of the nuclear arms control regime would also have negative consequences for the Non-Proliferation Treaty, where non-nuclear weapons states would take it as one more indicator that the nuclear weapons states are not serious about their NPT commitment to disarm. That in turn could lead to greater global support for the nuclear ban treaty.

Finally, third countries could react in ways harmful to U.S. security. China, which has modernized its strategic nuclear forces at a modest rate, could change its policy and accelerate its nuclear build-up.

In sum, the end of the nuclear arms control regime would have significant downsides for the United States and its allies. It makes more sense for U.S. policy to strive to maintain and, if possible, improve that regime.

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- ³ Data from “Memorandum of Understanding on the Establishment of the Data Base Relating to the Treaty between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms.”
- ⁴ Department of State Fact Sheet, “START Aggregate Numbers of Strategic Offensive Forces (as of July 1, 2009, as compiled from individual data submissions of the Parties.” Note that the START I counting rules significantly overstated the total number of U.S. and Russian strategic forces, for three reasons. First, a number of the ICBM silos and SLBM tubes were empty but, because the silos and tubes had not been eliminated according to START I procedures, they still counted as carrying deployed ICBMs and SLBMs, with their attributed warheads. Second, four U.S. Trident submarines had been converted to carry conventional sea-launched cruise missiles instead of Trident SLBMs, and a number of U.S. B-1 bombers had been converted to carry conventional weapons only, but these systems continued to count under START I rules. Third, most U.S. ICBMs and SLBMs had been downloaded to carry fewer warheads than the number with which they were attributed.
- ⁵ Department of State, Bureau of Arms Control, Verification and Compliance Fact Sheet, “New START Treaty Aggregate Numbers of Strategic Offensive Arms,” April 1, 2017.