Beyond START: Negotiating the Next Step in U.S. and Russian Strategic Nuclear Arms Reductions

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Introduction and Summary

Moving Beyond START

Meeting in London on April 1, U.S. President Barack Obama and Russian President Dmitry Medvedev announced agreement to "work out a new, comprehensive, legally binding agreement on reducing and limiting strategic offensive arms." They stated their intention to conclude this agreement before the Strategic Arms Reductions Treaty (START) expires in December, and noted that the new treaty would "record levels of reductions in strategic offensive arms that will be lower than those in the 2002 Moscow Treaty on Strategic Offensive Reductions."[1]

The presidents instructed their negotiators to begin work immediately and report back by July, when President Obama will visit Moscow. U.S. and Russian negotiators held their first consultative meeting in Rome on April 24, and stated that they will hold their first round of full negotiations in mid-May.

Presidents Obama and Medvedev agreed to conclude a follow-on treaty to START as the first action in a step-by-step process of reducing their strategic nuclear arsenals with the ultimate goal of achieving a nuclear-free world. This ambitious objective will require broadening past U.S.-Russian nuclear arms control efforts, for example, to include non-deployed strategic nuclear warheads and tactical nuclear weapons, which have not been limited previously. This will be a long-term process.

In the immediate term, maintaining a strategic nuclear arms control framework beyond START and concluding a new agreement on strategic reductions can enhance U.S. security by promoting nuclear stability, strengthening predictability, and setting the stage for further reductions. It will restore U.S. credibility and leadership in the area of nuclear non-proliferation. A robust nuclear arms control dialogue historically has had a positive impact on the broader relationship between Washington and Moscow.

Replacing START is urgent. START limits each side to 1600 strategic nuclear delivery vehicles (SNDVs)—heavy bombers, deployed intercontinental ballistic missiles (ICBMs) and their associated launchers, and deployed submarine-launched ballistic missiles (SLBMs) and their associated launchers—and to 6000 strategic nuclear warheads on those systems.[2] It expires by its terms on December 5, 2009. The 2002 Strategic Offensive Reductions Treaty (SORT), which limits each side to 1700-2200 strategic nuclear warheads, will remain in effect until 2012, but START provides the principal framework for verifiably regulating U.S. and Russian strategic forces. SORT does not limit strategic bombers or ballistic missiles, has no counting rules, and contains no verification or monitoring measures.

Negotiating Considerations

Washington will have to weigh a number of considerations in developing a position for negotiations with the Russians on a START follow-on treaty to reduce and limit both strategic nuclear warheads and SNDVs:

- *Levels of Weapons and the Nuclear Posture Review*: The U.S. government must complete its nuclear posture review in order to be able to justify its proposed weapon levels and force structure. While the

United States and Russia might be able to agree on a reduction to 1000 deployed strategic warheads on each side in the not-too-distant future, doing so will not be possible this year. They should instead negotiate a treaty in 2009 that reduces each side's forces to no more than 1500 deployed strategic nuclear warheads on 700 SNDVs.

- *Time*: The negotiators have limited time, as START expires on December 5. In order to allow for Senate ratification, the follow-on treaty likely must be signed by September. Washington and Moscow should be prepared to consider some bridging arrangement should they require additional time to finalize and ratify the follow-on treaty.

- *Counting Rules*: A priority task will be determining the counting rules for the new agreement. In developing the follow-on treaty, the negotiators should adopt START-type counting rules that attribute a specific number of warheads to each type of strategic ballistic missile and bomber. This will facilitate counting and verification.

- *Downloading*: For purposes of nuclear stability, neither side will want to concentrate its warheads on too few missile launchers or submarines. The follow-on treaty should include downloading provisions to allow the sides to remove warheads from ballistic missiles, as START permits to a limited extent, and also to allow removal of submarine-launched ballistic missiles from missile-carrying submarines. Downloaded missiles would be counted with fewer warheads and downloaded submarines with fewer missiles than they are otherwise capable of carrying.

- *Conversion and Conventionally-Armed Systems*: The follow-on treaty should contain provisions that allow the sides to convert some strategic systems to conventional-only roles and remove them from being accountable under the treaty. A potentially difficult issue will be conventional warheads on treaty-accountable ballistic missiles.

- *Constraining Breakout Potential*: The follow-on treaty will need inspection measures and other procedures to prevent the rapid uploading of downloaded systems. This can be addressed by provisions for inspections of downloaded systems, for preventing rapid uploading, and for verifiably eliminating excess ballistic missiles and warheads.

- *Monitoring and Verification Measures*: The sides should consider streamlining START's verification measures. However, the follow-on treaty will need sufficient monitoring measures to give the sides confidence in their ability to verify the other's compliance. In order to complete the treaty quickly, the sides should avoid new verification provisions where possible, though more intrusive measures will be needed in subsequent agreements that provide for deeper reductions.

- *Third-Country Strategic Forces*: As U.S. and Russian strategic force levels decrease, the strategic forces of Britain, France, and China will assume greater importance. The United States and Russia should be able to reduce their deployed strategic warheads to 1500, or even 1000, without taking account of third-country forces. However, at some point thereafter those forces will have to be addressed, either through separate constraints or by multilateralizing the U.S.-Russian strategic nuclear reductions process.

- *Missile Defense*: As U.S. and Russian strategic forces are reduced, there will be greater pressure to address missile defense. This will have to be factored in at some point, but the sides should be able to cut their forces to 1500, and perhaps 1000, deployed warheads without limits on missile defense systems. Bringing constraints on missile defense into the negotiation of the START follow-on treaty would likely make it impossible to have a treaty concluded and ratified by December.

- *Tactical Nuclear Weapons*: As U.S. and Russian strategic nuclear forces are reduced, their tactical nuclear weapons will assume greater importance. They can be left aside for the immediate negotiation, but will have to be addressed at some future point as further strategic reductions are considered.

A U.S. Negotiating Position

Given the shortness of time until START's expiration in December, the Obama administration should seek a START follow-on treaty that sets a ceiling of 1500 deployed strategic warheads on 700 SNDVs on each side. As a subsequent step, perhaps in 2010, the United States and Russia could pursue deeper reductions.

When negotiating the follow-on treaty, the administration should draw heavily on START for counting rules and verification measures; seek to include provisions for downloading missiles and missile-carrying submarines, with appropriate verification measures and constraints on breakout potential; and allow some conversion of strategic systems to conventional-only roles. While third-country strategic nuclear forces, missile defense, and tactical nuclear weapons will need to be taken into account at some point in the strategic reductions process, U.S. negotiators should seek to leave them aside for the immediate negotiation of the START follow-on treaty or address them in other channels.

A limit of 1500 deployed warheads on 700 SNDVs would allow the United States and Russia to maintain survivable and effective strategic nuclear forces, though at levels significantly below those today. Under such an agreement, the United States could deploy a force structure with 300 single-warhead Minuteman III ICBMs, 168 Trident II SLBMs (with five warheads each), and some 50 nuclear-capable heavy bombers.

This is largely a modified START framework. President Obama has called for reductions in "all U.S. and Russian nuclear weapons—whether deployed or non-deployed, whether strategic or nonstrategic." If he and President Medvedev are serious about pursuing even deeper reductions, the START framework will have to be broadened. Washington and Moscow will have to develop new approaches that bring non-deployed strategic nuclear warheads and tactical nuclear warheads into the arms reduction process. Washington should take or propose several measures in parallel with the negotiation of a START follow-on treaty:

- *Comprehensive Test Ban Treaty*: The U.S. administration should seek Senate ratification of the treaty, which the Russians previously ratified.

- *A Broad Nuclear Security Approach*: With a view to the 2010 Non-Proliferation Treaty (NPT) review conference, Washington should suggest to Moscow that they lead in a broad effort that would go beyond negotiation of the follow-on treaty to include: support for measures to prevent further nuclear proliferation; a joint effort to provide enrichment services for civil nuclear reactors in non-nuclear weapons states; and leadership in promoting a fissile materials cut-off treaty.

- *Missile Defense*: While not bringing missile defense into the START follow-on negotiations, Washington and Moscow should discuss the relationship between offensive and defensive arms, differences over the U.S. plan to deploy a missile defense system in Central Europe, and possible joint approaches, including NATO-Russia cooperation, to address the challenge posed by new ballistic missile threats.

- *Warhead Numbers*: While counting rules can give a good tally of deployed strategic warheads, neither side knows with confidence the other's number of non-deployed warheads. At a level of 1500 deployed strategic warheads, this will not matter much. However, in anticipation of deeper reductions, Washington should propose to Moscow discussions on how the sides might better understand each other's strategic warhead numbers, non-deployed as well as deployed warheads. A process of continuing reductions will ultimately require a framework that addresses *all* strategic warheads.

- *Tactical Nuclear Weapons*: Washington should propose discussions on measures to increase transparency regarding tactical nuclear weapons and possible approaches for dealing with them in the future. Those discussions might also address measures to assure that tactical nuclear weapons on both sides are safely and securely stored.

Strategic Arms and Strategic Arms Control

Nuclear Deterrence

The primary purpose of U.S. nuclear weapons has been deterrence, that is, to make clear to a potential adversary that the risks and costs of aggression far outweigh any gains it might hope to achieve. During the Cold War, the Soviet Union was the primary potential adversary; strategic nuclear weapons levels on both sides grew to stunningly high levels. At their peak, U.S. strategic forces could launch more than 10,000 warheads.

U.S. nuclear arms have not only deterred attack on the United States; they have also provided extended deterrence to protect U.S. allies. Nuclear weapons played a special role in Europe during the Cold War. They were seen as NATO's equalizer in view of large Soviet and Warsaw Pact advantages in numbers of tanks, artillery, combat aircraft, and manpower. Extended deterrence has also been important for Japan, which must take account not just of Russia but also China's growing military might and North Korea's nuclear capabilities.

From the late 1960s on, efforts to control, and later to reduce, strategic forces made up a central element of the U.S.-Soviet relationship. The numbers of strategic weapons have decreased markedly since the 1980s, and nuclear weapons have assumed a lower profile in the overall U.S.-Russian relationship.

Presidents Obama and Medvedev on April 1 endorsed a nuclear-free world—zero nuclear weapons—to be achieved on a step-by-step basis. Actually getting to zero will be a complex task and realistically should be seen as a distant goal. It will require addressing non-deployed strategic nuclear warheads and tactical nuclear weapons plus a verification regime significantly more intrusive than anything agreed to date. It also likely would have to be accompanied by other arms control arrangements, for example, agreements limiting conventional arms so that the world would not be made "safe" for large-scale conventional conflict. In particular, if the numbers of nuclear weapons reach very low levels, the risks of covert weapons and surprise attack could grow if the process is not managed with extreme care.

For the foreseeable future, strategic nuclear weapons will continue to play an important role in U.S. security, but properly structured reductions can enhance U.S. security by promoting nuclear stability, strengthening predictability, increasing transparency, and setting the stage for further cuts. Reductions may also produce defense cost savings. The United States should aim to maintain a reduced strategic nuclear force that is survivable, secure, and effective. Survivability—the ability of a nuclear force to withstand a first strike and still be able deliver a devastating response—is a key factor for nuclear deterrence and stability. The force should also be capable of deterring a range of threats and reassure, or extend deterrence, to American allies in Europe and Asia.

START and SORT

Two treaties currently govern U.S. and Russian strategic nuclear force levels: START and SORT. START—the Strategic Arms Reductions Treaty—and its protocols, annexes, and other associated documents comprise many hundreds of pages.[3] The treaty, signed by Presidents George H. W. Bush and Mikhail

Gorbachev in 1991, was modified by the 1992 Lisbon Protocol to take account of the break-up of the Soviet Union. The protocol became necessary because the Soviet Union's collapse left Soviet strategic nuclear forces in Russia, Belarus, Kazakhstan, and Ukraine. Under the terms of the protocol, Belarus, Kazakhstan, and Ukraine eliminated the strategic nuclear systems on their territories during the 1990s, and most Soviet limits were applied just to Russian strategic forces.

START limits the United States and Russia each to no more than 1600 strategic nuclear delivery vehicles—heavy bombers, ICBM launchers, and SLBM launchers—and no more than 6000 warheads on those bombers and missiles. START contains several sublimits as well. For example, ICBMs and SLBMs may carry no more than 4900 of the 6000 warheads

The bulk of START's text comprises counting rules, measures for eliminating strategic arms, inspections and inspection procedures of various types, and procedures for notifications regarding treaty numbers and changes in treaty-limited items (e.g., elimination of missile silos or heavy bombers). A telemetry protocol bans most encryption of telemetry to allow each side to monitor the other's tests. These monitoring and verification measures are critical to each side's ability to monitor and confirm the other's compliance with the treaty.

In January 1993, Presidents George H. W. Bush and Boris Yeltsin signed the START II Treaty. START II would have reduced each side to no more than 3000-3500 warheads on their heavy bombers, ICBMs, and SLBMs. In March 1997, Presidents Bill Clinton and Yeltsin issued a joint statement establishing a START III limit of no more than 2000-2500 warheads on each side. The Senate ratified START II in 1996, but the Russian Duma (parliament) resisted. It ratified START II only in 2000, conditioning entry into force on a U.S.-Russian agreement on missile defense; that agreement did not win Senate approval. The Russians announced that they would no longer be bound by the terms of START II in 2002, following the Bush administration's withdrawal from the Anti-Ballistic Missile (ABM) Treaty.[4] The sides never concluded negotiations on START III.

The second treaty currently in force is SORT, the Strategic Offensive Reductions Treaty, also known as the Moscow treaty. Signed in the Russian capital by Presidents George W. Bush and Vladimir Putin in May 2002 and ratified by both sides in 2003, SORT limits each side to no more than 1700-2200 strategic nuclear warheads. In contrast to START, SORT does not limit the number of strategic heavy bombers, ICBMs, or SLBMs. SORT is barely two pages in length.[5] It provides no counting rules, contains no verification and monitoring measures, and does not define "strategic nuclear warhead."[6] The treaty states that each side will reduce to no more than 1700-2200 strategic nuclear warheads by December 31, 2012—the day the treaty expires.

Following the conclusion of SORT (and having withdrawn from the ABM Treaty), the Bush administration did not seriously pursue further reductions in strategic nuclear forces. Administration officials —who originally sought to avoid a legally binding treaty and instead proposed recording the 1700-2200 warhead limit only as statements of national policy—dismissed formal arms control as an anachronism and as likely to delay the strategic force reductions they sought to make, because of the time needed for prolonged negotiations. In general, the Bush administration preferred maximum flexibility in determining U.S. force structure to limitation and predictability.

U.S. and Russian nuclear arms are regulated by one other agreement: the treaty on intermediate-range nuclear force (INF) missiles. Signed in 1987, the INF treaty banned all U.S. and Soviet ground-launched ballistic and cruise missiles with ranges between 500 and 5500 kilometers. The Russian government has proposed to multilateralize this treaty, and some Russian commentators have suggested that, absent applying the ban to all countries, Moscow might reconsider its adherence.

Faced with the pending expiration of START, U.S.-Russian discussions in 2008 addressed the question of what might come next. The Bush administration preferred to avoid a legally binding treaty and originally suggested just transparency measures on stra-

tegic forces. It later offered to continue to limit operationally deployed strategic warheads. The Russians rejected limiting only deployed strategic warheads; the U.S. proposal did not constrain non-deployed warheads in the responsive force or limit strategic missiles or bombers. Moscow did not regard that as an acceptable approach, believing it could allow the United States the possibility to rapidly deploy extra warheads on unconstrained missiles and bombers and thereby increase its strategic forces well beyond the limit on deployed warheads.[7]

While unhappy with the Bush administration proposal, the Russians did express interest in further strategic reductions. Russian strategic forces are both aging and shrinking in number, as older systems reach the end of their service life. Interestingly, despite the 2004-2008 surge in revenues into the Russian government's coffers due to high energy prices, Moscow has made relatively modest investments in new strategic systems, though the Russians have begun to devote greater resources to their strategic forces.

In contrast to its predecessor, the Obama administration attaches priority to arms control and reductions and the contribution they can make to U.S. security. The administration is ready to pursue deeper cuts. It appears willing to accept a framework that will reduce and limit heavy bombers and strategic ballistic missiles as well as warheads.

The Obama administration also appears to recognize that a U.S.-Russian arms control dialogue can have a positive impact on the broader bilateral relationship. The Russians value the process, if for no other reason than it validates Russia as a nuclear superpower on par with the United States.

President Ronald Reagan made arms control a central element of his broader U.S.-Soviet agenda in the 1980s, using Moscow's interest in arms control to carve out diplomatic space to pursue other issues. As Presidents Reagan and Gorbachev signed the INF treaty and made progress in negotiating START, parallel talks won exit permission for Soviet dissidents and produced more helpful Soviet positions on regional problems. Presidents George H. W. Bush and Clinton likewise gave arms control a special place in their dealings with their Soviet and Russian counterparts. Arms control progress, including the signing of START, contributed to a more positive relationship, in which Moscow adopted positions of interest to the United States on questions such as German reunification, the 1990-91 Gulf crisis, and Bosnia.

Current U.S. and Russian Strategic Nuclear Forces

The United States and Russia have traditionally maintained a triad of strategic forces: heavy bombers, intercontinental ballistic missiles, and submarine-launched ballistic missiles. Each leg of the triad has advantages: bombers can be launched but have long flight times and can be recalled; ICBMs generally have larger payloads, fast reaction times, and have been more accurate (though SLBM accuracy has improved markedly); and SLBMs on submarines at sea have the advantage of survivability, due to their ability to lurk hidden under the world's oceans. Given a strong air force tradition and easy access to the sea, the United States has tended to place a greater portion of its weapons on bombers and SLBMs. Russia has historically placed greater stress on its ICBM force.

In keeping with arms control agreements and unilateral policy decisions, both the United States and Russia have reduced their strategic nuclear forces substantially over the past 15 years. U.S. strategic nuclear forces currently consist of some 900 heavy bombers and strategic ballistic missiles: 450 silo-based Minuteman III ICBMs, 336 Trident II SLBMs on 14 ballistic missile-carrying submarines, and 95 B-52H bombers and 20 B-2 bombers.[8] The U.S. military plans to operate the Trident program into the 2020s and 2030s, and Minuteman IIIs (which have been extensively refurbished) until 2030. The U.S. Air Force would like to develop a new bomber, with possible introduction in 2018.

The START-accountable number for U.S. strategic forces is higher. The most recent START data exchange showed the United States with 1198 ICBMs, SLBMs, and heavy bombers, attributed as carrying 5576 warheads.[9] These break down as follows:

- 550 Minuteman III ICBMs attributed with 1250 warheads
- 96 Trident I SLBMs attributed with 576 warheads
- 336 Trident II SLBMs attributed with 2688 warheads
- 56 B-1 bombers attributed with 56 warheads (bombs)
- 19 B-2 bombers attributed with 19 warheads (bombs)
- 94 B-52 bombers attributed with 940 warheads (cruise missiles)
- 47 B-52 bombers attributed with 47 warheads (bombs)

This count includes systems that no longer have a nuclear role but have not been eliminated according to START rules. They thus remain accountable under the treaty. These include, for example, retired B-52 bombers; B-1 bombers, which have been converted to carry conventional weapons only; and 96 Trident I SLBMs on four Trident submarines which have been modified to carry conventionally-armed cruise missiles instead.

Secretary of Defense Robert Gates has said that the United States would reach SORT's 2200 strategic warhead limit in 2010, though a February 2009 report asserted that U.S. strategic forces already deploy no more than 2200 warheads.[10] As noted above, however, the number of attributed warheads is significantly higher using START counting rules.

Russian strategic nuclear forces currently consist of some 700 heavy bombers and strategic ballistic missiles: 426 silo-based and mobile ICBMs of four different types, 228 SLBM launchers on 14 missile-carrying submarines of four different classes (though one of these has yet to be commissioned, and two may be undergoing decommissioning), 64 Tu-95 Bear and 15 TU-160 Blackjack bombers.[11] Given that Russian ICBMs and SLBMs are well into—and in some cases exceed—their service life, the Russians are building a new SLBM (the Bulava) and new ICBM (the SS-27), as well as a new class of ballistic missile-carrying submarine.

As with the United States, the START-accountable Russian strategic force is larger. According to the most recent data exchange, Russia has 814 ICBMs, SLBMs, and heavy bombers, attributed as carrying 3909 warheads.[12] These break down as follows:

- 180 SS-25 ICBMs attributed with 180 warheads
- 65 SS-25 variant (SS-27) ICBMs attributed with 65 warheads
- 120 SS-19 ICBMs attributed with 720 warheads
- 104 SS-18 ICBMs attributed with 1040 warheads
- 96 SS-N-18 SLBMs attributed with 288 warheads
- 40 SS-N-20 SLBMs attributed with 400 warheads
- 96 SS-N-23 SLBMs attributed with 384 warheads
- 36 RSM-56 SLBMs attributed with 216 warheads
- 14 Blackjack bombers attributed with 112 warheads (cruise missiles)
- 63 Bear bombers attributed with 504 warheads (cruise missiles)

This number includes SLBMs attributed to missile-carrying submarines that are being decommissioned but have not yet been eliminated according to START rules. Moscow has not yet said whether it has reached the SORT limit of 1700-2200 strategic nuclear warheads.

Considerations for a Follow-on Treaty

Presidents Obama and Medvedev in London made clear that negotiating a follow-on agreement to START tops their bilateral agenda for 2009. Crafting a U.S. negotiating position and then coming to terms with the Russians on a new treaty will involve a number of considerations.

Levels of Weapons and the Nuclear Posture Review

One of the key questions for the U.S. negotiating position will be the levels for limiting strategic warheads and strategic nuclear delivery vehicles. From the current SORT level of 1700-2200 strategic warheads, one possible goal would be to reduce to no more than 1000 deployed strategic warheads on each side. This could allow for SNDVs to be reduced significantly below START's limit of 1600, to 500-600 on each side. This, however, is too ambitious an objective for the 2009 negotiation of a START follow-on treaty for reasons noted below.

Congress in 2007 mandated that the executive branch carry out a nuclear posture review "in order to clarify United States nuclear deterrence policy and strategy." Among other things, the review will examine "the role of nuclear forces in United States military strategy, planning, and programming," "the levels and composition of the nuclear delivery systems that will be required for implementing the United States national and military strategy," and "the active and inactive nuclear weapons stockpile that will be required."[13] The primary work on the review, which is currently underway but may not be completed until fall, is done by the Joint Chiefs of Staff and the Office of the Secretary of Defense. In contrast to the past, the Departments of State and Energy are playing a greater role in the nuclear posture review process. This reflects the Obama administration's view that U.S. nuclear policy and force levels should take account of nuclear non-proliferation, arms control, and broader security objectives.

The nuclear posture review is important for determining the levels of warheads and SNDVs to which the United States can reduce; these numbers cannot come out of thin air. One of the key questions that the chairman of the joint chiefs and the commander of U.S. Strategic Command will have to answer during ratification hearings for any new strategic arms treaty will be whether the number of weapons allowed by the treaty is sufficient to execute U.S. nuclear policy.[14]

Given the shortness of time until December and the need to complete the current nuclear posture review, it would be unrealistic for the administration to set a goal of achieving a treaty in 2009 cutting strategic warheads to 1000. U.S. negotiators should aim instead for a less ambitious START follow-on treaty that reduces each side to no more than 1500 deployed strategic warheads on 700 heavy bombers, ICBMs, and SLBMs. While not as dramatic as 1000, a ceiling of 1500 nevertheless would represent a 30 percent reduction from SORT's upper limit of 2200. A limit of 1500 also is close to the 1700-2200 level validated by the 2001 nuclear posture review. The treaty could put in place the framework for further strategic reductions, perhaps to be negotiated in 2010.

The negotiators might also consider subceilings within the overall limit of 1500 deployed warheads, as in

START. They might agree, for example, to a subceiling on ballistic missile warheads or a subceiling that constrained the percentage of total warheads on any one element of the triad. The negotiators will have to consider the advantages of subceilings as opposed to the simplicity of a single overall limit that allows each side complete freedom to mix, that is, to choose how it distributes its allowed warheads on its ICBMs, SLBMs, and heavy bombers.

Time

U.S. and Russian negotiators have limited time. Unless Washington and Moscow agree to extend START for an additional five years—something the Russians have said they are not prepared to do—the treaty will expire on December 5. Given the need to have a follow-on agreement ratified by both the Senate and Russian Duma, a follow-on treaty probably will have to be completed and signed by September. Indeed, Senator Richard Lugar, the ranking Republican on the Senate Foreign Relations Committee, issued a statement on April 1 saying that any new treaty would have to be signed in early August in order to allow time for ratification.[15]

The timeline is daunting given how long it has taken to complete previous strategic agreements. Early START negotiations were suspended in 1983 when the Soviets walked out in protest against the deployment of U.S. intermediate-range nuclear missiles in Europe. START negotiations resumed in earnest in spring 1985, but the treaty was only completed and signed in July 1991. Negotiating SORT took a relatively short amount of time, spread over six months. It is, however, a far less meaningful and substantial agreement.

Fortunately, much of the START experience, particularly with monitoring and verification rules, can be carried over into a new agreement with minimal adjustment. However, it may still be difficult to conclude an agreement reducing each side to 1500 warheads in time to have it ratified by December 5. If this becomes apparent and it looks like three-six months' more time might be needed, Washington and Moscow will need to consider a bridging arrangement. (The Russians likely would not agree to an overly long period, and it would be useful to maintain time pressure to complete the negotiations.)

One example of a bridging arrangement would be for each side to announce that it would continue to observe START's provisions as a matter of national policy for three-six months. There is precedent for this: the Reagan administration observed the terms of the signed but unratified Strategic Arms Limitation Treaty II (SALT II) until 1986 as a matter of unilateral national policy. The Soviet Union had a similar policy. (One issue for the Russian side would be whether the military would require a legal basis in the absence of START for continuing data exchanges and inspections. This involves release of information that the Russian government considers classified.)

Counting Rules

One of the principal tasks for the negotiation will be to determine the counting rule regime for the START follow-on treaty. While U.S. strategic forces may be at or nearing the SORT limit of 2200 warheads, applying the START counting rules to the numbers of heavy bombers and strategic missiles in the U.S. strategic arsenal yields a warhead count of more than 5500.

START's counting rules attribute a specific number of warheads to each type of SNDV. For ICBMs and SLBMs, the counting rule was originally based on the maximum number of warheads for which a missile of a particular type had been flight-tested. For example, under START, each Trident II missile was counted as carrying eight warheads. A Trident submarine, with 24 SLBM tubes with Trident II SLBMs attributed with eight warheads each, thus counts as carrying 192 warheads against the overall START warhead limit of 6000. On the Russian side, each SS-18 ICBM counts as carrying ten warheads. The 75 deployed SS-18 ICBMs therefore were attributed with 750 warheads against Russia's START aggregate limit of 6000 warheads.

SORT has no counting rules. It implies an actual loading count rather than the maximum attributed number, but only the United States knows exactly

how many warheads are on its ICBMs and SLBMs, just as only Russia knows the number on its strategic ballistic missiles. SORT by itself offers no way for the Russians to confirm the number of warheads on any U.S. missile, nor for American inspectors to confirm the number of warheads on any Russian missile.

Given that the sides will want confidence in their ability to monitor the other's compliance with warhead limits, U.S. and Russian negotiators will most likely need START-type counting rules for the follow-on treaty. Each type of SNDV should be attributed with a specific number of warheads for counting purposes. The sides might agree, for example, to attribute each Trident II with five warheads (see the downloading discussion below), relying on START verification procedures to allow Russian inspectors to confirm that Trident II missiles are deployed with no more than that number. While there may be some interest in counting actual warhead loads (which could vary from missile to missile), it is difficult to see how such a counting rule could be monitored without extremely intrusive verification measures.

Downloading

Related to the counting rule issue will be the question of downloading, that is, removing warheads from missiles and perhaps removing missiles from missile-carrying submarines. In order to maintain a survivable force, both the United States and Russia will want to spread out their warheads. Neither, for example, will want to deploy too many warheads on one missile-carrying submarine. This is the nuclear stability version of not putting too many eggs in one basket.

The problem is most evident with regard to the Trident submarine fleet. Under START counting rules, 336 Trident II missiles (attributed with eight warheads each) on 14 Trident submarines by themselves count as 2688 warheads—well above the 2200 limit below which Presidents Obama and Medvedev have pledged to reduce. For operational and stability purposes, the U.S. Navy may not wish to reduce the number of ballistic missile-carrying submarines below 14. Hence the U.S. need for downloading as reductions are implemented.

START allows for downloading missiles by type and attributing a lower number of warheads to those missiles, albeit under a complex set of limitations. For example, some Minuteman III ICBMs are already counted as having been downloaded and carrying a single warhead, and some Trident II SLBMs have been downloaded as well.[16] START's verification rules allow Russian inspectors to spot-check missiles and confirm that they carry no more than the declared number of warheads.

The negotiators should adopt provisions to permit downloading ICBMs and SLBMs in the START follow-on treaty. The negotiators might agree, for example, that Trident II missiles could be downloaded and counted with five warheads each. START verification measures would permit Russian inspectors to spot-check individual Trident II missiles and confirm they carry no more than the agreed number of warheads. (Similar procedures could be applied to downloaded Russian ballistic missiles.) Even at five warheads per Trident II, however, the 14 Trident submarines carrying SLBMs would be counted as carrying 1760 warheads.[17]

If the START follow-on treaty limits each side to no more than 1500 warheads, U.S. negotiators should seek provisions to allow downloading U.S. and Russian missile-carrying submarines. For example, each Trident submarine could be counted as carrying no more than 12 Trident II missiles (instead of its capacity of 24). Relatively simple monitoring provisions could allow Russian inspectors to spot-check this: Russian inspectors visiting a Trident base could choose a submarine at random and ask that 12 missile tubes be opened to confirm that they were empty. (The "empty" tubes likely would contain some ballast, but that would be clearly distinguishable from a missile.) Counting each Trident II as carrying five warheads and each Trident submarine as carrying 12 Trident II missiles would mean the 14 submarines would be attributed with 840 warheads.

Whatever the particular numbers, downloading will be a key element for the United States in a START follow-on agreement if that agreement is to limit each side to a number of warheads less than 2200. The

Russians, however, will be less interested in downloading, as Russian SLBMs carry fewer warheads than Trident II SLBMs, and most Russian submarines have only 16 missile tubes in contrast to 24 on the Trident.

Conversion and Conventionally-Armed Systems

Dealing with heavy bombers, missile-carrying submarines, and strategic ballistic missiles converted to conventional-only roles will pose one of the most difficult issues for the negotiators. The United States likely will want significant relief in this area, probably more so than Russia. The Russians, moreover, may seek limits that will constrain U.S. conventional as well as strategic nuclear capabilities.

START II (which never entered into force) would have allowed each side to convert up to 100 heavy bombers to conventional-only roles, which would not count against the SNDV limit.[18] The United States has converted its B-1 bomber fleet to conventional-only roles, though they still count as strategic bombers under START I counting rules. U.S. negotiators should seek a variant of the START II rule to allow for some number of conventional bombers outside of the follow-on treaty's SNDV and warhead limits. The follow-on treaty could contain a numerical limit on conventional-role only bombers, as did START II.

Four of the original 18 Trident submarines have been modified to carry conventionally-armed Tomahawk land-attack cruise missiles (TLAMs) instead of SLBMs. Each of the four submarines has been refitted so that 22 of its missile tubes hold a canister launcher containing seven TLAMs; the remaining two tubes have been modified to support special operations forces.[19] Since START requires that SLBM launchers be eliminated by completely removing them from the submarine, which has not happened, these submarines continue to count under START. Washington will likely seek provisions allowing this conversion so that these submarines are not counted as carrying SLBMs, with inspection procedures that allow Russian inspectors to confirm that the converted submarines do not carry SLBMs.

If Moscow is not interested in similar relief, the Russians could try to limit conventional-only Trident submarines as strategic systems or propose other measures for such submarines. For example, Moscow might propose that such submarines be restricted to certain patrol areas (away from Russia) and that the United States provide information on those areas. The U.S. Navy traditionally has not been interested in such ideas.

Conventionally-armed strategic ballistic missiles pose a more difficult challenge. The Bush administration developed a plan to arm two Trident II SLBMs on each of 12 Trident submarines with conventional warheads in order to have a prompt global conventional strike capability.[20] As a matter of general practice, the United States will not want conventionally-armed systems to be counted as strategic nuclear arms. But developing verification measures to demonstrate that such conventionally-armed SLBMs are not uncounted nuclear systems will not be an easy task, unless the United States is prepared to accept very intrusive monitoring measures. With a higher ceiling on strategic nuclear warheads and a small number of conventionally-armed Trident II SLBMs, counting those conventional warheads as nuclear warheads may not pose a big problem. However, a precedent would be set that could prove difficult to live with if strategic nuclear warhead levels later were cut more drastically.

The problem may be further complicated if the Russians regard SLBMs outfitted with highly accurate conventional warheads as posing a "strategic" threat to targets such as ICBM silos. Should the Obama administration wish to protect a conventional Trident option outside of limits on strategic nuclear arms, this could pose one of the most difficult issues for the negotiators.

Constraining Breakout Potential

Closely linked to the downloading question is the issue of constraining breakout potential, that is the ability of one side or the other to deploy strategic nuclear warheads and missiles beyond the limits contained in the follow-on treaty, for example, by uploading downloaded systems—returning removed warheads

to missiles or removed missiles to submarines. This problem is particularly acute if downloaded missiles or submarines can be uploaded quickly. Part of the solution could be the elimination of excess warheads.

For eliminating warheads removed from downloaded missiles, the sides can draw on the experience of the INF treaty. It provided that the front sections of INF ballistic missiles, following removal of the nuclear warhead device and guidance elements, would be crushed or flattened.[21] U.S. and Russian negotiations can develop similar procedures to apply to strategic warhead bodies. Such procedures, with provisions for inspection, will give the inspecting side a good count of the number of warheads eliminated, which will increase confidence in compliance with the follow-on treaty. Those procedures will not, however, provide certainty regarding the number of remaining warheads, as neither side likely knows precisely how many warheads the other built, and there may be questions about the possibility for surreptitious production of new warheads.

Another way to cap breakout potential would be to include a provision in the follow-on treaty, as START did, that limits the aggregate number of downloaded warheads. Yet another approach would be to redesign and build a new "bus" or platform for downloaded missiles; the new platform would be capable only of carrying a reduced number. This option, however, could prove expensive.

The problem of constraining breakout potential is simpler to address with regard to SLBMs and missile-carrying submarines. Several steps can be taken regarding the empty missile tubes to preclude rapid reloading. First, for ballast purposes, a concrete or some other weight would likely be placed in empty tubes (to compensate for the loss of the removed missile's weight). Such a weight would be visibly different from an SLBM. It could be fixed in the missile tube in such a way that removing it would be difficult and require time and special equipment. Second, other obstructions could be inserted into the tube that would require time and special equipment to return the tube to launch-capable status, or other ways could be found to render the tube incapable of launching a missile. On U.S. Trident submarines, the steam generators which propel the SLBM from the missile tube could be removed from empty tubes, making the tube incapable of launching an SLBM. Russian inspectors could be allowed to verify the removal.[22]

An alternative approach would be to allow the other side's inspectors to examine empty missile tubes, confirm they are empty, and then observe the deck hatches to the tubes being welded shut. The drawback to this approach is that it would not permit easy subsequent confirmation that the tube was empty without allowing inspectors to enter the submarine. If they were allowed internal access, inspectors could confirm that tubes were empty (for example, the missile tubes on Trident submarines have portals that can be opened to allow access to the inside of the tube from the missile compartment.)

The negotiators might develop a provision to limit the number of non-deployed SLBMs (that is, SLBMs that are not deployed in submarine missile tubes). Each side will want some non-deployed SLBMs, for use as spares and for reliability and training test launches. An excessively large number of non-deployed SLBMs, however, could give rise to concern that SLBMs were being retained for possible redeployment to downloaded submarines.

Take the example of the Trident force. The U.S. Navy plans to continue procurement of the Trident II through 2013, when it will have bought a total of 561 Trident II missiles to equip 14 Trident submarines and four British submarines (the United Kingdom uses the Trident II as well), and to have spares and extra missiles for reliability and training launches. The U.S. Navy normally keeps 12 Trident submarines in operational status (at any time, two are usually undergoing overhaul and thus do not carry missiles). The Navy thus requires 288 missiles for the operational submarines.[23] The total number of Trident II missiles could be cut significantly if Trident submarines were downloaded to carry only 12 missiles each. If the treaty limited each Trident submarine to no more than 12 SLBMs instead of its capacity of 24, at least 144 Trident II missiles (12

submarines x 12 SLBMs) would not be needed. This would allow earlier than planned termination of the Trident II procurement program, with significant cost savings.

If necessary, the sides could also agree to eliminate excess SLBMs in a verifiable manner. Although START required elimination of ICBM and SLBM launchers—silos and missile tubes on submarines—not of ICBMs and SLBMs, the United States and Russia have extensive experience monitoring elimination of missiles under the INF treaty.

Monitoring and Verification Measures

Monitoring and verification measures include data exchanges, notifications, inspections of various kinds, and other measures. Their purpose is to give each side the ability to monitor with confidence the other's compliance with the terms of the agreement, while protecting information that each military considers to be sensitive.

Among its verification provisions, START provides for more than a dozen different kinds of inspections and exhibitions, as well as providing for monitoring by national technical means, data exchanges, notifications, and a ban on most missile telemetry encryption. Over the past 20 years, the United States and Russia have gained considerable experience with inspections under the START and INF treaties. For example, as of September 2008, U.S. officials had conducted 621 START inspections in Russia, Belarus, Kazakhstan, and Ukraine, while Russian officials had made 437 START inspections on U.S. territory.[24]

The Russian military reportedly wishes to streamline START's verification provisions, eliminating some measures which it considers no longer necessary or overly burdensome. It may be that the U.S. military also would like to shed some of the verification provisions. This should be a subject for the follow-on negotiation. It is in the interest of both sides to make treaty implementation as simple as possible, provided that the verification measures suffice to give each side confidence that it can monitor the other's compliance with treaty limitations. That said, if the sides are serious about pursuing even deeper reductions, more intrusive verification measures will be necessary later.

Third-Country Strategic Nuclear Forces

In addition to the United States and Russia, three other countries have strategic nuclear forces: Britain, France, and China. (Other countries, such as India and Pakistan, have nuclear weapons and intermediate-range delivery systems, but they do not have ICBMs, SLBMs, or heavy bombers.)

Britain operates four missile-carrying submarines, each of which can carry 16 Trident II missiles, though only three submarines normally carry missiles at any one time. Trident IIs on British submarines carry significantly fewer than eight warheads. British Prime Minister Gordon Brown recently stated that the British strategic force deploys 160 warheads and that Britain stood ready to enter a broader negotiation on reducing strategic nuclear arms.[25]

President Nicolas Sarkozy has said that France will maintain fewer than 300 nuclear weapons in its arsenal. The bulk of these are on SLBMs (France has three missile-carrying submarines, with a fourth under construction). France also has some 50 Mirage-2000 aircraft with a strategic nuclear strike role.[26]

China has 37-49 single-warhead ICBMs and is building a modern missile-carrying submarine. China is modernizing its ICBM force and also has a number of intermediate-range missiles and aircraft. The estimated total number of warheads on these strategic and intermediate-range systems is some 175.[27]

Strategic nuclear arms control agreements thus far have been bilateral accords between the United States and the Soviet Union or Russia, with the exception of the Lisbon Protocol that applied the START limits to Belarus, Kazakhstan, and Ukraine as well as Russia. U.S. negotiators staunchly resisted Soviet efforts to take account of British and French nuclear forces in the past. However, the lower the level for U.S. and Russian strategic warheads, the greater the relative weight of British, French, and Chinese forces.

As President Obama said in Prague on April 5, as the nuclear reductions process proceeds, the United States "will seek to include all nuclear weapons states in this endeavor."[28] That said, the United States and Russia should be able to reduce to 1500, or even 1000, deployed warheads on each side without having to get into the complex subject of addressing limits on third-country strategic forces. At some point below 1000 warheads, however, account of third-country forces will have to be made.[29] This could be done by applying separate constraints to those countries' forces or by multilateralizing the U.S.-Russian strategic nuclear negotiations process. This should be an issue for the future, not for the U.S.-Russian negotiation in the coming months on the START follow-on treaty.

Missile Defense

U.S. and Russian strategic offensive ballistic missile forces and missile defense are related, in that effective strategic missile defenses deployed by one country could diminish the other's strategic offensive capability. The first U.S.-Soviet agreement limiting strategic forces, the 1972 Interim Agreement on Strategic Offensive Forces, was accompanied by the ABM Treaty, which limited anti-ballistic missile systems. The reasoning for pairing the two agreements and constraining missile defenses was concern that, in a crisis, one side might have a greater incentive to strike first, believing its missile defense systems could cope with a degraded retaliatory strike. Restrictions on missile defenses were seen as reducing incentives for building more offensive ballistic missiles.

Despite the attention and resources given to President Reagan's Strategic Defense Initiative in the early 1980s and efforts since then, effective defense against strategic offensive missiles remains a very challenging proposition.[30] The START and SORT agreements were signed in 1991 and 2002 without reference to limits on missile defense. Indeed, SORT was signed five months after the Bush administration gave notice of its intention to withdraw from the ABM Treaty.

However, as U.S. and Russian strategic offensive forces are reduced, missile defense will assume greater relevance. Missile defense—particularly the Bush administration plan to deploy ten missile interceptors and a missile defense radar in Poland and the Czech Republic—has been a major problem on the U.S.-Russian agenda. Presidents Obama and Medvedev on April 1 acknowledged their differences on this issue; they also agreed that the relationship between offensive and defensive arms would be discussed.[31]

There is a point below which one side or the other will not be prepared to reduce its strategic forces without somehow dealing with the missile defense question. Russian Duma member (and former Deputy Defense Minister) Andrey Kokoshin believes the sides are already at that point. He has called for taking U.S. missile defenses into account in the new negotiations, stating "Today, when the matter involves more significant limitations and reductions of offensive arms, the ABM factor becomes more weighty and prominent."[32] Other Russian analysts have suggested that the sides could each reduce to 1500 strategic warheads without addressing missile defense, but deeper reductions below that would require some constraints in the missile defense area.

Given the short time until December, it would be best to keep missile defense limits out of START follow-on negotiation. Were the U.S. and Russian negotiators to have to tackle missile defense as well as the issues associated with the follow-on treaty, it would be impossible to have a new agreement in time. It should be possible to reduce U.S. and Russian strategic forces to 1500, and perhaps even 1000, warheads without agreeing beforehand or in parallel on constraints on missile defense. But this issue, as that of third-country strategic forces, will at some point have to be addressed if further reductions are to be negotiated in U.S. and Russian strategic forces.

Tactical Nuclear Weapons

In addition to strategic weapons, the United States and Russia each maintain sizeable arsenals of tactical nuclear warheads. These normally have smaller explosive yields than strategic nuclear warheads, but the primary distinction between the two is the range of their delivery systems. One other concern is related to the safety and security of tactical nuclear warheads:

they are generally more susceptible to theft or seizure by terrorists than strategic warheads.[33] Ensuring that tactical weapons are closely protected is in the interests of both sides.

Although the United States and Russia have reduced their tactical nuclear arsenals, the numbers on both sides remain classified and difficult to know with precision. A Congressional Research Service paper places the U.S. tactical nuclear arsenal at about 1100 weapons, while estimating the Russian arsenal at 3000-8000 weapons.[34] Other estimates vary, but all give Russia a significant numerical advantage.

For the United States, the end of the Cold War, collapse of the Soviet Union, and development of new U.S. conventional force capabilities have been major factors in reducing the U.S. tactical nuclear stockpile. While the United States in the 1970s deployed as many as 7000 tactical nuclear weapons in Europe as part of NATO's effort to offset Soviet and Warsaw Pact conventional force advantages, the number today is believed to be several hundred nuclear bombs.[35]

Russia, however, has since the collapse of the Soviet Union increased its stress on tactical nuclear weapons. The Russian army has shrunk dramatically over the past 18 years, has lacked funding to modernize its equipment, and faces future manpower shortages as the country's demographic decline drastically reduces the number of draft-age males. As Moscow has watched U.S. conventional capabilities grow and worries about the rise of a large Chinese army with increasingly modern equipment, Russian military strategists have placed greater emphasis on tactical nuclear weapons for Russia's defense. Essentially, they are adopting the earlier NATO strategy of using tactical nuclear weapons as an equalizer for conventional force shortcomings.

In view of the increasing importance of tactical nuclear weapons for Russia and the large imbalance in numbers, negotiating reductions in and limits on tactical nuclear weapons will prove difficult. The primary U.S. bargaining chip would be a readiness to withdraw its nuclear weapons from Europe and agree that U.S. and Russian tactical nuclear weapons would not be deployed outside of national territory. Given the important role that nuclear weapons have played in NATO's deterrent posture, such a proposal could only be put forward after close consultations within the Alliance.

As with third-country strategic forces and missile defense, the lower the number of U.S. and Russian strategic forces, the more relevance the question of U.S. and Russian tactical nuclear weapons will assume. Ultimately, nuclear arms reduction negotiations will need to cover all nuclear warheads, whether strategic or tactical. However, this should not be an issue for the negotiation of the immediate follow-on treaty to START.

Elements of a U.S. Proposal

A U.S. Negotiating Position

In negotiating a follow-on treaty to START in 2009, the Obama administration should seek to reduce U.S. and Russian strategic forces each to no more than 1500 deployed warheads on no more than 700 strategic bombers, ICBM launchers, and SLBM launchers. These limits should allow both the United States and Russia to maintain survivable and effective strategic forces, but at levels well below the SORT maximum of 2200 warheads and START's limits of 6000 warheads on 1600 SNDVs. Such an agreement would implement Presidents Obama and Medvedev's April 1 statement on reducing nuclear arms and reaffirm U.S. and Russian readiness to meet their obligations under Article VI of the NPT in the run-up to the 2010 NPT review conference.[36]

When signing the follow-on treaty, and in keeping with their April 1 joint statement, the presidents might pledge to negotiate further cuts, perhaps to a level of 1000 warheads, as the next move in a step-by-step reductions process. The political statement would be useful for underscoring U.S. and Russian commitment to continue nuclear arms reductions and thereby meet their NPT Article VI commitments. This could be an element of a broader U.S.-Russian nuclear security approach (as described below).

Even with good intentions in both Washington and Moscow, concluding and ratifying an agreement may take longer than the time between now and December 5. If the sides need additional time, they should consider a bridging arrangement, for example, announcing that each will continue to observe all START provisions for three-six months' time as a matter of national policy.

The follow-on treaty should be legally binding. It should draw heavily on START's provisions, to minimize having to reinvent wheels. It should use START-like counting rules, i.e., each type of strategic bomber, ICBM, and SLBM should be attributed with a specific number of warheads that will be the limit for that type. The treaty should use START provisions for verifying the number of warheads on a missile or bomber, including spot-checks.

The follow-on treaty should permit ICBMs and SLBMs to be downloaded. It should also allow each type of ballistic missile-carrying submarine to be eligible for downloading and attributed with a specific number of SLBMs less than its capacity. This number could be 12 for U.S. Trident submarines and eight for Russian Delta class submarines (that is, each submarine class could have half of its missile tubes downloaded). Downloaded missile tubes (i.e., tubes not holding missiles) should not count under the SNDV limits. The downloading provisions should be accompanied by measures to assure the other side that SLBMs have not been placed back into downloaded tubes. Such measures could include inspections, modifications to prevent rapid uploading, and elimination of excess warheads and SLBMs.

The simplest way to deal with bombers will be to continue the START counting rules, which attribute ten warheads to B-52s armed with cruise missiles and eight warheads to Blackjack and Bear bombers armed with cruise missiles, while counting bombers

not armed with cruise missiles as carrying only one warhead.[37]

The follow-on agreement should permit some conversion of strategic systems to conventional-only roles. For the United States, this will be particularly important so that bombers converted to conventional-only roles and the four Trident submarines modified to carry conventional cruise missiles are not counted in the strategic warhead or SNDV limits. The U.S. side is likely to be more interested in this kind of conversion than the Russians. It therefore may have to accept more intrusive inspection measures than would be the case were both sides to want to convert systems and have to implement such inspections.

The issue of conventionally-armed Trident II missiles, should Washington decide to continue that program, will pose a particular challenge. While, as a general rule, a strategic nuclear arms agreement should not limit conventionally-armed systems, there may be no workable verification scheme to distinguish between conventionally-armed and nuclear-armed Trident IIs. The United States could find itself with no option other than to count Trident II missiles as armed with nuclear warheads, regardless of whether the warheads were nuclear or conventional.

U.S. negotiators should be prepared to review the START monitoring provisions and, where possible, eliminate or modify procedures to simplify the verification process. The sides should avoid new verification provisions if at all possible, in order not to slow up completion of the treaty. However, they will need to include sufficient measures in the follow-on treaty to allow confidence that the United States and Russia can monitor the other's compliance.

Missile defense, third-country strategic nuclear forces, and U.S. and Russian tactical nuclear weapons should not be subjects for negotiation of a START follow-on treaty. With a view to negotiation of an agreement subsequent to the follow-on treaty, Washington should begin to think now about how it will handle these issues as it seeks reductions to levels such as 1000 strategic warheads or lower.

A Notional U.S. Strategic Force Structure

With limits in a follow-on treaty of 1500 strategic warheads and 700 SNDVs, the United States might deploy a strategic nuclear force along the following lines:

- 300 Minuteman III ICBMs downloaded to one warhead each—300 warheads
- 168 Trident D-5 SLBMs downloaded to five warheads each on 14 submarines (each submarine downloaded to carry 12 SLBMs)—840 warheads
- 19 B-2 bombers—19 warheads (bombs)
- 34 B-52 nuclear-capable bombers—340 warheads (cruise missiles)

The United States could also maintain four Trident submarines carrying conventionally-armed cruise missiles and a combination of B-1 and B-52 bombers in a conventional-only role outside of the SNDV limit. This force structure would allow the United States to continue to maintain a strategic triad but would require a significant contraction in the nuclear-capable bomber force. Should the United States be prepared to reduce the number of its Trident missile-carrying submarines to ten or 12, it could maintain a larger force of nuclear-capable bombers.

Parallel Measures

While the focus will understandably be on negotiating a follow-on treaty to START, the United States and Russia should take other steps in parallel with those negotiations. These measures would in part lay the foundation for deeper future reductions that encompass the entire range of nuclear weapons.

Comprehensive Test Ban Treaty. The U.S. administration should, as President Obama has said he will, resubmit the Comprehensive Test Ban Treaty (CTBT) prohibiting all nuclear testing to the Senate for ratification. Russia has already ratified the CTBT. The administration will have to develop strong arguments for ratification, which failed in 1999 due to two primary concerns: questions about the reliability of U.S.

warheads over the long term in the absence of testing, and concern about the ability to detect any nuclear test, even if of very low yield. The administration will have to prepare the ground with the Senate carefully in order to win ratification. Among other issues, it will have to decide how to handle the reliable replacement warhead question.

A Broad Nuclear Security Approach. Washington and Moscow should discuss a broad approach to nuclear security questions with a view to the 2010 NPT review conference. This is an area on which the two capitals can show global leadership. Elements of this approach should go beyond U.S. and Russian strategic nuclear reductions to include:

- U.S.-Russian support for measures to strengthen the bar against other states acquiring nuclear weapons, such as universal adherence to the International Atomic Energy Agency's additional protocol;

- a joint U.S.-Russian effort to make low-enriched uranium fuel for civil nuclear power reactors available to all non-nuclear weapons states that abide by their NPT obligations; and

- a joint effort to achieve a fissile materials cutoff treaty that would ban the production of new highly-enriched uranium or plutonium for nuclear weapons purposes.

This broad approach would reaffirm the basic bargain of the NPT: the nuclear-weapons states disarm (or move in that direction) and share civil nuclear technology with the non-nuclear weapons states, which for their part agree not to acquire nuclear weapons.

Missile Defense: While not bringing missile defense into the START follow-on negotiations, Washington and Moscow should continue discussions on missile defense issues. These exchanges should cover the broader question of the relationship between offensive and defensive arms, differences over the U.S. plan to deploy a missile defense system in Poland and the Czech Republic, and possible joint approaches to address the challenge posed by new ballistic missile threats. Joint approaches should include ideas for NATO-Russia cooperation, given that theater missile defense has been identified as a subject for work between the Alliance and Russia.

Warhead Numbers. While counting rules can give a good tally of deployed strategic warheads, neither side knows with confidence the other's number of non-deployed warheads. At a level of 1500 deployed strategic warheads, this will not matter much. However, in anticipation of deeper reductions, Washington and Moscow should begin side discussions regarding verifying numbers of *all* strategic nuclear warheads—non-deployed as well as deployed warheads. The United States and Russia will each want to maintain some number of spare warheads beyond the deployed warhead limit, but too large a number will raise concerns about breakout potential. At some point, further strategic cuts may not be possible unless the sides have greater confidence in their knowledge of the other's spare and other non-deployed warhead numbers.

The sides thus should begin to discuss now how they can develop a limit that covers all strategic warheads. One immediate step would be for both sides to declare to the other the number of its deployed and non-deployed strategic warheads. While neither side now could verify the other's declared number of non-deployed warheads, this would create a baseline against which future monitoring measures might be applied.[38]

Tactical Nuclear Weapons. The United States and Russia should begin discussions on how to increase transparency regarding tactical nuclear weapons on both sides and possible approaches for dealing with them in the future. This could begin to prepare a basis for a more formal negotiation at a later time, bearing in mind that the absence of any limits on tactical nuclear weapons will at some point become a barrier to future strategic force reductions. In parallel with this, and as part of the development of the new NATO strategic concept mandated by Alliance leaders at their April 3-4 summit, the United States and its NATO allies should discuss the future role of and requirements for U.S. tactical nuclear weapons in Europe.

This is a broad and ambitious agenda. Moving along these lines will maintain the U.S.-Russian strategic nuclear framework and open the possibility of deeper reductions in U.S. and Russian strategic arsenals that will improve their mutual security, reduce the costs of maintaining strategic forces, and signal their commitment to live up to their commitments under the NPT. Beginning discussions now, as opposed to formal negotiations, on issues such as non-deployed warhead numbers and tactical nuclear weapons could facilitate later negotiations of further nuclear arms cuts. Finally, embedding their approach to negotiating a follow-on treaty to START in a broader nuclear security effort offers Washington and Moscow the opportunity to take a joint leadership role to press a more aggressive effort to constrain nuclear proliferation worldwide.

Endnotes

[1] White House, Office of the Press Secretary, "Joint Statement by Dmitriy A. Medvedev, President of the Russian Federation, and Barack Obama, President of the United States of America, Regarding Negotiations on Further Reductions in Strategic Offensive Arms," April 1, 2009.

[2] Technically, START does not limit ICBMs and SLBMs per se. It limits strategic ballistic missile launchers, that is, ICBM silos and mobile launchers, and SLBM launch tubes on missile-carrying submarines. This is for purposes of monitoring: silos, mobile launchers, and submarine tubes can be more readily identified and counted than can actual missiles.

[3] See *The Treaty between the United States of America and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms*, U.S. Arms Control and Disarmament Agency, U.S. Department of State Dispatch supplement, 1991.

[4] In view of growing concern about a North Korean ballistic missile capability, the U.S. government sought in the late 1990s to negotiate with Russia amendments to the ABM Treaty to allow deployment of a limited national missile defense. Those efforts failed. In December 2001, the Bush administration gave notice of its intent to withdraw from the treaty.

[5] White House, Office of the Press Secretary, "Text of the Strategic Offensive Reductions Treaty," May 24, 2002, http://www.fas.org/nuke/control/sort/sort.htm.

[6] The Bush administration subsequently used the term "operationally deployed strategic nuclear warheads," which it defined as warheads on ICBMs and SLBMs plus nuclear bombs stored at bomber bases. It differentiated these warheads from spare warheads and warheads in the "responsive force"—warheads that could be redeployed as operational warheads should the United States need to exceed the SORT limit of 1700-2200.

[7] Conversation with senior Russia Foreign Ministry official, December 2008.

[8] Amy F. Woolf, *U.S. Strategic Nuclear Forces: Background, Developments, Issues*, Congressional Research Service, January 6, 2009, p. 8.

[9] U.S. Department of State, Bureau of Verification, Compliance and Implementation, "START Aggregate Numbers of Strategic Offensive Arms," fact sheet, April 1, 2009.

[10] Hans M. Kristensen, "United States Reaches Moscow Treaty Warhead Limit Early," FAS Strategic Security Blog, February 9, 2009, http://www.fas.org/blog/ssp/2009/02/sprt.php.

[11] Russian Strategic Nuclear Forces, http://russianforces.org.

[12] U.S. Department of State, "START Aggregate Numbers of Strategic Offensive Arms."

[13] S. 1547, National Defense Authorization Act for Fiscal Year 2008, as marked up by the Senate Armed Services Committee, http://www.fas.org/spg/congress/2007/sen-npr.html.

[14] Shortly before meeting with President Yeltsin in Helsinki in 1997, President Clinton expressed interest in offering a START III number below 2000-2500. The chairman of the joint chiefs noted, however, that while the work had been done to justify a U.S. strategic force limited to 2500 warheads, there was not enough time to develop the policy and justification for a lower level. President Clinton stayed with the 2000-2500 level in Helsinki.

[15] Michael D. Shear and Scott Wilson, "Obama, Medvedev Pledge Cooperation," The Washington Post, p. 1, April 2, 2009.

[16] START's downloading provisions are complex. They impose a number of restrictions on downloading. For example, neither side may download an aggregate total of more than 1250 warheads; Minuteman III ICBMs had to be downloaded within seven years of START's entry into force; and any ICBM or SLBM downloaded by more than two warheads must have a new "bus" or warhead platform. The provisions do not require that all missiles of the same type be downloaded; they do, however, prohibit deployment of downloaded missiles and non-downloaded missiles at the same base. The complexity of the provisions is illustrated by the fact that, while some Trident II SLBMs have been downloaded, all continue to be attributed as carrying eight warheads each.

[17] Of the original 18 Trident submarines, four have been refitted to carry cruise missiles and special operations forces, leaving 14 equipped to carry SLBMs.

[18] START II provided that such conventional-only bombers not train in nuclear missions and not be deployed at air bases with heavy bombers with nuclear roles, and that storage areas for nuclear weapons not be located within 100 kilometers of the air bases where conventional-only bombers were deployed. See *Treaty Between the United States of America and the Russian Federation on Further Reduction and Limitation of Strategic Offensive Arms* (START II), January 3, 1993, http://state.gov/www/global/ arms/starthtm/start2/strt2txt.html.

[19] "Ohio Class SSGN-726 Tactical Trident," GlobalSecurity.org, http://www.globalsecurity.org/military/ systems/ship/ssgn-726.htm.

[20] Amy F. Woolf, *U.S. Strategic Nuclear Forces: Background, Developments, Issues*, p. 18.

[21] See the *Protocol on Procedures Governing the Elimination of the Missile Systems Subject to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles*, December 1987.

[22] Russian missile-carrying submarines use other mechanisms for launching SLBMs from the missile tube.

[23] Amy F. Woolf, *U.S. Strategic Nuclear Forces: Background, Developments, Issues*, p. 17.

[24] Department of State, "The Legacy of START and Related U.S. Policies."

[25] Phillip Webster and Tony Halpin, "Gordon Brown Offers to Cut Britain's Nuclear Arsenal," TimesOnLine, March 18, 2009, http://www/timesonline.co.uk/tol/news/uk/article5927160.ece.

[26] Robert S. Norris and Hans M. Kristensen, "French Nuclear Forces, 2008," Bulletin of the Atomic Scientists, September/October 2008, vol. 64, no. 4, pp. 52-54.

[27] Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2008," Bulletin of the Atomic Scientists, July/August 2008, vol. 64, no. 3, pp. 42-45.

[28] White House, Office of the Press Secretary, "Remarks by President Barack Obama, Hradcany Square, Prague, Czech Republic," April 5, 2009.

[29] Given the military and political significance of strategic nuclear weapons, there presumably is some level below which either the United States or Russia would not reduce without addressing third-country strategic forces. And one key U.S. ally, Japan, is already concerned that the credibility of the U.S. nuclear umbrella for Japan might be undercut if U.S. strategic forces were reduced too far without some constraints on Chinese nuclear forces.

[30] The U.S. missile interceptors deployed by the Bush administration in Alaska and California are designed to defend against a rudimentary North Korean ICBM and are believed to have little capability against the far more sophisticated Russian strategic missiles.

[31] White House, Office of the Press Secretary, "Joint Statement by President Dmitriy Medvedev of the Russian Federation and President Barack Obama of the United States of America," April 1, 2009.

[32] Viktor Ruchkin, "The ABM Factor," Krasnaya Zvezda, March 4, 2009, http://www.redstar.ru/ 2009/03/04_03/1_02.html.

[33] Most deployed strategic warheads are on top of ICBMs in secured missile silos or SLBMs on board submarines. Illicitly removing such warheads would be far more difficult than stealing a tactical nuclear warhead.

[34] Amy F. Woolf, *Nonstrategic Nuclear Weapons*, Congressional Research Service, January 28, 2009.

[35] Oliver Meier, "U.S. Cuts Tactical Nuclear Weapons in Europe," Arms Control Association, http://www.armscontrol.org/2714.

[36] Article VI of the NPT provides that "Each of the Parties to the [NPT] Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at any early date and to nuclear disarmament …"

[37] START counted bombers not armed to carry cruise missiles with only one warhead, even though they could carry a number of nuclear gravity bombs or short-range attack missiles. This lenient counting rule in part reflected the fact that air defenses are unconstrained.

[38] Edward Ifft, "Next Steps in U.S.-Russian Arms Control," paper prepared for PIR Center conference, Moscow, March 5, 2009.

About the Author

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