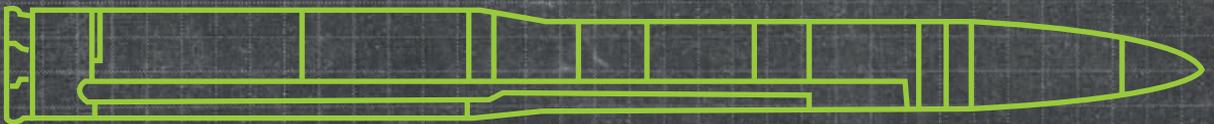


JAMES M. ACTON



LOW NUMBERS

**A PRACTICAL PATH TO
DEEP NUCLEAR REDUCTIONS**



CARNEGIE ENDOWMENT

FOR INTERNATIONAL PEACE



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WASHINGTON DC ■ MOSCOW ■ BEIRUT ■ BRUSSELS ■ BEIJING

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SUMMARY

U.S. policy seeks to create the conditions that would allow for deep reductions in nuclear arsenals. This report offers a practical approach to reducing the U.S. and Russian stockpiles to 500 nuclear warheads each and those of other nuclear-armed states to no more than about half that number. This target would require Washington and Moscow to reduce their arsenals by a factor of ten.

To achieve these low numbers, the United States should:

- **Take a comprehensive approach on arms control.**

Achieving deep reductions in U.S. and Russian nuclear weapons will be difficult, for both technical and political reasons. Moreover, such reductions could create challenges to “strategic stability.” As a result, U.S. arms control policy must adopt a comprehensive approach aimed at verifiably eliminating warheads (including tactical and non-deployed ones), deterring rearmament, and reducing the incentives to use nuclear weapons first in a crisis.

To accomplish this, formal arms control efforts must limit certain types of high-precision conventional weapons, phase out missiles armed with multiple warheads, and enhance the transparency of nuclear weapon production complexes. More informal confidence building between the United States and Russia—on ballistic missile defense in particular—also has a key role to play, not least because it may help cement a lasting domestic political consensus in the United States around scaling defenses to the size of the threats posed by Iran and North Korea.

- **Engage with U.S. allies to review security threats and responses.**

Besides working with Russia, the United States must convince its allies—both in Europe and in East Asia—to support deep reductions. Together, they should initiate wide-ranging reviews to identify security threats and appropriate responses. These reviews should help illustrate the very narrow circumstances in which nuclear weapons could prove useful, thus reducing allies' fears about deep reductions.

The United States should consult with allies before making decisions that directly affect their security (such as withdrawing capabilities or reducing weapons stockpiles). More generally, Washington should also work with allies to find ways of demonstrating and enhancing its political commitment to them so they—and potential adversaries—do not interpret reductions as signaling a weakening of the American commitment to extended deterrence.

- **Address conventional imbalances.**

Stabilizing conventional imbalances among the United States, China, and Russia is another daunting but necessary step toward deep reductions in nuclear weapons.

In the short term, the U.S.-Russia balance poses the biggest threat to the reductions process. Russia sees nuclear weapons as a way to offset its conventional inferiority. If it makes tactical nuclear arms control contingent on conventional arms control, the nuclear reductions process could be quickly derailed given the immense political challenges to resurrecting the conventional arms control regime in Europe. Nonetheless, the United States should continue to pursue conventional arms control efforts in Europe to reduce the chance that Russia will link them into the next round of nuclear negotiations.

Over the longer term, the fluid conventional balance between the United States and China is likely to exert an increasing influence on the nuclear reductions process. The key issue is whether they can agree that rough equality of capability in the West Pacific serves both their interests. If they cannot, a costly conventional arms race between the two nations could ensue. The state that loses could increase its reliance on nuclear weapons and, correspondingly, become reluctant to participate in efforts to reduce nuclear arsenals.

- **Push for a transparent and multilateral process.**

The United States and Russia aim to eventually advance a multilateral arms control process with other nuclear-armed states. A key step toward this goal is enhanced transparency from France, the United Kingdom, and particularly China. Beijing, however, opposes transparency partly because it worries that openness would undermine the survivability of its nuclear forces. The first step toward multilateral arms control is, therefore, for China and the United States to engage in a program of mutual strategic reassurance.

As difficult as achieving a multilateral agreement among the five officially recognized nuclear-weapon states will be, it is complicated yet further by the impact of states outside the Nuclear Non-Proliferation Treaty—India, Pakistan, Israel, and North Korea. This process will probably be derailed entirely if Iran is successful in acquiring nuclear weapons.

While cutting the number of nuclear weapons so significantly is a formidable challenge, the United States, Russia, and other nations can do much in the short term to advance this goal—as the conclusion of this report highlights. Washington should lead this process to ensure that it at least gets started.

INTRODUCTION

It is the policy of the United States to try to create the conditions that would allow for deep reductions in its nuclear forces. On April 8, 2010, at the signing ceremony for the New Strategic Arms Reduction Treaty (New START), President Barack Obama stated that

[w]hile the New START treaty is an important first step forward, it is just one step on a longer journey. As I said last year in Prague, this treaty will set the stage for further cuts.¹

The administration's Nuclear Posture Review (NPR), which was released two days before the President's remarks, sets out in broad terms the preconditions for deeper reductions. The NPR emphasizes that the U.S. approach to disarmament will be a gradual one in which "any future nuclear reductions must continue to strengthen deterrence of potential regional adversaries, strategic stability vis-à-vis Russia and China, and assurance of our allies and partners."² The initial goal is to engage Russia "in negotiations aimed at achieving substantial further nuclear force reductions and transparency that would cover all nuclear weapons."³ However, the NPR made it clear that bilateral U.S.-Russian reductions would not continue indefinitely and that "following substantial further nuclear force reductions with Russia" further progress would be contingent on other nuclear-armed states' joining a multilateral process.⁴

The aims of U.S. policy are clear; this report suggests how the United States can try to achieve them. Specifically, it proposes a detailed policy agenda with the ultimate goal of securing a multinational agreement to limit the United States and Russia to 500 nuclear warheads apiece (whether deployed, non-deployed, strategic, or tactical) and the other nuclear-armed states to no more

than about half that number (which is roughly what China, France, and the United Kingdom now have). These figures correspond to the “minimization point” defined by the International Commission on Non-proliferation and Disarmament as a key step on the way to a world without nuclear weapons.⁵ To reach this goal the United States and Russia would have to reduce their total active stockpiles by a factor of ten.⁶ This would unquestionably require a long-term, step-by-step process. However, even in the short term, there are many steps the United States can take toward this goal.

Obviously, reducing U.S. and Russian nuclear arsenals would also mean reducing the number of targets that either side can hold at risk. This immediately raises the question of

whether deep reductions would undermine deterrence (including extended deterrence). The United States describes its targeting policy only in the most general of terms. Contrary to popular belief, it does not deliberately target civilians. Instead, it focuses on four broad target categories—military forces (both nuclear and conventional), military and national leadership, weapons of mass destruction infrastructure, and war-supporting infrastructure—on the grounds that these are the assets the United States believes potential adversaries value the most.⁷ A companion study to this one (to be published as an *Adelphi* book) considers in detail the question of target prioritization and its effect on deterrence.⁸ That study concludes that deep reductions probably would not diminish the United States’ ability to deter aggression against itself or its allies.

However, while deep reductions would probably not undermine deterrence, they could create other challenges related to “strategic stability.”⁹ The first challenge is rearmament. There are a number of reasons why a state might choose to rebuild its nuclear arsenal, but the most likely rationale is the need to offset a growing *conventional* imbalance with a potential adversary. This effect could become more problematic at low numbers because “a state with nuclear plenty could mount a nuclear response to a growing conventional imbalance by changing its war plans; a state with a small arsenal might decide that it must rearm to take on a new mission.”¹⁰

Deep reductions probably would not diminish the United States’ ability to deter aggression against America or its allies.

The second challenge relates to the survivability of Russia's nuclear forces. Moscow is already concerned that its nuclear forces are highly vulnerable and that, in a deep crisis, the United States might try to destroy those forces preemptively. This fear—whether or not it accurately reflects U.S. intentions—could pressure a Russian leader to use nuclear weapons before the United States could attack them. This danger is an example of crisis instability.¹¹ Deep reductions could exacerbate Russian fears. Taking steps to reassure Russia and enhance crisis stability is in the U.S. national interest, irrespective of whether America's ultimate goal is to reduce the number of nuclear weapons worldwide. However, its pursuit of deep reductions provides the United States with an additional reason for doing so.

The United States faces several challenges as it embarks on the path to deep reductions, including the development of arms control measures to mitigate the risks of rearmament and crisis instability. It also faces political challenges as it engages allies and potential adversaries in the disarmament process. The report is structured as follows:

- **Chapter 1** considers the future of **U.S.-Russian arms control** efforts, focusing in particular on steps to enhance strategic stability beyond the immediate challenge of negotiating a successor to New START.
- **Chapter 2** sets out a strategy for **engaging U.S. allies** in order to win their support for deep reductions.
- **Chapter 3** considers the way forward for **conventional arms control**, recognizing that unaddressed conventional imbalances are likely to impede nuclear disarmament.
- **Chapter 4** proposes a practical pathway to **multilateral arms control** and asks how the United States can engage other nuclear-armed states in this endeavor.

The emphasis on the United States in this report should not be misunderstood. This report focuses on America because it is the avowed policy of the United States to seek deep reductions. This focus does not imply that, by itself, the United States can create the conditions necessary to achieve this goal. Indeed, doing so will require the cooperation of other nuclear-armed states, as well as many non-nuclear-weapon states, particularly those that are allied to the United States. Whether their cooperation will be forthcoming remains to be seen.

CHAPTER 1

BILATERAL STEPS: WHAT THE UNITED STATES AND RUSSIA CAN DO TOGETHER

Let us focus instead on a more practical, more attainable peace—based not on a sudden revolution in human nature but on a gradual evolution in human institutions—on a series of concrete actions and effective agreements which are in the interest of all concerned.

John F. Kennedy¹²

The next round of U.S.-Russian arms control is likely to be the most challenging ever attempted. Any discussion of how negotiations will proceed is necessarily speculative, since neither side appears to have formulated its negotiating position. Indeed, Russia seems to be in no hurry to enter into further negotiations of any kind. In remarks to the State Duma on January 14, 2011, Russian Foreign Minister Sergei Lavrov stated that further negotiations would begin “only after we emerge confident that [New START] has been carried out by the Americans.”¹³ Furthermore, through public statements and private channels both sides have made it clear that, even if negotiations do begin, very significant gaps will have to be bridged.

The United States is interested in further reciprocal reductions of strategic nuclear weapons and, more importantly, the inclusion of tactical nuclear weapons in arms control for the first time. By contrast, Russia is worried that reductions in strategic weapons would make a U.S. first strike easier. Russia’s consent to such reductions will be contingent on America’s adequately addressing its concerns.¹⁴ For this reason, it is almost certain that Russia will raise the issues of ballistic missile defense, high-precision conventional weapons (sometimes termed “non-

nuclear strategic weapons” by Russians), and the American “upload potential” (that is, the U.S. ability to deploy additional nuclear warheads relatively quickly by placing non-deployed warheads onto ballistic missiles that are currently loaded with fewer warheads than they can carry).¹⁵ Russia may also raise issues like the weaponization of space and limits on anti-submarine warfare activities.

Moscow does not appear to have much of an appetite for reducing tactical nuclear weapons either; it is currently sticking to its long-standing position of unwillingness to even discuss tactical nuclear weapons until all such weapons have been withdrawn to national territory.¹⁶ The only tactical nuclear weapons currently deployed abroad are American B61 gravity bombs based in Europe, and NATO has categorically rejected withdrawing these weapons as a precondition for arms control talks. Even if both sides can overcome this impasse (and realistically this will only happen if Russia drops its precondition), then Moscow will still demand a high price for an agreement on tactical nuclear weapons. Exactly what that price will be, however, remains unclear, as this report discusses in more depth in chapter 3.

Beyond these political problems, the two sides also face a daunting technical challenge: negotiating a verification regime for non-deployed and tactical nuclear weapons.¹⁷ Past U.S.-Russian arms control agreements focused exclusively on launchers, delivery systems, and deployed warheads. Verifying inventories of non-deployed and tactical nuclear weapons will require inspections of unprecedented intrusiveness. Russia in particular has historically been reluctant to increase transparency of warheads besides those that are already in place on deployed strategic delivery vehicles. During New START negotiations, for instance, it did not even consider permitting inspections to verify the number of warheads stored at bomber bases.¹⁸ Even if the two sides can agree in principle that inventories of tactical and non-deployed warheads should be subject to verification, they will still have the challenge of developing the necessary procedures. Moreover, if the two sides deem that verifying the destruction of warheads is necessary, then they will have to develop new technology allowing

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inspectors to verify that an object slated for dismantlement is in fact a warhead without simultaneously revealing classified information.¹⁹

While many challenges must be overcome before and during the next round of arms control negotiations, it is by no means a hopeless task. Previous negotiations solved similarly difficult problems (albeit probably not so many at once). And the next round of U.S.-Russian arms control has the potential to clear away several significant obstacles to reaching low numbers. In particular, if the United States and Russia can agree on how to verify limits on non-deployed and tactical warheads, they will have a template that they can use for subsequent rounds of arms control, in much the same way that the New START negotiators employed somewhat modified versions of the START I verification provisions for strategic launchers and delivery systems. A number of recent and forthcoming studies by both American and Russian analysts have examined in considerable depth potential ways forward.²⁰ This report does not seek to reproduce their work; rather it focuses on a subset of issues that for various reasons lies wholly or partially outside the next round of formal U.S.-Russian arms control. These issues are:

- **ballistic missile defense**, which because of its political sensitivity within the United States cannot be subject to treaty-mandated limits;
- **high-precision conventional weapons**, which will pose challenges for the next round of arms control, but even greater ones for subsequent rounds;
- **“deMIRVing”** (derived from MIRV, or multiple independent re-entry vehicle), which has virtually dropped off the formal arms control agenda but should be reinstated to ensure crisis stability at low numbers; and
- **nuclear weapons complex transparency**, which would be necessary to ensure arms race stability at low numbers and which represents a completely new departure for arms control.

BALLISTIC MISSILE DEFENSE

Ballistic missile defense (BMD) is the issue most likely to derail U.S.-Russian arms control efforts. Given the depth of Moscow’s concerns, it is simply too optimistic to believe that Russia, like the Soviet Union during the START negotiations, will eventually agree to further cuts in offensive forces

without seeing some progress in its concerns being addressed.²¹ The Obama administration, like the Bush administration before it, has repeatedly stated that U.S. ballistic missile defense programs are not targeted against Russia.²² Therefore, neither administration has had a principled objection to assuring Moscow that the United States does not seek to undermine its deterrent. The practical challenges to doing this, however, have proved considerable.

The New START ratification debate has removed any remaining doubt about whether meaningful treaty-mandated limits on ballistic missile defense are politically acceptable in the United States (at least in the short or medium term). The U.S. Senate has made its opposition to any such limits abundantly clear. In its resolution of ratification for New START, it argues uncompromisingly that

defenses against ballistic missiles are essential for new deterrent strategies and for new strategies should deterrence fail; and . . . further limitations on the missile defense capabilities of the United States are not in the national security interest of the United States.²³

Thus the only remaining options are assurance and cooperation (indeed, efforts in this regard are already well underway). Even here, however, the potential for domestic criticism significantly curtails Washington's freedom of action. Any step that domestic critics could conceivably construe as undermining missile defense or as capitulating to Russian demands would be unlikely to win support. Given this constraint, it must be emphasized from the outset that the United States might not be able assuage Russian fears enough to enable further reductions.

American attempts to assure Russia can involve more than simply stating that Russia is not the target of U.S. BMD efforts (such statements appear to carry relatively little weight with Moscow). Moscow's perception of the threat posed by BMD appears to be somewhat influenced by the system's technical characteristics. In 2009, for example, the Obama administration decided to adopt a new missile defense architecture for Europe known as the Phased Adaptive Approach (PAA). It scrapped plans to deploy ten Ground Based Interceptors (GBIs), which are designed to engage intermediate range ballistic missiles (IRBMs) and intercontinental ballistic missiles (ICBMs). Instead, the administration is focusing—for the time being, at least—on intercepting shorter-range missiles using current and future versions of the Standard Missile-3 (SM-3) interceptor. The Obama administration adopted the PAA as a reaction to the developing nature of the Iranian missile threat, and this approach will almost certainly serve to protect Europe more effectively than the deployment of

GBIs. However, its advantages for U.S.-Russian relations were certainly not lost on the Obama administration.

Moscow's preference for the PAA (at least in its initial phases) over the deployment of GBIs is clear. Sergei Lavrov, for example, has stated that "[t]he initial focus [of the PAA] is on regional systems, systems that do not prejudice strategic stability, and do not create risks for the Russian strategic nuclear forces."²⁴ However, Moscow is concerned about the final stage of the PAA. Phase four will involve the deployment of land-based SM-3 Block IIB missile interceptors, which are designed to have some capability to intercept ICBMs. For this reason Lavrov added,

[w]hen and if our monitoring of the realization of these plans shows that they are reaching the level of a strategic missile defense, and this level will be regarded by our military experts as creating risks for the Russian strategic nuclear forces, it is then that we will have the right to take advantage of those provisions which this Treaty contains [that is, the right to withdraw].²⁵

Only a ballistic missile defense system that is capable of overcoming sophisticated countermeasures has any chance of being able to undermine

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Russia's nuclear forces. As the Next Generation Working Group on U.S.-Russia Arms Control has observed, in this regard phase four of the PAA may be of particular concern to Moscow because its goal is to intercept ballistic missiles in the ascent phase (that is, after the engines have been cut off but before the missile has reached the high point of its orbit).²⁶ The United States is interested in this technology precisely because it would, in the words of

the Missile Defense Agency, "allow us to intercept early in the battle space and optimize our ability to execute a shoot-look-shoot tactic to defeat a threat before countermeasures are deployed."²⁷ Moreover, a single interceptor that engages

a missile carrying multiple independent reentry vehicles very early in flight—before some or all of the warheads were dispensed—could destroy multiple warheads in a single shot.

The United States has told Russia that the SM-3 Block IIB interceptors will be sufficiently fast to intercept a liquid-fueled Iranian ICBM in the ascent phase but not a solid-fueled Russian ICBM unless the interceptors were placed extremely close to Russia, such as in the Barents Sea. The United States claims that this is not possible, given that the highly reactive fuel used by the Block IIB interceptors precludes them being based on naval vessels.²⁸ Although some Russian analysts have accepted this assurance, the broad direction of U.S. technological development may appear threatening to Moscow, which is currently investing heavily in MIRVed, road-mobile ICBMs and continues to use some liquid-fueled ICBMs.

All that said, if Russia becomes seriously concerned with the threat posed by ascent-phase interceptors (perhaps because the United States develops much faster interceptors than the SM-3 Block IIB), then it could employ a range of countermeasures. These might include deploying missiles in launch sites based farther from U.S. interceptors, deMIRVing its ICBMs, redesigning its post-boost vehicles to release multiple warheads simultaneously, and phasing out liquid-fueled ICBMs.²⁹ Some of these measures are expensive, but they would become relatively more affordable if the United States and Russia agreed to further reductions.

On balance, therefore, even the long-term potential of the PAA to undermine Russia's deterrent appears fairly limited. And if Washington were to provide Russia with credible information on the technical characteristics of the interceptors, then even Russia might eventually reach the same conclusion. Above all, Moscow ought to realize that the PAA is considerably less threatening than some alternative architectures, such as space-based interceptors. Developing space-based missile defense systems would present the United States with tremendous challenges, but it is probably the only form of missile defense that could really pose a significant threat to Russia's nuclear forces, especially at much lower numbers.

Therefore, continuity of policy is a potentially important and perhaps overlooked way of easing Russian fears about ballistic missile defense. Russia's greatest concern has always been that U.S. ballistic missile defense deployments are "open ended" and that limited deployments by the United States are stepping-stones to a much larger and more sophisticated system.³⁰ For instance, four well-respected Russian analysts, Sergei M. Rogov, Viktor Esin, Pavel S. Zolotarev, and Valeriy Yarynich, have argued that "reductions (especially to 500 warheads) would be destabilizing, if after Obama, the Republican Party returns

The lack of a domestic consensus within the United States about the purpose of ballistic missile defense exacerbates Russian fears.

debate, for instance, Senator Jim DeMint (R-SC) criticized the treaty because its “underlying assumption, which I’m afraid is absurd and dangerous, is that America should seek parity with Russia when it comes to nuclear weapons.”³² He went on to state:

... it’s very clear that we can develop defensive missile defense, as long as it does not threaten [Russia’s] offensive capabilities. I mean, that’s exactly what it says here. That’s what they’ve said in their statement. . . . We have complete flexibility with missile defense, until it gets to the point where it threatens their ability to deliver weapons.³³

The implication of DeMint’s remarks is crystal clear: The United States should seek to negate Russia’s deterrent, or at least maintain the option of doing so. Against this background, a lasting national consensus in the United States around the Phased Adaptive Approach, scaled to combat the evolving ballistic missile threat from Iran, would actually not be a bad outcome for Moscow. Cooperation on ballistic missile defense offers Russia a potential means to help build this consensus.

Cooperation on missile defenses began during the Bush administration when NATO and Russia worked together on countering the threat from short- and medium-range missiles. However, it ground to a halt in 2008 amid the acrimony between the United States and Russia over American plans to deploy ballistic missile interceptors in Poland and a radar in the Czech Republic. Presidents Obama and Medvedev took the first steps toward restarting cooperation on April 1, 2009, when they agreed to conduct a joint assessment of ballistic

to power in the United States and resumes after 2020 a massive deployment of strategic missile defenses, including ground-based, sea-based, air-based, and space-based [systems].”³¹

The lack of a domestic consensus within the United States about the purpose of ballistic missile defense exacerbates Russian fears. During the New START ratification

missile threats.³⁴ Although this assessment had not been released at the time of this writing, U.S. officials expressed confidence in late 2010 that it would be completed by early 2011.³⁵ More recently, the NATO-Russia Council has become the preferred forum for cooperation.³⁶ At the council meeting held in November 2010 as part of the Lisbon summit, NATO and Russia agreed to conduct a joint threat assessment, to resume cooperation on theater missile defenses, and, perhaps most significantly, to develop “a comprehensive Joint Analysis of the future framework for missile defense cooperation.”³⁷

Some analysts argue that cooperation on ballistic missile defense could fundamentally reshape the U.S.-Russian relationship. For example, Vladimir Dvorkin, a highly respected retired Russian general, argues that “two powers can hardly be enemies relying on nuclear deterrence if they deploy

and maintain a joint missile defense system.”³⁸ However, a *joint* missile defense system—in which both parties must consent to its use—is not in the cards, and it is unclear whether the effects of cooperation on the development of two independent systems would be nearly so far-reaching.

Nevertheless, cooperation might still have important benefits, albeit more prosaic ones. Proponents argue that, because of the location of Russian radars and Moscow’s access to advanced propellant technology, cooperation with Russia could significantly enhance the effectiveness of the PAA against Iranian missiles.³⁹ If this claim is correct, then future U.S. administrations of any political party would have a strong incentive not to jeopardize cooperation by pursuing a missile defense architecture that was unacceptable to Russia. Thus cooperation with Russia might help cement a political consensus around the PAA in the United States. There are myriad practical challenges that threaten to derail such cooperation before it has even begun.⁴⁰ For instance, as NATO and Russia work to develop a framework for future cooperation, they have started to disagree about the aim of cooperation. NATO believes that its system and the Russian system should each be capable of engaging all incoming ballistic missiles,

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regardless of their geographical origin. Russia, by contrast, favors an approach in which each system would be tasked with defending against threats arising from its own specified geographical “sector.”⁴¹ If the two sides can overcome these obstacles, then cooperation with Russia on ballistic missile defense might conceivably create the conditions for enabling further steps in U.S.-Russian bilateral arms control. At this point, however, it is hard to be optimistic.

U.S.-Russian ballistic missile defense cooperation has another often-overlooked aspect that could have a significant impact on the reductions process: its effect on third countries, particularly China. As this report will discuss in chapter 4, China is already worried about U.S. ballistic missile defense efforts. Successful U.S.-Russian cooperation risks exacerbating these concerns. In particular, cooperation between the United States and Russia on a global defense against all missile threats (a long-term project advocated by some) could pose a threat to Chinese nuclear forces and reduce its willingness to participate in the reductions process.

Involving China in cooperative ballistic missile efforts is not feasible for the foreseeable future. There is simply too much ambivalence among the United States and its allies on the question of whether China should be a target of ballistic missile defenses.⁴² On a more practical level, the Cox Report resulted in stringent

While cooperating with China on ballistic missile defense might not be possible at this stage, other confidence-building measures might be—especially bilateral ones with the United States.

legal barriers to the sharing of defense technology with China. Finally, the logistics of cooperation between the United States and Russia are already complicated enough; involving China at an early stage would doom the endeavor to failure.

While cooperating with China on ballistic missile defense might not be possible at this stage, other confidence-building measures might be—especially bilateral ones with the United States. As with Russia, the starting point should be the technical

realities of defending against Chinese ballistic missiles. China is already engaged in developing “maneuvering re-entry vehicles, MIRVs, decoys, chaff, jamming, thermal shielding, and anti-satellite (ASAT) weapons,” which would almost

certainly allow it to defeat even an expanded U.S. ballistic missile system.⁴³ Moreover, China probably has even less to fear than Russia from land-based interceptors like the SM-3 Block IIB that the United States plans to deploy in North East Asia as well as Europe; these interceptors cannot be placed close enough to Chinese ICBMs to threaten them in the early ascent phase. The United States should therefore try to find ways to convince China of the limited ambition it has for ballistic missile defense. If they are not already doing so, American officials could brief Beijing about the basic technical characteristics of its interceptors, its deployment plans, and the progress of cooperation with Russia. They could also invite Chinese personnel to visit ballistic missile defense installations in the United States and on allied territory (with the permission of the host governments, of course). Given that the Bush administration was prepared to negotiate provisions for short-notice “inspections” by Russia of ballistic missile defense facilities, the United States should now be able to extend to China the offer of more informal “visits.”⁴⁴ These visits might help China verify American statements about its ballistic missile defense deployments that Beijing would otherwise have had to take on faith. More importantly, they might also be of significant symbolic value. Over time, it might be possible to convince China that missile deployments in Northeast Asia and the western United States—provided that they are scaled to the developing North Korean threat—do not pose an unacceptable threat to China’s deterrent and induce it to take part in arms control. However, as with Russia, there is no guarantee of success given the limited steps that are politically feasible.

HIGH PRECISION CONVENTIONAL WEAPONS

Western arms control experts seldom appreciate the extent of Russian concerns about U.S. high-precision conventional weaponry. Its concerns about Conventional Prompt Global Strike, a program to develop conventional weapons that can be delivered anywhere in the world within an hour, are well known.⁴⁵ Less understood are its concerns about “non-prompt” weapons—long-range cruise missiles, in particular—and their ability to alter the strategic balance.⁴⁶ Those few U.S. analysts who do understand Russian concerns are often slightly dismissive of them, asserting, quite sincerely, that a conventional Tomahawk land-attack cruise missile would represent “a mere pinprick vis-à-vis hardened missile silos.”⁴⁷ Russian analysts assert—equally sincerely—that repeated cruise missiles attacks could disable a silo and render it inoperable.⁴⁸

Whether or not conventionally armed cruise missiles pose a real threat to Russian silos, they do pose a significant if underappreciated threat to the next

round of U.S.-Russian arms control. It is virtually inconceivable that the United States would ever agree to formal limits on conventional cruise missiles. Given its global military commitments, this position is not unreasonable. However, there are steps outside of formal arms control that the United States should be willing to take. Russian fears appear to be motivated, at least in part, by a technical disagreement with the United States about the capability of cruise missiles to destroy or disable silos. To try to close this gap, the U.S. and Russian governments should quietly commission their own technical experts to jointly assess the vulnerability of silos to cruise missiles. Additionally, the United States should make it clear to Russia that it is willing to discuss non-binding confidence-building measures (if it has not done so already).⁴⁹ For instance, reciprocal data exchanges on the quantity and location of cruise missiles might reduce Russian fears to the extent they are based on a lack of knowledge about U.S. cruise missile programs. If it does nothing else, U.S. willingness to discuss such measures would demonstrate that it takes Moscow's concerns seriously.

Washington should also emphasize to Moscow that deep reductions might actually play to Russia's advantage when it comes to the threat from cruise missiles.

Washington should also emphasize to Moscow that deep reductions might actually play to Russia's advantage when it comes to the threat from cruise missiles. Russia has recently focused on the development of air defense systems like the highly-capable Pantsyr system, which is designed to protect point targets such as silos and mobile missiles and is particularly effective against slower moving weapons like cruise missiles and aircraft.⁵⁰ Russia cannot

currently afford to deploy these systems in large numbers, but with a smaller ICBM force it could afford to protect a more significant fraction of them.

Conventional Prompt Global Strike (CPGS) systems would travel at much higher speeds than cruise missiles. A fact sheet from the Defense Advanced Research Projects Agency (DARPA) states that the Hypersonic Technology Vehicle-2 (HTV-2), a maneuverable gliding re-entry vehicle, could be boosted to "incredibly fast speeds—Mach 20 and above."⁵¹ As a result, CPGS systems would probably have a much greater capability than cruise missiles to destroy

silos (exactly how much greater remains unclear), and they would be much harder to defend against.⁵² Conventional Prompt Global Strike is embryonic. Not only have no systems yet been deployed; at the time that this report went to press in early 2011, the Obama administration had not yet released concrete details of its plans.⁵³ Actual deployments are not expected until later in the decade and, given the technical challenges of developing such systems and the probable downward pressure on the defense budget, significant delays would not be surprising.⁵⁴ The United States has repeatedly stated that CPGS is only a niche capability and that Russia is not the target of these efforts.⁵⁵ However, declaratory policy by itself is unlikely to ease Russian fears (or Chinese ones, for that matter). As CPGS develops over the next few decades it has the potential to cast an increasingly long shadow over nuclear arms control.

To try to convince Russia of its benign intentions, the United States agreed to count conventionally armed ballistic missiles as nuclear-armed under New START. In practice, this formula means that the United States can only deploy conventional warheads on ballistic missiles at the expense of an equal number of nuclear ones. Thus, for as long as New START is in force, the deployment of conventionally armed ballistic missiles—even hypothetical ones that were as effective as nuclear weapons at destroying hard and buried targets—cannot further undermine the survivability of Russia’s nuclear forces.⁵⁶ This provision provides a precedent that should be applied to future rounds of bilateral and even multilateral arms control. However, there are potential stumbling blocks.

One complicating factor is that the CPGS program is not limited to ballistic missiles armed with unguided re-entry vehicles (indeed, at the time of this writing, it is not clear whether the United States will end up pursuing such systems at all). The United States is also interested in launching maneuverable hypersonic gliders like the HTV-2 from ballistic missiles. Such “boost-glide” vehicles would travel largely in the atmosphere, not following a ballistic trajectory. The United States has argued that such systems “do not otherwise meet the definitions of the New START Treaty” and would therefore not be accountable under the treaty.⁵⁷ In response, Rogov, Esin, Zolotarev, and Yarynich stated, “It is unlikely that Russia would agree to not count such a missile toward the [New] START limits. This is the threat that could blow up [New START].”⁵⁸ In practice, boost-glide systems may well not be ready for deployment during the lifetime of New START, which would allow both sides to kick the can down the road. However, this issue will have to be resolved in future treaty negotiations.

Other, quite different systems could also prove problematic. In 2003, DARPA stated that the long-term U.S. goal was the development of “a reusable Hypersonic Cruise Vehicle (HCV) ... capable of taking off from a

conventional military runway and striking targets 9,000 nautical miles distant in less than two hours.”⁵⁹ In support of this goal, it is currently developing the X-51A “WaveRider” hypersonic cruise missile, which, in a successful May 2010 test, traveled at Mach 5 for more than three minutes.⁶⁰ These systems are not launched by ballistic missile. Russia is, however, likely to argue that they constitute “a new kind of strategic offensive arm”⁶¹ that should be treated in the same way as conventionally armed ballistic missiles.

In the final analysis, if CPGS systems are shown to have a significant capability to destroy silos, then there is a strong case for counting them as nuclear-armed in future arms control treaties. Moreover, depending on what Russia offers in return, the United States may ultimately be willing to accept such a solution, provided that it does not wish to deploy CPGS weapons in significant numbers. Indeed, the cost of CPGS is a very strong reason for its remaining a niche capability. However, cost will not necessarily stop Congress or a future administration from deciding to oppose the *principle* of limits at some point in the future, whether or not funds for a significant expansion in the number of CPGS munitions are available. Fortunately, judging by the debate over New START, limits on CPGS do not yet attract the visceral opposition that limits on ballistic missile defense do.⁶² Future administrations should try to ensure that this remains the case by emphasizing the cost of individual CPGS weapons and the extremely limited range of circumstances in which they might be uniquely useful.

Pressure not to treat CPGS systems as nuclear armed is likely to grow as the number of nuclear weapons comes down. The U.S. military was never likely to put up much opposition to counting a handful of conventionally armed ballistic missiles toward the New START limit of 1,550 deployed strategic warheads (with an unlimited number in reserve). But with a total arsenal of 500 nuclear weapons (including reserves), the loss of, say, 50 warheads to CPGS systems would entail a much bigger sacrifice. In this regard, arms control may actually get easier, the more effective CPGS becomes. CPGS systems that are proven to be effective against silos might not do much to exacerbate already acute Russian concerns, but they could make the United States more willing to accept the idea of counting them toward the limit for nuclear warheads at lower numbers.⁶³

Building a domestic consensus that would permit the United States to count future CPGS systems as nuclear armed is challenging and there are no guarantees of success. The U.S. should, therefore, also work at the problem from the other end, that is, try to ease Russian fears about CPGS. The stated U.S. willingness to discuss CPGS with Russia in a strategic dialogue is a good start. DeMIRVing—discussed in the following section—could be another important step.

DEMIRVING

Eliminating ICBMs armed with multiple independent reentry vehicles was a key goal of the arms control process of the 1980s and 1990s. U.S. interest in deMIRVing was motivated by concerns about crisis stability. Specifically, a nuclear attack on MIRVed ICBMs, especially ones based in silos, would generally have a favorable exchange ratio—that is, more warheads would be destroyed by the attack than were used in it. This might create a strong incentive to attack MIRVed ICBMs at the start of a crisis and, consequently, significant pressure to use them before they could be destroyed.⁶⁴

START II, which was concluded in 1993, banned silo-based and road-mobile MIRVed ICBMs.⁶⁵ However, that treaty never entered into force, and deMIRVing has more or less dropped off the formal arms control agenda. The

Bush administration was dismissive of the whole concept of strategic stability, branding it “outdated.”⁶⁶ The Obama administration is certainly more sympathetic to these concerns, but it is not interested in pursuing legally binding limitations on MIRVed ICBMs, partly because it believes that treaties that do not constrain force structure are more domestically saleable, and

partly because it values the flexibility that MIRVed ICBMs offer.⁶⁷ Moscow also has no interest in limitations on MIRVed ICBMs because loading missiles with multiple warheads allows it to maintain numerical parity with the United States at significantly reduced costs. As a consequence, New START, in language virtually identical to the Moscow Treaty, gives each party “the right to determine for itself the composition and structure of its strategic offensive arms.”⁶⁸

Although it seems relatively unlikely that the next round of arms control will take up the issue of deMIRVing, there are strong reasons why it should. Both the United States and Russia believe serious crises, in which the use of nuclear weapons would be credible, might still arise. For as long as this is the case, the concept of crisis stability remains relevant.⁶⁹ As a result, deMIRVing would be worthwhile even if deep reductions were not a goal of the United States. Because deep reductions could exacerbate Russian concerns about the survivability of its forces, they provide an additional impetus for deMIRVing.

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Moreover, deMIRVing could help mitigate the stability consequences of future developments in high-precision conventional weaponry. CPGS might appear less menacing to Russia if its silo-based ICBMs were loaded with only one warhead. Similarly, Russia would have less reason to worry about hypothetical ballistic missile defense systems capable of engaging a solid-fueled ICBM early in the ascent phase if its otherwise survivable road-mobile ICBMs contained a single warhead. Moreover, as numbers come down, it would become relatively more affordable for Russia to maintain numerical parity with the United States without MIRVed missiles.

The parties will not be able to eliminate MIRVed ICBMs in a single treaty. Russia recently introduced a new type of MIRVed, road-mobile missile, the RS-24; it would almost certainly reject any agreement that forced it to scrap or limit the deployment of this system. Moreover, both Russia and the United States currently deploy MIRVed, silo-based ICBMs in significant numbers (even if only some of them are currently loaded with multiple warheads). They are unlikely to agree to scrap these systems before the end of their service lives.

Given that deMIRVing cannot be completed in the next arms control treaty, both sides should focus on banning new deployments of MIRVed, silo-based ICBMs, which are inherently less survivable than road-mobile systems. This would be a relatively modest step, which is precisely why it might be achievable. Ideally, it would be accompanied by agreement to “download” (that is, remove) some number of warheads from MIRVed, silo-based ICBMs that are already deployed and loaded with multiple warheads. (The exact number of warheads to be downloaded would depend on the type of ICBM in question, which would be determined in negotiations.)

Although modest, a ban on new deployments of MIRVed, silo-based ICBMs would still be valuable. Russia recently announced that it is funding the development of a new “heavy” ICBM that would be silo-based and capable of carrying a large number of re-entry vehicles.⁷⁰ Russian experts have stated this new ICBM will be liquid fueled and hence more vulnerable to ballistic missile defenses.⁷¹ A final decision about the deployment of this system is due to be taken in 2012–2013. Arms control gives the United States its best shot at preventing this destabilizing development.

An agreement to download some warheads from the MIRVed, silo-based ICBMs that Russia currently deploys would be a positive development. Russia has two such systems: the SS-18 (which is loaded with ten warheads), and the SS-19 (which is loaded with six). These systems are currently being decommissioned, but the timeline for doing so remains unclear.⁷² If they will still be deployed in significant numbers during the lifetime of a future arms

control treaty, then the United States should press Russia during negotiations to reduce their extremely high loadings.

The United States has already announced plans to load all of its Minuteman III ICBMs, which can carry three warheads, with just one.⁷³ It should therefore be willing to agree to a ban on new deployments of MIRVed, silo-based ICBMs (on a reciprocal basis, of course). The United States intends to keep the Minuteman III force in service until 2030, and it is now starting to consider requirements for a successor.⁷⁴ To pave the way for a ban on new deployments of MIRVed, silo-based ICBMs, the United States should design a new single-warhead ICBM to replace the Minuteman III. This step would certainly not guarantee Russia's acceptance of a ban, but it would keep the possibility of one alive. Arms control advocates should thus welcome it as a more positive step than, say, trying to keep the Minuteman III force in service beyond 2030 with another life extension project.

NUCLEAR WEAPON COMPLEX TRANSPARENCY

As nuclear weapons numbers fall, both “the United States and Russia will worry increasingly about how quickly and competitively the other might try to send them back up.”⁷⁵ Why a numerical imbalance might be dangerous for the state with fewer weapons is rarely spelled out. However, the concern appears to be that a significant advantage in nuclear weapon numbers could somehow translate into political leverage. Accordingly, both the United States and Russia worry about falling victim to “nuclear blackmail” (or “compellence,” as it is more formally known) in the event that an adversary rebuilds its arsenal more quickly.

Whether an advantage in arsenal size really can be used to force an opponent to make concessions is an interesting and contentious question—from an academic perspective.⁷⁶ This debate is not rehearsed here, however, because as a matter of political reality the United States and Russia will probably only agree to deep reductions if they are convinced that effective safeguards to prevent an imbalance from arising are in place. To some extent, the risk of reconstitution would be reduced if future arms reduction agreements require the verifiable destruction of warheads (as well as delivery systems and launchers). However, slower reconstitution—by rebuilding warheads, delivery systems, and launchers from scratch—will always remain a possibility.

One possible solution to the problem of reconstitution is to develop a transparency regime for the American and Russian nuclear weapon production complexes that would give early warning of rearmament. Early warning would allow an opponent to preserve parity by responding in kind, thus creating a

significant deterrent to any state contemplating rearmament for aggressive purposes. For such an arrangement to be stable, neither side should be able to gain a significant lead in a “rearmament race.”⁷⁷ To this end, the maximum production rates of the two sides’ complexes would have to be roughly equal, and be limited so that it would be impossible for one state to produce a significant number of warheads before the other could respond. In practice, this

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would require limiting the maximum production rate of the complexes so that in a single year they could not produce more than, say, 10 percent or 20 percent of the total number of permitted warheads. Of course, both parties would need verification to guard against a number of possible violations.

The production rates of the American and Russian nuclear weapon complexes are currently far from equal. Today, the U.S. complex can produce a maximum of 20 pits per year (although its

actual production rate is smaller).⁷⁸ Russia’s capacity is very uncertain, but it can certainly produce hundreds of pits per year and perhaps more.⁷⁹ There is also an imbalance in the rates at which the United States and Russia can assemble pits and other components into weapons, although this disparity is apparently not quite as severe.

The difference between U.S. and Russian weapon production capabilities reflects, at least in part, their different approaches to stockpile management. The United States is currently not designing or manufacturing new warheads. In 1992, when it ceased testing, it launched what is now known as the Stockpile Stewardship Program to identify and correct possible faults in its arsenal of aging warheads. By contrast, Russian weapons were never designed to have long service lives. They are reportedly remanufactured once every ten or fifteen years.⁸⁰ To maintain its current stockpile (about 5,000 active warheads), Russia must produce a minimum of 300 to 500 weapons per year (and it may have the capability to produce significantly more). The imbalance between Russian and American production capabilities is already a source of some concern in

the United States.⁸¹ As numbers come down, it will become easier for Russia to use its greater production capability to gain a significant advantage in warhead numbers. Today it is Russia that expresses the most concern about rearmament because of the possibility that the United States could upload non-deployed warheads onto spare “slots” on ICBMs. In future, the two sides may reverse positions on this issue if something is not done about the disparity between their production capabilities.⁸²

Curtailing Russia’s production potential should therefore be a long-term arms control goal of the United States. Fortunately, as numbers come down, the size of the complex that Russia will require to manage its arsenal will also shrink. For example, if its stockpile consists of only 500 weapons, each of which needs to be remanufactured once a decade, Russia would only need the capability to produce 50

weapons per year. It might be possible to verifiably limit Russian weapons production capability—at least at declared pit production facilities and assembly plants—by dismantling key pieces of equipment.⁸³ Russia would benefit from similar limits on U.S. facilities.

The United States keeps thousands of pits from disassembled weapons in interim storage. Limiting the U.S. ability to assemble these pits into complete weapons would presumably be of significant interest to Russia.

There are no precedents in arms control for limits on nuclear weapon complexes. They would be extremely challenging to negotiate. Moreover, both states—but Russia in particular—would find it hard to accept the level of transparency required for verification, at least at present. Realistically, then, limiting production capacity should not be a goal for the next round of bilateral arms control, which is already overloaded with complex issues. It will, however, need to be addressed in subsequent stages.

That said, the United States and Russia could pave the way for negotiated limits on production capabilities by agreeing now to informal, reciprocal visits to one another’s pit production and weapon assembly facilities. Such visits have occurred before. From 1994 to 1998, as part of an effort to improve security and safeguards in Russian military facilities for handling fissile material, Russian delegations from the Siberian Chemical Combine at Seversk made several visits

Curtailing Russia’s production potential should therefore be a long-term arms control goal of the United States.

to TA-55 at Los Alamos National Laboratory, which houses plutonium research and development activities (as well as plutonium pit production).⁸⁴ The director of the Siberian Chemical Combine was shown the plutonium-handling facilities at TA-55, including areas in which plutonium metal was produced. (To avoid the leakage of sensitive or classified information, experimental areas were shrouded beforehand.) In November 1997, a Los Alamos delegation paid a reciprocal visit to the Siberian Chemical Combine, which then housed plutonium-handling facilities, including pit production. A Russian delegation also visited Pantex (where U.S. warheads are assembled), but Moscow failed to offer a reciprocal invitation to one of its own assembly facilities.

Resuming these visits would be a good first step toward more formal arms control. Informal visits would allow each side to assess the other's production capability (something that would be particularly valuable for the United States since Russia's capacity is so uncertain) and would help the two sides build up useful experience at handling visitors in highly sensitive facilities. Additionally, the information learned about one another's production techniques could serve to inform subsequent discussions of how to verifiably limit production capabilities.

In addition to seeking to limit Russia's production capability, the United States should augment its own. Indeed it already intends to do just that. Current plans call for an expansion in production capability of 50–80 pits per year.⁸⁵ Fortuitously, this is also approximately the capacity that Russia would require at low numbers. As this report noted earlier, equality of production rates between U.S. and Russian complexes is desirable for stability at low numbers. For this reason, U.S. plans to revitalize its infrastructure, which have been criticized by some arms control advocates, actually constitute a positive step toward deep reductions.⁸⁶ However, in order to facilitate future visits by Russian personnel, the United States should include transparency as a design criterion for its new plutonium laboratory, the Chemistry and Metallurgy Research Replacement (CMRR) at Los Alamos National Laboratory, and the new Uranium Processing Facility at the Y12 National Security Complex in Tennessee.

CHAPTER 2

ENGAGING ALLIES

[A]llies should not keep asking us to multiply strategic assurances that we cannot possibly mean, or if we do mean, we should not want to execute because if we execute, we risk the destruction of civilization.

Henry A. Kissinger⁸⁷

The United States seeks to do more than “merely” deter aggression against its allies and, if deterrence fails, defend them.⁸⁸ It also wants to convince its allies that they are secure. This task is known as assurance. Throughout the Cold War, assurance generally proved more challenging than deterrence. Today, even though most American allies no longer face the existential threats they did during the Cold War, assurance has not become any easier.

Both the United States and its allies traditionally saw the U.S. nuclear posture as a key tool for assurance; they still do today.⁸⁹ Many analysts often argue that assurance requires capabilities that are not necessary for deterrence. For instance, Keith Payne, a former U.S. deputy assistant secretary of defense, states that

officials in NATO countries have indicated that U.S. strategic nuclear force levels should be comparable to Russia’s and that some number of U.S. nuclear weapons must remain deployed on NATO territory. These metrics

appear to have nothing to do with the possible demands of “warfighting,” but are important for the psychological/political goal of allied assurance.⁹⁰

Similarly, in 2008 the Secretary of Defense Task Force on DoD Nuclear Weapons Management, chaired by former secretary of defense James R. Schlesinger, posited assurance as an important justification for maintaining the nuclear-armed Tomahawk Land Attack Missile (TLAM/N), even though “as viewed by the Navy, USSTRATCOM, and the Joint Staff, there is no specific military capability or gap identified that the TLAM/N would satisfy.”⁹¹ (The Obama administration disagreed and—following extensive consultations with the Japanese government, representatives of which had previously expressed concern about the possibility of TLAM/N’s retirement—scrapped it as part of the Nuclear Posture Review.)

There are two potential tensions between assurance and deep reductions. First, insofar as assurance is seen to require a large U.S. arsenal, it is directly incompatible with deep reductions. Second, deep reductions would force the United States to eliminate specific systems that currently, or might someday, play an important role in assurance. The most noteworthy system in this regard is the B61 “tactical” gravity bomb. There are about 400 of these weapons deployed in both Europe and the United States, as well as more in reserve.⁹² Because these aging weapons probably play no role in strategic war planning, they would almost certainly be scrapped to facilitate deep reductions.⁹³ Moreover, part of the Obama administration’s justification for scrapping TLAM/N was that air-launched cruise missiles and gravity bombs, which are capable of being forward deployed, could take on its assurance role.⁹⁴ The United States currently retains more than 300 warheads on deployed air-launched cruise missiles and deployed “strategic” gravity bombs (presumably with more in reserve).⁹⁵ Although these weapons probably have more of a role in strategic war planning than tactical gravity bombs, they would not in all probability make up anything more than a small fraction of a much smaller U.S. arsenal. Indeed, it is quite possible that the U.S. military might argue that they should be scrapped to get to an arsenal of 500 weapons.

Any U.S. administration that pursues reductions risks being accused of undermining assurance by both allies and domestic political opponents. If the administration believes that the reductions would not undermine the security of its allies, it could—in theory, at least—ignore the critics and carry out reductions anyway. America’s basic motivation for taking assurance seriously is the fear that, if it does not, allies might proliferate. While this possibility cannot be ruled out, there are clear reasons for thinking it overstated.

For the almost half century that the Cold War lasted, all but two U.S. allies (France and the United Kingdom) chose not to acquire nuclear weapons. They exercised restraint in spite of their belief that Soviet conventional forces posed an immediate existential threat and despite their having greater concerns about the credibility of extended deterrence than they do today. By contrast, while some contemporary U.S. allies (such as the Baltic States) worry about being overrun in the medium or long term, the threat to their territorial integrity is less immediate. This is certainly not to say that U.S. allies do not face serious security threats; they do, as North Korea's ongoing aggression against South Korea exemplifies. However, most contemporary U.S. allies do not worry for their very existence in the way that NATO allies did during the Cold War.

The very fact that only two NATO states proliferated during the Cold War in spite of the continual existential angst that most of them felt suggests that the barriers to American allies proliferating are significantly higher than generally recognized. For two reasons, these barriers are almost certainly higher now than they were early in the Cold War, when France and the United Kingdom

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first acquired their nuclear weapons. First, unlike contemporary American allies, Britain and France could expect to continue benefiting from U.S. security guarantees after proliferating. Second, the legal and normative barriers to proliferation have been strengthened considerably by the Nuclear Non-Proliferation Treaty, which was concluded in 1968. In

addition, Britain and France were not motivated to proliferate solely—or perhaps even principally—by security concerns. Both believed that acquiring nuclear weapons would give them control over their own destinies and help them retain great power status; U.S. security guarantees might actually have exacerbated these feelings!⁹⁶ There are therefore good reasons to doubt that, if the United States maintains parity with Russia and a numerical advantage over China, gradual reductions will spark the wholesale loss of confidence in American security guarantees that would be required for allies to forsake American protection in favor of their own, much less capable nuclear arsenals.

Yet even if the risk of allies proliferating is low, there are still good political reasons to take assurance seriously. The most important reason is that the concerns of foreign officials and analysts can give potent ammunition against reductions to domestic opponents of arms control. Easing the concerns of foreign governments could help to neutralize it. And if foreign officials can be convinced to tell American legislators—both publicly and privately—that they do not believe that gradual reductions would undermine their own nations’ security, then advocates of arms control would have their own source of foreign ammunition. This is why the United States must engage more closely with its allies.

By itself, this proposal is hardly controversial.⁹⁷ More controversial is the suggestion that the purpose of such a

dialogue should be not just to listen and respond to allies’ views but also to shape them. To be clear, for as long as the United States deems the provision of security guarantees to be in its own interest, it should make serious and honest efforts to listen to and understand the views of its allies as it shapes its nuclear posture; moreover, the United States should not reduce its arsenal if it believes that doing so would undermine the security of its allies. Neither of these points, however, precludes using the opportunity presented by dialogue to shape the views of allies and win their support for the stated U.S. policy goal of deep reductions. The following are possible elements of a strategy to achieve that goal.

The United States should not reduce its arsenal if it believes that doing so would undermine the security of its allies.

Discuss security broadly, not just nuclear deterrence. The perceived solution to a problem depends on the tools available. In other words, “when you have a hammer, all problems start to look like nails.”⁹⁸ Discussions with allies about nuclear deterrence can create the impression that nuclear weapons are an important tool for ensuring their security in a wide range of circumstances. This creates concern because, in many of these circumstances, nuclear threats would be completely incredible, as allies themselves realize. (A good example is the Japanese concern that deep reductions might undermine the United States’ ability to deter Chinese attempts to settle the dispute over the uninhabited Senkaku Islands by force.) The United States should seek to avoid this pitfall. It should not frame a dialogue with allies in terms of winning their support for deep reductions. While that might very well be an important goal, discussions

framed like this would run a significant risk of backfiring. Instead, discussions should focus on security, broadly construed—a topic that certainly includes but is not limited to nuclear deterrence.

A good starting point for a dialogue with allies would be a joint assessment of the security threats they face, followed by a discussion of appropriate responses stressing the full range of U.S. power: diplomatic, economic, and military (both conventional and nuclear). In particular, the United States and its allies should seek to develop in detail non-nuclear responses to security threats wherever possible. As Jeffrey Lewis writes with regard to a U.S.-Japan dialogue, “such discussions would demonstrate just how little the United States and Japan really rely on nuclear weapons for all but a tiny number of extreme scenarios.”⁹⁹

NATO already seems to be moving in this direction. The new Strategic Concept de-emphasizes the role of nuclear weapons in NATO strategy compared to its predecessors. It does little more than reaffirm, “As long as nuclear weapons exist, NATO will remain a nuclear alliance.”¹⁰⁰ Its only specific reference to the 200 or so B61 gravity bombs currently deployed in Europe is its insistence that

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further reductions of these weapons “must take into account the disparity with the greater Russian stockpiles of short-range nuclear weapons.”¹⁰¹ Moreover, the heads of state tasked the North Atlantic Council with “continu[ing] to review NATO’s overall posture in deterring and defending against the full range of threats to the Alliance.”¹⁰² Contrary to earlier calls from some governments and nongovernmental organizations, this review does not appear to be a narrowly focused “NATO Nuclear Posture Review” but

a broader study to examine “the range of NATO’s strategic capabilities required, including NATO’s nuclear posture, and missile defence and other means of

strategic deterrence and defence.”¹⁰³ Hopefully, this exercise will turn out to be exactly the kind of broad security review that this report advocates.

To ensure that NATO continues to discuss deterrence writ large once the review is concluded, the Nuclear Planning Group should be expanded to a “Deterrence Planning Group.”¹⁰⁴ It should not lose any of its current functions; rather, its remit should be broadened to include all forms of deterrence—nuclear and non-nuclear, which currently seems to fall between the cracks. NATO’s Military Committee does formulate contingency plans for conventional responses to aggression against member states, but there appears to be no political forum for discussing how to communicate those plans to potential adversaries for the purpose of enhancing deterrence. Indeed, the Baltic States regularly complain about this.¹⁰⁵ Thus they might be open to expanding the role of the Nuclear Planning Group. Moreover, if the remit of the Nuclear Planning Group were expanded, capitals would probably choose to send higher-ranking officials with broader responsibilities than just nuclear weapons policy to staff it on a routine basis (and it might meet more often at the ambassadorial and ministerial levels). This should both improve the quality of the Nuclear Planning Group’s work and increase its effectiveness as a tool for assurance.

Create mechanisms for exchanging classified information. As noted earlier, there can be significant gaps between deterrence and assurance—that is, between what the United States believes is necessary for deterrence and what allies sometimes say they want. Narrowing this gap is a prerequisite to deep reductions. A deterrence dialogue that gives the United States an opportunity to present classified details of its deterrence planning—both conventional and nuclear—might help realize this objective. NATO provides various forums, including the Nuclear Planning Group, in which classified information is exchanged. However, similar exchanges are impossible with Japan (and possibly with other allies too).

To its credit, the Obama administration has made good progress in creating ongoing deterrence dialogues with Japan and South Korea.¹⁰⁶ Judging from Tokyo’s positive reaction to the Nuclear Posture Review, including the retirement of TLAM/N (a move the Strategic Posture Commission had predicted a year or so earlier that Japan would be “very concerned” about¹⁰⁷), these efforts appear to have paid dividends. However, the efficacy of the Japanese dialogue is limited. Until Japan strengthens protections against the release of classified information, the United States cannot share with it the same kind of sensitive information that NATO allies are permitted to see.¹⁰⁸ Tokyo’s reluctance to rectify this problem may stem in part from fear of provoking a powerful (if misguided) backlash from the Japanese disarmament community. Nonetheless, Washington should make

it clear that this situation is unacceptable. If Japan can trust the United States with its security, then the United States ought to be able to discuss its plans for defending the country with Tokyo. The United States should emphasize to Japan that correcting this anomaly is a priority. Fortunately, some in the Japanese security establishment do desire to deepen dialogue with the United States.¹⁰⁹

Focus on demonstrating U.S. resolve. American allies' most basic fear is that the United States will abandon them in a crisis. To speak to this fear directly, the United States should seek to find ways to credibly demonstrate and enhance its political commitment to its allies. Engaging in serious consultations with allies is in itself a way of demonstrating resolve, since it shows allies that the United States regards their views as important. Public visits and public statements by

senior U.S. officials are yet another way.

Allies' doubts stem from uncertainty about whether their security really is a vital American interest.

Ultimately, however, these steps can only do so much. At a fundamental level, allies' doubts stem from uncertainty about whether their security really is a vital American interest.¹¹⁰ The National Institute for Defense Studies (NIDS), the Japanese Ministry of

Defense's in-house think tank, notes that the "Japan-US relationship suffers from weaker ethnic, cultural, and historical ties between the two countries compared with the relationship between the United States and Europe," and it argues that this could undermine the credibility of the U.S. commitment to Japan in the eyes of a potential aggressor.¹¹¹ The United States and its allies should therefore explore ways to strengthen the bilateral relationship beyond consultations, visits, and speeches to reinforce the perception that the security of U.S. allies is unambiguously in its national interest. The NIDS report, for example, argues that

stronger interdependence in the areas of the economy and trade, would increase the significance of Japan-US relations for the US side and strengthen the credibility of the United States' nuclear commitment to Japan in the eyes of potential aggressor states.¹¹²

This advice is relevant to all allies, not just Japan. For instance, the South Korea–U.S. Free Trade Agreement, which is currently awaiting ratification in both countries, could be a useful tool over the long term for both assurance and deterrence.

Given the extent to which assurance is affected by the broad state of bilateral relations, it should be a task for the whole of government, not just the Defense and State Departments. Of course, this is much easier said than done. Sustained high-level attention, led on a day-to-day basis by the National Security Council, would be required for the whole range of government departments that handle bilateral relations to internalize the potential assurance value of greater interdependence. Of course, U.S. policy in areas as diverse as trade, culture, immigration, and energy should not be dictated by assurance. Assurance is just one relevant consideration—albeit an important one.

The United States should avoid trying to use specific capabilities as a visible manifestation of resolve. The problem with this tactic is that it can lead allies to interpret the withdrawal of that capability, once it is no longer needed, as a weakening of U.S. resolve. As early as the 1994 Nuclear Posture Review, for instance, Washington apparently started telling Tokyo that the nuclear-armed Tomahawk Land Attack Missile was being retained specifically for Japan's benefit.¹¹³ Thus it should have come as no surprise that talk of retiring TLAM/N initially sparked some concern in Japan.

Consult with allies before taking decisions that directly affect their security. If the United States wants to win support for deep reductions from its allies, it should consult with them in advance of decisions about reductions or withdrawing specific capabilities. It is tempting to believe that the United States would undertake such consultations as a matter of course, but history suggests otherwise. The Obama administration had failed to consult with key NATO allies about its revised plans for missile defense in Europe when it discovered that news of those plans had leaked. Obama had to telephone Czech Prime Minister Jan Fischer “shortly after midnight” so he would not learn from the media that the United States no longer wanted to base a radar in his country.¹¹⁴ In 2008, the Bush administration consistently failed to consult with Japan about its ongoing and intensive bilateral diplomacy with North Korea, sparking considerable concern in Tokyo. Consultations would probably not have led to a change in American policy, but they might have avoided some of the damage done to the bilateral relationship. Looking forward, Ambassador Steven Pifer, a former U.S. deputy assistant secretary of state, has made the excellent suggestion that the Special Consultative Group, which was created to facilitate dialogue between the

U.S. and NATO allies during negotiations on the Intermediate Nuclear Forces Treaty, should be revived.¹¹⁵ That body should now be broadened to include all states with which the United States has a formal security commitment.

UNDERSTANDING AND RESPONDING TO ALLIES’ CONCERNS: A JAPANESE CASE STUDY

Although the United States should not frame a dialogue with allies around the goal of winning their support for deep reductions, it should certainly use dialogue for that purpose. To this end, the United States should give its allies an opportunity to fully air their views about reductions and take the time to understand them. While there is no doubt that some U.S. allies are concerned, the reasons behind their concerns are rarely explored. Yet for the United States to persuade allies that their concerns are misplaced—if indeed they are—it must first understand their origin.

Japan is an important case study. It is often identified as the American ally most worried about the credibility of U.S. security guarantees and, as a result of those concerns and its technical prowess, the one most likely to proliferate.¹¹⁶ To map out Japanese concerns, the author of this report conducted interviews with Japanese officials, analysts and politicians (with a promise of anonymity in order to encourage a frank exchange). The results of those interviews are presented here. They are interesting from a policy perspective because they give indications of how Washington might practically address Tokyo’s concerns. They also uncover questions that would benefit from further exploration on a governmental level.

The focus on Japan in this section of the report should not be construed as implying that U.S. engagement should be limited to Japan. On the contrary, the United States should attempt to engage *all* its allies and understand their concerns. Different allies may have different concerns. And, even if they do turn out to be broadly similar, confidence building requires engagement with each ally separately.

Three points from this set of interviews stand out. First, Japanese officials, analysts, and politicians are highly divided on the question of whether deep reductions would undermine extended deterrence. Some expressed no concern whatsoever about numbers. Others argued that arsenal size is one of a number of factors that can affect the viability of extended deterrence (none of the interviewees argued that arsenal size is the key to extended deterrence). Second, Japanese concerns about deep reductions relate almost entirely to the potential threat from China; North Korea was almost never mentioned by any interviewee who was skeptical about pursuing deep reductions. That said, there is no consensus about

why deep reductions would undermine Japan's security with respect to China. Third, although some of the concerns expressed were very specific, others were more amorphous—visceral even—and thus hard to pin down.

The first concern is that reductions by the United States would prompt China to build-up its arsenal in a “sprint to parity.” In response, the United States should emphasize—not just in private dialogue with Japanese officials but also in public statements about its disarmament policy—that bilateral reductions with Russia will not continue indefinitely and that, at some point, the arms control process will have to be multilateralized before further reductions take place (a point chapter 4 discusses further). In this regard, it is important for Washington to elicit—and try to shape—Tokyo's opinion on the question of how low the United States (and Russia) should go before refusing to make further reductions without Chinese involvement in arms control.

A second concern is that U.S. reductions would stimulate more “corrosive” or “assertive” Chinese behavior, especially in regard to long-running disputes between China and Japan over the ownership of disputed islands and oil and gas fields.¹¹⁷ (In deterrence jargon, this concern relates to “general deterrence,” that is, deterrence of provocative acts outside of any crisis, before specific threats have been issued.¹¹⁸) Why some Japanese officials and analysts feel that nuclear reductions would stimulate corrosive behavior from China is not entirely clear. One suggested that the Chinese concept of “comprehensive national power” leads to a belief in Beijing that relative gains in one area (in this case, an improvement in the nuclear balance) can be translated to gains in another (settling long running disputes with Japan on Chinese terms).¹¹⁹

Intriguingly, in spite of this concern, no interviewee suggested that the significant increase in Chinese naval activity that has *already* occurred was caused by the huge nuclear reductions undertaken by the United States (and Russia) since the end of the Cold War. When asked about this, they all identified its primary cause as the shifting conventional balance between China and Japan.¹²⁰ This observation suggests that not only is the conventional balance the real key to preventing China from settling outstanding territorial claims by force, but that bolstering conventional deterrence in Northeast Asia—a task that is at least as much Japan's responsibility as it is the United States'—would also probably be more effective than retaining a large nuclear arsenal for alleviating Japan's concerns.

A third concern expressed by some Japanese officials and analysts is that deep reductions would undermine deterrence during crises (that is, “immediate deterrence”). One of the most contentious questions about nuclear strategy in recent years has been whether the United States should recognize that, as a practical matter, it cannot deny China the ability to inflict damage on the

United States and thus should not try to do so. Some in Japan argue that the United States should not accept “mutual vulnerability” (as it is known in deterrence jargon) on the grounds that, for extended deterrence to be credible, the United States requires the ability to reduce, if not eliminate entirely, the damage it would suffer in a nuclear war with China. The NIDS report discussed earlier, for example, argues that the United States must retain

a superior damage-limiting capability made possible by a strong counterforce capability against the potential aggressor (the ability to effectively destroy the enemy’s nuclear strike force) and an effective strategic defense force. This is because, if the damage-limiting capability of the country providing the nuclear umbrella is superior to that of the aggressor, its threat to embark on a nuclear retaliation and nuclear exchanges will be all the more credible and its deterrent effect all the stronger.¹²¹

Following this logic, one interviewee worried that deep reductions would undermine U.S. damage limitation capabilities, with the result that the United States would become less willing to use nuclear weapons and that Japan and the United States would become “decoupled.”¹²² One official who did not articulate this particular logic simply expressed a more general sense that deep reductions would undermine immediate deterrence. Interestingly, this official readily acknowledged that the use of nuclear weapons by the United States in any of the scenarios of concern to Japan in the short or medium term would not be remotely credible, but he still felt that the size of the U.S. arsenal was an “important background element” that could affect Chinese behavior in a crisis.¹²³

The most effective critique of damage limitation—that existing capabilities are too ineffective to enhance deterrence¹²⁴—is unlikely to be of much comfort to Japanese officials already worried about U.S. willingness to wage a nuclear war on their behalf. Instead, the United States should emphasize its political commitment to Japan. This would speak to the very core of Tokyo’s concerns, namely its “fear of abandonment.”¹²⁵ As discussed earlier, finding ways of credibly demonstrating and strengthening this commitment should be a core goal of a U.S.-Japan dialogue on extended deterrence.

The fourth and final concern expressed by Japanese analysts and officials relates to the U.S. ability to manage multiple adversaries simultaneously with a smaller arsenal. One analyst, for instance, expressed concern that at low numbers Russia and China may form an alliance against the United States.¹²⁶ A former official worried that, if the United States were involved in a serious crisis in the

Middle East, it might not have enough spare nuclear weapons to deal with a simultaneous crisis in North East Asia.¹²⁷ Once again, Washington's repeated insistence that it will not agree to deep reductions if the arms reductions process is not multilateralized should help reassure Tokyo. In addition, a more candid discussion of U.S. targeting policy should help convince Japanese officials that the United States will retain enough nuclear weapons after reductions to deal with multiple contingencies simultaneously.

CHAPTER 3

CONVENTIONAL FORCE BALANCING: WHERE ALLIES' AND ADVERSARIES' CONCERNS INTERSECT

[T]he conventional superiority advantage is critical, because it obviates the whole debate about whether or not Washington would “sacrifice Los Angeles to save Tokyo” in a nuclear exchange.

Unnamed Japanese diplomat¹²⁸

Discussions about the effect of U.S. conventional power on nuclear disarmament tend to gloss over the difference between two sets of conventional capabilities. One set, which includes ballistic missile defense and Conventional Prompt Global Strike, consists of munitions that have, or could have, the capacity to destroy nuclear weapons before or after launch. Both Russia and China have expressed serious concerns about U.S. developments in this area, and those concerns will have to be addressed if the arms reduction process is to continue.

A very different set of conventional capabilities that includes aircraft, helicopters, tanks, artillery, and armored combat vehicles and can be used to defend territory—or seize it—must also be taken into account. Russia worries about its inferiority relative to both NATO and China with respect to this set of capabilities.¹²⁹ In this regard, Russian concerns are similar to those of NATO during the Cold War, or Pakistan today. As with those states, Russia sees nuclear weapons as a means of offsetting inferiority in conventional capabilities.

Conventional imbalances pose two different threats to the reductions process. First, Russian concerns about conventional inferiority reduce Moscow's willingness to make deep cuts in its nuclear arsenal. Second, if conventional

imbalances are not durably stabilized during the reductions process, they could grow and spark nuclear rearmament.¹³⁰ This dynamic could play out not just between the United States and Russia, but also between the United States and China, or between China and Russia. In fact, conventional force balancing and deep reductions combine to pose a single, inseparable challenge.

Conventional arms control provides one possible tool for managing conventional imbalances. The principle underlying this tool is simple: Limit the quantities and locations of weapons so that it becomes impossible for one state or bloc to invade another—at least not without giving significant warning.¹³¹ This concept was successfully implemented in the 1990 Conventional Forces in Europe Treaty.

This treaty, however, is currently in crisis and will have to be resuscitated (or a successor negotiated). Elsewhere in the world, new arrangements will have to be devised to stabilize the conventional balances between the United States and China, and China and Russia. There is of course essentially nothing that the United States can do about the Sino-Russian balance.

Managing conventional imbalances in Europe and the West Pacific clearly pose very different challenges. However,

one lesson from the European experience that may be relevant to the West Pacific (as well as other theaters) is that conventional imbalances can require constant attention. The member states of NATO and the Warsaw Pact signed the Conventional Forces in Europe Treaty in November 1990. Slightly more than a year later, the Soviet Union collapsed, leaving Russia conventionally inferior to NATO and rendering the two-bloc structure of the original treaty anachronistic.

Russia's immediate reaction was to insist on renegotiating treaty limitations on troop deployments in its northern and southern "flanks." In 1996, once these renegotiations were completed, the parties launched a more comprehensive effort to revise the treaty. This three-year process resulted in the Adapted Conventional Forces in Europe Treaty, which has not yet entered into force. Meanwhile, Russia has made it clear that it does not consider even the adapted treaty as an endpoint; it would like to renegotiate it, partly with a view to eliminating the flank limits entirely. (Norway and Turkey in particular find this demand unacceptable.)¹³²

**Conventional arms control
provides one possible tool
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imbalances.**

Of course, the twenty years since the Conventional Forces in Europe (CFE) Treaty was concluded have borne witness to great and unusual political changes. Future conventional arms control agreements will probably not have to withstand events as tumultuous as the collapse of the Soviet Union, the end of Warsaw Pact, and the expansion of NATO. However, it would also be unrealistic to expect a conventional arms control treaty to last indefinitely without ongoing attention. The parties will probably have to undertake periodic efforts to ensure that conventional deterrence remains robust as political circumstances change.

THE U.S.-RUSSIAN BALANCE

As it now stands, the conventional balance in Europe comforts neither NATO nor Russia. As shown in box 1, NATO forces massively outnumber Russian forces in the region stretching from the Atlantic to the Urals. Indeed, if it wanted to, NATO could probably pose a significant threat to Russia's territorial integrity. However, the local balance of forces around the Baltic is such that NATO could not stop Russia from invading one of the Baltic states (even if it could reclaim the territory through a prolonged campaign). Therefore, the question confronting Russia and the United States if they wish to achieve deep reduction is not whether to address conventional arms control in Europe, but when.

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Although Russia and the United States and its allies support conventional arms control in Europe in principle, the Conventional Forces in Europe Treaty is currently in tatters.¹³³ In 1999, Russia agreed to take various reciprocal steps, including closing four military bases in Georgia, in return for NATO member states' acceptance of the Adapted Conventional Forces in Europe Treaty. To date, Russia has failed to complete

its side of bargain, and so NATO states have refrained from ratifying the adapted treaty. A series of interlinked controversies, including missile defense and NATO

BOX 1: The Conventional Balance in Europe

Quantitative comparisons of equipment and troop numbers provide only a crude measure of the conventional balance. They hide important qualitative variations in training, readiness, and capability. Moreover, the point at which an imbalance becomes militarily significant is contentious. But in spite of all these caveats, the following two quantitative comparisons of conventional forces in Europe show imbalances that are stark enough to meet virtually any definition of significance.

The following table shows the numbers of troops and equipment (broken down into the five categories limited by the CFE Treaty) for NATO and Russia in the area stretching from the Atlantic to the Urals. Russia is outnumbered by at least 3 to 1 in all categories (except for aircraft, where it is still outnumbered by more than 2 to 1). Even if the other regional members of the Collective Security Treaty Organization (CSTO), Armenia and Belarus, are included in the Russian total, Russia is still outnumbered by about 2.5–1 or more in most categories. (Moreover, while Russia has stated it will come to the defense of Armenia or Belarus if they are attacked, the converse does not appear to be true.)

	Troops	Tanks	Artillery	ACV	Helicopters	Aircraft
NATO	1,806,000	12,732	16,112	24,372	1,243	3,703
Russia	578,000	3,716	4,465	7,926	385	1,679
CSTO	677,000	5,301	6,111	10,390	415	1,828

Key: ACV=Armored Combat Vehicle

All troop data has been rounded to the nearest thousand.

In spite of Russia's conventional weakness in Europe as a whole, it is still massively superior around the Baltic, NATO's most exposed point. The following table shows troop and equipment numbers for each of the three Baltic states and for the three adjacent Russian military commands (the Kaliningrad Special Military District, the Leningrad Military District, and the Baltic Fleet).

	Troops	Tanks	Artillery	ACV	Helicopters	Aircraft
Estonia	4,450	0	284	88	4	2
Latvia	5,160	3	76	0	6	3
Lithuania	8,380	0	133	187	9	5
Adjacent Russian commands	39,200	1,137	1,168	1,185	147	256

Sources: Data on states party to the CFE was obtained from their CFE declarations as reported in Dorn Crawford, "Conventional Armed Forces in Europe (CFE): A Review and Update of Key Treaty Elements," March 2010, U.S. Department of State. Since 2007 Russia has only supplied unverified, aggregated "summary data." Its latest such report was used. Data for NATO states not party to the CFE and for individual Russian military regions was obtained from International Institute for Strategic Studies, *The Military Balance 2010* (Abingdon: Routledge for the IISS, 2010). For consistency with CFE Treaty data, navy troops were excluded from troop data obtained from *The Military Balance* where possible.

expansion, has hampered the resolution of this dispute. Matters came to a head in December 2007, when Russia “suspended” its implementation of the treaty.

Prospects for the Conventional Forces in Europe Treaty are bleak. Perhaps the most problematic issue is the Gudauta base, which Russia agreed to close in 1999. This base is located in Abkhazia, the breakaway Georgian territory that Russia has recognized as an independent state since the 2008 Georgian War. Given that the de facto Abkhaz government has clearly expressed its desire for a Russian military presence, it seems virtually impossible for Russia to close the base without at least tacitly acknowledging Georgian sovereignty over the area.¹³⁴ Indeed, in December 2009, Russia announced that it was actually planning to increase its military presence in Abkhazia.¹³⁵

The Obama administration has been trying to break this impasse. It appointed a Conventional Forces in Europe Ambassador in early 2010, and Secretary of State Hillary Clinton has publicly urged Russia to resume implementation of the treaty in return for an offer to further “modernize” it.¹³⁶ Behind the scenes, the United States has reportedly proposed to Russia that they adopt three basic principles—transparency, reciprocity, and host nation consent for the stationing of foreign forces—as the basis for further negotiations.¹³⁷ If these efforts are successful, they will remove what could otherwise become a stumbling block to the next round of U.S.-Russian nuclear arms reductions (although, as mentioned, managing the NATO-Russian conventional balance will probably require ongoing effort).

The chances for a breakthrough still appear slim, however. In November 2010, one U.S. official gave it only a 10–15 percent chance.¹³⁸ Moreover, even if Russia and the United States can agree on principles, actually reaching a concrete solution to problems as thorny as the Gudauta base will probably require an improvement in U.S.-Russian relations considerably beyond even what has already been achieved by the “reset.”

The huge challenges of resurrecting the Conventional Forces in Europe Treaty (or designing an alternative) provide one reason why it would be highly desirable—from the U.S. perspective at least—for Russia *not* to link nuclear and conventional arms control during the next round of negotiations. There are other reasons too, however. To the extent that Russia’s self-image as a great power is wrapped up in its possession of a large nuclear stockpile, it might not agree to further significant nuclear arms reductions even if its concerns about the conventional balance in Europe were addressed. Similarly, if Russian leaders actually view China rather than NATO as Russia’s principal long-term strategic rival, then progress on nuclear arms control may be more closely linked to the Sino-Russian conventional balance than to the NATO-Russian balance.

It is still unclear whether Moscow will link conventional and nuclear arms control. Even if Moscow agrees that the next round of nuclear reductions would not increase Russia's vulnerability to conventional threats, Russian leaders might still want to use the U.S. interest in deep reductions as a means of extracting concessions about conventional forces in Europe. In this regard, Washington's strong desire to include tactical nuclear weapons in the next round of arms control may give Russia negotiating leverage. In public, Russia has long justified its large stockpile of tactical nuclear weapons by characterizing them as a counterweight to NATO's conventional superiority. Thus it would not come as a great surprise if Moscow makes its agreement to tactical nuclear arms control contingent upon NATO taking steps to address Russian concerns about the conventional balance in Europe.

It is also possible that Moscow will decide that the conventional balance in Europe is not its primary concern and link progress in tactical nuclear arms control to issues it regards as more important, such as non-deployed U.S. warheads and high-precision conventional weapons. Indeed, Moscow apparently sees tactical nuclear weapons as a way to offset the U.S. advantage in high-precision conventional weapon systems (including cruise missiles and Conventional Prompt Global Strike).¹³⁹ Moreover, Russian negotiating positions have sometimes been hard to predict. Ahead of negotiations for New START, for example, Moscow suggested that one

The United States should do all it can to prevent Russia from linking conventional and nuclear arms control.

of its priorities would be curtailing the U.S. "upload potential."¹⁴⁰ It made some efforts to accomplish this during negotiations by pushing for deeper reductions in delivery vehicles than the United States initially wanted to make. However, following the conclusion of the treaty, U.S. negotiators have consistently expressed surprise that Russia did not push much harder on this point.

The United States is only likely to gain a clear idea of the Russian negotiating position after the next round of nuclear arms control negotiations begins. Indeed, it is unlikely that Moscow has formulated its negotiating position. (Washington doesn't appear to have done so.) In the meantime, the United States should do all it can to prevent Russia from linking conventional and nuclear arms control. Clearly, it might not succeed at this task; Washington

has only limited ability to influence Moscow's position ahead of negotiations. Still, it is worth trying.

To this end, the United States should attempt to prevent the Conventional Forces in Europe regime from deteriorating any further. Although Russia has suspended its own participation in the treaty, all other states are continuing to abide by its terms as a sign of good faith. Moreover, all states, including Russia, are continuing to implement other confidence- and security-building measures that are part of the broader regime, such as the Open Skies Treaty. It remains to be seen whether this status quo will prove sustainable. Nonetheless, the United States should continue to implement the treaty and urge its allies to do so too.

In the event of the total collapse of the treaty regime, Russia would be more likely to formally link nuclear arms reductions to conventional arms control. As Anne Witkoswsky, Sherman Garnett, and Jeff MacCausland note in their comprehensive study of options for the future of the CFE regime: “[i]f CFE unravels completely, the Russian military will be able to argue even more convincingly, within Russia, for continued reliance on tactical nuclear weapons to defend itself in Europe.”¹⁴¹ They also note that “the permanent loss of binding equipment limits on Russia would feed the Baltic states’ perceived need for reassurance about NATO’s commitment, such as through more military exercises.”¹⁴² This in turn would probably exacerbate Russian fears about the conventional balance in Europe and make it even more likely to make the link between conventional and nuclear arms control.

The United States should also appreciate how its attempts to assure allies through conventional means might feed Russian fears. The 2010 Nuclear Posture Review sets out a vision of enhanced “regional security architectures” as

[a] key part of the U.S. strategy for strengthening regional deterrence while reducing the role and numbers of nuclear weapons. These regional security architectures include effective missile defense, counter-WMD capabilities, conventional power-projection capabilities, and integrated command and control—all underwritten by strong political commitments.¹⁴³

Their “regional” aspect appears to imply that these architectures are targeted against Iran (and North Korea) rather than Russia (and China). However, the Nuclear Posture Review is not completely explicit on this point, and it is possible—perhaps even probable—that Russia will assume it is being targeted and thus be tempted to link nuclear and conventional arms control. If Russia is not the intended target, then Washington should be willing to discuss its plans

with Moscow and possibly take concrete steps to address Russian concerns. (It is hard to be specific about what the United States might do since its plans are currently vague.) This is not to suggest that the United States should give Russia a veto over American force deployments in Europe; rather, it is to say that the United States should keep in mind that its efforts to assure European allies could prompt a serious backlash from Moscow—such as Russia’s complete withdrawal from the Conventional Forces in Europe Treaty or other confidence- and security-building measures—that would harm the security of U.S. allies.

U.S. success in preventing Russia from linking nuclear and conventional arms control during the next round of negotiations will not obviate the need to manage the conventional balance in Europe. However, it will provide considerable breathing space and ensure that the next round of nuclear reductions is not slowed unnecessarily. If U.S.-Russian relations improve to the point that it becomes possible to resolve the outstanding political problems that have caused the near collapse of the Conventional Forces in Europe Treaty, then it should also be possible to craft a new and hopefully long-lasting treaty to durably stabilize the conventional balance in Europe. While these negotiations would surely prove difficult (as arms control negotiations usually do), the very fact that two European conventional arms control agreements have been concluded in the past is good reason to suppose that another is possible. By contrast, force balancing in the West Pacific presents more profound challenges.

THE SINO-U.S. BALANCE

The United States has been the dominant naval power in the Pacific for the whole of the nuclear age, and it remains so today. However, China is rapidly expanding its naval capabilities, focusing for the present on area denial but also beginning to develop the ability to project power.¹⁴⁴ Its eventual goal may be conventional superiority in the West Pacific, including in the South and East China seas.¹⁴⁵ If it achieves superiority, or even parity, the United States might attempt to bolster extended deterrence by increasing its reliance on nuclear weapons. Over the long term, the United States might halt reductions in its arsenal (or, less probably, expand it) if it becomes unable to compete with China militarily in the region. Whether this would actually compensate for the loss of conventional superiority is highly debatable, but there might be intense pressure from U.S. allies and Congress to do so nonetheless.¹⁴⁶

Conversely, if the United States succeeds in maintaining a conventional advantage over China, China might respond by increasing the role of nuclear weapons in its own security posture and becoming more resistant to taking part

in a multilateral reductions process. (Such a response, it is worth noting, would be a significant departure from current Chinese policy, which, through its no-first-use pledge, reserves the use of nuclear weapons to responding to nuclear attacks.)¹⁴⁷ Thus the Sino-U.S. balance could significantly affect the pace and feasibility of deep reductions, although its effects will probably be felt at a later stage than the NATO-Russian balance.

The challenges for conventional arms control between the United States and China are daunting. Right now, formal arms control is so far off the bilateral agenda that even a discussion of its difficulties seems premature! The two states currently have nothing more than an “on-again/off-again military relationship.”¹⁴⁸ As a result, even a modest Sino-U.S. confidence-building

The Sino-U.S. balance could significantly affect the pace and even feasibility of deep reductions, although its effects will probably be felt at a later stage than the NATO-Russian balance.

process, similar to the one that preceded the Conventional Forces in Europe Treaty, appears to be a very ambitious goal.

Over the long term, the feasibility of arms control probably depends on whether China and the United States can agree that rough equality of capability in the West Pacific is in both their interests. (It is virtually impossible to imagine any other arrangement being politically acceptable.) If Beijing’s ultimate goal is conventional superiority, it may not be willing to settle

for parity. Similarly, because of its security guarantees, the United States, too, may not find parity acceptable. In particular, if the United States wants the *option* of defending Taiwan after a declaration of independence (even though it is not U.S. policy to do so), it will require conventional superiority in order to defeat Chinese anti-access forces and destroy the Chinese missiles and planes threatening Taiwan.¹⁴⁹ (By contrast, defending Taiwan from an actual Chinese invasion is an easier task.) All that said, if both states factor into their calculations the risk that refusing to accept approximate parity could lead to a costly conventional arms race, then they both might judge parity to be the “least bad” option.

Even if China and the United States can reconcile their currently incompatible aims, they will have to overcome considerable practical hurdles to negotiate a conventional arms control agreement. The Pacific is a naval theater. Limits on mobile assets such as ships and aircraft are problematic.¹⁵⁰ If a treaty only limits ships and aircraft based in the West Pacific, then China might worry that in a crisis the United States could quickly deploy assets from elsewhere into the theater. The United States, however, is unlikely to agree to global limits because they would interfere with its ability to project power and fulfill its defense commitments elsewhere. Significant asymmetries in American and Chinese forces complicate matters even further. U.S. forces in the Pacific (today, at least) are generally fewer in number than Chinese forces, but they are more technologically sophisticated.¹⁵¹ To compensate, China is developing anti-access capabilities such as conventionally armed ballistic missiles. Even if the two states could agree on equality of capability as the goal of negotiations, it might be very hard to agree on what configuration of forces would actually achieve it.

CHAPTER 4

TOWARD MULTILATERAL ARMS REDUCTIONS

The deep cuts in strategic offensive arms undertaken by Russia and the United States mean the appearance soon of a qualitatively new situation in the sphere of nuclear disarmament—the quantitative reduction in the gap between our countries’ arsenals and those of the other members of the “nuclear five” will inevitably lead to the fact that the nuclear potentials of these states can no longer remain outside the process of further concerted reductions.

Russian Foreign Minister Sergei Lavrov, July 2010¹⁵²

Over the last year or so, both Russia and the United States have repeatedly insisted that bilateral reductions cannot continue indefinitely and that—at some point in the future—the arms control process must be multilateralized. In addition to various national statements of policy (such as Lavrov’s above and the 2010 U.S. Nuclear Posture Review), the two states jointly endorsed, in the preamble to New START, the goal of “expanding this process in the future, including to a multilateral approach.”¹⁵³

There are important strategic reasons for including China, France, and the United Kingdom in a multilateral process.¹⁵⁴ Both Russia and the United States are concerned that continued reductions will prompt China to rapidly build up its arsenal in an attempt to “sprint to parity.” Indeed, in a thinly veiled reference to China in its resolution of ratification for New START, the U.S.

Senate urged the president to consult with it about withdrawing from the treaty should there be “an expansion of the strategic arsenal of any country not party to the New START Treaty so as to jeopardize the supreme interests of the United States.”¹⁵⁵ By taking part in a multilateral arms control process, China could clearly demonstrate that it does not intend to challenge Russia or the United States numerically. Russia is also concerned about what Lavrov has termed the “important nuance” of “the combined nuclear capability of NATO.”¹⁵⁶ His concern is that continued bilateral U.S.-Russian reductions could leave Russia in a position of strategic inferiority relative to the combined arsenals of France, the United Kingdom, and the United States, theoretically facilitating a NATO first strike against Russia. Multilateral arms reductions will help alleviate Russian fears.

The nuclear-armed states outside the NPT (India, Pakistan, Israel, and North Korea) and Iran’s apparent pursuit of nuclear weapons from within the NPT create additional layers of complexity. India and Pakistan are both building up their arsenals. According to recent news reports, the U.S. intelligence community believes that Pakistan now has 90–110 deployed warheads and is building more fairly rapidly.¹⁵⁷ India, by contrast, has about 60–80 warheads. It also appears to be expanding its arsenal, although more slowly than Pakistan.¹⁵⁸ The prospects for halting the Indian and Pakistani build-ups are bleak. India has significant reserves of weapons-grade plutonium that appear to give it the option of expanding its arsenal significantly in a relatively short space of time.¹⁵⁹ Pakistan, meanwhile, has invested in new fissile material production facilities.¹⁶⁰ Moreover, negotiations on a treaty to end the production of fissile material for military purposes have not even commenced, in large part because of Pakistani objections.

The growing Indian and Pakistani arsenals are already a matter of concern to other nuclear-armed states, particularly China, Russia, and the United States. If China, which keeps a watchful eye on India, significantly augments its arsenal in response to an Indian build-up, the challenges of deep reductions will be magnified. A credible, verified bilateral arms limitation process between India and Pakistan might ease the concerns of the five nuclear-weapon states recognized by the NPT (China, France, Russia, the United Kingdom, and the United States) and enable them to engage in a five-way multilateral process. However, India in particular wants to be treated like a global player on par with China and the United States and hence may be reluctant to engage in nuclear arms control in a purely South Asian context.

The effect of Israel’s nuclear arsenal on deep reductions is less clear. Unlike India and Pakistan, Israel may not be producing fissile material, and if it is, it may not be using the material to increase the size of its arsenal (which probably contains fewer, perhaps much fewer, than 200 warheads).¹⁶¹ Moreover, Israeli nuclear weapons are primarily a hedge against losing conventional superiority

in the Middle East. It is not clear whether Israel's arsenal features in the calculations of other nuclear-armed states—Pakistan and Russia in particular. If it does, however, it is almost certainly only a background element. It is possible, therefore, that the five nuclear-weapon states (along perhaps with India and Pakistan) could agree to deep reductions without Israel's participation in multilateral arms control. However, this is far from certain.¹⁶² And securing Israeli participation could prove extremely challenging, especially given that it would probably be contingent upon progress in the broader Middle East peace process.

North Korea's effect on the reductions process is also unclear. Even with its newly revealed enrichment program, it probably lacks the resources to significantly expand its arsenal. The United States and Russia could almost certainly maintain overwhelming nuclear superiority over North Korea with "just" 500 warheads, so they might agree to deep reductions without Pyongyang's abandoning its nuclear weapons.

By contrast, the acquisition of nuclear weapons by Iran might be a showstopper for deep reductions for any number of reasons. A nuclear-armed Iran

In spite of America and Russia's interest in multilateral arms control, they have given remarkably little thought to how such a process should be constructed.

would make it more difficult politically for the United States (and possibly Russia too) to make significant reductions. If other Middle Eastern states acquire their own nuclear arsenals in response to Iran, the political challenge of reductions would be magnified still further. Moreover, Iranian or Arab nuclear weapons might prompt Israel to declare or even augment its own nuclear arsenal. This in turn would reduce the likelihood of

Russia's agreeing to deep reductions without Israeli involvement in arms control (which would become even harder to secure).

Ultimately, therefore, developments in Iran and the nuclear-armed states outside the NPT will affect the feasibility of multilateral arms control. In the event that Iran does not acquire nuclear weapons, it might be a long-term possibility—albeit an exceptionally challenging one—to limit the arsenals of India, Israel, and Pakistan, either by integrating them into a global process or through regional processes. However, the absence of progress on that front need

not prevent China, France, and the United Kingdom from taking the initial steps outlined below.

In spite of America and Russia's interest in multilateral arms control, they have given remarkably little thought to how such a process should be constructed. When American and Russian policy makers and analysts talk about multilateral arms reductions, they probably have in mind a vision of the five nuclear-weapon states verifiably eliminating nuclear warheads, delivery systems, and launchers according to some agreed ratio, and to some agreed level.¹⁶³ However, there are four key reasons, among many others, that a treaty providing for multilateral reductions would be much harder to negotiate than past U.S.-Russian bilateral agreements.

First, a multilateral process that must accommodate the interests of five parties is inherently more complicated than a bilateral one. Second, China, France, and the United Kingdom would have to become significantly more transparent to take part in meaningful arms control. Although China is the least transparent of the three, neither the United Kingdom nor France has ever revealed information as complex, detailed or comprehensive as that released under U.S.-Russian data exchanges. Moreover, none of the three have any experience accepting the kind of intrusive on-site inspections that the United States and Russia accepted under START I and are about to accept under New START.

Third, Russia and the United States have been practicing bilateral nuclear arms control, in the broadest sense of the term, for almost fifty years.¹⁶⁴ While they still disagree on many fundamental questions (such as the effect of ballistic missile defense on deterrence), they have built up shared definitions and shared experience in negotiating and implementing agreements. In contrast, China, France, and the United Kingdom do not have individual experience of treaty-based nuclear weapon reductions, let alone shared experience. Their operating practices and deterrence concepts are quite different from those of Russia and the United States (as well as from each other). As a result, multilateral arms control will require new definitions and new practices that could prove very difficult to negotiate.

Finally, agreeing on the fundamental provisions of a treaty—in particular the ratio by which weapons should be withdrawn and the levels to which they should be reduced—could prove very contentious. China, France, and the United Kingdom could argue that they already have genuine “minimum deterrents” and that they could not make further reductions of any significance. This would conflict with the probable American and Russian goal of ensuring their continued numerical superiority. In addition, the parties would still have to surmount all of the usual challenges of arms control, the most significant of which is typically agreement on verification provisions.

Multilateral talks on a reductions treaty would have a much better chance of succeeding if they were preceded by a process designed to tackle this array of challenges, if not one-by-one, then at least not all at once. In this regard it is helpful to assume that the ultimate goal is a multilateral arms reductions treaty and then “work backward” to sketch out the kind of process that would help advance it. *It bears emphasizing that France, the United Kingdom, and China in particular will probably have serious concerns about this process.* However, it is helpful to sketch out the process before assessing these concerns.

LIMIT BEFORE REDUCING

The U.S.-Russian arms control process did not start with reductions. The first bilateral agreement on strategic offensive arms, the Strategic Arms Limitation Talks (SALT I) Interim Accord, merely capped the American and Russian build-up (interestingly, at higher force levels than those in existence at the time of the treaty’s conclusion). In that spirit, a multilateral *limitation* treaty, in which the five nuclear-weapon states declare their stockpiles of warheads, delivery systems, and launchers, undertake not to increase them, and accept verification provisions, would be a useful stepping-stone toward a multilateral *reductions* treaty.

In fact, a multilateral reductions treaty might not even be necessary for Russia and the United States to reduce their arsenals to 500 warheads each. Today, France possesses fewer than 300 warheads and the United Kingdom

A multilateral limitation treaty would be a useful stepping-stone toward a multilateral reductions treaty.

fewer than 225 (it is committed to reducing this number to 180 by the mid-2020s).¹⁶⁵ Neither state is likely to build up its arsenal. China is slowly increasing its arsenal, but it still only possesses about 240 nuclear warheads.¹⁶⁶ If it halts its expansion in the near future (or makes unilateral reductions after a significant

increase, as it has done in the past), then a verified limitation treaty might be sufficient for Russia and the United States to agree to deep reductions.

A limitation treaty would be significantly easier to negotiate than a reductions treaty. In particular, it would allow the five states to delay tackling the question of how many weapons should be withdrawn, thereby avoiding one

of the most challenging and potentially contentious issues facing a reductions treaty. Of course, negotiations would still have to overcome significant challenges. States would have to decide what items should be limited, how to define them, how to verify the number of treaty-limited items at declared facilities, and how to verify their absence at undeclared facilities.

At this stage, perhaps the most fundamental question would be whether China, France, and the United Kingdom would agree to a treaty that formally provides for Russia and the United States to have larger arsenals. Since these three states first acquired nuclear weapons, they have made do with *much* smaller arsenals than either Russia or the United States, in spite of having the capability to build up their arsenals significantly (albeit not to American or Russian levels). In addition, each conceives of nuclear deterrence in a way that stresses the value of small arsenals. Thus China, France, and the United Kingdom might be able to accept an unequal arrangement. On the other hand, one or more of them might decide that a treaty that formally enshrines inequality is politically unacceptable.¹⁶⁷ If this proves to be the case, then, Russia and the United States are extremely unlikely to continue reductions.

TRANSPARENCY BEFORE LIMITATIONS

As part of the START I transparency regime, Russia and the United States (as well as Belarus, Kazakhstan, and Ukraine) exchanged detailed updates on the disposition of their strategic nuclear forces once every six months. They made this information available to the broader international community three months after the end of each six-month period. China, France, and the United Kingdom presumably found this information extremely helpful for their own planning. As a prelude to more formal multilateral nuclear arms control, those three states could adopt, on a voluntary basis, similar transparency measures.¹⁶⁸

Table 1 is an example of the kind of information that China, France, and the United Kingdom could declare under a voluntary transparency regime. It is loosely based on the START I and New START transparency regimes. It is organized into six “tiers.” Each tier involves the release of more detailed information than the one before it. Participating states could start by releasing tier I information only, and, if the process proves successful, they could progress step by step to higher tiers. Two important elements of such a regime would be periodically updating the information (as Russia and the United States did under START I and will do under New START) and arranging private discussions amongst the five states to explore and clarify the questions that would inevitably arise about each of the declarations. It bears emphasizing that table 1 is merely illustrative; endless variations are possible.

The concept of a voluntary transparency regime is considerably less radical than it seems at first—at least for France and the United Kingdom. A great deal about the British and French arsenals is already known, including through official sources. For those two states the novelty of a transparency regime, at least in its early stages, would lie not in making information about their arsenals available so much as doing it periodically.

Table 1 differs from the START and New START transparency regimes in a number of important respects. First, it includes much more data about warheads—particularly about non-deployed warheads and warheads for short-range delivery systems—than even New START. This is because, as numbers come down, it will become increasingly important to include all warheads in arms control, not just deployed strategic warheads. Indeed, U.S.-Russian arms control appears to be heading in this direction.

Second, table 1 includes all types of delivery systems fielded by France, China, and the United Kingdom, not just those limited by START and New START. France has about 80 dual-capable aircraft (some of which are based on its aircraft carrier) that can carry short-range nuclear-armed air-to-surface missiles.¹⁶⁹ China may also have some dual-capable aircraft.¹⁷⁰ What China certainly has is hundreds of ballistic missiles of less than intercontinental range, all of which could probably be modified to carry nuclear weapons but only some of which are nuclear-armed.¹⁷¹ (Pursuant to the Intermediate Nuclear Forces Treaty, the United States and Russia have already verifiably eliminated all ballistic missiles with ranges between 500 and 5,000 km. Other systems, such as dual-capable aircraft, air-to-surface missiles, and short-range ballistic missiles, have not been subject to U.S.-Russian arms control, but they could be declared under a transparency arrangement similar to table 1.)

A transparency regime such as that outlined in table 1 would advance the prospects of multilateral arms control for at least three reasons. First, by institutionalizing the periodic release of information, a voluntary transparency regime might help to build bureaucratic support—or, at least, reduce bureaucratic opposition—in China, France, and the United Kingdom to more formal arms control further down the line.

Second, and more importantly, the discussions that ought to accompany declarations by China, France, and the United Kingdom could help to develop the definitions needed for formal arms control. Because the United Kingdom's only delivery system is so similar to the sea-based leg of the U.S. triad, for which there are already arms control definitions, British declarations of missiles, delivery systems, and launchers would probably be straightforward and easily interpreted. The same would almost certainly not be true for France and China.

TABLE 1. Proposed transparency regime for China, France, and the United Kingdom

Level	Numerical data on missiles, launchers and delivery systems	Numerical data on warheads
I	Total number of NBMs, SLBMs, and NATSMs Total number of NBM launchers, SLBM launchers, and DCA Total number of SSBNs and NACs	Total number of warheads
II	As above, but disaggregated according to deployed or non-deployed status	As above, but disaggregated according to deployed or non-deployed status
III	As above, but disaggregated according to type	As above, but disaggregated according to the type of delivery system on which deployed warheads are emplaced
IV	As above, but disaggregated according to the base at which deployed NBMs, deployed NBM launchers, deployed SLBMs, deployed SLBM launchers, deployed NATSM, and deployed DCAs are located Name and type of each SSBN based at each SLBM base Name, type, and base of each NAC	As above, but disaggregated according to the base at which deployed warheads are located
V	Type of NBM deployed in each silo Type and location of each non-deployed NBM and each non-deployed NBM launcher Type and location of each non-deployed SLBM and each non-deployed SLBM launcher Type and location of each non-deployed DCA and each non-deployed NATSM	Number and locations of non-deployed warheads
VI	<i>Number of warheads emplaced on each deployed NBM, each deployed SLBM, and each deployed DCA</i>	

Key

DCA: Dual-Capable Aircraft

NAC: Nuclear-armed Aircraft Carrier (that is, an aircraft carrier on which nuclear-armed DCA can be deployed)

NATSM: Nuclear-armed Air-To-Surface Missile

NBM: Nuclear-armed Ballistic Missile

SLBM: Sea-Launched Ballistic Missile

SSBN: ballistic missile submarine

This transparency regime is based on the START and New START data exchanges. One of the major purposes of such a regime is to induce states to discuss the definitions of the terms used in the table.

Supplementary data

Maximum number of warheads that can be emplaced on each type of NBM, SLBM, and **NATSM**

Number and type of SLBM launchers on each type of SSBN

Maximum number and type of DCA that can be deployed on each NAC

Maximum number and type of NATSM that can be emplaced on each type of DCA

Notification of new types of delivery systems

Coordinates of bases for NBMs

Coordinates of basing areas for mobile NBMs

Coordinates of SLBM bases

Coordinates of land-based DCA bases

Coordinates of NAC bases

Detailed technical data on each type of NBM, **NATSM, and DCA***

Coordinates of deployed and non-deployed silo NBM launchers

Coordinates of fixed structures for mobile NBM launchers

*Coordinates of loading, maintenance, production, repair, storage, training, conversion, and elimination facilities for (as applicable) NBMs, NBM launchers, SLBMs, SLBM launchers, SSBNs, **NATSMs, DCAs, NCAs, and warheads***

Coordinates of space launch facilities, NBM test ranges, and DCA flight test centers

Data not exchanged under START or New START is marked in bold.

Data exchanged under START but not made public is marked in italics.

* Such data is primarily useful for distinguishing nuclear-armed from conventional systems. Similar data was exchanged under START. See, for example, Annexes F, G, and H of "START Treaty Memorandum of Understanding Data for United States," July 1, 1998, available at www.fas.org/nuke/control/start1/text/mou/usmoutoc.htm.

Reportedly, all Chinese warheads are “demated” from their missiles, raising questions about whether such systems should be classified as deployed or non-deployed.¹⁷² (Indeed, one Chinese analyst interviewed for this project noted, only half jokingly, that, according to the New START counting rules, China is already “at zero.”) Similarly, there is a question about whether French carrier-based dual-capable aircraft should be counted as deployed when the carrier from which they are based is in dock. There are also questions about how to distinguish French dual-capable aircraft from variants that have no nuclear capability and how to distinguish nuclear-armed Chinese ballistic missiles from those designed purely for conventional weapons. Declarations about warheads from all three states would certainly also raise many questions, including, most fundamentally, what constitutes a warhead. A transparency regime that triggers discussions of these and other questions could be a useful step toward multilateral arms control.

Third, a voluntary transparency regime involving China, France, and the United Kingdom could help facilitate the next steps in American and Russian bilateral arms control. In particular, greater transparency by China could help convince Russia and the United States that Beijing will not attempt to challenge them numerically if they reduce their arsenals. Such reassurance might not only enable deeper U.S.-Russian cuts than would otherwise be the case; it might also help to combat potentially significant opposition within the United States to concluding another bilateral arms control treaty at all. U.S. opponents of New START occasionally cited its failure to include China.¹⁷³ The U.S. Senate signaled its concern about Chinese intentions in its ratification resolution for New START.¹⁷⁴ These concerns will likely grow as the U.S. arsenal shrinks. By itself, greater Chinese transparency would not assuage these concerns completely. Without doubt, Chinese involvement in formal multilateral arms control will be necessary for the United States and Russia to get to 500 warheads each. However, greater transparency by China might enable the United States and Russia to reduce far enough bilaterally that multilateral arms control becomes a realistic possibility.

Greater transparency by China might enable the United States and Russia to reduce far enough bilaterally that multilateral arms control becomes a realistic possibility.

The concept of a multilateral transparency arrangement could be advanced among the five nuclear-weapon states. Over the last couple of years, there has been a growing interest in cooperative disarmament initiatives among the five. In September 2009, the United Kingdom hosted a conference for the nuclear-weapon states on nuclear confidence building.¹⁷⁵ The 2010 NPT Review Conference encouraged similar initiatives in its consensus final document, which called upon the nuclear-weapon states “to promptly engage with a view to . . . [f]urther enhance transparency and increase mutual confidence.”¹⁷⁶ Discussing and implementing a transparency arrangement would certainly constitute significant progress in fulfilling this action item.¹⁷⁷

British, Chinese, and French willingness to release information on their nuclear arsenals might depend on how much information Russia and the United States release under New START. Like its predecessor, New START defers detailed discussions of this question to the commission set up to oversee the treaty’s implementation (the Bilateral Consultative Commission in the case of New START).¹⁷⁸ Hopefully, the commission will follow the positive precedent set by START and release relatively detailed information. If it does not, however, Russia and the United States could agree to release more information provided that some combination of China, France, and the United Kingdom do likewise.

ASSESSING THE PROSPECTS FOR BRITISH, FRENCH, AND CHINESE INVOLVEMENT

There appears to be a significant gap between, on the one hand, American and Russian perspectives and, on the other, those of China, France, and the United Kingdom about when it would be appropriate to multilateralize the arms control process. Today, Russia and the United States each possess about 5,000 nuclear warheads of all types (with more awaiting dismantlement). Edward L. Warner, the representative of the U.S. Secretary of Defense to the New START negotiations, summed up a broad consensus in both the United States and Russia when he stated that “there’s probably one more major bilateral nuclear arms reduction negotiation, and hopefully, agreement ahead between the United States and Russia” before other nuclear-armed states must be involved.¹⁷⁹ By contrast, in private conversations about the ideas raised in this report, British and French officials expressed extreme skepticism about both the need and the desirability of initiating a multilateral process in the near or medium term. Similarly, some Chinese officials have spoken privately about Beijing accepting limits on its arsenal when the United States and Russia reach 1,000 nuclear warheads of all types—a factor of two or three below what the next U.S.-Russian bilateral agreement might reasonably be expected to accomplish.

Realistically, the parties will have to reach a compromise. Even after the next round of arms control, the total American and Russian arsenals are likely to be about ten times larger than those of France, China, and the United Kingdom. Insisting on British, French, and Chinese involvement in formal multilateral arms control at that point will be unrealistic. However, unless these three states show a willingness to move in this direction by, for example, agreeing to more informal transparency arrangements, it will become politically impossible for Russia and the United States to make further reductions.

The United Kingdom is the state most likely to agree to take part in a transparency regime. A great deal is already known, including by means of official documents, about its arsenal. There are strong domestic constituencies in favor of disarmament. Moreover, the Conservative-Liberal coalition government elected in May 2010 has retained the positive attitude of its Labour predecessor toward multilateral nuclear disarmament. Indeed, as the 2010 NPT Review Conference was concluding, the newly-appointed UK Foreign Secretary William Hague took the significant step of disclosing, for the first time, the total size of the British arsenal—an important precedent for a more comprehensive transparency regime.¹⁸⁰ More generally, the UK government has underlined for a number of years that “when it will be useful to include in any negotiations the one percent of the world’s nuclear weapons that belong to the UK, we will willingly do so.”¹⁸¹

France is likely to be more skeptical. As with the British arsenal, there is already a great deal of information about the French nuclear arsenal in the public domain. Paris might, therefore, conclude that it could release some of the information in table 1—particularly from the lower tiers—without prejudicing its national security. However, there is likely to be a more fundamental barrier to French involvement: the very goal of multilateral arms reductions. Rhetorically, Paris supports nuclear disarmament. In private, however, French officials are deeply skeptical of U.S. and British talk of a world without nuclear weapons.¹⁸² They have worked hard behind the scenes to temper American and British enthusiasm for disarmament—for instance, during negotiations over UN Security Council Resolution 1887 (2009) on disarmament and nonproliferation. So it should not come as a surprise if France shows reluctance to participate in a transparency regime.

That said, French officials do frequently talk of the importance of transparency. In his March 2008 speech on disarmament, President Nicolas Sarkozy “invite[d] the five nuclear weapon States recognized by the NPT to agree on transparency measures.”¹⁸³ It is open to debate whether his suggestion was made in good faith or was merely a cynical ploy to slow down disarmament by promoting an idea that he believed China would find unacceptable. Either

way, however, France would find it awkward not to take part in a transparency regime if China comes on board.

Much will, therefore, depend on China. To date, the very concept of transparency has been anathema to Beijing. This attitude stems, at least in part, from concerns about the survivability of its forces.¹⁸⁴ China has a small arsenal and worries that greater transparency would make a U.S. first strike easier. Chinese fears have probably been compounded by the refusal of successive U.S. administrations to accept mutual vulnerability—a step that the United States had been willing to take, rhetorically at least, with the Soviet Union and Russia. However, the Obama administration has recognized Chinese “concern that [ballistic missile] defenses might negate China’s strategic deterrent,”¹⁸⁵ assured China that a Chinese ballistic missile attack on the United States is “not the focus of”¹⁸⁶ American ballistic missile defense efforts, and promised that Conventional Prompt Global Strike capabilities will “not negatively [affect] the stability of”¹⁸⁷ the Sino-U.S. nuclear relationship.

Unambiguously accepting mutual vulnerability with China would probably help ease Chinese fears. However, taking such a step would not be easy for a number of reasons. First, there would probably be strong domestic opposition in the United States. Indeed, in the ratification resolution for New START, the U.S. Senate stated that “policies based on ‘mutual assured destruction’ or intentional vulnerability can be contrary to the safety and security of [the United States and Russia].”¹⁸⁸ In addition, even if the United States accepts mutual vulnerability, it might have trouble convincing China that its words are more than rhetoric.¹⁸⁹

Thus progress on a voluntary transparency arrangement will have to wait until Chinese concerns are at least partially addressed. In fact, raising the prospect of a transparency arrangement too early could prove counterproductive. Experience from the 2009 London conference mentioned above is instructive: Suggestions by some states that transparency should appear in the conference title proved highly controversial and apparently jeopardized Chinese involvement.

An important first step to reassuring Beijing would be a serious and sustained dialogue on deterrence between the United States and China.¹⁹⁰ If China can be convinced that advanced American conventional weaponry (in particular ballistic missile defense and Conventional Prompt Global Strike) is not targeted against China, it may find greater transparency somewhat more palatable. Likewise, if the United States can be convinced that China’s ongoing nuclear weapons modernization program is aimed at preserving the status quo by ensuring the survivability of Chinese nuclear forces and not an attempt to undermine extended deterrence and advance its interests at the expense of U.S. allies, then the United States may find deep reductions easier to contemplate.

The Bush administration tried to initiate a dialogue on nuclear strategy and policy with China. One round of talks occurred in 2008, but they did not continue after China failed to respond to an invitation for a second round.¹⁹¹

In the 2010 Nuclear

Posture Review, the Obama administration expressed a desire to initiate a “dialogue on strategic stability” with China.¹⁹² Like its predecessor, it has found making progress to be challenging. To be fair, the conditions have been far from auspicious; there has been a general deterioration in Sino-U.S. relations since late 2009 (caused by disagreements over climate change and exchange rates, and by the Dalai Lama’s visit

to the White House, among other reasons). Moreover, in January 2010, China suspended all military-to-military contacts with the United States to protest U.S. arms sales to Taiwan. A year later, Beijing and Washington are only just beginning to resume these contacts and, in a positive development, U.S. Defense Secretary Robert Gates paid a visit to the headquarters of the Second Artillery (the People’s Liberation Army Corps responsible for nuclear operations) in January 2011.¹⁹³

Even in the event of a sustained recovery in the U.S.-China relationship (something that is far from certain), a meaningful U.S.-China deterrence dialogue could still prove very challenging to orchestrate. China’s continuing refusal to engage with the United States suggests that its concerns are broader than the survivability of its forces. After all, survivability concerns may explain Beijing’s reluctance to discuss its capabilities, but they cannot explain its reluctance to discuss doctrine and policy. Having been opaque about its nuclear posture for so long, China probably has to overcome significant domestic hurdles before it can meaningfully engage on deterrence. The exact nature of these hurdles is not clear, but they may include everything from unresolved policy debates within the Second Artillery to a lack of suitable personnel.¹⁹⁴ In addition, just as an internal U.S. debate about the future of Sino-U.S. relations impedes American military engagement with China, so too may a similar debate in China impede Beijing’s military engagement with Washington.¹⁹⁵

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It is exceedingly difficult to assess the relative importance of these internal factors against Chinese concerns about force survivability when attempting to explain Beijing's resistance to engage. However, it is probably incorrect to assume that an acceptance of mutual vulnerability by the U.S. would be a sufficient condition for China's involvement in dialogue, transparency, and, eventually, multilateral arms reductions. While acceptance would surely improve the prospects for Chinese engagement, factors beyond the control of the United States are at work and these could prove serious barriers to progress. That said, the United States should persist in urging China to enter into a dialogue. This policy might not work, but there do not appear to be any better options.

CONCLUSIONS

The U.S. policy agenda needed to create the conditions allowing for deep reductions is truly challenging. Some of the challenges are technical. In the next stage of arms control, Russia and the United States will have to negotiate a verification system for tactical and non-deployed warheads. Further down the line, they will need to develop a transparency regime for their nuclear weapon production complexes. Ultimately, other nuclear-armed states will have to participate in a multilateral arms control regime—a process that will require the rethinking of definitions, concepts, and procedures the United States and Russia developed together over many years. Yet as difficult as these problems are, they can almost certainly be overcome if all parties have the political will to do so.

Generating that political will is likely to prove more difficult and will require focusing on a second layer of strategic and political challenges. In spite of their shared forty-year history of arms control, Washington and Moscow maintain different concepts of nuclear deterrence, and the difference between them may even be growing. This disparity manifests itself in debates over a range of issues, including the role of tactical nuclear weapons and the effects of high-precision conventional weapons and ballistic missile defenses on strategic stability. Narrowing that conceptual gap is a priority.

Outside the U.S.-Russia relationship, there are other political and strategic challenges that are just as significant. U.S. allies need to be assured that deep reductions will not undermine their security. In part, this is a political problem that might be significantly ameliorated by Washington redoubling its already impressive efforts to engage with its allies. However, it is also a strategic problem that raises the issue of conventional imbalances. At some point, Russia and NATO will have to resurrect conventional arms control in Europe (both to

ensure that Moscow feels that it is able to reduce its reliance on nuclear weapons and to improve the security of the Baltic states). This process is complicated, however, by a number of vexatious political disagreements, including, most notably, the status of Abkhazia. China, the United States, and American allies are paying increasing attention to the conventional balance in the West Pacific. If China and the United States cannot find a *modus vivendi* in the region, reductions could stall. Meanwhile, China has many of the same fears as Russia about advances in U.S. conventional weapons. Easing these fears is a prerequisite to engaging China in multilateral arms control. Finally, regional dynamics in the Middle East and South Asia—Iran’s pursuit of nuclear weapons, Israeli security concerns, and a burgeoning arms race between India and Pakistan—have the potential to significantly complicate the task of building a multilateral regime to regulate the arsenals of all the nuclear-armed states.

In many relevant states, there are domestic considerations that significantly limit governments’ freedom of action to solve this array of political, strategic, and technical challenges. Meaningful limits on ballistic missile defense might theoretically be a good way of assuring Russia, but it is clear that the U.S. Senate would not ratify an agreement containing them. Meanwhile, some Russians view their large nuclear arsenal (along with their seat on the Security Council) as the last vestige of their superpower status, an attitude that makes them reluctant to contemplate deep reductions. Even prosaic issues like finances could prove significant barriers to deMIRVing ballistic missile forces, for example.

The United States should have no illusions about the difficulty and complexity of the task it faces. However, there are plenty of opportunities to begin developing solutions. Although a few of the key challenges, such as the expanding Indian and Pakistani arsenals and China’s growing conventional superiority with respect to Russia, are beyond the influence of U.S. power, Washington can make progress in many other areas, even in the short term. Indeed, the United States can do a great deal *in the next year or two* to advance its avowed goal of deep reductions.

Washington’s attention is already starting to turn to the next round of U.S.-Russian arms control. Limits on launchers, delivery vehicles, warheads (including tactical and non-deployed weapons), and potentially Conventional Prompt Global Strike will have to be agreed in what will doubtless prove a long and difficult series of negotiations. However, there are a number of steps the United States can take now, away from the negotiating table, to advance the prospects for this and future rounds of arms control:

- **Continue to engage with Moscow** at a high level to develop a framework for ballistic missile defense cooperation that

can ultimately lead to a more effective European defense architecture against threats from Iran than NATO could build alone;

- **Indicate that it is willing to discuss with Russia** voluntary confidence-building measures (such as data exchanges) on “non-prompt” high-precision conventional weapons;
- **Suggest to Moscow that it conduct** with the United States a joint technical assessment of the threat that cruise missiles pose to ICBM silos;
- **Emphasize to domestic audiences** the high costs of Conventional Prompt Global Strike and the very limited set of circumstances in which it could be uniquely useful;
- **Design a single warhead ICBM** to replace the Minuteman III;
- **Continue to fund the revitalization** of the U.S. nuclear weapon complex;
- **Incorporate transparency as a design criterion** for both the Chemistry and Metallurgy Research Replacement and the Uranium Processing Facility;
- **Suggest to Russia that they restart** reciprocal transparency visits to each other’s nuclear weapon complexes.

As part of its Nuclear Posture Review, the Obama administration made unprecedented efforts to engage with its allies, including the formalization of deterrence dialogues with Japan and South Korea. So far, these efforts have proved highly successful. To build upon them the United States can:

- **Initiate wide-ranging** reviews with all its allies to jointly assess threats to their security and develop credible means of deterrence and prevention (hopefully NATO’s deterrence review, as announced at the Lisbon Summit, will become a model for such a review);
- **Insist that all allies** who have not yet done so take steps that will allow the United States to exchange classified information about deterrence planning;
- **Discuss within NATO** the expansion of the Nuclear Planning Group into a higher-level Deterrence Planning Group to cover all aspects of deterrence (including but not limited to nuclear deterrence).

Although resurrecting and revising the Conventional Forces in Europe Treaty is an important step in creating the conditions for deep reductions, the prospects for doing so are currently poor. To try to prevent the next round of nuclear arms control from foundering over sovereignty issues in the Caucasus, the United States should try to persuade Russia not to link tactical nuclear arms control with conventional arms control in Europe. To this end, the United States can:

- **Present Russia with a credible path** to addressing its concerns about the conventional balance in Europe by continuing to make it clear that NATO is committed to rebuilding the conventional arms control regime in Europe;
- **Continue to abide** by the terms of the Conventional Forces in Europe Treaty and the other agreements that make up the broader European security regime (such as the Open Skies Treaty);
- **Encourage its allies** to do likewise;
- **Explain to Russia** its plans for a “regional security architecture” in Europe (as announced in the 2010 Nuclear Posture Review).

For Russia and the United States to agree to deep nuclear reductions, other nuclear-armed states will eventually have to be integrated into a multilateral arms control process. The first step is a mutual confidence-building process between the United States and China that may ultimately convince Beijing that greater transparency will not undermine its security. To advance this agenda, the United States can:

- **Continue to press China** to engage in a meaningful dialogue on strategic stability;
- **Suggest concrete confidence-building measures** to China (such as informal visits to ballistic missile defense installations) that will demonstrate that the United States is serious about its stated goal of enhancing strategic stability;
- **Encourage France and the United Kingdom** to participate on a voluntary basis in periodic data exchanges modeled on those in START and New START.

As modest as some of these proposals are, they would, as a whole, constitute real and meaningful first steps toward a world with far fewer nuclear weapons. Taking them would certainly not guarantee success, but it would ensure that the very real practical difficulties of facilitating deep reductions do not lead to paralysis before the project has even been begun.

NOTES

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- 2 U.S. Department of Defense, *Nuclear Posture Review Report*, April 2010, www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf, 30.
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- 4 Ibid.
- 5 *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers* (Canberra/Tokyo: International Commission on Nuclear Non-proliferation and Disarmament, 2009), www.icnnd.org/reference/reports/ent/pdf/ICNND_Report-EliminatingNuclearThreats.pdf, 76–77.
- 6 The United States and Russia possess, respectively, 5,113 warheads (as of September 30, 2009) and about 4,600 warheads (with more awaiting dismantlement). Robert S. Norris and Hans M. Kristensen, “Russian Nuclear Forces, 2010,” *Bulletin of the Atomic Scientists*, vol. 66, no. 1 (January/February 2010): 74; “Fact Sheet: Increasing Transparency in the U.S. Nuclear Weapons Stockpile,” May 3, 2010, www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency__FINAL_w_Date.pdf.
- 7 Hans M. Kristensen, “Obama and the Nuclear War Plan,” Federation of the American Scientists Issue Brief, February 2010, www.fas.org/programs/ssp/nukes/publications1/WarPlanIssueBrief2010.pdf, 6. For some useful insights into U.S. targeting see Linton Brooks, “America’s Nuclear Posture,” Conference on Rebuilding the NPT Consensus, Center for International Security and Cooperation, Stanford University, October 16–17, 2007, <http://iis-db.stanford.edu/pubs/22218/RebuildNPTConsensus.pdf>, 70, 74–75.
- 8 James M. Acton, *Deterrence During Disarmament: Deep Nuclear Reductions and International Security*, Adelphi 417 (Abingdon: Routledge for the IISS, forthcoming), chapters 1 and 2.
- 9 Strategic stability is used here in its narrow “technical” sense. In a stable deterrence relationship between two parties, neither side has an incentive to build up its nuclear forces (arms race stability) or, in a crisis, to use nuclear weapons first out of the fear of the other side doing so (crisis stability).
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- 11 For a more detailed introduction to crisis stability see Thomas C. Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966), chapter 6.
- 12 John F. Kennedy, remarks at American University, Washington, D.C., June 10, 1963, www.jfklibrary.org/Research/Ready-Reference/JFK-Speeches/Commencement-Address-at-American-University-June-10-1963.aspx.

- 13 Sergei Lavrov, remarks to the State Duma, Moscow, January 14, 2011, www.mid.ru/brp_4.nsf/0/B4B970B7D9B7FAD9C3257818005CDBD2 (in Russian).
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- 15 See, for example, Lavrov, remarks to the State Duma; Sergei M. Rogov, Viktor Esin, Pavel S. Zolotarev, and Valeriy Yarynich, "Sood'ba Stratyegichyeshkih Vooroozhyenyi Poslye Pragi" [The Fate of Strategic Arms after Prague], *Nyezavisimoye Voyennoye Obozryeniye* [Independent Military Review], August 27, 2010, http://nvo.ng.ru/concepts/2010-08-27/1_strategic.html (in Russian).
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- 18 Personal communication with U.S. official, November 2010.
- 19 For a review of the issues see David Cliff, Hassan Elbahtimy, and Andreas Persbo, *Verifying Warhead Dismantlement: Past, Present, Future*, Verification Matters 9 (London: Verification Research, Training and Information Centre [VERTIC], 2010), www.vertic.org/media/assets/Publications/VM9.pdf.
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- 22 See, for example, U.S. Department of Defense, *Ballistic Missile Defense Review Report* (2010), www.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630_for%20web.pdf, 12-13; *Nuclear Posture Review Report*, 28-29.
- 23 United States Senate Resolution of Advice and Consent to Ratification of New START Treaty, December 22, 2010, www.state.gov/documents/organization/154123.pdf, para. (c).(1).(A).
- 24 Transcript of Remarks and Response to Media Questions by Russian Foreign Minister Sergey Lavrov at Press Conference in Relation to the Upcoming Signing of a Treaty Between Russia and the USA on Measures to Further Reduction and Limitation of Strategic Offensive Arms, Moscow, April 6, 2010, www.mid.ru/brp_4.nsf/0/F45DC88975370C9DC32576FE003B0772.
- 25 Ibid.
- 26 See the forthcoming report of the Next Generation Working Group on U.S.-Russia Arms Control. Lieutenant General Patrick J. O'Reilly, Director of the Missile Defense Agency, has testified that phase four should enable the United States "to intercept large raids of medium- to long-range missiles early in flight." Patrick J. O'Reilly, prepared statement on "Fiscal Year

- 2011 Missile Defense Programs” to the hearings before the Subcommittee on Strategic Forces of the Armed Services Committee of the United States House of Representatives, April 15, 2010, http://democrats.armedservices.house.gov/index.cfm/files/serve?File_id=211f2394-53c7-472b-abac-fa93e502519f, 6.
- 27 “A System of Elements,” Missile Defense Agency, www.mda.mil/system/elements.html.
- 28 Personal communication with U.S. official, November 2010. The official also stated that the burn-out velocity of the SM-3 Block IIB missile will be 5 km/s. However, an interceptor launched 1,000 km from a modern solid-fueled ICBM would require a burn-out velocity of about 10 km/s in order to intercept the ICBM at the end of its boost phase (i.e. just before the start of the ascent phase). Almost all Russian ICBM basing areas are further than 1,000 km from Redzikowo, Poland (a probable deployment site for SM-3 Block IIB interceptors). David K. Barton et al., “Report of the American Physical Society Study Group on Boost-Phase Intercept Systems for National Missile Defense: Scientific and Technical Issues,” *Reviews of Modern Physics*, vol. 76, no. 3 (October 5, 2004), http://rmp.aps.org/pdf/RMP/v76/i3/pS1_1, S361.
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- 31 Rogov, Esin, Zolotarev, and Yarynich, “Sood’ba Stratyegichyeskih Vooroozhyenyi Poslye Pragi.”
- 32 Hearings before the Committee on Foreign Relations of the United States Senate on “The New START Treaty,” S. HRG. 111–738, Washington, D.C., May 18, 2010, <http://foreign.senate.gov/download/?id=A0C2E5F0-8CB7-46B8-A3C1-014024059D16>, 71.
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- 37 “NATO-Russia Council Joint Statement,” November 20, 2010, www.nato.int/cps/en/natolive/news_68871.htm. See also “NATO Moves Ahead with Missile Shield,” Global Security Newswire, November 22, 2010, http://gsn.nti.org/gsn/nw_20101122_4923.php.
- 38 Vladimir Dvorkin, “Reducing Russia’s Reliance on Nuclear Weapons in Security Policies” in *Engaging China and Russia on Nuclear Disarmament*, edited by Cristina Hansell and William C. Potter, Occasional Paper 15 (Monterey, Calif.: James Martin Center for Nonproliferation Studies, Monterey Institute of International Studies, 2009), <http://cns.miis.edu/opapers/op15/op15.pdf>, 95. See also Alexei Arbatov and Vladimir Dvorkin, *Beyond Nuclear Deterrence: Transforming the U.S.-Russia Equation* (Washington, D.C.: Carnegie Endowment for International Peace, 2006), chapter 6.
- 39 Dvorkin, “Reducing Russia’s Reliance on Nuclear Weapons,” 97–98; Nikolai Sokov, “Missile Defense: Towards Practical Cooperation with Russia,” *Survival*, vol. 52, no. 4 (August–September 2010): 121–30.
- 40 Weitz, “Illusive Visions and Practical Realities.”
- 41 “Russia, NATO Remain at Odds over Missile Shield,” Global Security Newswire, January 27, 2011, www.globalsecuritynewswire.org/gsn/nw_20110127_5137.php.
- 42 See, for example, J. D. Crouch, Robert Joseph, Keith B. Payne and Jayson Roehl, “Missile Defense and National Security: The Need to Sustain a Balanced Approach,” *Comparative Strategy*, vol. 28, no. 1 (2009): 1–9. This article— notable because of its authors—is revealing. Its focus is on Iran and North Korea but the brief references to China (p. 4) and Taiwan (p. 8) illustrate the desire among some for ballistic missile defenses to be targeted against China over the longer term.

- 43 U.S. Department of Defense, Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2010*, (2010), www.defense.gov/pubs/pdfs/2010_CMPR_Final.pdf, 34.
- 44 Weitz, "Illusive Visions and Practical Realities," 108–12.
- 45 See, for example, Dvorkin, "Reducing Russia's Reliance on Nuclear Weapons in Security Policies" in *Engaging China and Russia on Nuclear Disarmament*, Hansell and Potter (ed.), 100. This point has also been made in multiple interviews with the author.
- 46 See, for example, Yevgeny Miasnikov, "The Counterforce Potential of Precision-Guided Munitions," in *Nuclear Proliferation: New Technologies, Weapons, Treaties*, edited by Alexei Arbatov and Vladimir Dvorkin (Moscow: Carnegie Moscow Center, 2009), www.carnegieendowment.org/files/12574Blok_YadernoyeRaspr_Eng_fin1.pdf, chapter 5. See also Eugene Miasnikov, "On the Relationship between Nuclear and Conventional Strategic Arms in the New START Treaty," Center for Arms Control, Energy and Environmental Studies, Moscow Institute of Physics and Technology, September 10, 2010, www.armscontrol.ru/pubs/en/em091010.pdf.
- 47 Dennis M. Gormley, *The Path to Deep Nuclear Reductions: Dealing with American Conventional Superiority*, Proliferation Papers 29 (Paris: Ifri, 2009), www.ifri.org/downloads/pp29gormley1.pdf, 36.
- 48 Personal communication with former Russian official, Washington, D.C., November 2010. Russian analysts also express concern about the ability of cruise missiles to destroy mobile missiles. In doing so, they generally underplay the extreme practical difficulties of locating and tracking such targets.
- 49 For some interesting ideas see Gormley, *The Path to Deep Nuclear Reductions*, 40–41, 43–44.
- 50 Alexei Arbatov, Vladimir Dvorkin, and Sergei Oznobishev, *Nejadernyje Faktory Jadernogo Razoruzheni* [Non-Nuclear Factors of Nuclear Disarmament] (Moscow: Institute of World Economy and International Relations [IMEMO], 2010), www.imemo.ru/ru/publ/2010/10024.pdf (in Russian), 33. "Pantsyr" means "shell" in Russian. For more information see, for example, www.army-technology.com/projects/pantsyr.
- 51 DARPA, "Fact Sheet: Falcon Hypersonic Technology Vehicle 2 (HTV-2)," www.darpa.mil/tto/programs/falcon/files/program_fact_sheet.pdf. HTV is also sometimes referred to as Hypersonic Test Vehicle.
- 52 The capability of a CPGS missile against a silo would depend very sensitively on its accuracy—something that is, as yet, unknown.
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- 54 Elaine M. Grossman, "Cost to Test U.S. Global-Strike Missile Could Reach \$500 Million," Global Security Newswire, March 15, 2010, www.globalsecuritynewswire.org/gsn/nw_20100315_8655.php; Turner Brinton, "Pentagon's New Long-Range Missile Program off to Rocky Start," *Space News*, April 26, 2010, www.spacenews.com/military/042610darpa-loses-contact-with-hypersonic-vehicle.html.
- 55 For example, *Nuclear Posture Review Report*, 28–29.
- 56 Russia may not admit this publicly and is likely to argue in negotiations for a ban on all conventionally armed ballistic missiles. However, it is ultimately likely to be satisfied by counting such weapons as nuclear armed.
- 57 James N. Miller, prepared statement to the hearings before the Committee on Foreign Relations of the United States Senate on "The New START Treaty," S. HRG. 111–738, June 16, 2010, 275.
- 58 Rogov, Esin, Zolotarev, and Yarynich, "Sood'ba Stratyegichyeskih Vooroozhyenyi Poslye Pragi."
- 59 DARPA, "FALCON (Force Application and Launch from CONUS) Technology Demonstration Program Fact Sheet," November 2003, www.darpa.mil/news/2003/falcon_fs.pdf.
- 60 Boeing, "Backgrounder: X-51A WaveRider," June 2010, www.boeing.com/defense-space/military/waverider/docs/X-51A_overview.pdf.
- 61 New START, article V.2.

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- 63 The effect on deterrence of destroying isolated silos with conventional rather than nuclear weapons is worthy of further study.
- 64 It is generally assumed that two warheads are required to destroy a silo.
- 65 It did, however, contain some provisions for downloading.
- 66 Colin Powell, prepared statement to the hearings before the Committee on Foreign Relations of the United States Senate on “Treaty on Strategic Offensive Reduction: The Moscow Treaty,” S. HRG. 107-622, Washington, D.C., July 9, 2002, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=107_senate_hearings&docid=f:81339.pdf, 15.
- 67 Personal communication with former senior U.S. official with knowledge of the current administration’s position, January 2011.
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- 69 Acton, *Deterrence During Disarmament*, Introduction.
- 70 “Russia to Develop New Heavy ICBM by 2020,” RIA Novosti, December 20, 2010, <http://en.rian.ru/russia/20101220/161856876.html>.
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- 80 Ibid.
- 81 Ibid. See, in particular, the quote from Douglas J. Feith.
- 82 James M. Acton, Edward Ifft, and John McLaughlin, “Arms Control and Deterrence,” forthcoming.
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- 84 Interview with Siegfried S. Hecker, Stanford, Calif., May 19, 2010. Hecker led the U.S. delegation that visited Seversk in 1997.
- 85 Young and Gronlund, “The Cart Before the Horse,” 9. The United States currently retains a large number of non-deployed warheads that serve as a hedge against both adverse geopolitical change and technical failures in its deployed weapons. The Obama administration argued in its Nuclear Posture Review that a revitalized infrastructure would

allow the United States “to reduce the number of warheads retained as a geopolitical hedge, by helping to dissuade potential competitors from believing they can permanently secure an advantage by deploying new nuclear capabilities.” *Nuclear Posture Review Report*, 41. As the Next Generation Working Group has argued, a revitalized infrastructure would also open up a new approach to stockpile management that would allow the United States to draw down the non-deployed warheads retained as a technical hedge.

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- 96 On France see Scott D. Sagan, “Why Do States Build Nuclear Weapons?: Three Models in Search of a Bomb,” *International Security*, vol. 21, no. 3 (Winter 1996–1997), 76–80. On the UK see Margaret Gowing assisted by Lorna Arnold, *Independence and Deterrence: Britain and Atomic Energy, 1945–1952*, vol. 1, *Policy Making* (New York: St. Martin’s Press, 1974), especially 184–85.
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- 99 Jeffrey Lewis, “Extended Deterrence Policy Committee,” Arms Control Wonk, October 19, 2010, <http://lewis.armscontrolwonk.com/archive/3057/extended-deterrence-policy-committee#more-765>. See also George Perkovich, “Extended Deterrence on the Way to a Nuclear-Free World,” paper commissioned by the International Commission on Non-Proliferation and Disarmament, May 2009, www.icnnd.org/research/Perkovich_Deterrence.pdf.
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- 111 National Institute for Defense Studies, *East Asian Strategic Review 2010* (Tokyo: Japan Times, 2010), www.nids.go.jp/english/publication/east-asian/e2010.html, 34.
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- 114 Douglas Lytle and Lenka Ponikelska, “Obama to Drop Poland, Czech Missile Defense Proposal,” Update 9, September 17, 2009, *Bloomberg*, www.bloomberg.com/apps/news?pid=newsarchive&sid=awZyw2fptKCQ.
- 115 Pifer, *The Next Round*, 19.
- 116 See, for example, Murdock and Yeats, *Exploring the Nuclear Posture Implications of Extended Deterrence and Assurance*, Chapter VI; National Institute for Public Policy, *U.S. Extended Deterrence and Assurance for Allies in North East Asia* (National Institute Press, 2010), www.nipp.org/National%20Institute%20Press/Current%20Publications/PDF/US%20Extend-Deter-for%20print.pdf, 21–38.
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