CNS

OCCASIONAL PAPER

#15 · MARCH 2009

Engaging China and Russia on Nuclear Disarmament

Cristina Hansell, William C. Potter, eds.

Middlebury Institute *of* International Studies at Monterey

James Martin Center for Nonproliferation Studies

JAMES MARTIN CENTER FOR NONPROLIFERATION STUDIES

The James Martin Center for Nonproliferation Studies (CNS) strives to combat the spread of weapons of mass destruction by training the next generation of nonproliferation specialists and disseminating timely information and analysis. A research center at the Monterey Institute of International Studies (an affiliate of Middlebury College), CNS is the largest nongovernmental organization in the United States devoted exclusively to research and training on nonproliferation issues.

For more information about CNS, visit cns.miis.edu.

James Martin Center for Nonproliferation Studies
Monterey Institute of International Studies
460 Pierce St., Monterey, CA 93940, U.S.A.
Tel. +1 (831) 647-4154; fax +1 (831) 647-3519; e-mail: cns@miis.edu

Editors Cristina Hansell and William C. Potter

Policy recommendations, statements of fact, and opinions expressed in this Occasional Paper are the responsibility of the authors and do not imply the endorsement of the James Martin Center for Nonproliferation Studies or the Monterey Institute of International Studies.

ISBN 978-0-9798703-5-4 (PDF)

Cover: Composite using images from iStockphoto.com: Hands © Chen Chih-Wen; Chinese flag © Bjorn Kindler; Russian flag © Matt Trommer; U.S. flag © Lugo Graphics.

Engaging China and Russia on Nuclear Disarmament

Cristina Hansell and William C. Potter, Editors

James Martin Center for Nonproliferation Studies
Occasional Paper No. 15
April 2009

CONTENTS

Foreword iii
Cristina Hansell and William C. Potter

Summary Report

Chinese and Russian Perspectives on Achieving Nuclear Zero 1
Nikolai N. Sokov, Jing-dong Yuan, William C. Potter, and Cristina Hansell

Figure 1. Chinese Nuclear Arms Control and Disarmament: Principal Players and Policy-Making Processes. 20

Figure 2. Structure of Russian Decision Making on Disarmament and International Security. 22

Commissioned Essays

China and the Nuclear-Free World 25
Jing-dong Yuan

Chinese Nuclear Posture and Force Modernization 37
Jeffrey Lewis

How Chinese Analysts View Arms Control, Disarmament, and Nuclear Deterrence after the Cold War 47
Lora Saalman

The Evolving Role of Nuclear Weapons in Russia's Security Policy 73
Nikolai N. Sokov

Reducing Russia's Reliance on Nuclear Weapons in Security Policies 89
Vladimir Dvorkin

The Prospect of Universal Complete Nuclear Disarmament 103
Pavel S. Zolotarev

Formulation of Nuclear Policy in Moscow: Actors and Interests 113
Mikhail Tsypkin and Anya Loukianova

Strategic Relations between the United States, Russia, and China and the Possibility of Cooperation on Disarmament 123
Cristina Hansell and Nikita Perfilyev

CONTRIBUTORS 149

FOREWORD

The past several years have witnessed a major revival of interest in nuclear disarmament in the United States. The primary contributor to this phenomenon was a January 2007 essay on the topic in the Wall Street Journal by George Shultz, William Perry, Henry Kissinger, and Sam Nunn. The essay sent a shockwave through the U.S. national security establishment by daring to discuss the need for totally eliminating nuclear weapons: so-called nuclear zero. While the "road to zero" steps that the essay recommended were not new, they lent credibility to the call for a serious debate on a topic that was until recently considered taboo in the United States. This call was taken up at a meeting entitled "Reykjavik Revisited" [1] at Stanford University's Hoover Institution in October 2007 and at a follow-up conference on "Achieving the Vision of a World Free of Nuclear Weapons," held in Oslo in February 2008.[2]

While the Shultz et al. initiative has clearly expanded the political space for debate about nuclear disarmament in the United States and appears to be playing a role in shaping some elements of the new U.S. approach to nuclear arms control and risk reduction, it is more difficult to discern the impact of the initiative on other nuclear weapon states, with the possible exception of the United Kingdom.[3] Chinese and Russian policy makers, in particular, have tended to be very circumspect in their public commentary on the initiative, and it remains to be seen how receptive they will be to new thinking on the subject of nuclear disarmament. And yet unless key decision makers in Beijing and Moscow are engaged in a serious discussion of these issues, it will prove impossible to make progress toward disarmament.

In order to try to remedy this situation, and with an eye to engaging Beijing and Moscow in a serious dialogue about practical steps along "the road to zero," the James Martin Center for Nonproliferation Studies (CNS), with the support of the Norwegian Foreign Ministry and the William and Flora Hewlett Foundation, embarked on a project to analyze the prevailing perspectives, bureaucratic players, and politics related to nuclear disarmament in China and Russia. In addition, the project sought to develop recommendations on how to build support for desired policy changes in Beijing and Moscow and to devise a strategy for bringing the study's findings to the attention of relevant policy makers and experts.

The essays in this Occasional Paper represent the findings from the first stage of the project: the examination of thinking on strategic policy, nuclear postures, and prospects for disarmament in Beijing and Moscow. The first essay summarizes the main findings and recommendations of the project. It also provides detailed charts on nuclear policy making in Russia and China. The other essays constitute the background papers that were commissioned for the project.

Three of the commissioned papers examine Chinese nuclear perspectives. In the first of these essays, Jing-dong

1. This followed an earlier conference George Shultz initiated at Stanford in October 2006, on the twentieth anniversary of the Reagan-Gorbachev meeting in Reykjavik, to review the goals of the original Reykjavik Summit. The 2006 conference instigated the composition of the *Wall Street Journal* piece the following January.
2. In addition, a number of other high-profile efforts to promote nuclear disarmament have been launched recently, including a campaign for Global Zero and the creation of the International Commission on Nuclear Nonproliferation and Disarmament, an initiative supported by the Australian and Japanese governments.
3. Several high-level statements in support of disarmament have been made by U.K. officials, beginning with Secretary of State for Foreign and Commonwealth Affairs Margaret Beckett's address to the Carnegie International Nonproliferation Conference, "A World Free of Nuclear Weapons?" on June 25, 2007. Most recently, in February 2009, the Foreign and Commonwealth Office issued a document entitled "Lifting the Nuclear Shadow: Creating the Conditions for Abolishing Nuclear Weapons," <www.fco.gov.uk/en/fco-in-action/counter-terrorism/weapons/nuclear-weapons/nuclear-paper>.

Yuan looks at the Chinese reaction to the recent calls for nuclear zero as well as a variety of nuclear nonproliferation measures promoted over the past decade. He interprets Chinese positions on these issues with reference to Beijing's understanding of the role of nuclear weapons in the current international strategic environment and notes the particular importance China attaches to U.S. missile defense and space activities, as well as qualitative improvements in U.S. conventional forces. Yuan examines Chinese perspectives on relevant international agreements and a number of specific proposals made by advocates of nuclear zero; he also looks at Beijing's assessment of the potential impact of these proposed steps on China's security interests.

The next essay, by Jeffrey Lewis, assesses China's nuclear posture and the modernization of its nuclear weapons systems and provides a review of the technical, historical, and bureaucratic impetus driving Chinese nuclear policies. Lewis notes new challenges posed by the failure of Chinese and U.S. political leaders to think through the consequences of the interaction of the new strategic capabilities they are developing, which may include increased possibility of accidents, miscalculations, and misunderstandings. Nevertheless, Lewis remains optimistic; he believes that it should be possible to reinforce strategic stability through dialogue, as neither the United States nor China have any intention of attacking each other.

The final essay devoted to China is a review by Lora Saalman of Chinese analyses of arms control, disarmament, and deterrence since the end of the Cold War. Based on an extensive review of Chinese-language materials, Saalman provides a broad survey of contemporary viewpoints and demonstrates that opinion on nuclear issues in China is less uniform than often portrayed in the West. Her finding suggests that there may be a variety of ways to engage China on a path toward nuclear zero.

Another set of commissioned papers focuses on Russian players and perspectives. Nikolai N. Sokov examines Russian strategic policy and the evolving role of nuclear weapons since the end of the Cold War. He finds that while Russia's status is increasingly determined by economic and political factors—and less by the possession of nuclear weapons—Moscow continues to view nuclear arms as essential in dealing with a variety of security threats. A shift to reliance on conventional arms, Sokov believes, will take at least a decade. As a consequence, he suggests that tackling the causes of Russia's insecurity should involve a wide range of arms control and confidence-building measures directed at negotiating a new Strategic Arms Reduction Treaty (START), resolving differences over missile defense, addressing the imbalance of conventional forces in Europe, and repairing relations between Russia and NATO. Further progress toward disarmament, however, will require the restructuring of the entire fabric of Russia's relations with the West.

The essays by Vladimir Dvorkin and Pavel S. Zolotarev, two retired Russian officers, also focus on the role of nuclear weapons in Russian security policy. Dvorkin explicates the differences between Russia's declaratory and actual nuclear policy, noting that the role of nuclear weapons is set by military planning and force posture, not by official doctrine alone. Although he regards nuclear deterrence today to be misguided because it does not address the actual threats facing the United States and Russia, he is not optimistic that existing policy can be readily revised. Dvorkin details eleven initial steps that will have to be taken in order to reduce reliance on deterrence. He also examines Russian perspectives on U.S. missile defense plans and proposes that cooperative missile defense could become the basis for a new partnership in the military realm.

The essay by Zolotarev reviews the demise of the Cold War–era arms control and nonproliferation regime and suggests a number of approaches for reducing impediments to nuclear disarmament. Although he advocates greater use of international mechanisms for this purpose, he differs with Dvorkin in his approach to some specific issues, including risk reduction measures that rely on de-alerting.

The final paper with a Russia focus, by Mikhail Tsypkin and Anya Loukianova, examines the bureaucratic arms control and disarmament landscape in Russia. It identifies actors with nuclear policy-making authority and potential institutional advocates for policy change on nuclear disarmament issues. The authors note that although the decision-making system is highly centralized and relatively closed to outside influence, it is not impenetrable. Interactions between nongovernmental organizations and Russian governmental agencies—especially the Foreign

Ministry—allow new ideas to be brought to the attention of decision makers. Tsypkin and Loukianova also suggest that engagement by foreign officials in talks on two issues of paramount interest to Russia—replacing START I and resolving missile defense—provides an opportunity to move forward on disarmament.

Unlike the essays focused narrowly on China and Russia, the essay contributed by Cristina Hansell and Nikita Perfilyev examines the trilateral relationship among Beijing, Moscow, and Washington. The authors are particularly interested in Chinese and Russian views of changes in U.S. policy since the end of the Cold War, as well as continuity and change in their perspectives of one another. Arguing that cooperation is likely to continue to grow in the short term, Hansell and Perfilyev detail differences in nuclear force posture and doctrine, possible prospects for Russian missile defense cooperation with the West, and plans for improvements in conventional military capabilities that endanger long-term cooperation. The authors also note that current trajectories involving U.S. and Russian weapons dismantlement and developments in missile defenses and high-tech weaponry will have a major effect on mutual perceptions. As such, the three countries must either cooperate to reduce mutual threats, unilaterally halt programs such as missile defense or long-range conventional weapons, or counter each other's programs militarily. The essay concludes with an examination of Chinese and Russian views of various cooperative measures that have been proposed in the nuclear sphere and how these issues connect with other strategic issues. Progress on nuclear disarmament will not be easy, the authors believe, but it is possible. They note that a window of opportunity exists today to move cooperatively toward nuclear zero; however, as decisions on military procurement are realized over the next few years, the window will shrink, making disarmament far more difficult.

All of the commissioned papers contributed to the analysis and recommendations provided in the introductory essay to this Occasional Paper. These essays, along with the flowcharts depicting the bureaucratic landscape in Russia in China (Figures 1 and 2, respectively) benefited greatly from reviews by Bonnie Glaser (Center for Strategic and International Studies), Evan S. Medeiros (RAND), Bates Gill (Stockholm International Peace Research Institute), John Lewis (Center for International Security and Cooperation/Stanford), Christopher Twomey (Naval Postgraduate School), and Jeffrey Lewis (New America Foundation). Discussions with Vladimir Dvorkin (Carnegie Moscow Center), the above-named reviewers, and other U.S, Chinese, and Russian government officials and experts provided invaluable insights that informed the analysis and conclusions in the introductory essay. The authors would also like to thank Catherine Auer for her editorial oversight of the majority of the essays in this Occasional Paper, Stephen Schwartz and Sarah Diehl for their extensive editing of the essays by Lora Saalman and Vladimir Dvorkin, respectively, and Lala Kylycheva and Amy Van Dyke for translating the essays by Pavel Zolotarev and Vladimir Dvorkin. The project research and this Occasional Paper would not have been possible without the support of the Norwegian Foreign Ministry and the William and Flora Hewlett Foundation.

Cristina Hansell
Director, Newly Independent States Nonproliferation Program
James Martin Center for Nonproliferation Studies

William C. Potter
Director, James Martin Center for Nonproliferation Studies
Monterey Institute of International Studies

Chinese and Russian Perspectives on Achieving Nuclear Zero

Nikolai N. Sokov, Jing-dong Yuan, William C. Potter, and Cristina Hansell

Today two key nuclear powers, China and Russia, stand at the crossroads of nuclear policy: both Beijing and Moscow are reassessing their nuclear policies and postures. The decisions they make will affect their negotiating positions for years to come; therefore, now is the time to engage both countries in discussions about deep nuclear reductions that could ultimately lead to the elimination of their arsenals. Such actions will contribute to reaching "nuclear zero"—the complete elimination of all nuclear weapons—an idea that was the focus of two recent opinion articles coauthored by George Shultz, William Perry, Henry Kissinger, and Sam Nunn, who stressed the necessity of "turning the goal of a world without nuclear weapons into a practical enterprise among nations."[1]

The window of opportunity to affect a reassessment of the role of nuclear weapons in Chinese and Russian security policies is likely to be short-lived. In the next few years, policy makers in China and Russia may reinforce the nuclear role—or they may decide to join the "practical enterprise" and seriously contemplate ways to reduce reliance on, and eventually phase out, nuclear weapons.

This report summarizes the findings of research conducted by analysts at the James Martin Center for Nonproliferation Studies (CNS) and outside experts to identify optimal ways to engage China and Russia in negotiations on practical steps toward disarmament. In particular, ways were sought to begin to engage China in new nuclear disarmament and risk reduction negotiations and to engage Russia more fully. CNS has developed a plan to disseminate the findings of this report in order to maximize its impact on decision-making in Washington, Moscow, and Beijing, using public events as well as briefings for relevant officials.

The report consists of three parts:

- Part I discusses the current nuclear policies of China and Russia, their threat perceptions, the missions they assign to nuclear weapons, and the trajectory of internal debates about possible modification of their nuclear policies.
- Part II sketches the bureaucratic landscapes in China and Russia, emphasizing the identification of agencies and offices with authority over nuclear policy making and disarmament negotiations, as well as the access points that could be used to influence disarmament policy. Figure 1 and Figure 2, at the end of this essay, provide visual schematics of the nuclear decision-making bureaucracy in each country.
- Part III outlines the nuclear disarmament policies of Beijing and Moscow, analyzes the issues that they feel impede further progress, and suggests a menu of practical steps aimed at moving forward with deep reductions and eventual elimination of nuclear weapons; it also assesses the prospects for establishing a productive trilateral dialogue between China, Russia, and the United States.

1. George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "Toward a Nuclear-Free World," *Wall Street Journal*, January 15, 2008, p. A13. This idea was referred to as a "joint enterprise" in an earlier piece; see George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "A World Free of Nuclear Weapons," *Wall Street Journal*, January 4, 2007, p. A15.

Our analysis indicates that nuclear policy is at a critical juncture in both China and Russia. Both countries are engaged in modernization programs and are either considering (China) or have recently modified (Russia) their nuclear strategies to enhance reliance on nuclear weapons. The main drivers of these policies are associated with concerns over U.S. actions:

- The overwhelming U.S. superiority in conventional weapons (particularly advanced precision-guided munitions) undermines traditional nuclear deterrence.
- The United States is seen as having used force in a variety of circumstances over the past decade, often without UN Security Council authorization; this has created some unease in Russia and China over a possible U.S. role in existing or potential regional conflicts (for example, a clash over Taiwan or a conflict similar to Russia's 2008 war with Georgia over South Ossetia).
- Russia and China perceive U.S. missile defense plans as potentially harming their ability to deter a U.S. strike. The U.S. justification for missile defenses—the need to intercept missiles launched by "rogue" states such as Iran and North Korea—is not regarded as credible in Beijing or Moscow.
- The 2001 Nuclear Posture Review issued by the George W. Bush administration created the impression that the United States plans to integrate nuclear weapons into an array of other military assets and lower the nuclear threshold.

Under these circumstances, the "disarmament" policies of Russia and China concentrate on near-term goals that can be classified as optimization rather than disarmament. Nevertheless, in many important aspects these goals are compatible with an agenda of minimizing nuclear risks; it is possible to build upon their short-term interests and create momentum that would enable a transition to more tangible disarmament-oriented measures.

Part I: Prevailing Nuclear Threat Perceptions, Deterrence, and Nuclear Weapons

China

China has traditionally adhered to a minimalist view of deterrence. Beijing has long maintained that its development of nuclear weapons is largely driven by the need to respond to nuclear coercion and blackmail. The role of nuclear weapons in this context is purely defensive and emphasizes retaliation rather than war fighting. Nuclear weapons are for strategic deterrence only; no tactical or operational utility is entertained. If China suffers a nuclear strike, regardless of the scale, it warrants strategic responses and retaliation. Chinese leaders and military strategists consider the role of nuclear weapons as one of defensive nuclear deterrence (*ziweifangyu de heweishe*).

Prevailing Chinese nuclear threat perceptions revolve around at least four issues: the 2001 U.S. Nuclear Posture Review and its inclusion of China as one of seven target countries; U.S. missile defenses, in particular as they are deployed in the East Asian region; space weaponization; and the U.S. ability to use precision-guided conventional weapons to attack China's nuclear infrastructure. While Chinese understanding of the post–Cold War U.S. nuclear restructuring may not be completely accurate, the predominant discourse in China suggests the United States is seeking to lower the nuclear threshold and blur the nuclear-conventional boundary. Given China's small nuclear arsenal and the weaknesses of its current intercontinental ballistic missile (ICBM) inventory, which is very old, U.S. missile defenses in East Asia could threaten to neutralize Chinese nuclear deterrence capabilities. Washington's declared policy of maintaining space dominance combined with the danger of weaponizing outer space further erode Chinese confidence. Finally, China's no-first-use (NFU) policy would be seriously challenged if potential adversaries could use precision-guided munitions to attack its nuclear facilities and nuclear forces.

This assessment of the security environment has generated internal discussions in China on the role of nuclear weapons and the viability of sustaining its NFU policy. China continues to modernize its nuclear forces, most noticeably in the development and deployment of new-generation land-based and submarine-launched ballistic mis-

siles. It is also developing land-attack cruise missiles. Our review of the literature and discussions with both U.S. and Chinese analysts suggest that the Chinese focus is on missile rather than warhead development; indeed, there is no evidence that China is engaged in the design of new nuclear warheads. This could change, as some U.S. analysts point out, as existing Chinese nuclear arsenal ages and confidence in its reliability deteriorates. For the time being, though, China is expending its efforts mostly on developing and deploying new-generation, solid-fuel, long-range missiles that are either road-mobile or submarine-launched to strengthen their survivability and hence enhance the credibility of China's minimum nuclear deterrent capabilities. Increasingly, missile modernization also emphasizes dual capability: having both nuclear and conventional warheads to give China the option of not resorting to nuclear weapons in response to a conventional attack.

Some independent experts believe that the Chinese military is considering a shift from its current nuclear doctrine of minimum deterrence to one of limited deterrence, which would require the ability to engage in nuclear escalation and counterforce capabilities, but there is no official confirmation of this assessment. In any event, China clearly intends to keep its arsenal small: the conceptualization of deterrence promoted by Chinese analysts emphasizes preventing nuclear coercion by the superpower(s) without China being coercive itself.

If one relates China's ballistic and cruise missile modernization programs to its predominant nuclear threat perceptions, it is clear that Beijing wants to: (1) maintain the credibility of its nuclear deterrent by improving the survivability of its nuclear missiles; (2) develop the capacity to respond to various contingencies, including conventional weapons attack; and (3) sustain the NFU unilateral obligations under the new security environment. China therefore has not tested or contemplated the development of new nuclear warheads and has maintained a moratorium on nuclear testing despite the fact that it has not ratified the Comprehensive Nuclear-Test-Ban Treaty (CTBT).

Russia

In 2000, Russia adopted a new Military Doctrine that expanded the missions assigned to nuclear weapons. In addition to the traditional mission of strategic deterrence, which is oriented toward preventing a large-scale war, the new doctrine included the mission of deterring limited conventional attacks. The focus of that concern is the United States. Moscow is worried that overwhelming U.S. conventional power could be used coercively, to deny Russia's national interests and limit its freedom of action in domestic and foreign policy. More recently, U.S. plans to deploy a missile defense system in several regions of the world have elicited Russian government and expert concern about the long-term viability of Russia's strategic deterrent and, on a broader plane, about Washington's long-term plans.

Thus, almost two decades after the end of the Cold War, *nuclear weapons have three partially overlapping roles in Russian national security policy*, each with a distinctly different impact on the prospects of nuclear disarmament:

1) Russia sees its status as one of five nuclear weapon states recognized by the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) as an important symbol in the emerging multipolar world. The symbolic value of nuclear weapons should not be a major impediment to the elimination of nuclear weapons, however, because Russia's place in the emerging international system ultimately will be defined by its political and economic power.

2) With the end of the Cold War, strategic deterrence became a "just-in-case" mission guarding against the possibility of future U.S. aggression. This conceptualization is similar to the primary mission for nuclear weapons in the 2001 U.S. Nuclear Posture Review, in which U.S. weapons are seen as guarding against possible future Russian or Chinese aggression. Until nuclear weapons are eliminated, the implicit strategic deterrence role will remain, but it should not prevent progress in nuclear disarmament.

3) Deterrence of conventional armed forces has emerged as the primary mission of Russian nuclear

weapons since the war in Kosovo in 1999, which Moscow saw as evidence that the United States will resort to force to achieve its goals if political instruments do not yield success and that international law (authorization of the UN Security Council) does not hinder Washington. The 2000 Military Doctrine developed the concept of "de-escalation" to deter conventional conflicts: it is assumed that threat of a limited nuclear strike (fewer than ten warheads) should prevent or quickly terminate conflict. This mission has given nuclear weapons a new lease on life: Moscow assesses the conventional threat as real and immediate, while regarding alternative deterrence options (such as conventional forces, alliances, or international law) as unavailable in the foreseeable future, at least until conventional weapons are sufficiently modernized.

In 2007, Russia began the process of developing a new Military Doctrine. Early indications derived from interviews and public debates suggest that the role of nuclear weapons will probably remain the same as in the 2000 document.

Russian nuclear forces remain on high alert. Recently, the commander of the Strategic Rocket Forces, Nikolai Solovtsov, revealed that existing procedures foresee the decision time for the launch of nuclear weapons as just two to three minutes. This suggests that the Russian military regards the requirements of the strategic deterrence relationship with the United States as having fundamentally the same properties as during the Cold War and also that the agreement reached by the United States and Russia in the early 1990s, about "de-targeting" their nuclear weapons, is clearly insufficient for moving away from so-called hair-trigger alert status. Proposals for "de-alerting" nuclear arsenals to prevent their use on short notice (as advanced by both American and Russian nongovernmental experts) have gone unheeded by the Russian military in recent years. Russia's withdrawal from bilateral discussions with the United States about de-alerting coincided with the development, adoption, and fine-tuning of its 2000 Military Doctrine, which Russia continued to amend through 2003.

Renewed attention to nuclear weapons has made Russia particularly sensitive to *U.S. plans to deploy a missile defense system*. The planned deployment area in Eastern Europe (Poland and the Czech Republic) is attracting the most attention, but Russia takes into account other areas as well, including U.S. missile defense sites in Alaska, California, and Japan. The official attitude, shared by the majority of nongovernmental experts—even those who are critical of reliance on nuclear weapons—is defined by two main theses:

- The United States continues to pursue missile defense plans unilaterally or with allies (Japan in particular), but Russian proposals to participate have stalled; this is regarded as an indication that U.S. plans are ultimately aimed at Russia and China. U.S. assurances that missile defense is intended to protect against proliferant states such as Iran and North Korea are seen as obscuring "real" U.S. intentions.
- The U.S. rejection of Russian requests to set limits on the ultimate size and capability of the missile defense system has generated suspicion that current, limited U.S. plans are just a "foot in the door" and that eventually the system will be significantly expanded.

Yet, in spite of the intensity of political conflict over U.S. missile defense plans, *Russian nuclear modernization programs proceed at a very slow pace*—the rate of deployment of new weapons systems is about eight to ten times slower than during the Soviet period. Clearly, Russia does not regard this element of defense policy as a high priority, even though public rhetoric seems to suggest otherwise. In late 2007 the government explicitly rejected calls to allocate more funds to the production of nuclear weapons.

According to the 2000 National Security Concept, *reliance on nuclear weapons is a temporary solution until conventional forces are modernized* sufficiently to support the missions currently assigned to nuclear assets. Conventional programs consume the bulk of attention and resources allocated to modernization. According to the latest plans, rearmament of conventional forces should be completed by 2020. Some of the more important programs include GLONASS, a Russian analogue of the Global Positioning System (GPS); precision-guided air- and sea-launched conventional cruise missiles; short-range land- and sea-launched ballistic and cruise missiles; precision-guided bombs, and more—mirroring conventional modernization programs pursued by the United States in the 1980s and 1990s.

If Russia implements these plans, then in ten to twelve years it should be in a position to reduce its dependence on nuclear weapons. However, Russia's limited production capability and long track record of multiyear delays in all modernization programs suggest that its plans are too optimistic. Thus, in the foreseeable future, Russian deterrence policy directed at the United States and NATO will probably continue to rely on the threat of nuclear use.

Part II: Bureaucratic Political Landscape

China

It is difficult to accurately sketch the bureaucratic/political landscape in China regarding nuclear policy making and the institutional and individual proponents and opponents of nuclear disarmament. Overall, nuclear policy remains under the purview of the highest policy-making bodies in China: the Standing Committee of the Chinese Communist Party Politburo and the Central Military Commission (CMC). The actual process of policy making on nuclear strategy and disarmament appears to be more complex and involves a multitude of governmental agencies whose input varies depending on the specific issue; debates are usually conducted behind closed doors, and what little information about them that becomes public is not always reliable. Research institutes and think tanks affiliated with government ministries and universities also provide some input into the process via analyses that are funneled into the decision-making system either through their supervisory organizations, if engaged in interagency processes, or through the China Arms Control and Disarmament Association (CACDA), as described below. The CACDA yearbook on international arms control and disarmament, published since 2004, provides an overview of such analyses.

In doctrinal and operational terms, the General Staff Department (GSD), and to a certain degree, the Second Artillery Corps (SAC), play the key role. The General Armaments Department (GAD) of the People's Liberation Army (PLA) is responsible for nuclear weapons programs and provides important input on nuclear arms control and disarmament, especially from a technical perspective. In recent years, with the elevation of the PLA Navy (PLAN) and the PLA Air Force (PLAAF) commands to the CMC, there is speculation that the two services may also have a say in decisions on nuclear doctrine and nuclear weapons use.

In arms control and disarmament matters, a number of important stakeholders in China are periodically engaged in review and discussion of major issues, provide input in the policy-making process, and are charged with implementation of policy. These actors include government ministries, PLA general departments, nuclear laboratories, and occasionally, research and academic institutions. On the civilian side, the Department of Arms Control and Disarmament in the Ministry of Foreign Affairs (MFA) remains the lead agency in stipulating and implementing government policies. Some of the government-affiliated think tanks, such as the China Institutes of Contemporary International Relations (CICIR) under the Ministry of State Security, the China Institute of International Studies (CIIS) under the MFA, and CACDA, play important advisory roles and are actively involved in research, analysis, and outreach activities. CACDA in particular serves as a bridge between the Department of Arms Control and Disarmament and the research and academic communities at large, organizing research projects and outreach activities and disseminating government policies. Outside this group, individuals who are leading experts, such as Li Bin of Tsinghua University and Shen Dingli of Fudan University, may also be involved in advising on these matters.

On the military side, GAD has an important part as a strong voice in arms control and disarmament debates and deliberation. Its Science and Technology Committee and Lieutenant General Qian Shaojun (now retired) have played major roles in representing the PLA in interagency arms control and disarmament consultations. The China Defense Science and Technology Information Center (CDSTIC) under GAD provides valuable advice to the Science and Technology Committee and therefore exercises some influence. Some of the center's core staff members, such as Liu Huaqiu and Zou Yunhua, both semi-retired major generals, have been actively involved in research and analysis of crucial arms control issues affecting China's security. The nuclear weapons laboratories, such as the China

Academy of Engineering Physics (CAEP) and its affiliate, the Beijing Institute of Applied Physics and Computational Mathematics (IAPCM), provide technical advice on many nuclear weapons–related issues and negotiation, in particular on CTBT-related issues. CAEP was formerly under the Commission on Science and Technology in National Defense but now is under GAD, although most of its staff wear civilian rather than military uniforms. The GAD Foreign Affairs Bureau does not play a significant role, but its Arms Control and Disarmament Desk is responsible for documentation and policy implementation. Finally, the Academy of Military Sciences (AMS) also provides input and analysis, as do to a lesser extent the National Defense University (NDU), SAC Command College, and the China Institute of International Strategic Studies (CIISS) under GSD.

Although GAD's positions on various disarmament issues remain unclear after a review of open sources, one can glean insights about its perceptions through the publications of CDSTIC analysts. These analysts tend to be unenthusiastic about disarmament given their concerns over U.S. missile defenses, space dominance, and perceived development of new nuclear weapons, which they view as potentially threatening to China's limited nuclear deterrent. Some members of the CDSTIC staff's arms control group have been CNS visiting fellows over the years, including Liu Huaqiu, Zhu Qiangguo, and Ma Chunyan. NDU, CIISS, AMS, and the China Foundation for International & Strategic Studies (CFIIS) provide research and analyses for the military on arms control and disarmament issues; CIISS staff members often serve in Chinese delegations to the Conference on Disarmament (CD) and other international/multilateral fora. The perspectives of analysts affiliated with the military institutions described above are diverse but in general are cautious about the prospects of nuclear disarmament.

Outside access to Chinese governmental agencies and departments is severely limited, and their representatives tend to toe the official line during interactions with foreign experts. At the same time, they eagerly follow international debates and new proposals, although it is difficult to judge how these proposals are processed in internal deliberations. It is clear that new concepts and initiatives get into the system, but response is often delayed due to a complex assessment and interpretation process. Take for example the debate in the late 1990s and early 2000s over whether the Chinese government should always link the Taiwan issue to Sino-U.S. bilateral discussions on nonproliferation issues. Because several Chinese governmental agencies are involved in setting policy on interactions with the United States on Taiwan—the Chinese Communist Party Center/State Council Taiwan Affairs Office, the Department of North American Affairs, and the Department of Arms Control and Disarmament, as well as the relevant PLA departments—policy formulation necessitated drawn-out interagency deliberation and bargaining. It was not until 2002 that the Taiwan issue was more or less de-linked from the other Sino-U.S. bilateral issues. Other new proposals are likely to involve similarly lengthy and complex interagency bargaining processes.

Semigovernmental and nongovernmental actors offer a more available avenue of access to the Chinese decision-making system, both in terms of understanding the current debate and in terms of influencing it. The most important of these actors include CACDA, CICIR, the Center for Arms Control Studies affiliated with the Institute of American Studies at the Chinese Academy of Social Sciences (CASS), Tsinghua University, Fudan University, NDU, the Academy of Military Sciences, CIISS, CFIIS, and the Chinese People's Association for Peace and Disarmament. CACDA, for instance, essentially plays the role of an outreach arm of the MFA's Department of Arms Control and Disarmament. It typically performs the role of coordinating nongovernmental organizations (NGOs) in providing expert opinion on a range of arms control, disarmament, and nonproliferation issues, and it organizes activities that aim to improve dissemination and implementation of government policies. CICIR, under the Ministry of State Security, assesses international and regional security and arms control developments and provides advice to the government. At the university level, members at a number of arms control and disarmament programs, such as those at Tsinghua and Fudan (and to some extent NDU), and individuals who actively monitor international and regional arms control developments, such as Major General Pan Zhenqiang (retired), Li Bin, and Shen Dingli, interact with their international counterparts. Through their connections with people who have played or still play important roles in government, they may participate in debates that could indirectly influence policies. More importantly, given their exposure and their nongovernmental affiliations, these individuals can be more receptive to new ideas and open to advocating positions that may not be identical with those maintained by the government. However, the extent and frequency of these organizations' and individuals' participation in the policy debate within China remain uncertain.

Therefore, their abilities to influence policy deliberation and formulation are similarly unclear.

Out of this group, one could generalize that CACDA and CICIR closely follow Chinese government positions, while CASS, Tsinghua, and Fudan express more independent views. The military institutions are more suspicious of nuclear disarmament concepts although some analysts (especially those considered retired) offer interesting perspectives and at least conditionally support the idea of nuclear zero. However, they tend to emphasize the missions of nuclear weapons and resist numerical reductions or limits on modernization as long as nuclear weapons remain a critical component in other states' national security policies and defense doctrines.

Interestingly, discussions with Chinese analysts affiliated with CAEP/IAPCM revealed that weapons scientists and/or nuclear physicists–turned–arms control analysts may be very engaged in discussion of arms control matters. Many of them have participated in discussions with their American and other foreign counterparts, and some have also had stints as visiting fellows at Stanford, MIT, Princeton, and the Union of Concerned Scientists, among other places. For example, Li Bin and Shen Dingli—among the most active and well-known Chinese arms control analysts—were postdoctoral fellows at MIT and Princeton and are relatively open-minded, can assess issues from both technical and policy angles, take the lead in training the next generation of arms control specialists in China, and occasionally are called upon to advise government officials.

Russia

The Russian decision-making system with regard to national security and disarmament became considerably more closed after Vladimir Putin's ascendance to the presidency than it was under Boris Yeltsin. During his two terms as president from 2000 to 2008, Putin built a decision-making pyramid that consolidated power in his hands. Today as prime minister he retains much of that power as half of a duumvirate with his successor, President Dmitri Medvedev. It does not appear, however, that they delve into the details of the Russian position on disarmament issues: rather, they set the tone and respond to proposals, initiatives, and analysis provided by the government machine. For them, disarmament seems to serve as a tool in a broader foreign and defense strategy to be advanced or withheld as grand strategy requires.

Formally, at the top of the pyramid is the Security Council (a close analogue of the U.S. National Security Council), but its actual role varies depending on the person who occupies the position of its secretary. The Security Council played a prominent role in formulating nuclear strategy and nuclear disarmament policy during the tenure of Sergey Ivanov until his appointment as minister of defense. Currently, the Security Council takes a more passive stance. The only exception appears to be former chief of the General Staff Yuri Baluevski, who continues to play an important role as a "brain" behind military policy, offering advice independent of the formal military establishment. Baluevski primarily looks after the interests of the military, but he is also generally supportive of limited nuclear arms reduction.

As in any large bureaucracy, decision-making on disarmament is built around an interagency mechanism, which is apparently similar to the one that existed in the Soviet Union and was behind arms reduction initiatives of the 1980s. As in the past, the key players in the field are the Foreign and Defense Ministries, the Foreign Intelligence Service, and, since 2006, the Military-Industrial Commission, which represents the interests of the defense industry, including the weapons component of the nuclear industry.

The relative influence of various agencies has waxed and waned mostly as a result of the stature of their heads and their degree of access to Putin (and more recently, Medvedev). It appears that two agencies play pivotal roles in disarmament decisions: the Foreign Ministry and the Defense Ministry—or, rather, the Defense Ministry's General Staff, since both the current and the former defense ministers, Anatoly Serduykov and Sergey Ivanov, respectively, lack expertise in the area. However, the appointment of a new chief of General Staff, Nikolai Makarov—and the replacement of several key figures whose portfolios include nuclear policy and arms control—is likely to result in the General Staff's decreased capacity and diminished willingness to entertain changes in arms control and nuclear policy.

Within the Defense Ministry, arms control is the prerogative of the General Staff's Main Operations Depart-

ment and the Main Directorate for International Cooperation (which is formally charged with participation in all arms control and disarmament negotiations). Several key services (the Strategic Rocket Forces, the Navy, and the Air Force) and research institutes of the Defense Ministry (such as the 4th Institute, which supports operations of the Strategic Rocket Forces) play a pivotal role in the development of the Defense Ministry's position on disarmament and to a large extent dominate the discourse because of their monopoly on technical expertise.

Closely associated with the Defense Ministry is the Academy of Military Sciences, which is staffed primarily by retired, high-ranking military members. The academy tends to take a very hardline position on key international security and military posture issues, including nuclear strategy. Yet, contrary to common perception, only two or three experts get a hearing in the military establishment; the academy's role is thus very limited.

The enhanced role of the Foreign Ministry is a relatively new phenomenon and can be attributed primarily to the success of Minister Sergey Lavrov in strengthening his position in the Russian bureaucracy. While the rising profile of the Foreign Ministry is a welcome sign, its willingness to push forward the disarmament agenda should not be overestimated, as over the past ten years high-level diplomats have been reluctant to challenge the military's control over that issue area.

Compared to China, Russian governmental agencies have greater experience and expertise in all matters pertaining to nuclear policy and disarmament. Although the turmoil of the 1990s created a partial breakdown in institutional memory, the depth and breadth of experience generated by almost uninterrupted arms control negotiations since the 1960s make Russian military and civilian policy makers highly informed and experienced in both technical and diplomatic details. The downside of that experience is relatively low interest in outside proposals.

The role of the nongovernmental community in decision making on nuclear arms control and disarmament matters has significantly decreased in comparison to the 1990s as a result of Putin's efforts to control information. Still, NGOs continue to participate in discussion of arms control matters and can serve as a useful conduit for innovative approaches.

The Russian NGO scene includes a number of well-established academic research centers, such as the Institute of USA and Canada Studies, as well as the Institute of World Economy and International Relations; it also includes some new organizations established in the post-Soviet era, including the PIR Center and the Moscow office of the Carnegie Endowment for International Peace. These organizations continue to maintain close contacts with governmental agencies, often through personal relationships; their expertise and ability to contribute to policy deliberations are enhanced by the presence on their staff of retired military and foreign policy officials with insider knowledge and good bureaucratic connections. NGO publications often reflect debates that are taking place within the Foreign and Defense Ministries. While direct NGO input into policy formulation is limited, they can provide a useful alternative channel for raising issues with decision makers.

Russian officials are reasonably open to contacts with foreign counterparts and NGO experts. The system is therefore open to Track 2 and even Track 1½ contacts. The responsiveness of officials to proposals about nuclear disarmament is, obviously, limited by general political guidelines, but at a minimum this channel can be used to raise new ideas and explore possible alternative approaches.

Part III: Disarmament Policy—Recommendations for Moving Forward

China

China's official positions on nuclear disarmament can be summarized as follows. Beijing insists that it has long maintained an NFU position and has called on other nuclear weapon states to follow suit. In addition, China has pledged negative security assurances to non-nuclear weapons states under the NPT and to various nuclear-weapon-free zones (NWFZs). It opposes the deployment of nuclear weapons outside national territories of nuclear weapon

states and calls for abandoning nuclear umbrellas and nuclear sharing policies. It has supported efforts to start negotiations on a Fissile Material Cutoff Treaty (FMCT) and has signed but not ratified the CTBT. It is believed to have stopped producing weapon-grade highly enriched uranium and military plutonium, although it retains a stockpile sufficient for future expansion of its nuclear arsenal should the need arise. Beijing in principle endorses the vision of a nuclear-free world; its known positions on related issues include:

- CTBT. China has yet to ratify the treaty but maintains a moratorium on testing. It calls for restraint on research and development of new types of nuclear weapons and reduction of their role in the national security strategy. China is actively involved in the preparation for the treaty's entry into force and hosts twelve international monitoring stations in China. There have been no signs of Chinese plans to ratify the treaty. It should be noted that the PLA resisted the signing of the CTBT but was persuaded to accept the government position. Chinese officials say that U.S. ratification will provide a positive environment for China.

- FMCT. China reportedly stopped producing weapon-grade fissile materials in the early 1990s. Beijing's official position supports negotiation of a legally binding treaty, but Beijing has been unwilling to commit to a certified moratorium. Chinese analyses suggest that given the uncertainty generated by U.S. missile defense plans, the growing gap in conventional capabilities, and space weaponization, there may be a need for future production to maintain a relative safety margin.

- De-alerting and de-targeting. China maintains an NFU position and calls on other nuclear weapon states to follow suit. China's 2008 Defense White Paper suggests that only if it comes under nuclear threat will its nuclear missile force go into a state of alert. China's current strategic nuclear arsenals are reportedly separated from ICBMs and submarine-launched ballistic missiles, which are not fueled. China has also pledged negative security assurances to non-nuclear weapon member states of the NPT and NWFZs. In 1994, China and Russia signed a de-targeting agreement. China and the United States signed a non-targeting agreement in 1998 during President Bill Clinton's visit to China. Both agreements commit the parties not to target nuclear missiles at each other. The 2008 Defense White Paper reaffirms this position: "In peacetime the nuclear missile weapons of the Second Artillery Force are not aimed at any country." However, with road-mobile ICBMs and a new generation of nuclear-powered ballistic missile submarines entering into service, this situation may change.

- Materials security. China officially maintains that its nuclear arsenals and nuclear facilities are secured, and it has adopted a material protection, control, and accounting (MPC&A) program to enhance their protection against nuclear terrorism. It is also implementing provisions in accordance with its obligations under UN Security Council Resolution1540.

- Arsenal reductions. China supports legally binding, verifiable, and irreversible nuclear disarmament measures and, in particular, calls on Russia and the United States to continue undertaking "drastic" cuts of their nuclear arsenals, with some suggesting a number below 1,000 for each. Chinese analysts note that the Strategic Offensive Reductions Treaty (SORT, or the Moscow Treaty) does not fall into the category of irreversible nuclear disarmament because reduced operational warheads would be moved into reserve, so the total numbers will remain large.

- Beijing remains opposed to ballistic missile defenses and has not indicated any interest in the proposal for multilateral missile defense and early warning arrangements. China continues to call for negotiation of a treaty on the prevention of an arms race in outer space (PAROS) due to its concerns over space being increasingly used as part of the U.S. military dominance, in particular in C^4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance) in support of its conventional long-range and precision strike capabilities and missile defenses.

- NPT. China supports the NPT and its three pillars, which emphasize peaceful use in addition to nuclear nonproliferation and disarmament. Chinese analysts note the challenge of growing demands for civilian

nuclear reactors and the potential for proliferation but have not engaged in detailed discussions on alternative international nuclear fuel cycle management proposals.

- NWFZs. China supports the principle of NWFZs and has pledged unconditionally not to use or threaten to use nuclear weapons against them (or against non-nuclear weapon states). Beijing's official position is that China respects and supports efforts by states to establish NWFZs.

China's positions on nuclear arms control and disarmament are likely to be influenced by four aspects of U.S. policy:

1) The overall strategic orientation of U.S. nuclear doctrine, nuclear posture, and nuclear weapons use, especially where they may affect vital Chinese interests in the Taiwan Strait.

2) The perception of U.S. efforts to develop new types of nuclear weapons, which are relatively low in yield and radiation and have enhanced ability to penetrate hardened underground facilities and therefore reduce the nuclear threshold.

3) U.S. missile defense deployments in East Asia, which are regarded as a serious threat to China's strategic deterrence capabilities. Given the size and sophistication of its small nuclear arsenal, survival of a first strike is critical to maintaining the credibility and reliability of its deterrence. Despite Washington's assurance that it only wants a limited missile defense not directed at China, Beijing continues to seek—and this may well explain its current nuclear modernization efforts—to reverse the potential imbalance that could be caused by U.S. missile defense plans.

4) Superiority of U.S. conventional long-range, precision-guided weapons that could, Chinese military and civilian experts fear, support a disarming non-nuclear first strike, leaving China effectively defenseless.

These concerns may well become significant impediments to Chinese participation in nuclear disarmament and certainly could strengthen the hands of opponents, both institutional and individual, to adoption of the measures and steps proposed in the Shultz et al. articles and in the Final Document of the 2000 NPT Review Conference.[2] In practical terms, these opponents' concerns about the possible negative impact of these measures on Chinese security act as strong disincentives to negotiating an FMCT or ratifying the CTBT.

Clearly, *limited proposals relating to nuclear safeguards and nonproliferation* are more acceptable to Beijing than far-reaching disarmament steps, since nuclear terrorism and WMD proliferation pose serious threats to China. The U.S. Department of Energy maintains an office in the U.S. Embassy in Beijing for nuclear safety and security, tasked with enhancing bilateral nuclear cooperation on topics including MPC&A for Chinese nuclear facilities. More regular exchanges between Chinese and American nuclear scientists on these issues could foster dialogue not only on nuclear safeguards and preventing nuclear terrorism, but also on technical aspects of nuclear arms control and strategic stability. The goal should be to promote the development of an "epistemic community" among Chinese and U.S. analysts, similar to that forged between the United States and the Soviet Union during the Cold War.

The Sino-U.S. dialogue on arms control and disarmament at the official level is minimal, unlike U.S.-Russian strategic nuclear arms control interactions. There are some encouraging signs, however. One is that over the last few years, CSIS and its Chinese counterpart CFIIS have cosponsored four Track 1½ conferences on Sino-U.S. strategic nuclear stability. In addition, a dedicated dialogue on nuclear issues between the U.S. and Chinese militaries was launched in April 2008. Furthermore, drawing on the lessons from the 1999 NATO bombing of the Chinese Embassy in Belgrade and the April 2001 midair collision between a Chinese fighter aircraft and U.S. EP-3 spy plane, analysts in both countries have initiated dialogues on how to develop measures for crisis stability and management. At the official level, it would be useful if the two countries would reaffirm their commitment to the

2. See specifically the so-called Thirteen Practical Steps, 2000 NPT Review Conference, "Final Document," NPT/CONF.2000/28, pp. 14–15.

1998 nuclear non-targeting agreement.

China's support of an FMCT and its ratification of the CTBT will largely be conditional on its assessment of future needs for nuclear weapons development, which in turn is influenced by its threat perceptions and confidence in its defense capabilities, nuclear as well as conventional. The more confidence it has in its conventional military capabilities and a survivable nuclear arsenal, the more likely it is to engage in multilateral nuclear disarmament processes. At the same time, China continues to shun bilateral or multilateral negotiations on freezing—much less reducing—its nuclear arsenal, citing the large gap that continues to exist between its arsenal and those of the United States and Russia.

Given the above considerations:

- The United States will need to assume the leadership role in further deep reductions of its nuclear arsenal that are legally binding, verifiable, and irreversible. At the same time, Washington should also maker greater efforts in encouraging China to move toward nuclear zero. One useful step it could take is to ratify the CTBT. Because China does not like to be isolated diplomatically, U.S. ratification would likely prompt China's ratification of the treaty.

- Maintaining a minimum deterrence capability is of utmost concern to China and serves as a guiding principle in decisions related to multilateral nuclear disarmament. China is less concerned with the numerical total of its arsenal than with the overall strategic balance. Issues such as missile defenses, space, and the role of nuclear weapons in other nuclear weapon states will need to be addressed in this context.

- The Obama administration needs to engage China in a strategic dialogue on these issues, better understand Beijing's concerns, and generate proposals with a realistic prospect for engaging China on multilateral nuclear disarmament. While Washington and Beijing currently maintain channels of regular communication on political/security, economics, and defense issues, there is no official Sino-U.S. strategic nuclear dialogue, something Defense Secretary Robert Gates proposed creating in mid-2008. A Chinese response to this idea has been delayed, likely put on hold after the October 2008 U.S. arms sales to Taiwan. Given the asymmetry in the Chinese and U.S. nuclear arsenals and delivery capabilities, the U.S.-Soviet experience during the Cold War is not a relevant model. Instead, the focus should be on strategic confidence-building and reassurance measures, rather than pursuing transparency and verification issues in the initial stage of engagement.

- Sino-U.S. lab-to-lab cooperation in the 1990s generated both goodwill and useful experiences for both countries related to MPC&A. Considering China's growing demands for nuclear reactors, there is need and opportunity to promote cooperation in the area of best practices in securing nuclear materials against nuclear terrorism threats. In addition, interactions of Chinese and American nuclear scientists over time can contribute to enhanced mutual trust and respect, better understanding of each other's concerns and priorities, and development of epistemic communities in nuclear arms control and disarmament in both countries.

- The Obama administration should strengthen the current Track 1½ bilateral arms control and disarmament dialogue and seek to engage the Chinese military in such semi-official fora. Both funding and the visa process should be improved to facilitate PLA participation in various ongoing visiting fellow programs and multilateral meetings.

- There should also be better use and leverage of resources in the United States, where a number of academic institutions regularly engage and host Chinese analysts and nuclear scientists. Joint efforts among U.S. institutions that coordinate and integrate existing activities into collaborative programs would have a significant long-term impact. The current Monterey–University of Georgia training sessions for Chinese export control officials is one model to consider. Additional funding to support efforts to engage PLA

officers in various visiting fellows programs would be particularly important as a potential window to understand the perspectives, concerns, and policy preferences of a critical stakeholder in China's nuclear arms control and disarmament policy making.

Russia

Russian leadership regards nuclear disarmament as a distant goal, a theoretical rather than practical notion. This attitude is based on the belief that nuclear weapons support an important mission in the context of national security policy. Thus, *Russian disarmament policy primarily concentrates on the near-term goal of maintaining a stable strategic balance with the United States at a reduced level of nuclear weapons*.

At the heart of the Russian disarmament agenda is a dual task: negotiating a replacement to the U.S.-Soviet 1991 Strategic Arms Reduction Treaty (START I, converted into a five-party document with Russia, Belarus, Kazakhstan, and Ukraine in place of the Soviet Union), which is set to expire in December 2009, and preventing—or at least limiting—the deployment of U.S. missile defense architecture.

U.S.-Russian arms control talks have been deadlocked for several years. Moscow attributes this to political and ideological rather than military or technical reasons—the unwillingness of the Bush administration to accept meaningful limits on U.S. military (including nuclear) capabilities. The Russian government pins its hopes on the Obama administration, which has expressed interest in an early agreement on nuclear weapons reduction and could modify the U.S. position to make it more compatible with Russian interests.

START I replacement is seen by Moscow as a step toward optimization of nuclear posture at low levels, rather than as a stage of nuclear disarmament. Still, to the extent that a new treaty is intended to further reduce nuclear arsenals (perhaps to the level of 1,000–1,200 warheads) and enhance strategic stability and the predictability of the bilateral nuclear balance, it in practice represents a step in the direction of nuclear zero.

The two main stumbling blocks that have prevented progress at the START I replacement talks are verifiability and irreversibility (Russia insists that a new treaty prevent return of warheads to delivery vehicles, something that the 2002 SORT does not achieve). Effectively, Moscow wants the new treaty to become a "light" version of START I, while the Bush administration advocated using SORT as a foundation.

Controversy over missile defense has emerged in recent years as the central stumbling block to engaging Russia on arms control. It is still unclear whether a new treaty on offensive arms reduction (START I replacement) can be concluded without first finding a compromise on the missile defense issue. Two retired generals who contributed to this study, Pavel Zolotarev and Vladimir Dvorkin, were skeptical about the possibility of concluding a START replacement agreement without first resolving the missile defense impasse. In 2008, the U.S.-Russian strategic dialogue concentrated on developing confidence-building measures to ensure that the missile defense assets the United States plans to deploy in Eastern Europe will not be able to intercept Russian strategic missiles. However, this discussion has remained deadlocked because Russia finds U.S. proposals insufficient, while the United States regards the restrictions requested by Moscow as excessive.

Recently, the Kremlin has expressed cautious hope that the Obama administration might revisit its missile defense plans, although Russian experts likely realize that complete cancellation of U.S. plans is improbable. Thus, even a delay in the implementation of missile defense deployment plans could be conducive to a future agreement. A combination of confidence-building measures coupled with limits on the size and the capability of the future missile defense system—what would amount to a new-generation Anti-Ballistic Missile (ABM) Treaty—could represent a long-term solution that would open a path to even deeper nuclear reductions.

Russian experts continue to propose a joint missile defense system to counter the threats from proliferant states. These plans were originally proposed in the early 2000s. Although official support for the idea has diminished, nongovernmental experts continue to view it as a viable and preferable solution. Moreover, the April 2008 U.S.-

Russia Sochi Strategic Framework Declaration noted, "[b]oth sides expressed their interest in creating a system for responding to potential missile threats in which Russia and the United States and Europe will participate as equal partners."[3] However, it remains to be seen if the U.S.-Russian dialogue on missile defense can be revived under the next U.S. administration.

While START I replacement and missile defense cooperation could be important steps toward eventual nuclear disarmament, they do not address the more important issue of *reducing reliance on nuclear weapons in Russia's security policy*, in particular the role of nuclear weapons in deterring the conventional power of the United States and NATO. The framework for conventional arms control and stability in Europe that was created during the Cold War is almost nonexistent, especially since Russia froze its participation in the 1990 Conventional Forces in Europe (CFE) Treaty, apparently out of fear that CFE flank limitations could undermine Russian security after Georgia and/or Ukraine join NATO. This concern has intensified in the wake of the summer 2008 conflict in Georgia.

One possible way to assuage these worries would be to initiate discussions with the intent of *finalizing an adapted version of the CFE Treaty.* Recent statements made by Russian Ambassador to the United States Sergey Kislyak suggest that a NATO commitment to hammering out an agreement on conventional forces could go a long way to addressing Russian concerns regarding the perceived security "imbalance" on the continent. Finding a solution to this issue could help remove the "new" mission of limited nuclear use and significantly heighten the nuclear threshold.

Beyond START I replacement and the missile defense controversy, which preoccupy Russian policy makers and military today, *ideas regarding subsequent steps toward nuclear disarmament remain vague*.

Over the past year, the Russian military has clarified its view that following START I replacement *the arms control process should become multilateral*. Several public pronouncements have contended that the other three NPT nuclear weapon states must join the process, initially by freezing their arsenals and limiting modernization programs. This policy clearly is aimed first and foremost at China; France and the United Kingdom have already started unilateral reductions of their nuclear arsenals, while China is widely expected—including by Russian intelligence—to increase its deployed nuclear warheads.

Concern about China is probably one of the reasons behind the Russian initiative (now a joint U.S.-Russian proposal) to *make the 1987 Intermediate-Range Nuclear Forces Treaty (INF) multilateral*. Although Russian officials do not publicly point fingers at China, behind closed doors they freely admit that China's growing substrategic nuclear capability is a concern. The initiative to broaden the INF Treaty has helped to divert Russia from its erstwhile position of abrogating the treaty, but this postponement is only temporary. The issue can be expected to reemerge in the coming years.

With regard to *tactical nuclear weapons* (TNWs), Russia has remained almost completely silent. TNWs are barely mentioned; when they are, they are linked to the withdrawal of U.S. TNWs from Europe. Because this class of weapons apparently does not have a place in Russian nuclear strategy (TNWs are only promoted by conservative nongovernmental experts, never by officials or active-duty military), it appears that Russia views Western interest in them as a lever with which to achieve withdrawal from Europe of U.S. TNWs, one of its long-standing objectives.

Seen from Moscow's perspective, restarting a meaningful dialogue on nuclear arms control requires only political will—above all a willingness by the new U.S. administration to forego the Bush administration's insistence on freedom of action and rejection of meaningful limits on U.S. military capabilities. Washington's ratification of the CTBT could send an important message to Moscow regarding U.S. strategic intentions as well. It is important to note, however, that *beyond the near-term agenda, U.S. and Russian interests in arms control and disarmament*

3. U.S.-Russia Strategic Framework Declaration, Russian-American Summit Meeting, Sochi, April 6, 2008, <www.kremlin.ru/eng/events/articles/2008/04/163213/163215.shtml>.

are likely to converge to a greater extent than commonly anticipated. In particular, both countries share an interest in involving other nuclear weapon states, especially China, in the nuclear arms reduction process, an FMCT, and limiting or banning intermediate-range nuclear forces, among other issues.

Thus, a feasible nuclear arms control and disarmament agenda that could be acceptable to Russia might include the following elements (many of which go beyond its current positions):

1) A START I replacement treaty and a solution to the missile defense issue (perhaps a new-generation ABM Treaty). These two issues currently dominate the Russian agenda.

2) De-alerting. A breakthrough on missile defense could create conditions for reopening a meaningful discussion on de-alerting—removing nuclear weapons from ready-to-launch status. Proposals developed by Vladimir Dvorkin (who contributed to this study) and Aleksei Arbatov could serve as a foundation for such negotiations.

3) Progress on TNWs. This could perhaps include, in the initial stage, a reaffirmation of the 1991 Presidential Nuclear Initiatives, in which Washington and Moscow made unilateral commitments to reduce their TNW arsenals. Basic data exchange and confidence-building measures could follow a U.S.-NATO agreement to withdraw U.S. TNWs from Europe; this step would also be welcomed by China, whose position that nuclear weapons should be based only in national territories is identical to that of Russia.

4) A new or updated CFE Treaty. A revised treaty, or perhaps a broad security framework for Europe as proposed by Medvedev, is likely to help reduce the role of nuclear weapons in Russia's national security strategy and open a path toward even deeper reductions of nuclear arsenals.

5) Reducing warhead stockpiles. Within the framework of START I replacement—or, more likely, during the next stage, which should include TNWs—the arms control agenda could shift from limiting delivery vehicles (missiles and bombers) to nuclear warhead stockpiles. This would represent a critical new phase in the movement toward nuclear zero because the emphasis will change from reduction of deployed (immediately usable) assets to nuclear weapons as a category.

6) Enhanced safety and security measures. A shift to the reduction of warhead stockpiles will help to qualitatively enhance the safety and security of nuclear weapons. Existing efforts, although highly commendable, are hampered by the remaining limits on access to highly classified storage facilities. Verification measures attached to a stockpile agreement should help overcome this impediment by applying a safety and security regime equally to both parties—to all parties, if the agreement is multilateral. (The unilateral nature of existing Cooperative Threat Reduction Program measures has been an important hindrance to greater U.S.-Russian cooperation in this area.)

7) A verifiable FMCT agreement. This treaty should play a similar role with regard to stockpiles of weapon-grade fissile materials. Moscow's proposal for international verification of an FMCT involves monitoring nuclear fuel cycle facilities, not all civilian nuclear enterprises. This proposal should be given due consideration in Washington and Beijing. The latter, like Moscow, would likely have trouble with a "comprehensive" verification approach.

Going beyond this (or a similar) combination of steps toward complete elimination of nuclear weapons will require additional efforts. Although the profile of nuclear weapons in Russian national security policy has markedly increased over the decade, the prospects for moving Moscow toward nuclear disarmament are not completely bleak. Russia is mindful of its obligations under Article VI of the NPT and supports the overall goal of the elimination of nuclear weapons, at least at the rhetorical level. Moreover, Russia's 2000 National Security Concept (as well as the new version now under development, according to publicly available information) regards reliance on nuclear weapons as a temporary "fix" until modernization programs for conventional weapons have been completed.

Current official Russian policy foresees that reliance on nuclear weapons will decrease in another ten to twelve years, thanks to a policy of "asset substitution"—the replacement of nuclear with conventional deterrence. While it is doubtful that the conventional rearmament program can be implemented in that period of time, the overall orientation toward viewing nuclear deterrence as a temporary fix for security problems is an encouraging sign. At the very least, it suggests that current policy is not set in stone and that the Russian government may be amenable to the vision of a non-nuclear world, if only in the distant future.

Efforts aimed at advancing the nuclear disarmament agenda in the U.S.-Russian context should be directed at both parties. While the near-term steps (START I replacement and missile defense) need to be discussed primarily with Washington, subsequent steps have to be raised with Moscow. The review of the Russian bureaucratic landscape outlined in the previous section suggests a multi-prong approach that includes several parallel avenues:

1) Convening of Track 1½ meetings with Russian officials, preferably using Moscow-based NGOs as a venue. The purpose of these meetings should be to get Russian officials to start thinking beyond the near-term arms control agenda toward a broader range of disarmament measures, as well as to explore the conditions for those subsequent steps.

2) Using personal relations with active-duty military in the Ministry of Defense and diplomats for similar purposes.

3) Restarting lab-to-lab exchanges and joint projects, some of them possibly focused on combating the common threat of nuclear terrorism. These ties proved highly fruitful in the past, but gradually died out and were replaced with government-to-government, Track 1 contacts. Since early in the first Putin administration, the Russian nuclear defense complex has remained virtually isolated from outside world with only a select few continuing to travel to the West and meet with foreign experts and officials. As a result, the level of expertise in the defense industry on international security matters has dwindled.[4]

4) Convening additional Track 2 meetings and joint projects with Russian NGOs (both those belonging to the Academy of Sciences and independent ones) that have links to Russian governmental agencies. The purpose of these activities will be to encourage a greater breadth of debates on security and nuclear disarmament in order to set a more welcoming stage for discussion of practical steps leading ultimately to elimination of nuclear weapons. Of particular importance will be discussion of the broad international security scene to identify ways to reduce the perceived external threats that underlie reliance on nuclear weapons.

Prospects for a Trilateral Dialogue

In response to written questions prior to his election as president, Barack Obama stated: "I will initiate a high-level dialogue among all the declared nuclear-weapon states on how to make their nuclear capabilities more transparent, create greater confidence, and move toward meaningful reductions and the eventual elimination of all nuclear weapons."[5] This embraces the call by Shultz, Perry, Kissinger, and Nunn for "continuing to reduce substantially the size of nuclear forces in all states that possess them."[6] Indeed, while bilateral U.S.-Russian arms control may continue to be fruitful in the short term, it will soon be necessary to involve additional nuclear weapon states.

4. For example, weapons designers at Sarov were found to have no idea that the United States had terminated the Advanced Concepts Initiative and have continued to operate on the assumption that Russia needs to respond to a low-yield nuke program.
5. "*Arms Control Today* 2008 Presidential Q&A: President-elect Barack Obama," responses received September 10, 2008, <www.armscontrol.org/2008election>.
6. Shultz, Perry, Kissinger, and Nunn, "A World Free of Nuclear Weapons."

As noted above, Russia has already called for engaging more nations in arms control. China is not against engagement in arms control—indeed, it has a long-standing policy of support for disarmament. However, Beijing does not believe that Chinese forces should be reduced until U.S. and Russian levels come down further, reaching comparable levels. Indeed, some increases in Chinese force levels would not contradict China's stance that it takes its NPT Article VI commitment seriously and seeks global disarmament, but requires nuclear weapons to counter the weapons of other countries.

Engaging China in arms control, whether in the near future or further down the road, could be quite tricky. The U.S. and Russian (Soviet) methods of accounting and verification could be very problematic for the Chinese deterrent, given its reliance on a lack of transparency to reduce vulnerability of its small nuclear force. Additionally, if the United States (and Russia—since it is increasingly talking about the importance of non-nuclear precision munitions itself) continues to improve its non-nuclear strategic force, particularly together with missile defense, China would have to increase either the quantity or quality of its weapons systems (the latter could be considered vertical proliferation), and may well rethink its no-first-use pledge. To avoid this eventuality, missile defense and long-range non-nuclear weapons would have to be the focus of arms control talks that aim to subject them to controls, or possibly internationalization in the case of missile defense.

Russian experts seem to be of two minds regarding Moscow's security relationship with Beijing. On the one hand, the two countries cooperate closely, in a relationship they have deemed a strategic partnership. Most Russian analysts accept the official explanation provided by the Chinese military for upgrading its nuclear arsenal: to increase China's capabilities for global strategic deterrence and guarantee a second-strike capability in case of a global nuclear war. Generally speaking, it is nearly taboo in Russian political circles to speak about Sino-Russian differences, in particular any potential Chinese threat to Russia.

On the other hand, a few Russian experts—as well as military officials in confidential conversations—look eastward. These observers tend not to worry about China's military aspirations today, but rather about possible future hostile Chinese designs carried out by either military or non-military means, going as far as possible incorporation of the sparsely populated Russian Far East into China.

According to Russian military analysts, China's unfavorable balance of nuclear weapons vis-à-vis Russia and the United States explains the cautious attitude of the Chinese leadership toward the possibility of the use of nuclear weapons. Given increasing Chinese conventional capabilities, this view does not necessarily ensure stable Sino-Russian relations. In this regard, the Russian scenario of limited nuclear use in response to limited conventional attack potentially applies to China, as well as to the United States and NATO.

The Chinese view of Russia appears far more benign. While recognizing that Russia continues to maintain a huge nuclear arsenal, Beijing does not generally seem to believe that Russia poses a threat to it. Instead, China perceives as key the possibility of working together with Russia to balance the United States.

Today's status quo cannot be maintained: the trajectory of current policies, in particular on missile defense, strategic conventional weapons, and space weaponization, is unsustainable. In the relatively near future—perhaps as soon as 2015 or 2020—Washington, Beijing, and Moscow will find themselves at a critical decision-making juncture. They must either cooperate to reduce mutual threats or unilaterally halt problematic programs (such as missile defense or long-range conventional weapons), or they will have to find ways to counter each other's programs.

While Beijing is likely to resist attempts to engage in full-scale trilateral arms reductions negotiations with the United States and Russia, there is an array of more limited but still highly useful avenues that could be explored, among them:

1) Exchange data to enhance confidence and predictability in the trilateral context, including:

- location of production facilities for long-range delivery vehicles;

- notification about production and testing of new types of long-range delivery vehicles;
- notification about exercises involving long-range nuclear-capable delivery vehicles; and
- notification of conversion and/or elimination of existing facilities and delivery vehicles.

This data could include technical characteristics of the facilities, missiles, and strategic bombers that would be agreed by contracting parties. Engaging China in discussions of possible confidence-building measures in and of itself is a promising pathway for building the understanding and trust needed to engage in arms control talks at some point in the future.

2) Negotiate an NFU treaty between the United States, Russia, and China (this would require a major new commitment on the part of the former two, however). This treaty might have to include obligations to refrain from using conventional weapons against nuclear assets, a prospect that has caused Chinese experts to consider revision of the no-first-use policy.

3) Provide assurances to non-nuclear weapon states that the nuclear weapon states will not strike them with nuclear weapons. Such assurances have been provided under the auspices of NWFZ treaties but have yet to be codified in a more general document.

4) Commit to an agreement that nuclear weapons of the three states would be based exclusively in their national territories. Such a step could logically follow a possible agreement between Russia and the United States on tactical nuclear weapons (see discussion above).

5) Discuss measures to reduce the alert status of nuclear weapons.

6) Pursue PAROS. While the United States currently opposes this joint Russian-Chinese initiative, it also has a strong interest in the safety of the large constellation of military and civilian satellites—an interest that is increasingly shared by Russia, which is deploying its own version of GPS and communication and early warning satellites.

Given China's reluctance to engage in substantive arms control negotiations, it seems advisable to initiate the discussion of most of these issues as a set of three bilateral dialogues at the Track 1½ and Track 2 levels. Once elements of a common approach are identified in that framework, it will be possible to shift to the trilateral format.

Conclusion

Engaging China and Russia on disarmament will require U.S. action in a variety of areas. While progress will likely be difficult, it is an opportune time to begin work on this issue area; without such engagement, decisions are likely to be made in the very near future that will make disarmament far harder in several years' time.

As this paper makes clear, there is a need to recognize the intricate linkages between treaties and agreements, nuclear and conventional armament decisions, and other areas related to national defense. Nuclear doctrines and weapons decisions do not stand alone and cannot be tackled in isolation. Both Russia and China have made clear that their top security concerns are U.S. missile defense plans and the overwhelming U.S. superiority in conventional weapons that makes limited conventional war (including a strike against Russian and Chinese nuclear assets) theoretically possible without crossing the nuclear threshold. Alleviating these concerns is critical to any meaningful progress at arms control or disarmament talks.

Paradoxically, moving the U.S.-Russian dialogue forward might prove to be an easier task. The agenda is reasonably well defined and the two countries share extensive experience in arms control. China is still "testing the waters" with regard to interstate negotiations on these issues, although initial discussions with the United States demonstrate that involving it is far from impossible.

It should be noted, however, that finding a consensus on missile defense issues alone will not lead to success in the nuclear disarmament sphere. The U.S. administration is more likely to make progress in disarmament if missile defense discussions are linked to confidence-building and other measures in the nuclear sphere, such as a START I replacement and agreements on TNWs. Further, Washington must bargain with Beijing and Moscow; care must be taken to get the most political benefit from U.S. policy changes.

Missile defense aside, progress on disarmament is linked to other security concerns in Beijing and Moscow. The current standstill at the CD, which has been deadlocked in disagreement over an agenda thanks to issue linkage, makes this clear. Beijing initially insisted that the CD work simultaneously on multiple issues and tied negotiation of an FMCT to progress on PAROS; although Beijing no longer insists on a direct link between these negotiations, PAROS remains a top priority for China, and U.S. unwillingness to discuss space issues has been a major contributor to the impasse at the CD. Russia has supported Beijing in its PAROS initiative and should be engaged in such discussions as well. In addition to weaponization of space, Beijing and Moscow must be engaged in talks regarding long-range conventional forces and cruise missiles. All of these factor into decisions about nuclear deterrent forces.

In this context, more attention should be accorded to the Adapted CFE Treaty; progress in putting it in force could gain purchase on nuclear issues in Europe. Additionally, the United States can gain goodwill by supporting the nonproliferation achievements or initiatives taken by its negotiating partners. A case in point is the Russian creation of an International Uranium Enrichment Center in Angarsk, designed to prevent the spread of enrichment technologies to new sites. Promoting Moscow's and Beijing's nonproliferation bona fides at the appropriate times can help to alleviate the sense in those capitals that they are constantly being criticized and are not engaged in solving proliferation problems. Indeed, engaging the Russians and Chinese on thinking through proliferation hazards—and linking these problems to the disarmament issue—can only serve to strengthen arms control, disarmament, and nonproliferation.

Today and in the near future, Washington, Moscow, and Beijing are making decisions about their nuclear postures and nuclear delivery systems that will affect their negotiating positions for years to come. There is a small window of opportunity to affect these decisions and make headway on disarmament. Without such progress, the nuclear nonproliferation regime itself will be endangered.

There are several possible strategies for engaging Moscow and Beijing. Certainly, some issues could be handled in bilateral discussions. Negotiating a follow-on to START would involve only Moscow and Washington. However, engaging Chinese diplomats as observers could facilitate a move to bring Beijing, along with London and Paris, into future talks about multilateral arms control. Both bilateral and multilateral talks may be helpful in other areas, too. While Russian concerns about missile defense in Europe are likely to be resolved through bilateral negotiations with the United States, U.S. steps to deploy missile defense in the Pacific is a shared concern of Moscow and Beijing. On space issues, China and Russia have differences (Moscow has a robust space capability, whereas Beijing is just staring out), but an international solution requires talking to both.

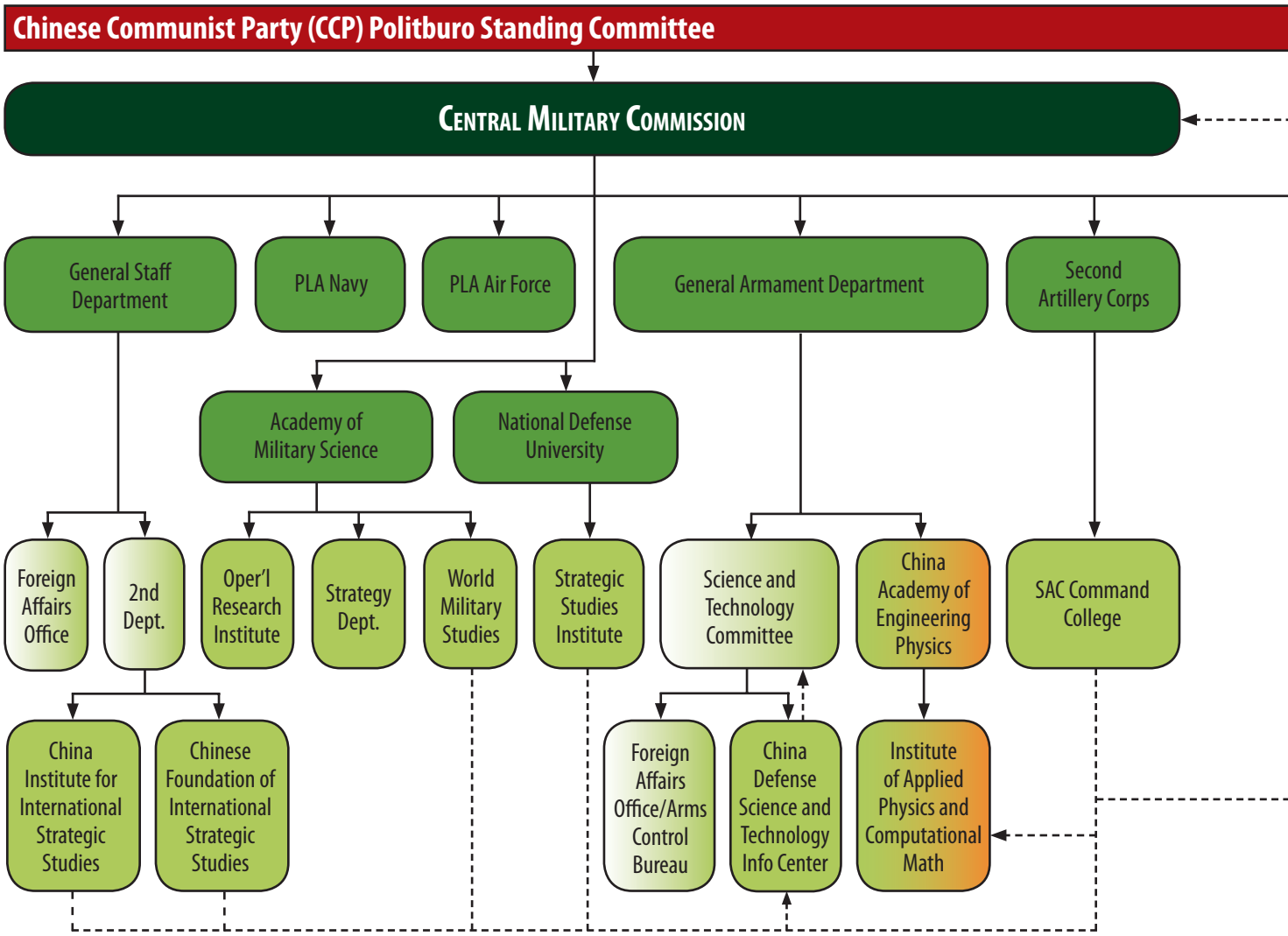
Although official agreements between China and Russia appear to suggest that trilateral talks would lead to China and Russia "ganging up" on the United States, this is not necessarily the case in all issue areas. Russia too is wary of a rising Chinese military force, while China is more dependent on the U.S. economy than is Russia. Depending upon the issue, one of the capitals may in fact side with Washington. Thus, a decision on whether engagement in a bilateral or a trilateral format would benefit Washington requires a careful examination of each potential issue and its linkages.

Outreach to groups and private individuals who can influence policy makers ad their thinking complements the official track. Talking to think tanks, briefing key members of the defense establishments, as well as reaching out to the general public can promote interest in nonproliferation and bolster those who support arms control and disarmament. In Russia, the parliament could begin to play a greater role in this process, or at the very least bring more attention to the issue. The fact that two Russian parliamentarians have signed on to the concept of nuclear zero is indicative that progress can be made in this regard. Thus, holding briefings for key policy makers in Moscow

and Beijing—as well as in Washington—both public and privately, is quite important. Bringing together disarmament supporters from the three nations could help spur movement in Beijing and Moscow, while bilateral engagement of naysayers is important both to understanding opponents' arguments and to discovering which counterarguments receive a better hearing.

Taking meaningful steps down the road toward nuclear zero over the next four years will likely to prove extremely difficult. However, waiting for a year or two to start such efforts will make eventual disarmament far harder. The time to engage China and Russia in partnerships to eliminate nuclear weapons is *now*.

Figure 1. Chinese Nuclear Arms Control and Disarmament: Principal Players and Policy-Making Processes



EXPLANATORY NOTES:

I. China's strategic nuclear forces are under the direct command and control of the CMC. The SAC, under CMC, directly controls and is responsible for nuclear use.

II. GSD, SAC, and PLAN formulate strategic and operational nuclear policies. CIISS, AMS, and NDU provide analytic input.

III. MFA's Deptartment of Arms Control and Disarmament and GAD's relevant departments evaluate and formulate nuclear arms control and disarmament policies based on outside input and their own assessments. CAEP/IAPCM provides technical expertise.

IV. CACDA, as the coordinating body of the emerging Chinese arms control community, works closely with DACD, organizes research, holds meetings, provides expert input to DACD, publicizes government policies, and liaises with foreign counterparts.

V. CICIR, IAS/CASS, CIISS, CIIS, CFISS, IAPCM, CDSTIC, and relevant departments at AMS, NDU, and PLAN are all government-/military-affiliated research organizations that perform advisory roles and undertake research projects assigned to them.

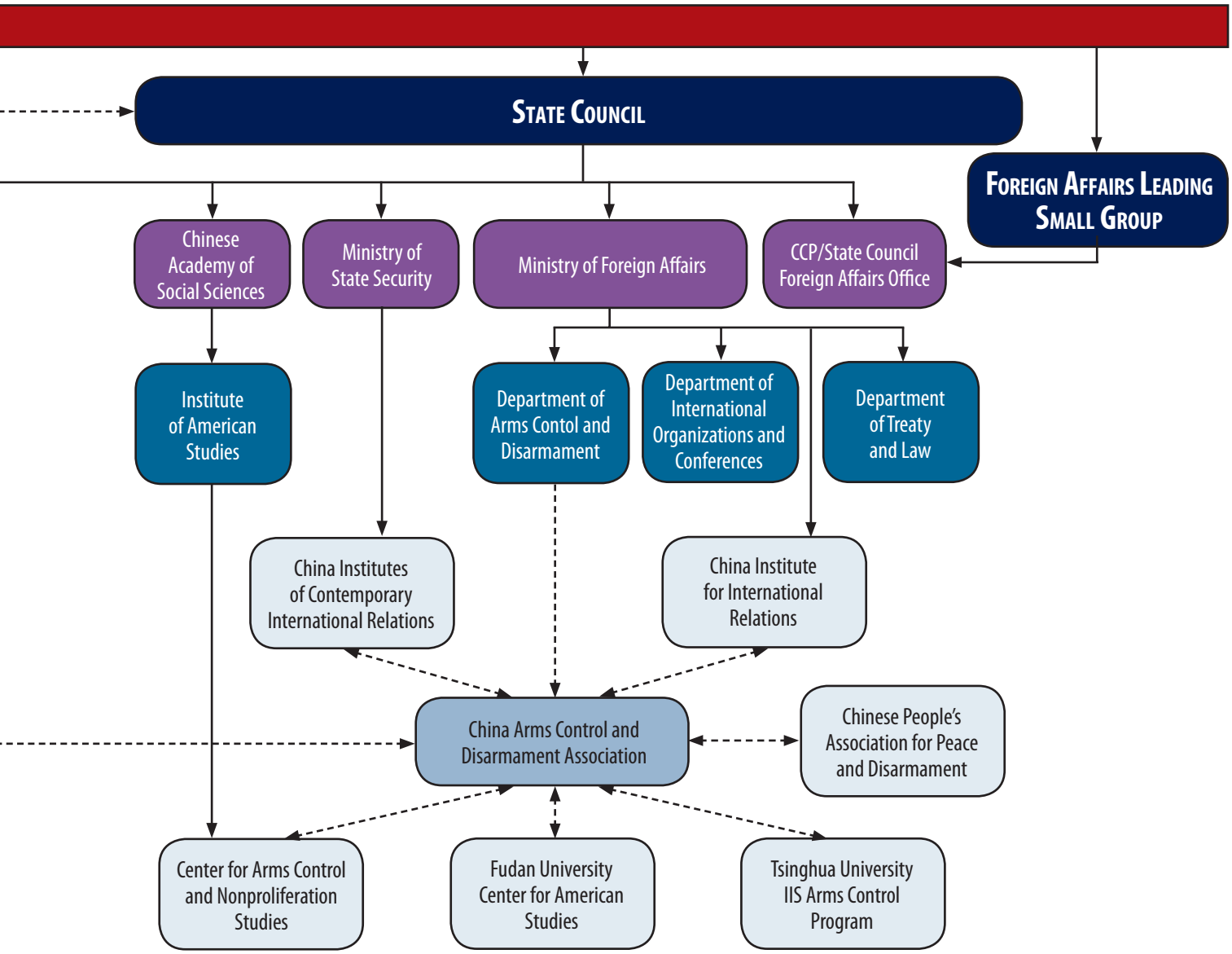
VI. University-affiliated research centers conduct more long-term oriented research; some individuals have been able to be involved in policy deliberation.

KEY:

- CCP leadership
- Military agencies
- PLA general departments and services-level organizations
- PLA research institutes/college
- Nuclear weapons labs/research institutes
- PLA second-level departments
- Government
- Ministerial-level departments
- Director-general-level departments
- Designated coordinating NGO
- Civilian think tanks and associations

→ Direct subordination

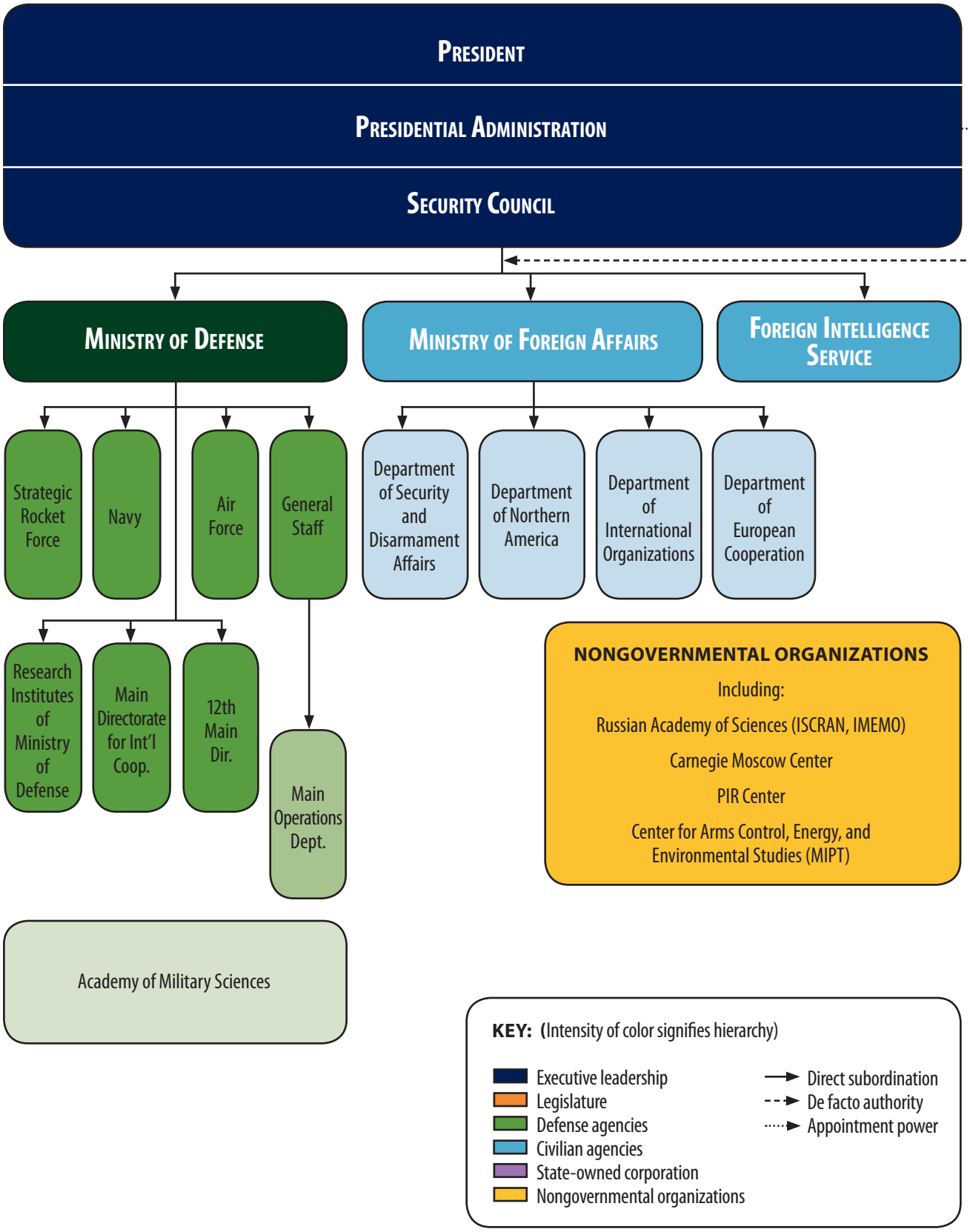
--→ Consultative relations

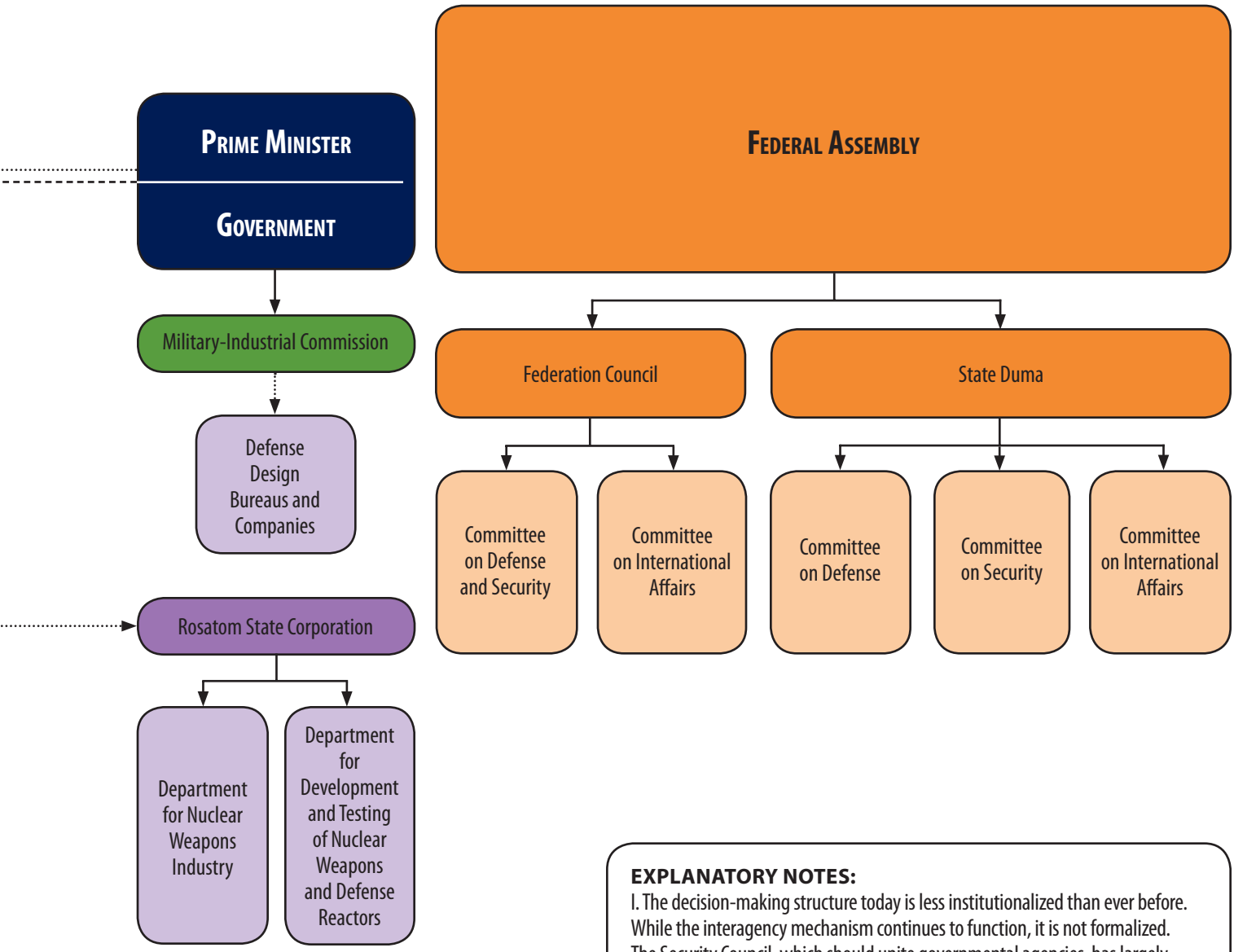


ACRONYMS:

AMS	Academy of Military Science (PLA)
CAEP	China Academy of Engineering Physics (GAD)
CASS	Chinese Academy of Social Sciences
CACDA	China Arms Control and Disarmament Association
CDSTIC	China Defense Science and Technology Information Center
CFISS	China Foundation for International Strategic Studies
CICIR	China Institutes of Contemporary International Relations (MSS)
CIIS	China Institute of International Studies
CIISS	China Institute for International Strategic Studies
CMC	Central Military Commission
DACD	Department of Arms Control and Disarmament (MFA)
GAD	General Armament Department (PLA)
GSD	General Staff Department (PLA)
IAPCM	Institute of Applied Physics and Computational Mathematics (CAEP)
IAS	Institute of American Studies (CASS)
MFA	Ministry of Foreign Affairs
MSS	Ministry of State Security
NDU	National Defense University
SAC	Second Artillery Corps
PLAN	People's Liberation Army Navy

Figure 2. Structure of Russian Decision Making on Disarmament and International Security





EXPLANATORY NOTES:

I. The decision-making structure today is less institutionalized than ever before. While the interagency mechanism continues to function, it is not formalized. The Security Council, which should unite governmental agencies, has largely abandoned that function.

II. Formally, the president and his staff are at the apex of the decision-making structure. In 2008, the Office of the Prime Minister began to play a visible and consequential role.

III. The Foreign and Defense Ministries jointly make most decisions on the Russian position with regard to disarmament issues and negotiations. Their interaction is informal but remains strong, including at the interdepartmental level.

IV. Since 2006, the interests of the defense industry have been aggregated by the Military-Industrial Commission. This includes the nuclear weapons complex: Rosatom is largely preoccupied with the development of the civilian nuclear sector.

V. NGOs maintain contacts with both the Foreign and the Defense Ministries, usually through personal contacts, and thus informally contribute to the development of the Russian position.

China and the Nuclear-Free World

Jing-dong Yuan

Introduction

The 2007 and 2008 *Wall Street Journal* essays by George Shultz, William Perry, Henry Kissinger, and Sam Nunn[1] have generated some initial interest and discussions among Chinese civilian and military analysts on the subject of eliminating nuclear weapons. While there is not yet any official statement on the feasibility of a nuclear-free world or where Beijing stands on the issue, three broad and very preliminary perspectives are beginning to emerge that could provide insights into whether and to what extent China will be receptive to some of the recommendations called for by the four elder statesmen or to other initiatives, such as the "Thirteen Practical Steps" from the Final Document of the 2000 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).[2] The three perspectives—which by no means are mutually exclusive—and their proponents could be characterized roughly as:

- The first perspective includes the endorsement of the general principles of a nuclear-free world, as well as the argument that China has maintained a position in support of complete prohibition and thorough destruction of nuclear weapons ever since the day it conducted its first nuclear test. Proponents of this perspective also argue that the United States and Russia should take the lead in drastically reducing their nuclear arsenals, with some alluding to numbers below 1,000.

- A second perspective argues that instead of pursuing a nuclear-free world as measured by the number of weapons in nuclear stockpiles, the focus should be on changing the role of nuclear weapons in states' national security policies and defense doctrines. The fewer nuclear weapons incorporated into military strategies, the better prospect there is for nuclear disarmament. Proponents of this perspective also call for the delegitimization of nuclear weapons.

- A third view suggests that careful analyses be undertaken of the specific proposals in the two *Wall Street Journal* articles and the Thirteen Practical Steps to see if adopting some, many, or all of these measures would advance China's national security interests and enhance its overall security.

This essay begins with a summary of the initial Chinese responses to the nuclear-free world initiative. This is followed by a careful analysis of Chinese positions on the role of nuclear weapons and of its arms control and disarmament policies, in particular, Beijing's stance on the actions proposed in the *Wall Street Journal* articles; however, discussions in China on this topic are very preliminary, limited to a very small community of experts and not yet raised to the level of policy makers. Finally, the essay offers some recommendations on what needs to take place to remove the obstacles and concerns that may prohibit Beijing from endorsing and participating in efforts toward eliminating nuclear weapons. (More detailed discussions of these recommendations are contained in the summary report, to which this author contributed.)

1. George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "A World Free of Nuclear Weapons," *Wall Street Journal*, January 4, 2007, p. A15; George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "Toward a Nuclear-Free World," *Wall Street Journal*, January 15, 2008, p. A13.
2. Given the limited discussions by and with Chinese analysts, this categorization is rather tentative and serves more as an analytical framework for the paper than as a definitive or even accurate one at that.

Beijing's Views of the Nuclear-Free World[3]

Chinese officials (in their unofficial capacities) and analysts are beginning to offer their responses to and assessments of the nuclear-free world initiatives. Indeed, they view these in the plural because they have considered the ideas contained in the two *Wall Street Journal* articles as well as those embodied in other equally high-profile, well-publicized efforts, such as the Final Report of the Weapons of Mass Destruction Commission, the Canberra Commission on the Elimination of Nuclear Weapons, and the 2008 Oslo Conference on Nuclear Disarmament. One Chinese analyst characterizes these as the nuclear-free-world "movement."[4]

In rhetoric if not in substance, China is no stranger to the idea of nuclear disarmament. Beijing called for complete prohibition and thorough destruction of all nuclear weapons on the very same day it conducted its first nuclear test—October 16, 1964. That position has remained unchanged over the past forty-five years, even though the global strategic landscape has undergone multiple changes and transformation. In a recent speech at an international conference on arms control and disarmament, a high-ranking Chinese diplomat argued emphatically that if mankind could invent nuclear weapons in the twentieth century, surely it can eliminate them in the twenty-first.[5] China's 2008 Defense White Paper reiterates the position that "China holds that all nuclear-weapon states should make an unequivocal commitment to the thorough destruction of nuclear weapons, undertake to stop research into and development of new types of nuclear weapons, and reduce the role of nuclear weapons in their national security policy."[6] In addition, the Chinese government has also proposed measures calling for abandonment of the policy and practice of providing a "nuclear umbrella" through extended deterrence and has called for pledges by nuclear weapon states not to develop new types of nuclear weapons and to renounce nuclear first use.[7]

While most Chinese analysts support the ideal of a nuclear-free world as a noble cause and a desirable goal, they also point out that getting there requires painstaking efforts that must involve both nuclear weapon states and non-nuclear weapon states, with the United States and Russia bearing special responsibilities. They argue that before the complete destruction of nuclear weapons can be achieved, nuclear weapon states should negotiate and sign a legally binding international document banning the use of nuclear weapons, with a no-first-use (NFU) pledge by all nuclear weapon states as the first step. In addition, nuclear disarmament should follow the principles of ensuring global strategic stability, striving for downward balance and large-scale reduction of arsenals, and withdrawing overseas deployments.[8]

Chinese diplomats and analysts in particular draw attention to four key steps critical to successful nuclear disarmament: the Comprehensive Nuclear-Test-Ban Treaty (CTBT), Fissile Material Cutoff Treaty (FMCT), treaty on the Prevention of an Arms Race in Outer Space (PAROS), and negative security assurances (NSA).[9] The first two would restrict the development of nuclear weapons in both quantitative and qualitative ways. The third prevents a potential arms race in a new arena, and the last gives assurance to non-nuclear weapon states that nuclear weapon states would not use or threaten to use nuclear weapons against them, therefore removing fear (and incentives) from non-weapon states who might pursue nuclear weapons in response to nuclear coercion or blackmail.

3. The following discussion is based on the author's interviews with Chinese analysts and information gathered from papers presented at academic conferences, as well as a review of the publicly available literature on the subject. Given the nature of the subject, only broad references are provided, except for published works.
4. Teng Jianqun, "Dangqian wuhe wuqi shijie yundong de qianjing" [The Prospect of the Current Nuclear-Free World Movement], online analysis, China Institute of International Studies, September 2, 2008.
5. The 11th PIIC Beijing Seminar on "International Security: Building a Harmonious World of Stability and Win-Win," Qingdao, China, October 26–30, 2008.
6. Information Office of the State Council of the People's Republic of China, "China's National Defense in 2008," January 2009, <www.gov.cn/english/official/2009-01/20/content_1210227.htm>.
7. "Recommendations for Achieving the Objective of Nuclear Disarmament and Non-Proliferation of Nuclear Weapons," working paper submitted by China, Disarmament Commission, United Nations, 2006 substantive session, April 10–28, 2006, A.CN.10/2006/WG.I/WP.3.
8. Presentation at the 11th PIIC conference, October 27, 2008.
9. Ibid.

On whether creating a nuclear-free world is remotely plausible, the Chinese offer two contrasting views. One group, a clear minority, believes that "nuclear zero" is achievable. Those in this minority note that in the 1990s, when a group of Princeton professors proposed that the United States and the former Soviet Union could reduce their respective nuclear arsenals by 90 percent, the idea was dismissed as "crazy." Today, that goal has been achieved. Therefore, there is reason to believe that further reduction toward zero is within the realm of possibility. Proponents cite two grounds for this hopefulness: first, further reduction of the nuclear stockpiles by major nuclear powers would not undermine their national security; and second, non-state terrorist groups such as Al Qaeda simply cannot be deterred, even if large nuclear arsenals are maintained and their use is threatened.[10] In that context, some even suggest that regardless of what the United States and Russia do, China should and could undertake its own nuclear reductions.

Those in the majority are far less sanguine about the prospect of a nuclear-free world in the near future. Analysts within this group do note the drastic and continuing reduction of the nuclear arsenals in nuclear weapon states, but they continue to see nuclear weapons as relevant in states' national security policies and defense doctrines. Indeed, they suggest that given the volatile international security environment, some states may find it imperative to maintain nuclear weapons for self-defense and security and to deter potential adversaries.[11] In addition, they are also aware of the divergent views on how to get to nuclear zero, specifically, who should do what with regard to nuclear reduction. Some Chinese analysts point out that current reductions typically involve excess stockpiles or older systems and weapons facilities, without affecting or weakening their deterrence or even nuclear war-fighting capabilities.[12]

A more effective approach to achieving a nuclear-free world, they argue, would address the doctrinal rather than the numerical issues. As long as nuclear weapons remain a critical component in states' national security policies and defense doctrines, there will be resistance to reducing the number of nuclear weapons beyond a certain level and motivation to improve the existing nuclear arsenals by developing new nuclear weapons. This in turn provides a reason to keep the option of nuclear tests open and reduces incentive to engage in good-faith negotiation leading to fissile material production cutoff and stockpile accounting and elimination.[13]

Chinese responses to the nuclear-free-world concept remain preliminary and exploratory with some analysts recognizing that important progress has been made since the end of the Cold War toward the final goal of a nuclear-free world. U.S.-Soviet/Russian arms control and arms reduction treaties such as the Strategic Arms Reduction Treaty and the Strategic Offensive Reductions Treaty are considered to be positive steps. But it is also acknowledged that the road to the ultimate goal remains tenuous and full of difficult twists and turns. Given the unique political and military utility of nuclear weapons, proliferation is still a major threat and concern. Divergent interests and motivations among states further complicate the process of nuclear arms control and disarmament.[14] One Chinese arms control analyst points out that for some time to come, China is not likely to stop its research and development of new types of nuclear weapons, for a number of reasons. One reason is that U.S. missile defenses require that China maintain its minimum deterrent capabilities, including the ability to penetrate and defeat missile defenses. This will require the development and deployment of new nuclear weapons. In addition, for security and safety reasons, China will need to modernize its nuclear arsenals.[15] Some argue that China needs to assess what pre-conditions are

10. Ibid.
11. "Junshi zhuanjia: hewu zongxiang kuosan weixian zhuyao laizi hedaguo" [Military Expert: Risk of Horizontal Nuclear Proliferation Mainly Comes from Major Nuclear Powers], *Zhongguo Pinglun Xinwen* [*China Review News*], February 11, 2009.
12. Teng, "Dangqian wuhe wuqi shijie yundong de qianjing" [The Prospect of the Current Nuclear-Free World Movement]; presentation at the 11th PIIC conference, October 30, 2008.
13. Arend Meerburg and Frank N. von Hippel, "Complete Cutoff: Designing a Comprehensive Fissile Material Treaty," *Arms Control Today* 39 (March 2009).
14. Wang Zhongchun, *Hewuqi, Heguojia, Hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*] (Beijing: Shishi chubanshe [Public Affairs Press], 2007), pp. 432–46.
15. Teng Jianqun, "Zhongguo weihe butingzhi yanjiu xinxing hewuqi" [Why China Does Not Halt Research on New Types of Nuclear Weapons], *Renminwang* [*People's Daily Online*], January 26, 2009.

needed and how momentum for nuclear disarmament would affect Chinese diplomacy and its national security interests. While published works are scant, Chinese analysts, including arms control specialists in both civilian and military institutions, are beginning to organize studies and attend international meetings.

While most view the *Wall Street Journal* articles and the steps proposed therein as laudable efforts to re-jump-start the nuclear disarmament process, many also harbor doubts about whether the ultimate goal can ever be obtained. One People's Liberation Army (PLA) analyst commented that it would be difficult for China to follow some of the sixteen steps stipulated in the two *Journal* articles.[16] An earlier article on the prospects for the implementation of the "Thirteen Steps" cautioned against overly optimistic expectations. As the author pointed out, key nuclear weapon states, in particular the United States, still seek a nuclear disarmament framework that would give the United States maximum flexibility.[17] Indeed, Chinese analysts point out that the United States continues to modernize both nuclear and conventional arsenals, and U.S. military doctrine strongly suggests that it does not rule out first use of nuclear weapons in any circumstance. Coupled with U.S. deployments of missile defenses in East Asia and the declared U.S. intention for space dominance—including potential space weaponization—quantitative nuclear disarmament without constraints on qualitative improvement to the U.S. nuclear arsenal along with additional measures could pose serious threats to Chinese security interests.[18] These could become major obstacles to Beijing's participation in the nuclear disarmament process as proposed in the *Wall Street Journal* articles and promoted by an increasingly growing number of nongovernmental organizations.

The Role of Nuclear Weapons in Chinese Defense Posture

China has long maintained that its nuclear weapons development is largely driven by the need to respond to nuclear coercion and blackmail. The role of nuclear weapons, in this context, is purely defensive and retaliatory, rather than war-fighting, as some western analysts suggest.[19] Indeed, in the early years, China even rejected the concept of deterrence, regarding it as an attempt by the superpowers to compel others with the threat of nuclear weapons. This probably explains the glacial pace with which China introduced, modified, and modernized its small-size nuclear arsenals over the past four decades. Mainly guided by the principle that nuclear weapons will only be used (but used in a rather indiscriminate way) if China is attacked with nuclear weapons by others, nuclear weapons in China's defense strategy serve political rather than military purposes.[20]

16. Author discussion with Chinese analysts, October 2008.
17. Tian Jingmei, "Dui hecaijun '13 ge buzhou' de fenxi yu zhanwang" [An Analysis and Forecasting of the '13 Steps' in Nuclear Disarmament], in China Arms Control and Disarmament Association, *2005: Guoji Junbei Kongzhi yu Caijun Baogao* [*2005 Yearbook on International Arms Control and Disarmament*] (Beijing: Shijie Zhishi Chubanshe [World Affairs Press], 2005), pp. 19–27.
18. Wu Tianfu, "Waikong junshi jingzheng xingshi ji fazhanzhong guojia mianlin de waikong weixie" [Military Competition in Outer Space and the Threat Faced by Developing Countries], in Li Genxin and Teng Jianqun, eds., *2008: Guoji Junbei Kongzhi yu Caijun Baogao* [*2008 Yearbook on International Arms Control and Disarmament*] (Beijing: Shijie Zhishi Chubanshe [World Affairs Press], 2008), pp. 141–52.
19. See Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* 20 (Winter 1995/96), pp. 5–42, for a discussion of whether or not Chinese nuclear strategists are debating such a doctrinal shift. See also, Michael S. Chase and Evan Medeiros, "China's Evolving Nuclear Calculus: Modernization and Doctrinal Debate," in James Mulvenon and David Finkelstein, eds., *China's Revolution in Doctrinal Affairs: Emerging Trends in the Operational Art of the Chinese People's Liberation Army* (Alexandria, VA: The CNA Corporation, November 2005), pp. 119–54; Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps: Transition to Credible Deterrence," in James C. Mulvenon and Andrew N.D. Yang, eds., *The People's Liberation Army as Organization* (Santa Monica, CA: RAND, 2002), pp. 510–86.
20. Wang, *Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*; Sun Xiangli, "Zhongguo hezhanlue pingxi" [China's Nuclear Strategy], in China Arms Control and Disarmament Association, *2005: Guoji Junbei Kongzhi yu Caijun Baogao* [*2005 Yearbook on International Arms Control and Disarmament*] (Beijing: Shijie Zhishi Chubanshe [World Affairs Press],

PLA analysts emphasize that the terms "nuclear strategy" and "nuclear doctrine" are rarely used in Chinese strategic discourse; instead, a more commonly used term refers to "nuclear policy," which in turn is governed by the country's national strategy. Hence, the deployment and use of nuclear weapons are strictly under the "supreme command" of the Communist Party and its Central Military Commission. Nuclear weapons are for strategic deterrence only; no tactical or operational utility is entertained. If and when China is under a nuclear strike, regardless of the size and the yield, it warrants strategic responses and retaliation.[21] Chinese leaders and military strategists consider the role for nuclear weapons as one of defensive nuclear deterrence (*ziwei fangyu de heweishe*). Specifically, the country's nuclear doctrine and force modernization have been informed and guided by three general principles: effectiveness (*youxiaoxing*), sufficiency (*zugou*), and counter-deterrence (*fanweishe*).[22] China's 2006 Defense White Paper emphasizes the importance of developing land-based strategic capabilities, both nuclear and conventional, but provides no specifics on the existing arsenal, the structure of the Second Artillery Corps (China's strategic nuclear force) order of battle, or the projected size of the nuclear force. It indicates only that China will continue to maintain and build a lean and effective nuclear force. While Chinese analysts acknowledge that deterrence underpins China's nuclear doctrine, it is more in the sense of preventing nuclear coercion by the superpower(s) without being coercive itself, and hence it is counter-coercion or counter-deterrence. Rather than build a large nuclear arsenal as resources and relevant technologies have become available, a path pursued by the superpowers during the Cold War, China has kept the size of its nuclear weapons modest, compatible with a nuclear doctrine of minimum deterrence.[23] According to Chinese analysts, nuclear weapons' role in China's defense doctrine and posture is limited and is reinforced by the NFU position, a limited nuclear arsenal, and support of nuclear disarmament.

China's 2006 Defense White Paper for the first time describes at length the country's nuclear doctrine. Reaffirming its long-held NFU principle and calling for the comprehensive prohibition and complete elimination of nuclear weapons, the white paper emphasizes the defensive nature of its nuclear strategy, stating that

> Its fundamental goal is to deter other countries from using or threatening to use nuclear weapons against China. … China upholds the principles of counterattack in self-defense and limited development of nuclear weapons, and aims at building a lean and effective nuclear force capable of meeting national security needs. It endeavors to ensure the security and reliability of its nuclear weapons and maintains a credible nuclear deterrent force. … China exercises great restraint in developing its nuclear force. It has never entered into and will never enter into a nuclear arms race with any other country.[24]

This position is reinforced in China's latest white paper on defense, released in January 2009. Specifically, the paper lays out the circumstances in which Beijing may contemplate the use of nuclear weapons in retaliation against nuclear attacks against it:

2005), pp. 213–20; Jia Qingguo, "China's Nuclear Weapon Policy," in Christopher P. Twomey, ed., *Perspectives on Sino-American Strategic Nuclear Issues* (New York: Palgrave/Macmillan, 2008), pp. 87–92.

21. Yao Yunzhu, "Chinese Nuclear Policy and the Future of Minimum Deterrence," in Twomey, *Perspectives on Sino-American Strategic Nuclear Issues*, pp. 111–24.

22. Yao Yunzhu, "China's Nuclear Policy," in Yan Xuetong, ed., *World Politics—Views from China: International Politics* (Beijing: New World Press, 2007); "Summary of Key Findings," Conference on U.S.-China Strategic Nuclear Dynamics, Beijing, June 20–21, 2006. <www.csis.org/media/csis/events/060620_china_nuclear_report.pdf>.

23. Wu Zhan, "Heweishe" [Nuclear Deterrence], *Meiguo Yanjiu* [*American Studies*] (Spring 1988), pp. 16–22; Yao Yunzhu, "Chinese Nuclear Policy and the Future of Minimum Deterrence," *Strategic Insights* 4 (September 2005). Jeffrey Lewis characterizes China's nuclear doctrine as one of maintaining "the minimum means of reprisal." Jeffrey Lewis, *The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (Cambridge, MA: MIT Press, 2007).

24. Information Office of the State Council of the People's Republic of China, "China's National Defense in 2006," Beijing, December 29, 2006, <english.peopledaily.com.cn/whitepaper/defense2006/defense2006.html>.

> In peacetime the nuclear missile weapons of the Second Artillery Force are not aimed at any country. But if China comes under a nuclear threat, the nuclear missile force of the Second Artillery Force will go into a state of alert, and get ready for a nuclear counterattack to deter the enemy from using nuclear weapons against China. If China comes under a nuclear attack, the nuclear missile force of the Second Artillery Force will use nuclear missiles to launch a resolute counterattack against the enemy either independently or together with the nuclear forces of other services.[25]

While NFU remains China's official policy regarding nuclear weapons use, it is clear that Beijing also emphasizes the importance of maintaining an effective and reliable strategic force composed of both nuclear and conventional weapons capabilities. Nuclear weapons would be used for strategic retaliation and counterstrikes, while conventional weapons would be used for precision attacks, presumably in an offensive posture. In essence, China's nuclear doctrine, the size of its nuclear arsenal, and scope and speed of its modernization will depend on a host of politico-strategic considerations, Sino-U.S. relations, and developments in the revolution in military affairs (RMA).[26]

China continues to modernize its nuclear arsenal, not so much in quantitative terms, but focusing more on the survivability and effectiveness of a credible second-strike capability. To that goal, efforts are under way to develop and deploy new-generation land- and submarine-based ballistic and cruise missiles.[27] Among the five nuclear weapon states, China claims to maintain the smallest number of operational nuclear weapons. The most recent publicly available sources estimate that China's current nuclear forces consist of approximately 176 deployed warheads and an unknown number of additional warheads in the stockpile.[28] China's strategic arsenal is deployed on a triad that includes 121 land-based missiles, 55 strategic bombers, and an unspecified number of submarine-launched ballistic missiles on board the newly deployed *Jin*-class nuclear-powered submarine. Of this relatively small arsenal, only a limited number of missiles (about two dozen) are capable of striking targets throughout the continental United States (compared to the hundreds of U.S. missiles that could strike Chinese targets). In addition, China's medium-range ballistic missiles, such as the DF-4 and DF-21, could effectively reach U.S. bases in Guam and Japan.[29]

Nuclear Arms Control and Disarmament

While one could give credit to China for its efforts in recent years with regard to its nonproliferation policy and practices, less can be said about its nuclear arms control and disarmament policy.[30] On disarmament, Beijing could claim that it has held a principled position on complete nuclear prohibition since 1964, when it conducted its first nuclear test. At the same time, over the past four decades, China has maintained that the two largest nuclear weapon states should take the lead in drastically reducing their nuclear arsenals before the second-tier nuclear weapon states participate in multilateral nuclear disarmament. China's 2008 Defense White Paper argues that further U.S. and Russian reductions in "a verifiable and irreversible manner" could "create the necessary conditions for the participation of other nuclear-weapon states in the process of nuclear disarmament." In addition, the paper argues that nuclear arms control

25. Information Office of the State Council of the People's Republic of China, "China's National Defense in 2008."
26. See Lewis, *The Minimum Means of Reprisal*.
27. See Jeffrey Lewis, "Chinese Nuclear Posture and Force Modernization," included in this publication. See also, Michael S. Chase, Andrew S. Erickson, and Christopher Yeaw, "Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States," *Journal of Strategic Studies* 32 (February 2009), pp. 67–114.
28. Robert S. Norris and Hans M. Kristensen, "Chinese Nuclear Forces, 2008," *Bulletin of the Atomic Scientists*, July/August 2008, pp. 42–45.
29. Toshi Yoshihara and James R. Holmes, "China's New Undersea Nuclear Deterrent: Strategy, Doctrine, and Capabilities," *Joint Forces Quarterly* 50 (2008), pp. 31–38; Reuters, "U.S. Voices Concerns over China Nuclear Weapons Plans," June 4, 2008.
30. On nonproliferation, see Evan S. Medeiros, *Reluctant Restraint: The Evolution of China's Nonproliferation Policies and Practices* (Stanford, CA: Stanford University Press, 2007).

and disarmament measures cannot succeed unless the root causes of global/regional conflicts are addressed.[31]

In recent years, Beijing has put more emphasis on how nuclear arms control and disarmament should contribute to global strategic stability and the national security of participating states, rather than undermine them. Strategic stability and national security considerations may become both a benchmark for and an excuse against China's participation in multilateral nuclear disarmament processes. As alluded to above, Chinese analysts are not encouraged by recent developments in both nuclear and conventional armament of a number of states and are concerned that they could invite reactions that ultimately result in an arms race. Some have suggested that certain nuclear weapon states spend more on conventional systems than nuclear arsenals because the latter cannot be used; others argue that fear of being coerced and intimidated continues to be the logic for non-nuclear states to pursue nuclear weapons options.[32] In addition, the RMA, missile defenses, and the potential for space weaponization are red flags that caution, if not deeply concern, Chinese strategists. Beijing is keenly aware that

> Some major powers are realigning their security and military strategies, increasing their defense investment, speeding up the transformation of armed forces, and developing advanced military technology, weapons and equipment. Strategic nuclear forces, military astronautics, missile defense systems, and global and battlefield reconnaissance and surveillance have become top priorities in their efforts to strengthen armed forces.[33]

Beijing continues to have strong reservations about U.S. missile defenses. A November 6, 2008 statement by the Foreign Ministry spokesman pointed out that "China always believes that setting up global missile defense system, including deploying such system in some regions of the world or conducting cooperation in this field, is detrimental to global strategic balance and stability, undermines mutual trust among countries and affects regional stability. The recent development of situation makes it evident that relevant countries should take other countries' concerns seriously."[34] Indeed, Chinese analysts remain keenly attentive to this issue against the larger context of the international strategic environment at any given time. One of the key criteria for Chinese analysts is to assess how a specific offense-defense configuration could affect international strategic stability, major power relations, and global arms control processes and direction. This being the point of departure, missile defense itself would not be treated merely as a military development. Instead, one needs to look at the broader implications, since this particular military posture both reflects the threat perceptions and strategic intentions of the state adopting it and inevitably will affect the existing international strategic environment and the perceptions and interests of other major powers.[35]

During the early 1980s, China followed the U.S. Strategic Defense Initiative closely. Beijing feared that the Reagan administration's missile defense plan could trigger certain Soviet reactions, including the development and deployment of Moscow's own ballistic missile defense, resulting in possible neutralization of China's limited nuclear deterrent force. This would exert strong pressure on China to spend more on nuclear modernization, thus taking away much needed resources from economic development priorities. At the same time, the superpower arms race raised the specter of space weaponization and hence serious implications for international security and stability.[36]

31. Liu Huaqiu, "Evaluation and Analysis of China's Nuclear Arms Control Policy," *Xiandai Junshi* [Conmilit], November 11, 1995, pp. 15–18, in FBIS-CHI-95-246, December 22, 1995; Information Office of the State Council of the People's Republic of China, "China's National Defense in 2008."
32. Dingli Shen, "China's Nuclear Perspective: Deterrence Reduction, Nuclear Non-Proliferation, and Disarmament," *Strategic Analysis* 32 (July 2008), pp. 637–53.
33. Information Office of the State Council of the People's Republic of China, "China's National Defense in 2008."
34. Chinese Foreign Ministry, "Foreign Ministry Spokesperson Qin Gang's Regular Press Conference on November 6, 2008," November 11, 2008, <www.fmprc.gov.cn/eng/xwfw/s2510/2511/t521425.htm>.
35. See Michael Swaine and Ashley J. Tellis, *Interpreting China's Grand Strategy: Past, Present, and Future* (Santa Monica, CA: RAND, 2000); David M. Finkelstein, *China's National Military Strategy* (Alexandria, VA: Center for Naval Analysis, 2000).
36. Bonnie S. Glaser and Banning N. Garrett, "Chinese Perspectives on the Strategic Defense Initiative," *Problem of Communism* 35 (March–April 1986), pp. 28–44; John W. Garver, "China's Response to the Strategic Defense Initiative," *Asian Survey* 26 (November 1986), pp. 1220–39. For an outstanding analysis of the Strategic Defense Initiative programs,

Over a quarter-century later, the issues remain the same for China: the credibility and effectiveness of its nuclear deterrence; the danger of weaponization of outer space; and the need to determine priorities and allocate resources.

Chinese positions on nuclear arms control and disarmament could be influenced by three specific developments in U.S. defense policy. The first revolves around the overall strategic orientation of U.S. nuclear forces. Chinese analysts argue that the end of the Cold War has resulted in a unique environment in which the United States is gradually achieving unchallenged nuclear dominance, as the result of declining Russian nuclear arsenals and still-limited Chinese nuclear capabilities. Chinese analysts are concerned that Washington may be emboldened by this newfound advantage to pursue policies of unilateralism and preemptive attack more aggressively than in the past.[37]

In addition, Chinese analysts have expressed considerable concern about perceived U.S. efforts to develop new types of nuclear weapons. The United States has already achieved unchallenged conventional and nuclear weapons dominance but is still pursuing research and development programs that will eventually make nuclear weapons more readily usable and capable of penetrating hardened underground facilities. For instance, the George W. Bush administration's Reliable Replacement Warhead (RRW) Program planned, when fully operational, for the production of 125 new nuclear warheads annually up to the year 2022, in order to maintain a sizable U.S. nuclear arsenal that is reliable, safe, and available for use. These new nuclear warheads would also be easier to maintain and have a longer service lifetime than existing systems.[38] Despite the fact that the RRW program has been suspended due to congressional "zeroing out" of funding for its research and feasibility studies,[39] Chinese analysts argue that the U.S. attempt to change the nuclear balance of power in this way could lead to renewed nuclear arms races between nuclear weapon states, induce threshold states to openly pursue nuclear weapon capabilities, and fundamentally undermine global nuclear nonproliferation efforts.[40] This may give the Chinese some pause as to if and how they should proceed with regard to nuclear disarmament, given the high degree of asymmetry between the U.S. and Chinese nuclear arsenals. While China possesses about two dozen missiles capable of reaching continental United States, the United States has 830 missiles capable of striking targets in China.[41]

Finally, U.S. missile defense deployments in East Asia pose a serious threat to China's second-strike nuclear capabilities. Given the size and sophistication of China's small nuclear arsenal, the ability to survive a first strike is critical to maintaining the credibility and reliability of its deterrence.[42] Despite Washington's assurance that it seeks only a limited missile defense not directed at China, Beijing continues to seek—and this may well explain its current nuclear modernization efforts—to reverse the growing imbalance as a result of U.S. missile defense plans,[43] not to mention the new nuclear security environment that China has to face, namely, the emergence of India and Pakistan as nuclear weapon states and North Korea's nuclear weapons development. The U.S. dependence on space assets for

see Frances Fitzgerald, *Way Out There in the Blue: Reagan, Star Wars and the End of the Cold War* (New York: Simon & Schuster, 2000).

37. Wang Zhongchun, "Nuclear Challenges and China's Choices," *China Security* 5 (Winter 2007), pp. 52–65.

38. Shen Yan, "Dui bushi hewuqi caijian he hewuqi zongheti tiaozheng jueding de fenxi" [An Analysis of the Bush Administration's Nuclear Weapons Reduction and Adjustment to Its Nuclear Complex], in Li and Teng, eds., *2008 Yearbook*, pp. 29–36; Zhang Yulong, "Meiguo kekao tihuan dantou jishu yuanli he zouxiang pingxi" [An Analysis of the Technical Aspects and Future Direction of U.S Reliable Replacement Warheads], in Li and Teng, eds., *2008 Yearbook*, pp. 37–45.

39. Robert Norris and Hans Kristensen, "U.S. Nuclear Forces, 2008," *Bulletin of the Atomic Scientists*, March/April 2009, pp. 59–69; Richard L. Garwin, "A Different Kind of Complex: The Future of U.S. Nuclear Weapons and the Nuclear Weapons Enterprise," *Arms Control Today* 38 (December 2008), pp. 13–17; "*Arms Control Today* 2008 Presidential Q&A: President-elect Barack Obama," *Arms Control Today* 38 (December 2008), pp. 31–36.

40. Dingli Shen, "Upsetting a Delicate Balance," *Bulletin of the Atomic Scientists*, July/August 2007, p. 37; "U.S. Develops Nuclear Blueprint to Implement Strategy of Preemption," China International Institute for Strategic Studies, April 12, 2006.

41. Reuters, "U.S. Voices Concerns over China Nuclear Weapons Plans."

42. Presentation by a PLA analyst at the 11th CIIP conference, Qingdao, October 26–30, 2008.

43. Mark A. Stokes, "Chinese Ballistic Missile Forces in the Age of Global Missile Defense: Challenges and Responses," in Andrew Scobell and Larry M. Wortzel, eds., *China's Growing Military Power: Perspectives on Security, Ballistic Missiles, and Conventional Capabilities* (Carlisle, PA: U.S. Army War College, 2002), pp. 107-167; Brad Roberts, "Arms Control and Sino-U.S. Strategic Stability," in Twomey, *Perspectives on Sino-American Strategic Nuclear Issues*, pp. 185–200.

military operations—along with the fact that Beijing sees U.S. missile defense systems as a precursor to weaponization of outer space—may also explain China's efforts to develop a limited antisatellite capability.[44] Chinese concerns extend beyond missile defenses; U.S. capabilities in long-range precision conventional strike weapons, combined with C^4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance), further deepen China's sense of vulnerability.

If these trends continue, it could lead China to take action to redress an emerging nuclear imbalance. Given its relatively smaller and less sophisticated arsenal, there is good reason Beijing would be reluctant to endorse measures that could impose significant constraints on its ability for self-defense. China's nuclear modernization efforts in recent years—with an emphasis on qualitative rather than quantitative improvements, especially in areas such as enhanced mobility, survivability, and, hence, credibility of its deterrence—are indicative of Beijing's serious concerns.[45]

This preoccupation with maintaining or restoring what Beijing considers to be strategic stability may be a major factor affecting its decision on CTBT ratification. Indeed, it was with great reluctance that the PLA and the nuclear weapons community endorsed China's decision to sign the treaty.[46] While China signed the CTBT in 1996, Beijing has not yet ratified it, mainly because of the U.S. Senate's rejection of it in 1999. Since then, a fierce internal debate about CTBT ratification has been raging in China. Some support ratification because China has already stopped testing, giving China the moral high ground on this global arms control issue. Others in China argue that ratification would prevent China from resuming testing in response to a new round of U.S. testing. Some Chinese analysts believe China was duped into signing the treaty before the United States initiated its missile defense programs. A few of them have even suggested that it is probable the United States could start testing again to develop a new generation of small nuclear warheads.[47] China's signature of the CTBT means that China continues to accept the constraints imposed on its ability to test, a critical step in the development of new nuclear weapons, especially the miniaturization of warheads for new ballistic missiles currently under development. If this is the case, then Beijing's acute concern about the shifts in U.S. nuclear thinking could precipitate shifts in Chinese policies on nuclear testing.

Related to the testing issue is the issue of fissile material production and China's position on an FMCT. Clearly, if there are serious concerns among Chinese strategic analysts about the need to maintain a sufficiently sized nuclear arsenal that could survive a first strike and still be able, in both quantitative and qualitative terms, to retaliate against the striking country by penetrating and defeating missile defenses, then China would have to consider the question of how much is enough as a hedge against future contingencies. China is believed to have stopped producing weapons-grade highly enriched uranium and military plutonium, although it retains a fissile material stockpile for future expansion of its nuclear arsenal, should the need arise.[48] In this context, the "how much" question is informed by three factors: changes in nuclear doctrine, the international security environment, and military technology.[49]

44. Bruce W. MacDonald, *China, Space Weapons, and U.S. Security,* Council Special Report No. 38 (New York: Council on Foreign Relations, 2008); Hui Zhang, "Action/Reaction: U.S. Space Weaponization and China," *Arms Control Today* 35 (December 2005), pp. 6–11.
45. Paul J. Bolt and Albert S. Willner, eds., *China's Nuclear Future* (Boulder and London: Lynne Rienner Publishers, 2006); Chase et al., "The Future of Chinese Nuclear Strategy."
46. Bates Gill and Evan S. Medeiros, "Foreign and Domestic Influences on China's Arms Control and Nonproliferation Policies," *China Quarterly* 161 (March 2000), pp. 66–94; Zou Yunhua, "China and the CTBT Negotiations," Center for International Security and Cooperation (CISAC), Stanford University, CISAC Working Papers, December 1998.
47. Zhu Qiangguo, "US Seeks Absolute Military Superiority," *China Daily*, March, 13, 2002; Zhou Jianguo, "Nuclear Strategy of Bush Administration Moving Gradually From Deterrence to Actual Combat," *Jiefangjun Bao*, March 18, 2002.
48. David Albright and Corey Hinderstein, "Chinese Military Plutonium and Highly Enriched Uranium Inventories," Institute for Science and International Security, June 30, 2005; David Albright, Frans Berkhout, and William Walker, *Plutonium and Highly Enriched Uranium 1996: World Inventories, Capabilities, and Policies* (Oxford: Oxford University Press, 1997), pp. 76–78.
49. Li Bin, "China," in International Panel on Fissile Materials, *Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty* (Princeton, NJ: Program on Science and Global Security, Princeton University, 2008), pp. 7–13, 70.

It is widely acknowledged that there is no evidence to suggest that China's NFU policy has changed; the country's security environment remains favorable. However, changes in military technology may pose the most serious challenge to China. Chinese analysts refer specifically to: U.S. discussions about developing new types of nuclear warheads, U.S. missile defenses, and advanced U.S. conventional weapons. These issues could have a major impact on Chinese decision makers as they determine the size of China's nuclear arsenal and on the question as to whether to retain the ability to produce fissile material for nuclear warheads or sign onto an international treaty that could deprive it of that option.

China and the Nuclear-Free World

Fundamentally, whether or not Beijing endorses and eventually participates in efforts to achieve a nuclear-free world will depend on whether the efforts enhance or undermine its security. Beijing is receptive to some of the ideas proposed for achieving nuclear zero, appears lukewarm to others, and remains strongly suspicious of the rest. China's positions are invariably linked to its threat perceptions and its assessment of the role of nuclear weapons in its national security policy.

As discussed above, prevailing Chinese nuclear threat perceptions revolve around at least four issues: the 2001 U.S. Nuclear Posture Review and its inclusion of China as one of the seven target countries; U.S. missile defenses, in particular as they are deployed in the East Asian region; space weaponization; and the U.S. ability to use precision-guided conventional weapons to attack Chinese nuclear infrastructure. These developments undermine U.S.-China strategic stability by eroding the credibility of China's nuclear deterrence.[50] Given China's small nuclear arsenal and the weaknesses of its current intercontinental ballistic missile inventory, which is very old (deployment of modern weapons is only beginning), U.S. missile defenses in East Asia could threaten to neutralize Chinese nuclear deterrence capabilities. Washington's declared policy to maintain space dominance and the danger of weaponization of outer space further erode Chinese confidence. And finally, China's NFU policy would be seriously challenged if potential adversaries could use precision-guided munitions to attack its nuclear facilities and nuclear forces.

This assessment of the security environment has generated internal discussions within China about the role of nuclear weapons and the viability of sustaining the NFU policy. China continues to modernize its nuclear forces, most noticeably in the development and deployment of new-generation land-based and submarine-launched ballistic missiles. A review of the literature and discussions with both U.S. and Chinese analysts suggest that the Chinese focus is on missile rather than warhead development; missile modernization emphasizes dual capability—missiles can be equipped with either nuclear or conventional warheads to give China the future option of not resorting to nuclear weapons in case of a conventional attack.

If one relates these programs to China's predominant nuclear threat perceptions, it is clear that Beijing wants to: (1) maintain the credibility of its nuclear deterrent by improving the survivability of its nuclear missiles; (2) develop the capacity to respond to various contingencies, including the scenario of being attacked by conventional weapons; and (3) sustain the NFU unilateral obligations under the new security environment.

Based on the analysis above, it could be argued that China is likely to be more willing to endorse and support the nonproliferation and nuclear materials protection measures proposed by the two *Wall Street Journal* articles. Given China's nuclear posture and its avowed position of NFU, nuclear warheads and ballistic missiles are typically separated (as stated in the 2008 Defense White Paper), a different structure than either launch on warning (LOW) or launch under attack (LUA). However, this does not mean that China will not seek to develop and eventually adopt a more launch-ready posture as it modernizes its nuclear arsenal. The deployment of an effective and operational sea-leg of its deterrent could raise new questions about LUA. Should China continue to improve its early

50. Li Bin and Nie Hongyi, "Zhongmei zhanlue wendingxing de kaocha" [Analysis of the Strategic Stability between China and the United States], *Shijie Jingji yu Zhengzhi* [*World Economics and Politics*] (February 2008), pp. 13–19.

warning capabilities and assure survival of its nuclear arsenal even after absorbing a disarming first strike, Beijing could be expected to support the proposed de-alert to alter the current hair-trigger status of superpowers' nuclear weapons readiness.

Less certain, though, is China's response to multilateral nuclear disarmament negotiations that would require deep cuts in its relatively smaller arsenal without adequately studying the full impact on its national security interests. While one readily acknowledges that China has come a long way in embracing the concept of security interdependence and has shown a willingness to participate in multilateral security arrangements, when it comes to nuclear arms control and disarmament, Beijing has taken very cautious steps—such as signing (but not ratifying) the CTBT and placing a moratorium on fissile material production—due to its relatively weaker position vis-à-vis other major nuclear powers; the uncertainty it faces in a volatile international security environment, including developments in the RMA and nuclear proliferation on its periphery; and the possibility of military conflicts over the Taiwan Strait.[51]

China's support of an FMCT and its ratification of the CTBT would largely be conditioned on its own assessment of future needs for nuclear weapons development, which in turn is influenced by its threat perceptions and confidence in its defense capabilities, nuclear as well as conventional. The more confident it becomes in its conventional military capabilities and a survivable nuclear arsenal for self-defense deterrence purposes, the more it will be willing to engage in multilateral nuclear disarmament processes. However, this would take place only if and after the United States and Russia undertake further reductions of their nuclear arsenals to a much lower level, perhaps under 1,000. At the same time, it is doubtful if Washington and Moscow would be comfortable in allowing Beijing a continued "free ride" in nuclear disarmament; indeed, China's ongoing efforts in nuclear modernization may give the two nuclear superpowers incentive to retain sizeable arsenals, at least in storage if not operationally deployed. Some analysts argue that this calculation could lead to a potential nuclear arms race between China and the United States.[52]

A number of specific steps, if taken by other major nuclear powers, could address China's security concerns and therefore offer good incentive for Beijing to be on board the nuclear-free-world enterprise. An NFU policy issued by all nuclear weapon states would lessen the threat of nuclear weapons and significantly reduce their role in states' national security and military strategies. De-alerting, withdrawing nuclear weapons deployed outside of national boundaries, and pledging universal and unconditional NSAs would further ensure the absence of misuse and accidental launch. Finally, reducing and eventually delegitimizing the role of nuclear weapons in national security policy could also enhance confidence among major powers. Continuing to rely on or even elevate nuclear deterrence in the current international security environment, where terrorist activities pose significant threats to all, could only induce additional states to pursue nuclear weapons.[53]

Washington could play an important role in eliciting desired policy changes in China in support of the nuclear-free-world agenda.[54] It should be noted that there remain significant misperceptions and misunderstandings between the United States and China over the issues of nuclear weapons, deterrence, and strategic stability.[55] Both countries are making important adjustments in defense policies, nuclear modernization, and force modernization

51. Bates Gill, *Rising Star* (Washington, DC: Brookings Institution, 2007); Banning N. Garrett and Bonnie S. Glaser, "Chinese Perspectives on Nuclear Arms Control," *International Security* 20 (Winter 1995/96), pp. 43–78.
52. Christopher P. Twomey, "Chinese-U.S. Strategic Affairs: Dangerous Dynamism," *Arms Control Today* 39 (January/February 2009), pp. 17–20.
53. These arguments are contained in Teng, "Dangqian wuhe wuqi shijie yundong de qianjing" [The Prospect of the Current Nuclear-Free World Movement].
54. See the introduction to this Occasional Paper for a detailed discussion.
55. There are a limited number of largely Track-II dialogues between Chinese and American analysts and officials (in their private capacities) on strategic nuclear issues. See Christopher P. Twomey and Kali Shelor, *Conference Report: U.S.-China Strategic Dialogue, Phase III* (Monterey, CA: Center for Contemporary Conflict, Naval Postgraduate School, 2008); Center for Strategic and International Studies et al., "Conference on 'U.S.-China Strategic Nuclear Dynamics': Introduction and Key Findings," October 2008, <www.csis.org/media/csis/pubs/081015_intro_and_key_findings.pdf>.

in response to perceived threats. However, such dynamics could lead to a security dilemma due to both structural differences and lack of good communication between the two countries.[56] U.S. officials and analysts point out that China's nuclear and ballistic missile modernization programs, and the lack of transparency about them, incite suspicion and contradict Beijing's rhetoric on nuclear disarmament.

The Obama administration may be sympathetic to substantial and verifiable nuclear arms reductions, and this offers a unique opportunity to engage China in the nuclear-free-world endeavor. Needless to say, the new U.S. administration faces both challenges and opportunities in responding to China's continued rise as a political, military, and economic power on the global stage. Beijing and Washington have been able to cooperate on a range of issues that advance both countries' security interests. At the same time, there remain significant differences and obstacles to further cooperation, given Beijing and Washington's differences over the priorities, approaches, and some substantive issues in managing current and future proliferation challenges. Failing to manage these differences could have serious long-term implications for regional stability and the prospect of peaceful transition to a multipolar world for both China and the United States.

56. Christopher P. Twomey, "Comparing Perspectives: Dangers to Avoid, Prospects to Develop," in Twomey, *Perspectives on Sino-American Strategic Nuclear Issues*, pp. 201–209.

Chinese Nuclear Posture and Force Modernization

Jeffrey Lewis

According to a recent U.S. government white paper, China "is the only major nuclear power that is expanding the size of its nuclear arsenal."[1] This claim is often invoked in the United States to imply that China's military modernizations are somehow illegitimate or to raise questions about what darkness may lie in the hearts of China's military and political leaders.

But what does the statement really mean? What are the technical, historical, and bureaucratic realities that have shaped China's nuclear posture and drive its ongoing modernization? What do these realities say about China's national security policy making? About how Chinese leaders view nuclear weapons, arms control, and disarmament? About the nature of the threat to the United States?

It is important to begin this discussion by noting that China's strategic modernization is largely a process of deploying new *delivery* systems—specifically ballistic missiles—rather than developing new nuclear warheads. China is now in the midst of a decades-long process of replacing older, liquid-fueled ballistic missiles with solid-fueled ballistic missiles and cruise missiles similar to those deployed by the United States in the 1970s and 1980s. China's decision to develop these weapons, as well as a new ballistic missile submarine, date to that same time period, even though many of the systems are only reaching technological maturity today, more than two decades later.

Second, although China is modernizing the missiles that form the backbone of its nuclear deterrent, the vast majority of China's new missiles are armed with *conventional* warheads. The reasons for this are unclear, but China's Second Artillery, which operates China's missile forces, may see nuclear missions as less desirable due to the strictures of China's nuclear no-first-use policy. The General Armaments Department (GAD), which is responsible for the development of new ballistic missiles, also continues to develop a variety of other defense technologies, including hit-to-kill interceptors that could, if deployed, be used in antisatellite and anti-ballistic missile roles.

There are no indications that China is designing, testing, or producing new nuclear weapons designs. China apparently completed development and testing of the nuclear warheads for those missiles now being deployed prior to signing the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in 1996. China is presumably producing these warheads now. China is also conducting stockpile stewardship activities, including hydrodynamic testing, to maintain its small stockpile of nuclear warheads. China may also be studying safety enhancements, such as the integration of insensitive high explosives, in the event that China's leadership authorizes a resumption of underground nuclear testing. China is not believed to be producing fissile material, although satellite photographs suggest a high level of readiness at China's major fissile material production facilities.[2]

1. "National Security and Nuclear Weapons in the 21st Century," Department of Defense/Department of Energy, September 2008, p. 6.
2. Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, DC: Department of Defense, January 2001). On the readiness of China's plutonium production reactor at Guangyuan and uranium enrichment facility at Heping, see: David Albright and Corey Hinderstein, *Global Stocks of Nuclear Explosive Materials*, Ch. 13, "Chinese Military Plutonium and Highly Enriched Uranium Inventories," Institute for Science and International Security, June 30, 2005.

What is driving China's development and deployment of new ballistic and cruise missiles? How will these technologies, in turn, affect China's nuclear posture?

Historically, China has maintained a nuclear posture that might be called "minimum deterrence," though Chinese officials for many years shied away from the term "deterrence" in favor of descriptions such as a "limited nuclear counterattack" capability or, in Marshal Nie Rongzhen's colorful phrase, "the minimum means of reprisal" in the event of a nuclear attack on China.[3] This posture reflected China's experience during the 1950s, when the United States made nuclear threats against Beijing during the Korean War and the Taiwan Strait crises—what Chinese leaders call "nuclear blackmail."

This posture, which emphasized possession of modern military capabilities, was well-suited to the ideological and bureaucratic structure of Mao Zedong's China. As a result, China deployed only small number of nuclear weapons based largely on a single mode of delivery, kept off alert and under the most restrictive declaratory posture—a categorical no-first-use pledge.

China's development of new ballistic and cruise missiles, as well as other technologies such as lasers, appears to be driven by a desire to "match" the same capabilities as the United States and other nuclear powers, rather than derived organically from operational or strategic requirements. The emphasis on possessing the same capabilities as other nuclear weapon states, if not in the same quantity, is deeply rooted in the historical development of the program, shaped by bureaucratic and ideological factors.

As a result, Chinese leaders have probably not fully considered the implications of the broad technological modernization under way. Although Chinese leaders appear willing to fund the development of a new class of ballistic missile submarine and solid-fueled missile, for example, there is relatively little to suggest that they have made corresponding investments in communications infrastructure that would allow the People's Liberation Army (PLA) Navy to operate a sea-based deterrent.

The ongoing modernization has profound implications for strategic stability. Over the past few decades, scholars have broadened conceptions of strategic stability from simple rational actor models that emphasize the offense-defense balance to encompass concerns about how leaders and organizations act under times of great stress. The large, alert forces deployed by the United States and the Soviet Union precluded any rational decision to initiate a nuclear war but raised the prospect of accidents, miscalculation, or unauthorized use of nuclear weapons.

On one hand, the failure of Chinese and U.S. political leaders to think through the interaction of new strategic capabilities—for example, mobile ballistic missiles and antisatellite capabilities in China; missile defenses and conventional strike options in the United States—raises the prospect of unintended consequences and perverse interactions in the event of a serious crisis over the status of Taiwan.

On the other hand, if China's leaders are still driven by a "possession" mentality, then prudent U.S. diplomatic efforts might result in China limiting the scope of its current modernization to preserve the general confines of its current limited posture—a posture manifestly in the national security interest of the United States. Since China seems to keep its nuclear arsenal off alert, it is possible, for example, to imagine Chinese leaders accepting proposals to maintain nuclear weapons under various proposals for de-alerting, including in various states of disassembly that would be broadly compatible with notions of nuclear zero.

At the same time, Chinese leaders continue to believe that China's small nuclear deterrent protects China against open-ended U.S. strategic modernization that includes the development of precision conventional strike capabilities and missile defenses, particularly relying on assets based in space.

3. The phrase is from Nie Rongzhen (translated by Zhong Renyi), *Inside the Red Star: The Memoirs of Marshal Nie Rongzhen* (Beijing: New World Press, 1988), p. 702.

Ideological and Bureaucratic Roots of China's Nuclear Posture

Why does China's nuclear posture look so different from those of the other nuclear weapon states? The most compelling explanation is that Chinese policy makers have tended to make decisions about China's strategic forces that suggest a widespread belief that deterrence is achieved early and with a small number of forces.

This view contrasts with the norm among Western security experts, who tend to believe that deterrence can be achieved only through difficult choices, sustained with intelligent effort, and will heavily depend on the technical details. This is the view expressed in Albert Wohlstetter's 1958 Rand monograph (and later an article in *Foreign Affairs*), *The Delicate Balance of Terror*, which helped to shape the dominant Cold War attitudes in the United States about deterrence.[4]

A different view is that, beyond a certain point, the technical details matter very little, if at all. The balance of terror is anything but delicate. An enemy who *can* be deterred, *will* be deterred by the prospect of a counterattack, even if it consists of only a few nuclear weapons. Drawing on his experience during the Cuban Missile Crisis, McGeorge Bundy later argued that decision makers are unlikely to "double-check the detailed consequences of an exchange, or to review how such a war might be fought." National leaders are likely to have "a healthy disrespect for such exercises," recognizing that the avoidance of a nuclear war is imperative.[5]

Mao's famous remark that "The atomic bomb is a paper tiger" is often treated as evidence of a dangerous irrationality in Chinese attitudes toward nuclear weapons. But, as Mark Ryan found in his study of the formation of Chinese attitudes about nuclear weapons during the Korean War, the first generation of Chinese Communist leaders formed highly accurate assessments about the physical limitations of nuclear weapons and the political constraints on the U.S. use of nuclear weapons.[6] Having successfully endured nuclear threats from the United States, Chinese leaders saw nuclear weapons as tools of political coercion that could be met with resolve and, eventually, possession of similar capabilities.

Some context may be helpful. Chinese Communist leaders first used the term "paper tiger" to refer to reactionaries, not nuclear weapons, in 1946. The reference is a metaphorical allusion to "an older Maoist revolutionary maxim which holds that men and politics, rather than weapons and economic power, are the determining factors in war."[7] In context, referring to nuclear weapons as paper tigers merely indicates that the balance of nuclear weapons is not likely to be decisive in conflict—a statement that the technical details matter very little. Calling nuclear weapons paper tigers is simply the "healthy disrespect" that Bundy predicted any world leader would have for plans to fight a nuclear war. It is perhaps no more colorful than similar remarks by U.S. and Soviet leaders.[8]

Of course, even if world leaders talk about nuclear weapons as though the details don't matter very much, the United States and the Soviet Union still expended enormous efforts tending to those details during the Cold War, deploying very large, diverse, and highly alert forces. The bureaucratic realities of China's nuclear weapons development, however, were different and seem to have reinforced the tendency toward minimalism suggested by the ideological description of nuclear weapons as paper tigers.

4. Albert Wohlstetter, *The Delicate Balance of Terror*, P-1472 (Santa Monica, CA: RAND, 1958).
5. McGeorge Bundy, *Danger and Survival: Choices about the Bomb in the First Fifty Years* (New York: Random House, 1988), p. 461.
6. Mark A. Ryan, *Chinese Attitudes toward Nuclear Weapons: China and the United States during the Korean War* (New York: ME Sharpe, 1989), p. 179.
7. Ralph L. Powell, "Great Powers and Atomic Bombs Are 'Paper Tigers,'" *China Quarterly*, No. 23. (July–September, 1965), pp. 55–63.
8. Matthew Evangelista cites a wonderful pair of remarks from Soviet Premier Nikita Khrushchev and President Dwight D. Eisenhower that suggest both saw nuclear weapons in terms of minimum deterrence. "Missiles are not cucumbers," Khrushchev said, "one cannot eat them, and one does not require more than a certain number in order to ward off an attack." Eisenhower was more precise about that "certain number." "We should develop a few of these missiles as a threat, but not 1,000 or more," Eisenhower said. He added that if the Soviet Union and the United States could launch more, then "he personally would want to take off for the Argentine." Matthew Evangelista, *Unarmed Forces: The Transnational Movement to End the Cold War* (Ithaca: Cornell University Press, 1999).

Although most histories of China's nuclear weapons program begin with a decision made by Mao in 1955, another date is perhaps more consequential. The leadership consensus behind pursuing nuclear weapons in the mid-1950s was not difficult to understand: Chinese leaders expected substantial Soviet assistance. But that consensus eventually cracked under the budgetary and technical constraints imposed by the suspension of Soviet technical assistance and the chaos of the Great Leap Forward.

In particular, many military leaders wanted to cut strategic programs—nuclear weapons and ballistic missiles—to free up money for ships, tanks, and aircraft that would be needed to defend China from the United States or the Soviet Union. In the summer of 1961, the Central Committee resolved the controversy during a meeting at the seaside resort of Beidaihe, selecting strategic programs for modernization at the expense of conventional forces. Marshal Nie Rongzhen, the head of China's defense science and technology complex after 1958, carried the day, arguing that strategic programs would serve as an organizing endeavor for national science and technology, a rationale that linked the development of "sophisticated weapons" to the broader theme of China's national economic development and emphasized the possession of advanced capabilities, rather than their battlefield uses.

This bureaucratic history may explain why China chose to invest very little in strategic bombers: advocates for the aircraft industry had aligned themselves with opponents of the strategic weapons programs. It may also explain the small number of ballistic missiles that China acquired: Since the advocates were largely scientists and engineers responsible for designing new missiles and warheads, the natural bureaucratic emphasis was on continuing research and development, rather than procurement. Finally, Nie and his political allies tended to be less alarmist than their political opponents about the international security situation. It is not a coincidence, for instance, that Nie was one of the four marshals who argued in 1969 that China ought to be open to U.S. overtures to improve relations.

All of these factors led advocates for the nuclear and ballistic missile programs to argue for a relatively small nuclear force that represented China's possession of the most advanced strategic capabilities.

The emphasis on possession, rather than use, of nuclear weapons is evident in how the Chinese describe their arsenal, both in terms of vocabulary and the content of declaratory policy. Chinese leaders tend to eschew using the word "deterrence" to describe the purpose of China's nuclear forces. The Chinese word for "deter" (*weishe*) echoes the Latin root shared with "terrorism"—*terreo*, to frighten. As a result, *weishe* carries a much stronger sense of *terror* or blackmail than the oddly clinical "deterrence" and "compellence." Chinese-speakers seldom use "deterrence" to describe China's posture, although the word sometimes appears in English-language translations and Western-oriented scholarship. The National Defense White Papers, for instance, tend to use "counterattack" rather than "deterrence"—with the exception of the 2004 paper, which used both.

China's rejection of the credibility of nuclear threats—what Thomas Schelling eloquently called "the threat of damage, or of more damage yet to come, that can make someone yield or comply," helps explain why many Chinese avoid using the word "deterrence" to describe China's arsenal.[9] Chinese leaders rejected the credibility of such threats to make one either yield or comply; either "counterattack" or "reprisal" seem a better choice for the purpose they had in mind. One can see echoes of this difference in contemporary debates. The National Academies' recently released *English–Chinese, Chinese–English Nuclear Security Glossary* was delayed for many months by a dispute over whether to include the term "limited nuclear deterrence."[10]

It is in this context—the ability to counter coercion—that we should understand China's no-first-use pledge. Where Western writers have tended to see such a pledge as a self-imposed constraint placed upon the state making the pledge, Chinese policy makers seem to view the pledge as a statement about the nature of nuclear weapons—an outright rejection of the value of nuclear threats—and, as a result, an observation on the reason that China's own small, vulnerable force still enjoys a kind of parity with the United States.

9. Thomas C. Schelling, *Arms and Influence* (Yale University Press, 1967), p. 3.
10. Committee on U.S.-Chinese Glossary of Nuclear Security Terms, *English–Chinese, Chinese–English Nuclear Security Glossary* (Washington, DC: National Academies Press; Beijing: Atomic Energy Press, 2008).

China's Strategic Forces Today

China does not publish information about the size of its nuclear weapons arsenal. The United States intelligence community, however, has released considerable amounts of information. Although some of this information is contradictory—the intelligence community is certainly not a monolith—some assessments can be made by comparing quantitative assessments from the intelligence community with qualitative descriptions provided by authoritative Chinese sources.

China appears to maintain the smallest operationally deployed nuclear force (and perhaps the smallest stockpile) of any of the five nuclear weapon states party to the Treaty on the Non-Proliferation of Nuclear Weapons. According to unclassified U.S. intelligence assessments, China "has over 100 warheads deployed operationally on ballistic missiles. Additional warheads are in storage."[11] Declassified documents from the 1990s place classified estimates of the total stockpile, including a small stockpile of aircraft-delivered gravity bombs, between 200 and 250 warheads.[12]

The majority of these missiles were developed in the 1960s and 1970s, beginning with the 1965 *banian sidan* plan ("eight years, four missiles") to develop medium-, intermediate-, and intercontinental-range ballistic missiles by 1972.[13] As it turns out, China did not complete deployment of its first-generation large liquid-fueled ballistic missiles until the deployment of the first DF-5 intercontinental ballistic missiles (ICBMs) in silos beginning in 1981.

In the 1980s, China focused on developing solid-fueled, mobile ballistic missiles to replace its first generation of ballistic missiles. Although China deployed the first of these new missiles, the DF-21, beginning in the early 1990s, flight-testing of the DF-21 continued through the 1990s, and China did not begin large-scale deployments in earnest until around 2000. China is just now beginning deployments of the DF-31 and DF-31A, which will replace China's DF-4 and DF-5 missiles. (See Table 1, "China's Deployed Nuclear Forces, 2008.")

China is also developing a submarine-launched variant of the DF-31, called the JL-2. China has built at least two new ballistic missile submarines since 2007. The Office of Naval Intelligence believes China may build as many as five of the new submarines to replace China's lone Xia-class nuclear-powered ballistic missile submarine, which is not believed to be operational. Although the JL-2 may become operational as soon as 2010, China appears to have rather limited capabilities for communicating with submarines at sea and probably has not established operational practices for conducting deterrent patrols.

The growth in China's ballistic missile arsenal is not confined to China's nuclear forces. China has also developed new conventionally armed solid-fuel short-range ballistic missiles, the DF-11 and DF-15, which it deploys in very large numbers near Taiwan. China has also deployed a conventional variant of the DF-21, the DF-21C, and is further developing a fourth modification to serve as an anti-ship ballistic missile. Finally, China has deployed a new land-attack cruise missile—the ground-launched DH-10—as part of a broad effort to acquire ground-, air-, and sea-launched cruise missiles.[14]

11. The quote is taken from Office of the Secretary of Defense, *Proliferation: Threat and Response* (Washington, DC: Department of Defense, 1997). The intelligence community continues to describe the Chinese nuclear stockpile in this manner. See, for example, Defense Intelligence Agency Director Michael Maples' statement in 2006 that "China currently has more than 100 nuclear warheads." Lieutenant General Michael D. Maples, "Current and Projected National Security Threats to the United States," Statement to the Senate Armed Services Committee, February 28, 2006.
12. See, for example, "China's Nuclear Weapons Testing: Facing Prospects for a Comprehensive Test Ban," Office of Scientific and Weapons Research, September 30, 1993, p. 1; and "China Seeking Foreign Assistance To Address Concerns About Nuclear Stockpile Under CTBT," *Proliferation Digest*, March 29, 1996, p. 38. (Both documents were released under the Freedom of Information Act.)
13. On the history of China's ballistic missile programs, see John Wilson Lewis and Hua Di, "China's Ballistic Missile Programs: Technologies, Strategies, Goals," *International Security* 17 (Fall 1992).
14. On Chinese ballistic missile developments, see *Annual Report to Congress: Military Power of the People's Republic of China 2008*, Department of Defense, 2008; and "Ballistic and Cruise Missile Threat," National Air and Space Intelligence Center, NASIC-1031-0985-06, March 2006.

Table 1. China's Deployed Nuclear Forces, 2008

Missile	U.S. Designation	Initial Op. Capacity	Yield (Mt)	Range (km)	Fuel, Basing	Missiles	Launchers
DF-5A	CSS-4 Mod 1/2	1981	4–5	13,000	Liquid, Silo	20	20
DF-31A	CSS-10 Mod 2	2008	0.4	11,200	Solid, TEL	<10	<10
DF-4	CSS-3	1979	3.3	5,400	Liquid, Silo/Cave	15–20	10–15
DF-31	CSS-10 Mod 1	2008	0.5	7,200	Solid, TEL	<10	<10
DF-3	CSS-2	1971	3.3	3,000	Liquid, TEL	15	5–10
DF-21*	CSS-5 Mod 1/2/3	1990s	0.4	1,750	Solid, TEL	60–80	60
Total						**110–155**	**95–125**

Abbreviations: DF=Dong Feng; km=kilometers; Mod=modification; Mt=megatons; TEL=transporter-erector-launcher.
* The DF-21C/CSS-5 Mod 3 is conventionally armed; the Department of Defense does not provide a breakout by Mod, although fewer than fifty are probably nuclear-armed Mods 1 and 2.

SOURCES: *Annual Report to Congress: Military Power of the People's Republic of China 2008*, Department of Defense, 2008; and "Ballistic and Cruise Missile Threat," National Air and Space Intelligence Center, NASIC-1031-0985-06, March 2006.

This process of replacing liquid-fueled ballistic missiles with solid-fueled ballistic and cruise missiles underpins China's ongoing strategic modernization. Although many observers have linked the deployment of the DF-31 and DF-31A to recent U.S. missile defense deployments, it is important to keep in mind that these programs date to the mid-1980s and were supposed to have been completed many years ago.

China is not developing new warheads for its new ballistic missiles. The warheads for the new nuclear delivery systems—the DF-31, DF-31A and JL-2—were tested during the 1990s, before China signed the CTBT in August 1996. Since that time, China has observed a moratorium on nuclear tests. Without resuming yield testing, China would have significant difficulty in designing and certifying a new design, such as those incorporating insensitive high explosives. China does appear to have a significant stockpile stewardship program that may make use of hydrodynamic experiments at the Lop Nor Test Site.[15]

China may also have a small stockpile of gravity bombs for delivery by aircraft, but no aircraft appear to have the primary mission of nuclear warhead delivery, and nuclear warheads do not appear to be deployed at Chinese airbases. Before permanently moving its nuclear testing underground in the 1980s, China tested numerous nuclear weapons by dropping them from aircraft; however, Chinese officials have stated that the purpose of "airdrop" tests was to reduce test debris that would assist foreign intelligence agencies in analyzing the test results.

China probably does not deploy tactical nuclear weapons, although it has the capability to do so and successfully tested an enhanced radiation weapon or "neutron bomb" in 1988.

If China's modernization seems unusual, perhaps it is because China is only now completing the deployment capabilities that other countries have possessed for decades.

15. On Chinese stockpile stewardship activities, see, "CTBT: Regional Issues and U.S. Interests," Bureau of Arms Control, U.S. Department of State, October 8, 1999.

This is not to suggest that missile defense and other aspects of U.S. strategic modernization have no effect on Chinese decisions. China has developed and flight-tested a sophisticated suite of penetration aids for the DF-21 and DF-31 family of ballistic missiles.[16] Some Chinese specialists have argued that China may increase the number of nuclear warheads capable of reaching the United States, rather than simply replacing the DF-4 and DF-5 on a one-to-one basis.[17]

It remains to be seen whether China will increase its number of nuclear warheads as much as current U.S. intelligence community predictions, which anticipate very large increases in Chinese nuclear forces to respond to U.S. missile defense efforts. In 2001, the U.S. intelligence community asserted that the number of Chinese warheads capable of reaching the United States could grow to 75–100 by 2015.[18] In 2006, the National Air and Space Intelligence Center warned that the number of Chinese nuclear warheads that could reach the United States "could expand to well over 100 in the next 15 years."[19]

Although such increases are within China's economic and industrial capabilities, especially if China were to deploy as many as five new ballistic missile submarines, it is also possible that China's modernization will occur within the general parameters of its overall force posture, characterized by keeping warheads in storage and a restrictive nuclear no-first-use declaratory policy.

China's nuclear arsenal also stands out from the other nuclear powers not merely due to its small size, but also because China keeps its nuclear forces off alert and under the strictures of a no-first use pledge.

By all indications, Chinese nuclear warheads are not normally mated to their missiles. Robert Walpole, then national intelligence officer for strategic and nuclear programs at the CIA, stated in 1998 that "China keeps its missiles unfueled and without warheads mated."[20] The warheads are stored at nearby, but separate, bases. Press reports of Chinese mobile ballistic missile exercises published by the state-run Xinhua News Agency indicate that nuclear warheads would be mated in the field to mobile ballistic missiles before launch, similar to the procedure used by Soviet Mobile Technical Rocket Bases (PRTB, in Russian) stationed in East Germany and elsewhere during the Cold War.[21]

Anecdotal evidence from public descriptions of Chinese exercises and doctrinal materials suggest that Chinese forces expend considerable effort training to conduct retaliatory missions in the harsh environment after a nuclear strike. One Chinese textbook that is used to train cadres is forthright about the difficulty of maintaining a survivable

16. See Senate Select Committee On Intelligence, *Current And Projected National Security Threats To The United States*, S. Hrg. 107–597, 107th Cong., 2nd sess., 2002, 321; and "Country Profiles: China," Ballistic Missile Defense Organization Countermeasure Integration Program, April 1995, pp. 12–18. China also has the capability to place multiple warheads on its older, liquid-fueled DF-5 ICBMs, although it has not yet done so.
17. For example, Sun Xiangli, deputy director of the Arms Control Research Division, Beijing Institute of Applied Physics and Computational Mathematics, has disputed the notion that "the number of weapons that make up a limited nuclear force is immutably fixed. In fact, the required size for such a capability is a dynamic quantity relating to the nuclear arsenal's survivability. For instance, one guide to the size required of China's nuclear force is to be able to mount a nuclear strike that can penetrate an enemy's missile defense system after surviving a first strike." Sun Xiangli, "Analysis of China's Nuclear Strategy," *China Security*, No. 1 (Autumn 2005), pp. 23–27.
18. International Security, Proliferation, and Federal Services Subcommittee of the Committee on Governmental Affairs, *CIA National Intelligence Estimate of Foreign Missile Developments and the Ballistic Missile Threat through 2015*, S. Hrg. 107–467, 107th Cong., 2nd sess., 2002.
19. "Ballistic and Cruise Missile Threat," National Air and Space Intelligence Center, NASIC-1031-0985-06, March 2006.
20. Robert D. Walpole, speech at the Carnegie Endowment for International Peace, September 17, 1998, <https://www.cia.gov/news-information/speeches-testimony/1998/walpole_speech_091798.html>. The textbook *Zhanyi Xue* implies this arrangement by defining the "missile base group" as "two or more missile bases and warhead bases." See *Zhanyi Xue* [*Operational Studies*] (Beijing: National Defense University, 2000), Ch.14, p.1. For a description of Chinese operating practices, see: *Strategic Missile Tidbits* (1995), p. 3 (released under the Freedom of Information Act).
21. PRTBs are described in Richard Clarke, *Your Government Failed You* (New York: Ecco, 2008), pp. 102–103. Chinese press reports of mobile ballistic missile exercises are described in Li Bin, "Tracking Chinese Strategic Mobile Missiles," *Science and Global Security* 15 (2007), pp. 11–30.

retaliatory capability under a no-first-use doctrine. "According to our principle of no first-use of nuclear weapons," the text *Zhanyi Xue* (Operational Studies) warns future commanders, "the nuclear retaliation campaign of the Second Artillery will be conducted under the circumstances when [the] enemy has launched a nuclear attack on us. … The personnel, position equipment, weapons equipment, command telecommunication system and the roads and bridges in the battlefield will be seriously hurt and damaged."[22]

Whether Chinese leaders will change these features of their nuclear posture is difficult to predict. Western analysts have long predicted, for example, that China would eventually move away from a no-first-use posture—yet China's political leaders continue to appear committed to the policy. In part, the judgment that China would dump no-first-use has been based on voluminous criticisms of no-first-use in Chinese military writings. The considerable ink spilled in Chinese military publications complaining about "no-first-use" is probably the best evidence that the policy remains in place.[23] Dissatisfaction among some Second Artillery commanders with no-first-use might also explain the growing deployments of conventionally armed ballistic missiles, which are presumably subject to less doctrinal interference from senior leaders and Chinese nuclear weapons scientists.

Fundamental changes are more likely to result from ongoing changes in China's domestic politics, rather than as a mechanistic response to changes in U.S. strategic capabilities such as missile defense or conventional strike. China's small cadre of scientists and engineers continue to play a significant role in matters relating to nuclear policy—but today, unlike in Nie's era, they are no longer the only voices on nuclear policy. As part of an effort to ensure that military priorities are better reflected in defense science and technology investment, the General Armaments Department replaced the Commission on Science and Technology for National Defense, which was run by Nie's son-in-law as late as the mid-1990s. Although the GAD itself may be a distinct interest group, relative to the Second Artillery or the Navy, it is presumably much less independent than in Nie's day.

Moreover, the Second Artillery and the Navy are vastly more professional today than even ten years ago. In the past it would have been difficult to imagine the parochial service interests overriding a desire for central control over China's nuclear forces—as embodied in aphorisms such as "the party must control the gun, the gun must never control the party." But today China is very different: the PLA is far more professional than ever before, and China's leaders were children when the United States subjected China to nuclear threats.

New Challenges in Sino-U.S. Crisis Stability

In the United States, we tend to think about two implications that will arise from China's deployment of new mobile ballistic missiles. Some argue that a more survivable Chinese deterrent will increase the threat to the United States, discouraging Washington from coming to the aid of Taiwan in a crisis. Others have suggested that the deployment of more survivable Chinese strategic forces will prove stabilizing because a U.S. president would be less likely to initiate a nuclear strike against Chinese targets.

Both of these views emphasize the role of nuclear weapons in deterring a *deliberate* attack. Yet the prospect that either a Chinese or U.S. political leader would initiate nuclear hostilities seems extremely remote. A very different concern is the possibility of an accident or miscalculation arising from the interaction of alert U.S. and Chinese forces.

China's strategic forces have been placed on alert only once, in 1969 during the Sino-Soviet crisis.[24] This event

22. *Zhanyi Xue* [*Operational Studies*].
23. Some Chinese military officers complain about the difficulty of maintaining the viability of China's small deterrent after riding out a nuclear attack. Others appear to favor preemptive doctrines more generally. These criticisms are summarized in Alistair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security* 20 (Winter 1995–96), pp. 5–42, especially pp. 21–23.
24. The alert is detailed in John Lewis and Xue Litai, *Imagined Enemies: China Prepares for Uncertain War* (Stanford, CA: Stanford University Press, 2006), pp. 51–74.

remains confusing—Lin Biao, Mao's heir apparent who would later die attempting to flee China, allegedly after a failed coup attempt against Mao, appears to have placed the Second Artillery on alert without going through established procedures.

The event may have reinforced concerns within the Chinese leadership about the need to maintain control over the country's nuclear forces.

Today, however, China is changing rapidly. Chinese leaders will have an arsenal comprising new solid-fueled missile systems that maximize survivability by standing alert—either by placing mobile missiles in the field or patrolling submarines at sea—and a vastly more professional military. Even if Chinese leaders do not keep forces on alert as a peacetime routine, in a severe crisis they may be tempted to raise the alert level of Second Artillery forces to demonstrate their resolve. *Zhanyi Xue* suggested such a course of action, calling it "anti-nuclear deterrence combat"—"the military operation that shows our nuclear power and will."[25]

Based on press reports of exercises, in a crisis China would disperse mobile ballistic missiles and fuel missiles in fixed sites.[26] How would American policy makers react, especially if U.S. forces were placed on alert? The history of U.S. alert operations suggests that they have an inherent escalatory potential. In studies of the four U.S. DEFCON-3 or higher alerts, Scott Sagan found that orders were frequently misunderstood or ambiguous events misinterpreted to confirm the sense of crisis, and he concluded that "keeping the alert at the desired level will be extremely difficult, and the degree of further grave escalation uncertain."[27] The inherent risk is captured by President John F. Kennedy's sardonic remark, upon learning that a U.S. U-2 plane had strayed into Soviet airspace during the Cuban Missile Crisis, that "There's always some son-of-a-bitch who doesn't get the message."[28]

One can imagine, for instance, the potential for escalation if Chinese missile submarines put out to sea during a crisis. U.S. attack submarines would surely attempt to tail them. What would happen if two submarines collided? Or if the Chinese submarine suffered a crippling accident, like the torpedo explosion that sank the Russian submarine *Kursk*? Would Chinese policy makers, in a crisis atmosphere, be able to distinguish the loss of contact with submarines from early efforts to eliminate their deterrent? How would U.S. policy makers react if China appeared to prepare mobile ballistic missiles that could perform antisatellite missions? Or anti-ship DF-21D missiles that, externally, are identical to China's nuclear-armed DF-21 and DF-21As?

Concluding Observations

The United States and China have begun a formal dialogue on strategic issues in recent years. In 2005, then-Secretary of Defense Donald Rumsfeld visited the headquarters of the Second Artillery. In 2008, the United States and China established a hotline linking the Department of Defense and the Chinese Defense Ministry and initiated talks between their two militaries on nuclear issues. In June 2008, the United States and China concluded the fourth bilateral U.S.-China Security Dialogue between Acting-Undersecretary of State John Rood and Vice Minister He Yafei.

These efforts are a welcome beginning to what will be a long dialogue between parties with very different views about nuclear weapons. While American commentators often state that the purpose of China's nuclear force is to discourage U.S. involvement in a crisis over Taiwan, Chinese officials continue to describe their deterrent in terms of an existential safeguard to prevent the United States from coercing China with the threat of a nuclear attack.

25. See Ch. 14 of *Zhanyi Xue* [*Operational Studies*].
26. For example, one exercise is described in Dong Jushan and Wu Xudong, "Build New China's Shield of Peace," *Beijing Zhongguo Qingnian Bao*, July 1, 2001, FBIS-CPP-2001-0703-000119.
27. Scott D. Sagan, "Nuclear Alerts and Crisis Management," *International Security* 9 (Spring 1985), p. 136.
28. Scott D. Sagan, *Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, NJ: Princeton University Press, 1993), pp. 117–18.

China's strategic modernization continues to be driven by a desire to possess the same military technologies as other technologically advanced nations, especially the United States. Although China is likely to increase the size and capability of its nuclear forces, Chinese leaders may continue to deploy these capabilities within the confines of a posture that emphasizes small numbers, low rates of alert, and a no-first-use doctrine. Whether Chinese leaders do so will, in large part, be determined by their own domestic dramas. But the United States can influence the outcome, in particular through political reassurances that the United States does not seek the capability to use nuclear weapons to coerce China.

Chinese leaders continue to seek such assurances, as evidenced by the continuing interest in securing a bilateral no-first-use pledge from the United States. He Yafei, in the 2008 bilateral talks with Rood, again expressed China's interest in having the United States pledge not to use nuclear weapons first against China. (China sought such an assurance in the 1990s, resulting in the so-called "non-targeting agreement" signed by President Bill Clinton and President Jiang Zemin.)

Chinese leaders, in return, might propose additional transparency measures to assure the United States that China seeks only a minimal deterrent and will not attempt to move toward numerical parity with the United States as it continues to reduce the number of operationally deployed strategic nuclear warheads. This would contribute to what Chinese officials have called "mutual strategic trust."

There are those in the United States who would believe U.S. security is best maintained by acquiring the ability to negate China's deterrent through technological superiority and to "dissuade" competition through overwhelming numerical advantage. An alternative view, however, is that keeping China's modernization within the confines of minimum deterrence and a doctrine of no-first-use is manifestly in the interest of the United States and requires a political commitment that reflects the simple reality that no U.S. president is likely to attempt a disarming first strike against another nuclear-armed power.

No matter which view one takes, China's possession of the minimum means of reprisal—and how that deterrent evolves—is now the central issue for the future of both countries' nuclear forces. At best, an effort by Washington to engage China more deeply on disarmament issues will require bureaucracies in both Washington and Beijing to more thoroughly consider the ramifications for stability of their respective strategic force modernizations. At the very least, opening such a dialogue can reduce the possibility of accidents, miscalculations, or misunderstandings.

How Chinese Analysts View Arms Control, Disarmament, and Nuclear Deterrence after the Cold War

Lora Saalman

Systemic Shifts

To better comprehend the manner in which Chinese analysts interpret their country's role in arms control and disarmament, it is instructive to begin with an overview of their perceptions of the shifts that emerged following the fall of the Soviet Union and the end of the Cold War. The volume *International Disarmament and Arms Control*, edited by Major General Pan Zhenqiang[1] and featuring contributions by Xia Liping[2] and Wang Zhongchun,[3] maintains that two conflicting but concurrent trends have developed after the Cold War: the United States has emerged as the sole superpower, and the global community has become increasingly multipolar.

According to the *Arms Control and Disarmament Handbook* edited by Liu Huaqiu, the U.S. strategic nuclear arsenal after 2003 surpassed that of Russia, exacerbating this shift.[4] Adversarial military groupings that balanced and characterized the Cold War era have collapsed. The West, led by the United States, serves as the primary arbiter of international dialogues and mechanisms. *International Disarmament and Arms Control* notes not only the centrality of the United States, but also how it has positioned itself to shape organizations and treaties in its favor.

The reduced threat of world war, regional armed conflict, and localized wars has had a pronounced impact on international security and stability, increasing the potential for intervention in regional conflicts by the major powers. *Nuclear Arms Control and Disarmament*, which includes contributions by Gao Chaoting, Li Bin, Li Wenlei, He Huo, and Zhang Cao, maintains that this new security structure features globally recognized constraints on invasion and war through talks, transparency measures, and organization formation.[5] Yet, the prevailing view of these authors is that the "regional security cooperation" (*diquxing anquan hezuo*) that has emerged remains a part of a biased and imbalanced framework for the protection and perpetuation of Western interests.[6]

1. Major General Pan Zhenqiang (retired) has served as professor and deputy president of the Shanghai Institute for International Strategic Studies (SIISS); as former director of the Institute of Strategic Studies, National Defense University (NDU), People's Liberation Army (PLA); as a senior research fellow, China Institute of International Studies; and as an adjunct professor at Tsinghua University's Institute of International Studies.
2. Xia Liping has served as general-secretary and professor at SIISS, as deputy director of the Department of American Studies and head of East Asia Security and Arms Control Project at the Shanghai Institute for International Studies (SIIS), as deputy director of Shanghai Center for Pan-Pacific Strategic and International Studies, as a colonel (PLA Reserve), and senior guest fellow at the Institute of International Technology and Economics in the Center for Development Studies under the PRC State Council.
3. Wang Zhongchun is professor of NDU and a senior colonel of the PLA.
4. General Liu Huaqiu (retired) has served as a senior fellow and director of the Program on Arms Control and Disarmament at the China Defense Science and Technology Information Center (CDSTIC) and as a member of Chinese delegation to Conference on Disarmament in the 1980s and early 1990s. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*] (Beijing: Guofang gongye chubanshe, 2000), p. 3.
5. Li Bin, a Chinese physicist, works on arms control and international security. He is the Director of the Arms Control Program and Professor of the Institute of International Studies, Tsinghua University.
6. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*] (2005), p. 142.

Arms Control Shifts

Nuclear Arms Control and Disarmament states that during the Cold War, nuclear deterrence constrained an adversary's destabilizing activities. Under this bipolar system, the United States and the Soviet Union were able to exercise absolute control and were aware of each other's nuclear strategy and red lines. But following the Cold War, as the only superpower, the United States was able to use its absolute advantages to engage in offense-oriented activities to protect its security and advance its interests.

Today, Chinese analysts envision a more complicated construct of nuclear deterrence, as the United States, Russia, and China are all engaged in group-oriented deterrence, while India and Pakistan, as well as China and India, also face bilateral frameworks vis-à-vis one another in their deterrence calculus.[7] In their view, this dual-tiered and intersecting deterrence arrangement has contributed to a varied power structure that leads to greater instability.

Nuclear Arms Control and Disarmament asserts that with the advent of the twenty-first century, the United States has lost interest in negotiations as a part of arms control.[8] The loss of bilateral restrictions on U.S. freedom of action and lack of a militarily comparable adversary mean that the United States does not need a treaty to guarantee its security. When it feels constrained by a treaty, the United States will extricate itself from or refuse to observe such structures. Chinese authors frequently cite as evidence the U.S. withdrawal from the Anti-Ballistic Missile (ABM) Treaty in 2002, deployment of missile defenses, and proposed research into new forms of nuclear weapons.

Under this new structure, mutual assured destruction has lost its relevance, as have negotiations, since the United States has been able to employ unilateral tactics that contravene Cold War style arms control.[9] Chinese analysts assert that the Intermediate-Range Nuclear Forces Treaty and the Strategic Arms Reduction Treaties (START) I and II all hew closely to U.S. negotiating positions.[10] It is important to note that Chinese authors, while bringing up the aforementioned unilateralist tendencies in relation to the George W. Bush administration, see this trend as beginning in the mid-1990s and not entirely specific to any administration.

Despite the tendency to fault the United States in particular for stagnation within or erosion of arms control and disarmament, Chinese experts also make frequent mention of other factors, including Japan's nuclear weapons potential, Iran's nuclear intentions, the U.S.-India civilian nuclear agreement,[11] India and Pakistan's nuclear tests in 1998, and the confluence of terrorism and proliferation after the September 11, 2001 terrorist attacks. Former Russian President Vladimir Putin's 2001 statement on the centrality of nuclear weapons in Russian security, North Korea's nuclear test in 2006, the ongoing power of nuclear weapons as balancers,[12] the weakening of the nonproliferation regime, and misperceptions leading to nuclear conflict or proliferation in the Middle East and Northeast Asia are also cited as major concerns.

Negative Shifts for China

As China's arms control and disarmament role has increased, Chinese analysts believe China has faced growing demands and restrictions through its participation in international regimes and treaties. The focus of arms control and disarmament has shifted from the struggle between East and West for vertical military advantage and prevention

7. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 51.
8. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 53.
9. Ibid.
10. Ibid
11. Zhongguo junkong yu caijun xieyi [hereafter, China Arms Control and Disarmament Association], *2008: Guoji junbei kongzhi yu caijun baogao* [*2008: International Arms Control and Disarmament Report*] (Beijing: World Knowledge Press, 2008); China Arms Control and Disarmament Association, *2007: Guoji junbei kongzhi yu caijun baogao* [*2007: International Arms Control and Disarmament Report*] (Beijing: World Knowledge Press, 2007); China Arms Control and Disarmament Association, *2006: Guoji junbei kongzhi yu caijun baogao* [2006: International Arms Control and Disarmament Report] (Beijing: Shijie zhishi chubanshe, 2006).
12. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 54.

of a U.S.-Soviet nuclear exchange to stemming the horizontal proliferation of nuclear weapons.[13] Chinese experts emphasize that China, which perceives itself as part of the developing world, is a target of these latter efforts.[14]

Discussion of restrictions on China's weapons exports and transfers, demands to desist from nuclear tests, requirements for increased transparency, and the imposition of technological sanctions, as well as unfair and unequal treaties, are rife throughout these analysts' writings. Constraints placed on both regional and global development of peaceful nuclear technology have led to limits on China's imports and exports of nuclear materials, technologies, and facilities.[15] Calls for increased transparency are frequently met with arguments that while countries with military dominance like the United States are able to base their security calculus on "certainty," militarily weaker countries are forced to rely on ambiguity or "uncertainty."

Chinese analysts are not exceedingly optimistic in their assessment of the future of arms control and disarmament. While reductions of weapons may occur through START and other such mechanisms, these authors express concerns over the qualitative improvements that will supplant numerical increases, including advances in warhead accuracy, penetration, and survivability.[16]

They believe the qualitative gap between the United States and China has increased, such that the United States is making strides toward achieving "absolute security" (*juedui anquan*)[17] and "absolute nuclear advantage" (*juedui he youshi*),[18] while China continues to confront quantitative and qualitative obstacles to military procurement and deployment.[19] When combined with even a limited missile defense capability (as is now being deployed by the United States), these analysts voice concern that China's retaliatory capabilities have been diminished.

Chinese analysts by and large see the focus of the major powers and international security remaining firmly tied to nuclear weapons, with a shift from strategic to tactical systems, thereby lowering the threshold on their use and leading to increased chances for conflict and instability that could adversely impact China's economic growth. According to this view, as long as these other powers retain and emphasize nuclear weapons, so must China.

Positive Shifts for China

While largely critical of the U.S. and Russian impact on arms control, Chinese experts are generally pleased that these two countries have curtailed the arms race and negotiated reductions in their nuclear arsenals. In the Asia-Pacific region, both countries have reduced their military presence and forces, decreasing the military threat and pressure that China faces.[20] On an international and regional scale, border troop reductions and the installation of confidence-building measures are under way, including establishing hotlines and bilateral exchanges between India and Pakistan, China and India, and China and Russia.[21]

13. Ibid., p. 53.
14. Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*] (Beijing: Guofang gongye chubanshe, 1996), pp. 419–23; Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 49–50, 52–56.
15. Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*], p. 424; Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 142–43.
16. Ibid., pp. 141–42.
17. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*] (Beijing: Guofang gongye chubanshe, 2000), p. 3.
18. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers and Nuclear Strategies*] (Beijing: Shishi chubanshe, 2007), p. 333.
19. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 600.
20. Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*], p. 423; Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 142–43.
21. Ibid.

Chinese experts also make note of the areas in which progress has occurred, including UN Resolution 1172 following India and Pakistan's nuclear tests in 1998, the signing of the Strategic Offensive Reductions Treaty in 2002 by the United States and Russia, Libya's implementation of an International Atomic Energy Agency (IAEA) Safeguards Agreement in 2004 and the six-party talks on North Korea's nuclear program.[22] But among the Chinese-language volumes and articles surveyed, when positive trends and Western scholarship are cited, the article "A World Free of Nuclear Weapons: Ending the Threat of Nuclear Arms"[23] does not receive mention, nor does it seem to have had a major impact on Chinese thinking.

Instead, the most significant recent discussion on nuclear disarmament among Chinese official and non-official players identified during this author's survey occurred during the 11th PIIC Beijing Seminar, "International Security: Building a Harmonious World of Stability and Win-Win," in Qingdao, China, from October 26–30, 2008. But in many ways this conference, as an international endeavor, is not fully representative of the internal dialogue and writings in China on the issue of arms control and disarmament. This essay offers a review of this domestic debate.

Chinese Views on Arms Control and Disarmament Principles

Principles

The Chinese concept of deterrence remains rhetorically rooted in "active defense" (*jiji fangyu*), a posture that developed in large part due to perceived pressure and threats, predominantly imposed by the West. Conventional force reductions are also a component of this equation. The reluctance of countries with small- to medium-sized nuclear arsenals to disarm stems not from a nuclear imbalance vis-à-vis the West but from U.S. dominance in conventional military capacity.[24] For developing countries, nuclear weapons serve as force levelers.

Most Chinese authors continue to point to the fact that after conducting its first nuclear test in 1964, China held a conference calling for the abolition of nuclear weapons, demonstrating its early commitment to disarmament. Despite China's shift from criticism of the arms control regime to active participation following the end of the Cold War, many of China's basic principles on arms control and disarmament carry over from earlier periods, in particular the Chinese People's Conference on the Protection of World Peace, held in 1986.

During this conference, China's leaders began with a denunciation of arms racing as a threat to global peace and stability, declaring the final outcome of disarmament to be total and complete elimination of nuclear weapons. Given that the United States and the Soviet Union had the largest stockpiles of nuclear weapons, Chinese delegates argued that these two superpowers should be the first to stop testing, producing, and deploying nuclear weapons. Beyond the much-touted "special responsibility" of the two countries in preventing nuclear war, all countries were encouraged to accept the no-first-use (NFU) principle and bilateral security assurances.[25]

Chinese analysts continue to emphasize that the goal of both arms control and disarmament should be the augmentation of common security, recognizing the demands of all countries.[26] As one former high-ranking Chinese military officer recently argued, the debate over disarmament is not about whether or not it is a

22. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers and Nuclear Strategies*] (Beijing: Shishi chubanshe, 2007), p. 335.
23. George P. Shultz, William J. Perry, Henry A. Kissinger, Sam Nunn. "A World Free of Nuclear Weapons: Ending the Threat of Nuclear Arms." *Wall Street Journal*, January 4, 2007, p. A15.
24. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 141–42.
25. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 333.
26. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*] (Beijing: Guofang gongye chubanshe, 2000), p. 1; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 435.

worthwhile goal, but rather about "who" should do "what" first.[27]

Chinese authors continue to emphasize the central principle that arms control and disarmament must not be used as tools for strong countries to control weak ones.[28] The *Arms Control and Disarmament Handbook* posits the goal of arms control and disarmament as establishing a means of reducing and/or eliminating the threat of war.[29] Still, the handbook does not provide concrete methods or recommendations, beyond declarations of intent. Moreover, it conflates the argument regarding whether nuclear weapons have mitigated or exacerbated the chances of war breaking out.

Some Chinese analysts have even suggested that nuclear weapons should be replaced by another unspecified weapon that would have the same function, without considering whether the solution may be more unstable than the status quo. In a similar vein, at the October 2008 PIIC conference at Qingdao, a senior official within the Chinese arms control community also expressed China's opposition to nuclear umbrellas, without addressing the repercussions of a U.S. decision to fold its nuclear umbrella on Japan's decisions about its nuclear future.

From the above tenets, Chinese analysts cite the following as core principles that guide their disarmament and arms control pursuits: 1) protection of world peace and security; 2) safeguarding of self-determination; 3) engagement in active defense; 4) opposition to power politics and hegemonism; 5) denunciation of the use of force in violating sovereignty and territorial integrity; 6) advocacy for the United States and Russia to act first in disarming; 7) promotion of nuclear and conventional weapons disarmament in tandem; 8) a refusal to engage in arms racing; 9) the belief that disarmament must not threaten a country's independence, sovereignty, or security; 10) a declaration that disarmament treaties should set strict measures for international nuclear verification and for universal participation in negotiation and monitoring; 11) rejection of extraterritorial deployment of nuclear weapons; 12) opposition to missile defense and weaponization of space; and 13) support for complete destruction of all nuclear weapons, their delivery systems, and all mechanisms involved in their research, testing, and production.[30]

A Unique Stance

In analyzing commonalities on which to base consensus, Chinese authors are often quick to point out the unique qualities and difficulties that China faces. Such distinctions are commonly lumped together under the term "Chinese characteristics" (*zhongguo tese*). In the nuclear context, such divergence is used to confirm China's special conditions compared with other nuclear weapons powers, such as the United States, Russia, the United Kingdom, and France.

China's analysts frequently mention its status as a developing country[31] and its shouldering of past nuclear threats from the United States and Soviet Union, including during the Korean War and localized conflicts over Jinmen and Mazu.[32] They remain proud of China's development of nuclear capabilities from a nearly absent base of assistance and its role in breaking the nuclear monopoly of the superpowers.[33]

27. Presentation (not for attribution) at the 11th PIIC Beijing Seminar on "International Security: Building a Harmonious World of Stability and Win-Win," Qingdao, China, October 26–30, 2008.
28. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], pp. 3, 14.
29. Ibid., p. 3.
30. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*] (Beijing: Zong zhuangbeibu dianzi xinxi jichubu, Yuanzineng chubanshe, Hangkong gongye chubanshe Bingqi gongye chubanshe, 2003), pp. 166–67; Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 135; Huang Hong and Cheng Weihua, eds., *Zouxiang xiandaihua de renmin jundui* [*Towards a Modernized People's Army*] (Beijing: Renmin chubanshe, 2007), p. 294; Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 3; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 74, 213, 391–92; Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*] (Shanghai: Shanghai renmin chubanshe, 2002), pp. 593–94, 597.
31. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 13.
32. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 8.
33. Ibid., p. 166; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear*

Analysts further emphasize that China has an unspecified but limited number of nuclear weapons and has conducted a conservative number of forty-five nuclear tests, thereby demonstrating self-restraint and reinforcing the concept that its nuclear stockpile is a reaction to weapons stockpiled by others. Xia Liping frequently points to the low level of China's military expenditure, especially when compared with countries like the United States.[34] This standpoint is pervasive, and Chinese authors feel it is further reflected by China's moral high ground in its commitment to the Comprehensive Nuclear-Test-Ban Treaty (CTBT) and NFU, demonstrating that its nuclear force is tailored toward averting nuclear war.

These analysts also stress that China's defense modernization is primarily indigenous, as they claim it has received relatively few imports of equipment or technology from other countries. Xia Liping asserts that China lacks the intent or ability to contribute to the long-range delivery, nuclear, or other capabilities of foreign countries.[35] Huang Hong and Cheng Weihua's volume *Towards a Modernized People's Army* even maintains that another sign of this commitment is that China "has never exported uranium enrichment, reprocessing, heavy water production or other sensitive technology."[36]

Similarly, Wang Zhongchun maintains that compared to other NWS, China has a number of distinctive stands, including: 1) a policy of NFU, which includes a declaration that it will not use nuclear weapons against any NNWS under any conditions;[37] 2) advocacy for counterstrikes, not preemptive or first strikes;[38] 3) commitment to an independent and sovereign foreign policy committed to non-threat; 4) refusal to base its national defense on its nuclear force; 5) maintenance of an active defense doctrine that is responsive to but does not initiate incursion or attack; 6) refusal to engage in a nuclear arms race; and 7) maintenance of limited nuclear force development, with investments instead directed toward industry, agriculture, education, and sciences.[39]

Reactive Stance

In accordance with its 2006 White Paper,[40] China sees its nuclear arsenal as a means of self-defense and of constraining other countries in their attempts to employ nuclear threats. As Wang Zhongchun argues, as long as nuclear weapons serve as the chosen deterrent of superpowers, China must have them to survive and develop. Wang further asserts that nuclear counterattack capabilities constitute China's right to fend off invasion and nuclear attack.[41]

China views both the United States and Russia as having used negotiations—particularly on nuclear issues—to constrain China's ability to develop its nuclear capability to defend itself, as well as to maintain their monopoly.[42]

Strategies], pp. 67–68, 217, 303.
34. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 599; Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 13.
35. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 600.
36. Huang Hong and Cheng Weihua, eds., *Zouxiang xiandaihua de renmin jundui* [*Towards a Modernized People's Army*], pp. 297. In fact, China has exported highly enriched uranium and has been cooperating with the IAEA for the past two years to convert Chinese-built reactors abroad to low-enriched uranium fuels. Like some of the other beliefs held by analysts in China and reported on in this essay, the views on Chinese exports expressed within Huang Hong and Cheng Weihua's edited volume conflict with the facts as seen by the West. On China's nuclear exports, see for example, "China's Nuclear Exports and Assistance to Pakistan," James Martin Center for Nonproliferation Studies, Nuclear Threat Initiative, <www.nti.org/db/china/npakpos.htm>; and Yan Kong, "A Wild Card: Chinese Heavy Water Exports," Center for Nonproliferation Studies, <www.nti.org/db/archives/nuc/eos/yankong.htm>.
37. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers and Nuclear Strategies*], pp. 214, 303.
38. Ibid., pp. 208–209, 214.
39. Ibid., p. 217.
40. People's Republic of China, Office of the State Council, *2006 Zhongguo de guofang* [*2006 China's National Defense*], December 2006.
41. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 216–17.
42. Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*], p. 410; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear*

Chinese analysts are frequently puzzled that despite U.S. supremacy in the nuclear and conventional realm, it still feels insecure. Under such conditions, they ask how can China, much less North Korea or any other country, feel secure if even the United States does not?

The perceptual weight of former invasions by foreign powers, issues over sovereignty, and self-reliance in the areas of science, technology, and defense all remain paramount in Chinese writings.[43] The Chinese analysts surveyed here uniformly perceive China as being forced down the path of becoming a nuclear power, to the point that it has only reacted to, rather than actively shaped, the threats and security environment around it.[44]

Nuclear threats and containment plans implemented by the United States during the early years of modern China's formation—combined with the scientific, political, and economic isolation following China's rupture with the Soviet Union—continue to have a significant and lasting impact on China's security reasoning and calculus. While Chinese arms control analysts increasingly see China as an agent of change and progress in arms control and disarmament, they continue to discuss their reactive stance, as well as constraints and burdens of the regime.

This conflicted stance plays out most directly when China calls for multilateral arms control and disarmament processes but routinely singles out the United States to unilaterally reduce its nuclear weapons. In addition, Chinese scholars fault the U.S. and Russian policy of preemption for exacerbating the pace of nuclear proliferation. Chinese authors view the two countries' current and proposed nuclear weapons modernization programs as perpetuating nuclear deterrence.

Thus, even as China has become more active in the arms control process, its strategists still tend to frame their nuclear program and structure as a reaction to the new developments in the U.S, nuclear program, whether these be in kinetic kill vehicles and missile defense or tactical nuclear weapons and a preventive or preemptive war doctrine. While Chinese analysts continue to express their disapproval of export control and other such constraints on China's development, they recognize the importance of disarmament and arms control as components of active defense and in safeguarding global and regional peace and stability.[45]

China's nuclear strategy may be summarized as follows: 1) constraining other countries from using or threatening to use nuclear weapons against it;[46] 2) maintaining a stance of nuclear defensive counterattack; 3) observing a principle of independent, limited nuclear development;[47] 4) employing a responsible management system with unified leadership and command and control of nuclear forces; 5) advocating a stand of complete disarmament;[48] and 6) focusing on defensive, targeted, responsive, and limited nuclear policies. Chinese analysts, on the whole, tend to view China's nuclear posture as open, cooperative, active, and responsible.[49]

Active Stance

Among the initiatives advanced by China are a proposal for a declaration by all NWS that under no conditions will they be the first to use nuclear weapons, as well as the negotiation and conclusion of an NFU Treaty between NWS. China has also been a proponent of nuclear-weapons-free zones (NWFZ) and pledges not to use or threaten to use nuclear weapons against states in these zones. Chinese writings further detail China's commitment to negotiation of full implementation of the CTBT, a Fissile Material Cutoff Treaty (FMCT), a treaty on the complete and verifiable prohibition of nuclear weapons, and the promotion of the peaceful use of nuclear energy.[50]

Strategies], p. 217.
43. Ibid., p. 217.
44. Ibid., p. 208.
45. Ibid., p. 74.
46. Ibid., p. 216.
47. Ibid., p. 217.
48. Ibid., p. 218.
49. Ibid., pp. 216, 218.
50. Huang Hong and Cheng Weihua, eds., *Zouxiang xiandaihua de renmin jundui* [*Towards a Modernized People's Army*], p.

Despite these proposals, given the fact that Chinese authors continue to emphasize the "defensive" (*fangyu xing*) nature of China's nuclear policy, derived from being "forced into developing its own limited nuclear force" (*beipo fazhanle ziji youxian de heliliang*) and directed toward serving as a "strategic nuclear counterattack combat capability" (*zhanlue hefanji de shizhan nengli*),[51] China is unlikely to relinquish its sense of moral rectitude and pragmatic necessity in maintaining its nuclear forces.

China's active involvement in the nonproliferation regime is ongoing, but so is the sense among its leadership, analysts, and populace of having been victimized in the process. There is also suspicion that U.S. efforts toward disarmament constitute thinly veiled attempts to solidify its military superiority. For countries like China, nuclear weapons have been one of the few means (if not the only means) to balance overwhelming U.S. conventional military power.

Nevertheless, Chinese experts continue to emphasize China's active role in Asia in: 1) facilitating the six-party process; 2) promoting progress on the South China Sea issue; 3)cconducting border dispute negotiations with Bhutan, India, and Vietnam;[52] 4) participating in regional organizations, like the Asia-Pacific Economic Cooperation (APEC) and the Shanghai Cooperation Organization; 5) strengthening and implementing export controls; 6) encouraging NWS to conclude a treaty on NFU; 7) limiting strategic attack forces and strategic defense systems; 8) researching and deploying survivable nuclear retaliatory capabilities; and 9) eliminating strategic systems that are vulnerable to first strikes or are characterized by weak survivability.[53]

How China Views Its Treaty Commitments

Taking Concrete Steps

Despite the tendency for Chinese analysts to reduce their analyses to abstract principles and doctrines, it is instructive to review some of the empirical underpinnings of Chinese arms control and disarmament efforts. Charting the inconsistencies in various historical accounts is one means of discovering Chinese analysts' shifting perceptions.

Books and articles that do not concentrate solely on arms control or disarmament, but rather on military tactics and information warfare, often reveal the most about how China views the future of its nuclear arsenal and program. One trend appearing in the late 1980s and early 1990s was the increasing willingness on the part of China to move beyond the rhetoric of principles to detailing concrete steps other countries should take, especially the United States and Russia.[54]

In each of these cases, China made a shift from blaming regimes or treaties for their inherent biases to criticizing the United States in particular for its inability to enforce treaties or for treaty violations.[55] For example, in an article published in the spring of 2008, Li Bin argued that the United States violates its own self-promoted Missile Technology Control Regime guidelines by cooperating with Japan and Israel on missile defenses.[56] Chinese analysts perceive the United States as uniquely poised to craft loopholes and to orchestrate treaty deadlines to keep agreements from unduly constraining China's interests.[57] The following sections concentrate on some of the more contentious issues.

293; Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 603; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 218.

51. Ibid., pp. 76, 208.
52. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 601.
53. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 3.
54. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], pp. 593–94.
55. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 344.
56. Zhao Tong and Li Bin, "US Compliance of MTCR," *Quarterly Journal of International Politics* 10 (2007), pp. 1–33.
57. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 344.

The No-First-Use Principle

NFU remains a central and unquestioned tenet of nuclear arms control and disarmament for Chinese analysts.[58] Indeed, NFU is the cornerstone of all Chinese arms control and disarmament-related literature. With the fall of the Soviet Union and the shift in the international relations and structure, in 1994 China put forward a draft on establishing bilateral NFU agreements with the United States, Russia, the United Kingdom, and France.

Since then, China has pursued universal adherence to NFU for all the nuclear powers. Addressing concerns about how such an agreement would be verified, a high-ranking Chinese arms control official stated in October 2008 at the PIIC conference that NFU is a question of declared intent that need not and cannot be verified. Verification is simply achieved through abstention from the use of nuclear weapons.[59] Another high-ranking Chinese official at the October 2008 PIIC conference asserted that intent can be verified through a country's limited nuclear force structure and NFU doctrine, obviating the need for a large arsenal of nuclear weapons or a missile defense system. In his view, NWS can no longer argue they need nuclear weapons for their own security, while denying others this option.[60]

Concluding a NFU agreement is viewed by the Chinese arms control establishment as a major confidence-building measure between NWS, one that will reduce the threat of nuclear war. But Chinese leaders also require assurances from the other powers that they would not be the first to engage in a nuclear attack against China.

Given such an environment of distrust, one Chinese expert commented at the October 2008 PIIC conference that it will be difficult to get rid of the "nuclear culture" already embedded in many countries' belief systems, in which nuclear weapons have become synonymous with security.[61] Chinese analysts also frequently remark that U.S. officials and analysts remain unwilling to reevaluate their stand and continue to use fundamentally flawed arguments of extended deterrence.

According to one high-ranking former Chinese military officer, the key to the question of nuclear disarmament is not the question of the numbers of weapons or technologies, but rather a change as to the role of nuclear weapons in these countries' nuclear strategies and doctrines. Under this assessment, the NWS must be the first to agree to NFU vis-à-vis each other and agree to the non-use of nuclear weapons against any NNWS with no exceptions.[62]

More recently, Li Bin has begun emphasizing the "non-threat" aspect of NFU, rather than the more commonly understood "non-use" provision. The reluctance of the United States to support NFU demonstrates to Chinese experts that the United States is unwilling to forsake nuclear threats and coercion in its foreign diplomacy, even with NNWS. This stance also calls into question the U.S. commitment to the basic spirit of arms control.

The Comprehensive Nuclear-Test-Ban Treaty

In recent years, China has become a strong proponent of the CTBT, and Chinese analysts frequently highlight Beijing's stand as divergent from the United States, which has refused to ratify the treaty.[63] In fact, they often cite the U.S. recalcitrance as the reason behind China's own decision to not yet ratify the treaty. The Chinese perspective is that the CTBT encapsulates much of what Chinese authors criticize in U.S. arms control policy. For example, they believe that the proposal to prohibit nuclear weapons testing came forward only once the United States completed the number of nuclear tests it deemed necessary, ignoring earlier U.S. calls for a test ban.[64] Yet, after championing

58. Ibid., pp. 76, 391.
59. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
60. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
61. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
62. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
63. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 304–305. China too has signed, but not ratified, the treaty.
64. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 10.

the treaty, the U.S. Senate subsequently refused to ratify and implement it, although the United States has not tested nuclear weapons since September 1992 and has adhered to the spirit of the CTBT.

Chinese scholars also tend to highlight the moral ground China has taken in supporting this treaty, since it has conducted the fewest nuclear tests of the NWS and would be the most likely to benefit from more. A high-ranking Chinese arms control official stated in October 2008 that, while China will maintain its moratorium on testing, such a ban can be lifted overnight. As such, an international body and treaty is required. Given that a moratorium can lead to a slowing down of treaty negotiations, this official advocated full-scale negotiations on ratification of the CTBT.[65]

At the same time, Wang Zhongchun and others are more circumspect in their assessment of the CTBT. They cite what they consider to be the treaty's deficiencies, such as its failure to incorporate an NFU provision and the non-use or threat of use of nuclear weapons against NNWS and territories, as well the lack of a pact on the complete prohibition of nuclear weapons.[66] Wang sees a tension between international monitoring and each country's technological base under the treaty. He identifies subjectivity and discrimination, arguing that advanced monitoring technology and systems are the domain of a select few countries worried about compromising sensitive technology and information.

Wang Shaolong and Luo Xiangjie, in their book *Nuclear Weapons Principles and Development*, note that the United States—with data from more than 1,000 nuclear tests, advanced supercomputer capabilities, and overall technological dominance—can afford to promote treaties such as the CTBT, since it is no longer dependent on nuclear tests to verify the viability of its nuclear stockpile.[67]

Yet despite levying these criticisms, when the United States failed to ratify the treaty, China in turn became its major proponent.[68] High-ranking Chinese arms control officials continue to express frustration as to why the United States as the "most important nuclear weapon state" would shift from supporting to refusing to ratify the CTBT. This reluctance is cited by a number of Chinese authors as evidence of the reluctance of the United States to carry out its final arms control and disarmament commitments.

Conference on Disarmament

Another arena in which Chinese analysts take the U.S. establishment to task for what they view as subverting the arms control and disarmament process is at the Conference on Disarmament (CD). While Chinese analysts like Yu Xiaoling praise the multilateral format of the CD, they also recognize its limitations and suggest one of its greatest weaknesses is the fact that the forum can be used by great powers to advance their own agenda at the expense of smaller members.[69]

A review of available Chinese-language sources reveals that a substantial number of Chinese analysts feel that "the United States is the primary threat for every country in a future space war."[70] One of the few full-length journal articles regarding China's own antisatellite test focused the majority of its text on U.S. capabilities, while overlooking those of China.[71] Still, Chinese authors like Xia Liping continue to argue that such a test, which is still referred to as a

65. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
66. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 304.
67. Luo Xiangjie has been affiliated with the College of Physical Science and Technology at Sichuan University. Wang Shaolong and Luo Xiangjie, eds., *Hewuqi yuanli yu fazhan* [*Nuclear Weapons Principles and Development*], pp. 196–97.
68. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 334.
69. Yu Xiaoling has been affiliated with the National Defense Science and Technology Information Center. Yu Xiaoling, "Caijun tanpan huiyi de xianzhuang ji jianjing" [Current Situation and Prospects for the Conference on Disarmament], in *2006: Guoji junbei kongzhi yu caijun baogao* [2006: International Arms Control and Disarmament Report] (Beijing: Shijie zhishi chubanshe, 2006), p. 43.
70. Feng Zhigang and Fang Changhua,"Shijie geguo fanweixing celue zongshu" [Summary of Each Country's Anti-Satellite Tactics], *Zhongguo hangtian* [China Aerospace], Issue No. 3 (2006), pp. 38–39.
71. "Meiguo zhushi zhongguo fanweixing nengli" [U.S. Monitoring of Chinese Anti-Satellite Capabilities], *Guoji zhanwang*

satellite experiment rather than an antisatellite test by the Chinese, was an attempt on the part of China to bring the United States back to the negotiating table at the CD.

For many years at the CD, China insisted on linking the negotiation of a FMCT to the issue of nuclear disarmament and a Prevention of Arms Race in Outer Space (PAROS) Treaty, contributing directly to a stalemate with the United States, which placed a greater emphasis on concluding the FMCT. But even after China's ambassador for disarmament affairs, Hu Xiaodi, made a proposal to de-link the two initiatives in 2001, Chinese authors continue to see the U.S. position as a hindrance to further progress.

As such, authors like Yu Xiaoling express strong concern regarding the future of the CD. Yu cites the previous focus of the United States only on nonproliferation and not on negotiations or disarmament. The outcome of the 2005 NPT Preparatory Committee meeting serves as further evidence of the "irreconcilable" dispute between the United States and developing countries on nuclear disarmament, nonproliferation, and peaceful use of nuclear energy.[72] Yu emphasizes that most Western countries, while not in agreement with the United States, will follow its mandate in order to maintain good relations.[73]

Still, Yu determines that despite the stalemate, it is not in either side's best interests to withdraw from the CD, given that: 1) withdrawal would create a new wave of international protests; 2) the conference has no real impact on constraining the military might and development of the United States; 3) the United States still hopes to realize the FMCT; and 4) the conference continues to provide a forum for small- and medium-sized developing countries to air their views and security interests.[74]

U.S. Nuclear Posture Review

The U.S. Nuclear Posture Review (NPR) remains one of the core litmus tests for the direction in which China sees the United States headed in its nuclear program and how Chinese officials choose to react. The promotion of a new strategic triad in the 2001 NPR, consisting of nuclear and precision non-nuclear strike forces and flexible response, contributes to the Chinese impression that the increasingly offense-oriented U.S. nuclear arsenal is redefining deterrence.[75]

In China's view, the proposed U.S. strategic triad will no longer simply contain preemptive nuclear attack strength or capabilities but is intended for combination with non-nuclear weapons to create a total attack system that includes both offensive and defensive systems to deter and destroy the capabilities of U.S. adversaries.[76]

U.S. deterrence under this framework is estimated in the view of Chinese strategists to be focused upon a credible and employable tactical nuclear deterrent. Among the more contentious points has been the NPR's insistence on the United States using nuclear weapons against non-nuclear military targets, as a response to nuclear, chemical, and biological attacks, and for unexpected contingencies.[77]

Qualitative improvements, such as the proposed Reliable Replacement Warhead (RRW), Robust Nuclear Earth Penetrator (RNEP), and other such initiatives are regarded with suspicion, with Chinese analysts suggesting that

[International Outlook], Issue No. 5 (2007), pp. 10–17; for more on China's 2007 antisatellite test, see Gregory Kulacki and Jeffrey G. Lewis, "Understanding China's Antisatellite Test," *Nonproliferation Review* 15 (July 2008), pp. 335–47.

72. Yu Xiaoling, "Caijun tanpan huiyi de xianzhuang ji jianjing" [Current Situation and Prospects for the Conference on Disarmament], p. 44.
73. Ibid., p. 43.
74. Ibid., p. 44.
75. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 10. Although it is not widely appreciated, bureaucratic, legislative, and technical setbacks meant that the proposed new triad was little more than a concept by the end of the Bush administration.
76. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 52.
77. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 153.

the U.S. nuclear stance is a question of intentions, not simply numerical reductions. Chinese strategists criticize U.S. plans to extend the life of existing weapons, as well as plans that would lower the threshold for their use.[78]

Not all Chinese analysts label U.S. strategic force restructuring as a nuclear triad. Instead, they view it as four arenas: land, air, sea, and space.[79] Min Zhenfan and Wang Baocun suggest that as the United States develops such a quadrilateral nuclear force structure a cascade effect may ensue, with Russia following suit.

From the 2001 NPR onward, China has observed an evolution of U.S. nuclear strategy and deterrence to include the following components: 1) core tenets of assure, dissuade, deter, and defeat;[80] 2) defined adversaries for nuclear attack, including Russia, China, North Korea, Iraq, Iran, Libya, and Syria, and regions of potential tension and conflict, including the Middle East, Taiwan Strait, and Korean Peninsula; 3) a multilayered strategic structure for nuclear deterrence, such as the use of large-scale strategic nuclear weapons to deter Russia, use of nuclear weapons and defense systems to deter smaller nuclear countries that have long-range delivery systems, and use of nuclear weapons and advanced conventional weapons to deter so-called rogue states; and 4) simplification of nuclear strike procedures, enabling nuclear strikes against countries or terrorists employing WMD.

Views on Consensus and Cooperation

Verification

There is consensus among a number of Chinese analysts and authors that verification is an integral part of designing and implementing any arms control or disarmament treaty and structure. Authors such as Liu Chengan and Wu Jue provide a step-by-step review of the verification technology and equipment currently available and under development. They also delineate central issues in nuclear verification, namely demonstrating compliance, clarifying facts, eliminating false alarms, providing default warnings, and using nuclear evidence as a means of resolving disputes.[81]

Liu and Wu display a marked sensitivity to the inequality present in the system, where technologically powerful countries can use nuclear verification to spy on other countries on matters not related to treaties. Wang Shaolong and Luo Xiangjie express similar concerns in their book *Nuclear Weapons Principles and Development*.[82]

According to this view, "through concluding such treaties as the CTBT and NPT, the United States can legally utilize its advanced technology and intelligence advantages to monitor each country's implementation of agreements, directing its spearhead at countries who it considers enemies, like the DPRK [Democratic People's Republic of Korea], Iran, Iraq, Libya, etc., interfering in other countries internal politics and harming their interests."[83] Despite their reservations, these authors still emphasize that verification is an essential part of any arms control or disarmament treaty negotiation.[84]

78. The Chinese are hardly alone in this. The U.S. Congress was and remains skeptical of both the RRW and the RNEP, and ultimately refused to provide funding for both, forcing the Department of Energy to cancel the RNEP. In early 2009, the Obama administration announced the cancellation of the RRW.
79. Min Zhenfan and Wang Baocun, eds., *Goujian xinxihua jundui de zuzhi tizhi* [*Construction of an Information-based Military Organization System*] (Beijing: Jiefangjun Chubanshe, 2004), p. 205.
80. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 339.
81. Liu Chengan and Wu Jun have been affiliated with the Beijing Institute of Applied Physics and Computational Mathematics. Liu Chengan and Wu Jun, eds., *He junbei kongzhi hecha jishu gailun* [*An Introduction of Verification Technology of Nuclear Arms Control*] (Beijing: Guofang gongye chubanshe, 2007), p. 1.
82. Wang Shaolong and Luo Xiangjie, eds., *Hewuqi yuanli yu fazhan* [*Nuclear Weapons Principles and Development*], p. 198.
83. Ibid.
84. Liu Chengan and Wu Jun, eds., *He junbei kongzhi hecha jishu gailun* [*An Introduction of Verification Technology of Nuclear Arms Control*], p. 3.

Export Controls

Chinese analysts are conflicted on the subject of export controls, although they remain optimistic in terms of China's overall progress on strengthening its regulatory system. Li Genxin and Sun Puzhong in their article, "A Discussion of China's Export Control Policy," elucidate what they perceive as a growing domestic shift from administrative and bureaucracy-based export controls to those founded in the rule of law.[85]

Li and Sun offer a detailed review of the treaties that China has signed but include little specific information on achievements in treaty implementation. Disarmament is not mentioned, nor is UN Security Council Resolution 1540. However, the authors do describe attempts to engage agencies, national and private industry, and joint and foreign venture firms in the export control process. They also note the failings within the Chinese system and cases of legal and regulatory violations, but only in broad terms.

Wang Zhongchun declares that China firmly adheres to the following three principles: 1) ensuring that exports are used only for peaceful purposes, 2) conducting transfers on the basis of acceptance of IAEA safeguards monitoring, and 3) receiving assurances from recipient countries that they will not transfer the technology to a third country.

Chinese analysts note the explicit use of double standards by the United States when it comes to so-called rogue states and China.[86] In fact, in the Chinese Arms Control and Disarmament Association's 2008 review of export controls, Li Genxin, Li Songnian, and Liu Xiaoming discuss the continuing and recently expanded scope of export controls to constrain China.[87] Such ongoing distrust reveals a much deeper chasm that must be bridged before any effective attempt at cooperation on verifiable and sustainable arms control or disarmament mechanism is realized.

Terrorism

One area of seeming mutual concern for Chinese and Western analysts is the issue of nuclear terrorism.[88] Since 2001 and the increased U.S. focus on WMD-related terrorism, Chinese analysts have also begun to publish on the subject, with two noteworthy hardcover volumes specifically dealing with nuclear terrorism, released in 2004 and 2005.[89]

Of these, Cao Baoyu in his book *Guarding Against and External Factors in Nuclear, Biological, and Chemical Incidents* describes what he sees as salient trends in WMD terrorism, which include the global network of development activities, high-tech growth, and expansion in both number and variety of attacks.[90] Cao views the impact of such attacks as predominantly political and directed at destabilizing a country or economic system.

Faced with terrorism as a common threat, Cao Baoyu and Pan Zhenqiang suggest that countries have become increasingly unified in their response and cooperation, with a number of them pursuing regulations, laws, sanctions, and military activities.[91] China, for example, has eighteen departments in its Ministry of Foreign Affairs and military

85. Li Genxin and Sun Puzhong, "Lun zhongguo de chukou guanzhi zhengce" [A Discussion of China's Export Control Policy], *Guoji Wenti Yanjiu*, Issue 3 (2007), p. 13.
86. Ibid., p. 15; Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 13.
87. Li Genxin, Li Songnian, and Liu Xiaoming, *2007 nian meiguo chukou guanzhi xin gongtai* [*The New Dynamic in US Export Controls for 2007*], in China Arms Control and Disarmament Association, *2008: Guoji junbei kongzhi yu caijun baogao* [*2008: International Arms Control and Disarmament Report*] (Beijing: Shijie zhishi chubanshe, 2008), pp. 183, 187.
88. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 444.
89. Pan Ziqiang, ed., *He yu fushe kongbu shijian guanli* [*Management of Nuclear and Radiological Terrorism Incidents*] (Beijing: Kexue chubanshe, 2005); Cao Baoyu, *Heshenghua shijian de fangfan yu waizhi* [*Guarding Against and External Factors in Nuclear, Biological and Chemical Incidents*] (Beijing: Guofang gongye chubanshe, 2004). See also Zou Yunhua, "Preventing Nuclear Terrorism: A View From China," *Nonproliferation Review* 13 (July 2006), pp. 253–73.
90. Cao Baoyu, *Heshenghua shijian de fangfan yu waizhi* [*Guarding Against and External Factors in Nuclear, Biological and Chemical Incidents*], pp. 10–13.
91. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], pp. 10–11; Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*], p. 185; Cao Baoyu,

involved in such a regulatory network.[92]

Cao sees China as vulnerable to such attacks due to the presence of religious extremists, ethnic separatists, and terrorists with ties to the Eastern Turkestan Independence Movement and networks in Central Asia, Afghanistan, and other countries. Among the potential scenarios are:

- attacks targeting foreign embassies, consulates, and organizations;
- assaults from Falun Gong members, or Xinjiang and Tibetan separatists, with support from external countries and organizations;
- overflow from terrorist incidents in other countries into China; and
- chaos sought by those supporting Taiwanese independence and espionage networks.[93]

Of the potential types of WMD incidents China has confronted and is most likely to face in the future, chemical attacks are considered the most likely.[94]

Cao advocates standing preparation, active coordination, unified command, and attention directed at protecting human lives and the environment,[95] through: establishing and improving its response and system for dealing with such threats; creating an information system providing data to the decision-making level; constructing scientific and integrated decision-making mechanisms that improve the level and quality of decision making in the context of crisis resolution; increasing legal regulations to create WMD terrorism security networks in cities; strengthening research into WMD terrorism at home and abroad; facilitating international cooperation and establishment of organizations; increasing training related to WMD terrorism; and expanding protection, security, and handling of nuclear materials.[96]

Views on Opposition and Disjunction

Sanctions

Most Chinese scholars note the utility of sanctions and force in international relations and even arms control. Yet, sanctions continue to be viewed as punishments meted out by hegemonic powers like the United States in a discriminatory, self-serving, and ultimately fruitless fashion. Hegemonic activities on the part of the United States, or even great power aspirants like India, are often seen as a vehicle for inducing or exacerbating, not stemming, proliferation.[97]

While China and India receive mention for the constraints they have faced in the past, recent moves by the United States to conclude a civilian nuclear cooperation agreement with India are viewed by a number of Chinese analysts, such as Zhang Ruiyang, as: 1) part of U.S. power politics, 2) an attempt to balance against China, 3) a trigger for regional arms racing with Pakistan, and 4) the creation of a double standard when compared to U.S. policy on

Heshenghua shijian de fangfan yu waizhi [*Guarding Against and External Factors in Nuclear, Biological, and Chemical Incidents*], p. 11.

92. Pan Zhenqiang, Xia Liping, and Wang Zhongchun, eds., *Guoji caijun yu junbei kongzhi* [*International Disarmament and Arms Control*], p. 18.

93. Cao Baoyu, *Heshenghua shijian de fangfan yu waizhi* [*Guarding Against and External Factors in Nuclear, Biological, and Chemical Incidents*], p. 28.

94. Ibid., p. 29.

95. Ibid., p. 30.

96. Pan Qijing and Huang Bo, eds., *Hehuasheng wuqi yu fangyu* [*Nuclear, Chemical, and Biological Weapons and Defense*] (Beijing: Guofang daxue chubanshe, January 2004), pp. 60–61; Cao Baoyu, *Heshenghua shijian de fangfan yu waizhi* [*Guarding Against and External Factors in Nuclear, Biological and Chemical Incidents*], pp. 10–13.

97. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 342.

Iran.[98] Such deals are interpreted as an U.S. effort to reshape the Asian balance of power and to use the nonproliferation regime, specifically the NPT, as a geopolitical tool to further U.S. interests.

In particular, Wang Zhongchun asserts that U.S. pursuits in arms control have been used to justify interventionism and as a tool in its global strategy.[99] Under the rubric of nonproliferation, the United States has sanctioned, embargoed, and attacked countries like Iraq, Iran, and North Korea, while tacitly accepting and even assisting other nuclear countries like India and Israel.[100]

While frequently referred to as "double standards" (*shuanzhong biaozhun*), only occasionally do Chinese authors qualify these various U.S. approaches as "multiple standards" (*duozhong biaozhun*). Li Genxin and Sun Puzhong make this ideological leap by discussing the varying levels and standards of export controls that the United States uses to completely isolate some countries from even normal trade in basic goods and technology, while partially or fully engaging others.[101]

Others like Tong Shuxing discuss what they view as U.S. extraterritoriality in export controls and resultant sanctions, namely in three forms: 1) foreign company transfers of items and technology originating in the United States, 2) exports of goods of foreign origin containing U.S. parts, and 3) exports of foreign goods that are made from U.S. technology.[102] But rather than viewing these measures as targeted, Chinese authors often view them as discriminatory, declaring that any measures for arms control and disarmament require universality.

Threats

When it comes to their accounts of the United States in general, Chinese analysts are much more specific about the threats they face. In part, this stems from the wealth of open-source materials on U.S. programs, as well as the preoccupation with the United States in China's security calculus. These views are particularly evident in Wang Shaolong and Luo Xiangjie's writings. Chinese authors, such as Li Genxin, Sun Songnian, and Liu Liming,[103] point out the following as major obstacles to disarmament:

1) In the first category are U.S. foreign policy shifts such as neo-interventionism and neoconservatism since the mid-1990s.[104] Unilateralism since 2001 has contributed to hegemonic activities, such as forceful intervention in other countries' domestic politics, pursuit of offensive and defensive absolute advantage and dominance,[105] active development of ballistic missile defenses, and targeting of countries with enemy intent, while making allowances for allies and friends. The United States has resumed Cold War tactics, such as the employment of counterbalancing tactics through using nuclear capabilities of some countries to facilitate its own strategic interests.

98. Zheng Ruiyang, *Dui yinmei minyong he hezuo xieyi de pinggu* [*Assessment of the Indo-US Civilian Nuclear Cooperation Agreement*], in China Arms Control and Disarmament Association, *2007: Guoji Junbei kongzhi yu caijun baogao* [*2007: International Arms Control and Disarmament Report*], pp. 117–18, 122.
99. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 336.
100. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 13; Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 343; Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 51–54.
101. Li Genxin and Sun Puzhong, "Lun zhongguo de chukou guanzhi zhengce" [A Discussion of China's Export Control Policy], p. 15.
102. Tong Shuxing has been affiliated with the University of International Business and Economics. Tong Shuxing, *Chukou guanzhi yu gaojishu guoji zhuanrang* [*Export Controls and International High-Technology Transfer*], *Chukou guanzhi yu gaojishu guoji zhuanrang* [Studies in International Technology and Economy] 6 (October 2003), p. 38.
103. China Arms Control and Disarmament Association, *2008: Guoji junbei kongzhi yu caijun baogao* [*2008: International Arms Control and Disarmament Report*], p. 193.
104. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 336.
105. Ibid., p. 333.

2) In the second category, newly emerging nuclear weapons powers threaten the future of nonproliferation.[106] India's nuclear stance and capabilities have allowed it to harden and strengthen its hegemonic status and pursuits in South Asia. Pakistan's response to India's tests has led to an arms race in the region and worsened the prospects for arms control and disarmament. North Korea's nuclear test also contributed to regional instability in East Asia, as Iran's nuclear pursuits have led to doubts as to the nuclear future of the Middle East.[107]

3) In the third category, the confluence of terrorism and nuclear proliferation threatens global security, as terrorist organizations exist outside of the controls or constraints of the international system and structure.[108]

4) In the fourth category, nuclear weapons continue to convey not only military, but also political weight and stature.[109] One Chinese expert recently argued that if nuclear weapons truly made countries more insecure, then they would have been abandoned long ago.[110] For NWS, insecurity actually comes from the potential for horizontal proliferation or the possession of too many weapons at home. Nuclear weapons continue to present a more cost-effective route than conventional weapons in deterring one's enemies, as well as the best method to contend with a country that dominates in conventional and comprehensive power.

5) In the fifth and final category, conflicts of interests in arms control and disarmament occur between such pairings as national and global interests, ethnic and majority population interests, as well as hegemonic and international interests.[111] Chinese analysts maintain that countries like India and Israel, now in possession of nuclear weapons, may be unable to relinquish their nuclear programs. Their inability to give up such capabilities affects the other countries around them.

Views on Information Deterrence Versus Nuclear Deterrence

Information and Nuclear Deterrence

Among the sources and experts surveyed, the topics that receive the most attention in open-source Chinese literature are information warfare and missile defense. Most military accounts tend to focus on one or the other subject and at times both in tandem. In fact, these two areas receive so much attention that China's nuclear posture has often been reduced to a side-note.

Ultimately, both information warfare and missile defense touch upon the long-held Chinese opposition toward weaponization of outer space. This triumvirate of issues, with weaponization of space at the top of the triangle, is frequently cited as damaging to confidence-building measures and strategic stability.

106. Ibid., pp. 443–44.
107. Shen Dingli and Li Zhijun, *2007 nian: Chaoxian he wenti fenghui luzhuan* [2007: Turn in the DPRK Nuclear Question]; Sun Xiangli, *Chaohe wenti de shizhi yu fazhan qianjing* [The Essence of and Development Prospects for the DPRK Nuclear Question; Teng Jianqun, *Chaohe wenti de lishi he diyuan zhengzhi jieshi* [Explanation of the History and Geopolitics of the DPRK Nuclear Question]; *2007 nian yilang hewenti zongshu* [Summary of the Iran Nuclear Issue for 2007]; China Arms Control and Disarmament Association, *2008: Guoji junbei kongzhi yu caijun baogao* [2008: International Arms Control and Disarmament Report]; Shen Dingli and Li Zhijun, *2006: Chaoxian daodan fashe, heshiyan yu liufang huitan* [2006: DPRK Missile Launches, Nuclear Test and 6 Party Talks]; Li Guofu, *Yilang hewenti zhengjie yu qianjing zhanwang* [The Crux of Iran's Nuclear Issue and Prospects]; Yu Xiaoling, *Jiexi yilang hewenti* [Analysis of Iran Nuclear Issue]; China Arms Control and Disarmament Association, *2007: Guoji junbei kongzhi yu caijun baogao* [2007: International Arms Control and Disarmament Report]; Shen Dingli, Li Zhijun, and Wu Chunsi, *2005 nian: Chaoxian bandao hetan dandao qifu* [2005: Ups and Downs on the Korean Peninsula]; China Arms Control and Disarmament Association, *2006: Guoji junbei kongzhi yu caijun baogao* [2006: International Arms Control and Disarmament Report].
108. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 444.
109. Ibid., pp. 444–45.
110. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
111. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 445.

In terms of information warfare and warfare under informationalized conditions, Chinese authors have begun to downplay the importance of large military platforms, in favor of the centrality of intelligence acquisition technology, smart weapons, laser and kinetic weapons, etc. These writings feature miniaturization, jointness, and multiple capabilities as military pursuits of the future.[112]

Rapid development of information technology and new technology in weaponry will lead countries to begin to decrease their reliance on nuclear weapons, open new arenas of competition in weaponry, expand the number of weapons pathways toward realizing military goals, and in the future will serve as a factor in increasing constraints on the use of nuclear weapons. These trends will reduce the necessity of using nuclear weapons to attain one's strategic and tactical objectives.

Wang Zhongchun posits that information deterrence is more readily employed in a military scenario than nuclear deterrence, which is more directed at political goals.[113] In an information-based attack, advantages stem from discovering and instantaneously destroying high-value targets. Yet, information-related attacks through such avenues as electronic warfare, computer viruses, software bombs, and the like do not incur the same level of destructive potential and pollution as nuclear weapons.[114]

Wang Zhongchun maintains that there exists a connection between information technology used in advanced warning, command and control, and guidance systems.[115] Still, his analysis lacks a connection between information-based attacks that could trigger a nuclear conflict through disinformation or concerns over rapid preemptive attack. Wang also omits any discussion of space debris and other collateral damage that could result from information warfare in space.

Information Deterrence Under the Nuclear Shadow

In distinguishing between nuclear deterrence and information deterrence, Wang Zhongchun suggests that the two can coexist.[116] In fact, successful implementation of information warfare can ensure the safety and reliability of nuclear weapons systems.

Nuclear weapons may be utilized in information warfare-related scenarios, such as using a nuclear weapon to destroy an enemy's command and control center buried deep underground. Still, he asserts that information-based deterrence could never replace nuclear-based deterrence, as its destructive capacity and potential are nowhere near as great.[117]

Similarly, in Zhang Li, Si Laiyi and Qian Qihu's edited volume (with contributing editors Xue Tong and Sun Chengjie), strategists discuss the inevitability of the current trend toward information warfare under nuclear deterrence.[118] In their view, while the military sphere is increasingly geared toward information warfare, the impact of nuclear weapons on the strategic calculus will persist.

As long as the United States maintains its unilateralist bent and tactical nuclear force restructuring, military

112. According to Wang Zhongchun's understanding, "In the future, the standard for measuring military advantage will no longer be estimated according to how many aircraft carriers, aircraft and tanks a country possesses, but rather how much intelligence acquisition, operationalization and control capabilities it is able to employ." Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 420–23.
113. Ibid., p. 423.
114. Ibid., p. 424.
115. Ibid.
116. Ibid., p. 425.
117. Ibid.
118. Si Laiyi has served as university President at the People's Liberation Army's Science and Engineering University. Zhang Li, Si Laiyi, and Qian Qihu, *Xinxihua zhanzheng zhong de fangyu yu fanghu* [*Defense and Protection in Informationalized Warfare*] (Beijing: PLA Press, 2004), p. 32.

modernization will continue to exist under a nuclear shadow.[119] Qian Shaojun makes the similar assertion in his book *Nuclear Weapons Equipment* that until there is a weapon to replace the function and capabilities of nuclear weapons, nuclear weapons will continue to maintain a central role in deterrence.[120]

Nonetheless, Wang Zhongchun acknowledges that the new generation of high-tech smart weapons, which are conventional in nature but have extensive destructive potential, have already begun to approach the capabilities of small nuclear weapons. Analysts contributing to the volume *Defense and Protection in Informationalized Warfare* envision this transformation toward tactical or "usable" nuclear weapons as a function of U.S. military readjustments.

Thus, Chinese analysts suggest that the United States cannot relinquish its nuclear deterrent, because: 1) even with its absolute advantages in information, the United States is unable to execute comprehensive monitoring of all of the world's nuclear weapons; 2) even with its extensive intelligence gathering, the United States is unable to fully avoid damage or attack by its adversaries; and 3) even with its security measures, the United States is unable to stem the growth of information systems in other countries that may be employed to attack parts of its own information infrastructure.

Missile Defense and Nuclear Deterrence

Aside from information warfare, Chinese strategist writings have concentrated to the greatest extent on the U.S. stance on ballistic missile defense, due to its potential to negate China's nuclear deterrent. Even a limited system is perceived to pose a substantial threat to China's ability to retaliate. Missile defense is described nearly universally in Chinese writings as yet another attempt by the United States to gain absolute security at the expense of other states, in particular negating the nuclear deterrent and self-defense capabilities of China and Russia.[121]

Missile defense's heavy reliance on systems deployed in space and capabilities associated with destruction of mobile targets and missiles in boost phase are interpreted as posing a threat to China's interests over Taiwan and maintenance of strategic stability in the region. Missile defense has been recently cited by Chinese experts as an effort by the United States to change the power balance by adding defensive capabilities to already dominant offensive capabilities.[122]

A number of Chinese analysts have argued that China must be capable of a response to nuclear attack. China cannot eliminate the probability that the United States might employ nuclear weapons against it in a Taiwan Strait scenario, via threat or actual use. They most commonly cite U.S. official reluctance to conclude an agreement on NFU as evidence of this threat.

These concerns directly translate into Chinese tactical and strategic considerations should a conflict break out in the Taiwan Strait.[123] In a further expansion of terminology and capabilities, U.S. weapons sales to Taiwan, including missile defenses, have been referred to by Chinese experts, such as Pan Zhenqiang, as a form of proliferation.[124] In fact, at the October 2008 PIIC conference, one high-ranking Chinese expert claimed that missile defense may be perceived as a new Manhattan Project for the new century that is bigger in scale and potentially more damaging and destabilizing in implications.[125]

119. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 70.
120. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 155.
121. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], pp. 3, 11.
122. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
123. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], pp. 49–50.
124. Panel interview on the CCTV program *Jinri guanzhu* [Today's Focus], in which the author participated during August 2004.
125. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.

Missile Defense Countermeasures

Chinese experts, like Li Bin and Shi Yinhong[126] assert that while U.S. missile defense may erode China's nuclear deterrent and retaliatory capabilities, the likelihood of the United States conducting a nuclear strike against China is constrained by nuclear taboo.[127] Yet, Li Bin argues that nuclear taboo may constrain use, but it will not block the use of nuclear coercion against China. Li asserts that there is always a chance of accidental launch or other irrational uses of nuclear arsenals, requiring a Chinese response.[128]

While Li does not explicitly state these measures, an overview of Chinese strategic writings reveals that a portion of Chinese analysts promote offensive actions, such as supplementing China's ballistic missile arsenal to overwhelm such defenses, while others advocate defensive measures, such as decoys and chaff. Chinese research into hit-to-kill technology and decoys over the past decade also suggests an interest in attempting to match, counter, evade, or all of the above U.S. missile defenses and maintain the credibility of this nuclear deterrent.

In terms of response, one Chinese expert maintained at the 2008 PIIC conference that as long as the United States does not have an operative missile defense system, China will have no need to raise its numbers of nuclear weapons.[129] Another high-ranking Chinese arms control official stated at the conference that regardless of whether missile defense is effective, perceptions are crucial. U.S. missile defense cooperation with myriad countries throughout the world may be perceived as a "new alignment" or "global missile defense." These ties are viewed as destabilizing precedents binding these countries even more inextricably to the U.S. security apparatus and framework.[130]

Views on U.S. and Russian Disarmament

U.S. and Russian Responsibility

Chinese scholars and military specialists for the most part envision arms control and disarmament as a function of the commitments made by the two countries holding the world's largest arsenals: the United States and Russia. Until these two countries make a concerted move toward disarmament, Chinese authors are generally pessimistic about the chances of other countries engaging in similar pursuits.[131]

Yet Wang Zhongchun asserts that the two countries with nuclear arsenals the size of that of the United States and Russia are unlikely to ever relinquish nuclear deterrence.[132] The United States is not only unable to abandon nuclear deterrence, but is also seeking absolute advantages in both offensive and defensive capabilities. And Russia with its economic resurgence, rise in military budget, unwillingness to relinquish its great power status, and various levels of security threats, will continue to maintain nuclear parity with the United States.

Among the factors that will impact global chances for disarmament, Xia Liping cites Russia's loss of its superpower status, economic turbulence, and internal unrest as the rationale behind: 1) the loss of U.S.-Russian counterbalance, 2) decreased chances for nuclear conflict, 3) the belief that both Washington and Moscow consider large nuclear arsenals to be economic burdens, 4) a diminished Russian nuclear arsenal less able to threaten targets in the United States, 5) desire to undertake arms control and disarmament to gain assistance and investment,

126. Shi Yinhong has served as a professor of international relations and director of the Center for American Studies at Renmin University.
127. Li Bin, "Zhongguo he zhanlue bianxi" [Analysis of Chinese Nuclear Strategy], *Shijie jingji yu zhengzhi* [World Economics and Politics], Issue 9 (2006), p. 22.
128. Ibid.
129. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
130. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
131. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 446.
132. Ibid., pp. 333–44.

and 6) realization of a common interest in fighting cross-border proliferation of nuclear weapons.[133]

The U.S. Role

According to Chinese authors, ongoing U.S. dominance of arms control and disarmament initiatives reduces pressure the United States would feel to even contemplate disarmament. This attitude is characterized by U.S. refusal to ratify the CTBT in 1999, its withdrawal from the ABM Treaty in 2001, and the issuance of the 2001 NPR, which advocated deploying a national ballistic missile defense system.[134] Wang Zhongchun has stated that he believes global and regional hegemonism has contributed to the trends of both horizontal and vertical proliferation.

According to Chinese strategists, the United States has yet to effectively reduce the importance of nuclear weapons in its deterrence calculus, even in non-nuclear arenas. As evidence, General Qian Shaojun cites U.S. and British threats during the Iraq War that the nuclear option would remain on the table, even against a NNWS, if chemical weapons were used.[135] This policy contravened China's vision of the centrality of NFU and negative security assurances to effective arms control.

A number of Chinese analysts recommend that China must use its diplomatic resources to cultivate a stand that is flexible and meets some of the demands of the United States, but at the same time gains U.S. concessions.[136] They emphasize the necessity of establishing a unified voice among its arms control and disarmament experts. In these accounts, nuclear weapons are generally not treated as a hindrance to good relations, but rather as a guarantee against undue military or political interference from the United States.

The recent push in the United States from nonproliferation to counterproliferation has lead to Chinese questions over U.S. violations of international law, through such mechanisms as the Proliferation Security Initiative and criticisms of U.S. policy as mired in Cold War thinking and alliances.[137] Yet, there is a dual and often contradictory criticism inherent in these arguments. For some regard the U.S. approach to nuclear deterrence and strategic stability as embodied in its 2001 NPR as changing the rules of the game,[138] while others see this as a return to the kind deterrence employed during the Cold War.[139]

Defense and Protection in Informationalized Warfare maintains that while the threat of a global nuclear war is at its lowest point in history, an increasing number of states are pursuing the nuclear weapons route due to U.S. positions, including its: 1) unwillingness to reevaluate its stance on NFU; 2) maintenance of the nuclear option if faced with a chemical weapons attack; 3) refusal to ratify the CTBT; 4) double standards on policies toward India, Pakistan, Iran, North Korea, and others; 5) use of verification mechanisms for intelligence acquisition; 6) employment of export controls to contain China's rise; 7) unilateralism in world affairs and pursuit of absolute security; 8) combination of information and nuclear deterrence; 9) use of missile defense to negate China and Russia's nuclear deterrent; and 10) research into "miniaturization" (*xiaoxinghua*), "specialization" (*zhuanmenhua*), and "conventionalization" (*changguihua*) or tactical use of new nuclear weapons.[140]

133. Xia Liping, *Yatai diqu junbei kongzhi yu anquan* [*Arms Control and Security in the Asia-Pacific Region*], p. 139.
134. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 334–36.
135. General Qian Shaojun has served as a member of the Chinese Academy of Engineering, and the Standing Commissary of Science and Technology Commission of General Armaments Department of the PLA. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 152.
136. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 50.
137. Liu Huaqiu, ed., *Junbei kongzhi yu caijun shouce* [*Arms Control and Disarmament Handbook*], p. 11.
138. Gao Chaoting and Li Bin, eds., *He junkong yu caijun* [*Nuclear Arms Control and Disarmament*], p. 54.
139. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 163.
140. Zhang Li, Si Laiyi, and Qian Qihu, *Xinxihua zhanzheng zhong de fangyu yu fanghu* [*Defense and Protection in Informationalized Warfare*, pp. 32–36, 213.

The Russian Role

While the brunt of blame for revalidating the importance and utility of nuclear weapons is aimed at the United States, a few authors, like Qian Shaojun, also recognize that Russia is working on miniaturized low-yield nuclear weapons and new weapons designs.[141] Other strategists refer to Russia's efforts to develop missile defenses and engagement in developing and deploying the SS-27 missile to penetrate U.S. missile defenses.

Some Chinese authors have raised the issue of Russia's strategic calculus on nuclear weapons, citing Putin's declaration in 2001 that Russia will continue to use nuclear weapons as its basis for averting war, assuring Russia and its neighbors security and maintaining international peace and security.[142] Qian suggests that Russia's stance stems from the fact that since the end of the Cold War, Russia's gap with Western powers in terms of high-tech conventional weaponry has grown. Russian President Dmitri Medvedev's discussion of upgrading Russia's military by 2020, in terms of missile and space capabilities, also concerns Chinese analysts.

Russia's nuclear weapons have largely taken on the role of deterring or retaliating against high-tech conventional warfare. If an adversary uses conventional high-tech weaponry to attack Russia's strategic nuclear power, including civilian nuclear facilities, or those targets that could result in ecological disaster as in chemical plants or dams, Russia reserves the right to use nuclear weapons to retaliate.[143] Under such developments and conditions as instituted by both the United States and Russia, Qian asserts that the threat of nuclear conflict has not been eliminated, and moreover the threshold for nuclear conflict has been lowered.[144]

Views on Future and New Generations of Nuclear Weapons

Weapons Development

Wang Zhongchun contends that the 1960s arms race between the United States and Russia never really ended. In his view, this is evident in the new strategic triad of the United States, which consists of both offensive and defensive systems,[145] combined with the fact that Russia is also engaged in researching and developing air defense, ballistic missile defense, and space defense as its own strategic triad of aerospace defenses.[146] In targeting weaknesses in U.S. missile defense systems, Russia is also continuing its promotion of new types of nuclear capable missiles.[147] Wang also makes brief references to similar efforts by the United Kingdom and France to develop tactical missile defense systems.[148] Yet, any moves taken by these other powers are often framed as a response to U.S. policy.[149]

Until the United States and Russia change their course on arms control and disarmament, China and the other nuclear powers will not follow suit. According to Wang Zhongchun, the nuclear deterrence structure consists of a series of bilateral relations that ultimately point to the two dominant nuclear arsenals. Such that in this pyramid if India does not give up its nuclear weapons, Pakistan will not; if China does not give up its nuclear weapons, India will not, and if the United States and Russia do not give up their nuclear weapons, China will not.[150]

141. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 153.
142. Ibid., p. 152.
143. Ibid., p. 153.
144. Ibid., pp. 153–54.
145. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 341–42.
146. Ibid., p. 342.
147. Ibid.
148. Ibid.
149. Qian Shaojun, ed., *Hewuqi zhuangbei* [*Nuclear Weapons Equipment*], p. 163.
150. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], pp. 445–46.

Keeping this trend in mind, the authors of *Defense and Protection in Informationalized Warfare* discuss low-yield nuclear weapons research and development that has occurred since September 11, 2001 in the United States.[151] While recognizing that these capabilities are largely a response to threats emanating from non-state group terrorism, at the same time they note the following three perceived arenas of U.S. nuclear development with concern:

- "Miniaturization" (*xiaoxinghua*). With the repeal of the 1994 ban on nuclear weapons with yields lower than 5 kilotons, Chinese authors note how the United States has opened the nuclear playing field on low-yield nuclear weapons development.
- "Specialization" (*zhuanmenhua*). The United States has also been developing nuclear weapons for targeted purposes, such as those that render chemical and biological weapons ineffective, electromagnetic pulse weapons that attack internet and electronic systems, and radioactive nuclear earth-penetrating devices that can reach targets buried deep within the earth.
- "Conventionalization" (*changguihua*). The United States is not alone on this factor of military development and along with Russia and France has engaged in developing its fourth generation of nuclear weapons, including hydrogen metal weapons, guided nuclear weapons, and anti-matter weapons, the first of which have a yield equivalent with twenty-five to thirty-five times that of TNT explosives.[152]

Wang Zhongchun, Pan Qijing and Huang Bo[153] also discuss the future of new types of nuclear weapons systems anticipated that may be developed by the United States, such as warheads that: 1) are low- or adjustable-yield; 2) result in only limited collateral damage; 3) possess special boring capabilities; 3) are capable of hitting within 10 meters of their intended targets; and 4) are accompanied by systems with increased penetration and electronic jamming capabilities.[154]

Wang writes that from October 2003, the U.S. Watts Bar reactor began producing tritium on behalf of the U.S. Department of Energy. He contends that this production means that, after a period of fifteen years, the United States will have all the nuclear material it needs for thermonuclear weapons.[155] In light of such concerns, a high-ranking Chinese arms control official at the October 2008 PIIC arms control conference stated that China itself will not make an official declaration on a moratorium on fissile material production, as such a cessation would have no set definition and might slow progress in achieving negotiations of a FMCT.[156]

The pursuit of information technology and new weapons technology under these programs is seen as likely to lead to the following: 1) the world's nuclear powers will make qualitative, but no longer numerical, increases in weaponry; 2) international arms control will shift from limitations and restrictions on certain kinds of weapons to a comprehensive control framework organization, posing a challenge to the structure and scale of nuclear weapons states nuclear forces; and 3) nuclear powers will place a greater emphasis on new generations of advanced conventional weapons and nuclear weapons research. Under these conditions, and particularly in the United States, Wang Zhongchun asserts that other nuclear powers will not cease their efforts to improve their nuclear deterrent and war fighting capabilities.[157]

151. Zhang Li, Si Laiyi, and Qian Qihu, *Xinxihua zhanzheng zhong de fangyu yu fanghu* [*Defense and Protection in Informationalized Warfare*].
152. Ibid., pp. 34–35.
153. Pan Qijing and Huang Bo, eds., *Hehuasheng wuqi yu fangyu* [*Nuclear, Chemical, and Biological Weapons and Defense*], p. 60.
154. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 430.
155. Ibid., p. 430.
156. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
157. Wang Zhongchun, *Hewuqi, heguojia, hezhanlue* [*Nuclear Weapons, Nuclear Powers, and Nuclear Strategies*], p. 431.

Qualified Optimism

Given these pursuits on the part of the United States and Russia, there is little doubt that the Chinese authors and analysts surveyed were reticent to express unqualified optimism for the future of disarmament. One former high-ranking Chinese military officer argued at the October 2008 PIIC conference that if the United States and Russia were to undertake "deep cuts" that drastically reduce gaps with second-tier nuclear states, the latter could begin to consider such reciprocal efforts. However, he questions whether these reductions would be adequate to serve as a basis for a nuclear-free world.[158]

According to his argument, deep cuts to the U.S. and Russian nuclear arsenals are not a difficult task, as the possession of too many nuclear weapons is already a burden in terms of cost, maintenance, safety, and effectiveness. Both countries could use weapons reductions as an opportunity to focus their efforts more on qualitative nuclear advances and missile defense, with the continuance of an "aggressive nuclear posture."

The Chinese analyst Wu Zhan contends in a 1992 article that ever since the United States and Russia began the START process, China has been under pressure to engage in disarmament activities.[159] But Wu also maintains that under START, the United States and Russia are not engaging in significant reductions, are not including tactical nuclear weapons, and are not ending testing, production, and deployment.[160] Given these deficiencies, China cannot engage in disarmament.

Wu argues that only once the United States and Russia reduce their nuclear force to a level comparable with (but not necessarily the same as) China, can it even contemplate the question of disarmament.[161] However, conditions for China's participation should include a reduction of U.S. and Russian nuclear arsenals by 90–95 percent, as well as an end to testing and production.[162] Only upon reaching this level would China even consider disarmament. But even with these conditions met, he asserts that China would most likely confine its participation to considering an agreement to maintain its arsenal at its current level.

Other Chinese experts surveyed by the author have suggested that if the United States were to come down to approximately 500 nuclear weapons, China would be likely to start to seriously consider its own nuclear reductions. At the same time, they also expressed skepticism that this would occur on the part of either country. Wu Zhan emphasizes that even these measures may not be sufficient because the United States and Russia's arsenals would continue to be greater than that of China. He asserts that disarmament will never constitute a rapid process.

Despite this pessimism, Wu maintains a similar view with the rest of Chinese analysts in asserting that bringing nuclear arsenals down to a low number is attainable. As such, realizing some form of disarmament, even if simply further reductions, is still possible.[163] But he, much like the other Chinese experts surveyed in this paper, submits that as long as nuclear weapons constitute an integral part of U.S. and Russian security policy, disarmament will be a distant and difficult goal to achieve.

The critical perceptions by Chinese experts on arms control and disarmament can be summarized with the following points:

- The Cold War era was marked by the United States and Russia engaging in an arms race and attempting to avert nuclear war, while arms control initiatives in the post–Cold War era target horizontal proliferation among developing countries, including China.
- The United States has no incentive to eradicate its nuclear arsenal as long as it remains part of an interna-

158. Presentation (not for attribution) at the 11th PIIC Conference, October 2008, Qingdao.
159. Wu Zhan has served as senior fellow at the Chinese Academy of Sciences. Wu Zhan, "Hecaijun de jinzhan" [Progress in Disarmament], *Meiguo yanjiu* [American Studies] 6 (Autumn 1992), pp. 39–40.
160. Ibid.
161. Ibid.
162. Ibid., p. 40.
163. Ibid.

tional structure in which it serves as hegemon and does not face any adversary capable of balancing it.

- The United States continues to place nuclear weapons at the forefront of its security doctrine, claiming threats from rising powers, deterring chemical, biological, and other attacks and increasing research into their tactical uses.
- Relinquishing nuclear deterrence consists of a series of bilateral relationships, such that if one state is unwilling to disarm, other states will follow suit, e.g. if the United States does not, then Russia will not, and if China does not, then India will not.
- Verification is accepted as an important part of any functioning regime, yet remains a major issue for China, due to concerns over potential espionage, fairness, and implementation.
- Intransigence on the part of the United States in participating in negotiations and re-evaluating its previously held stands on issues like NFU is faulted for stagnation in the arms control regime.
- Export controls are a growing arena of cooperation, yet concerns remain that restrictions, particularly on the part of the United States with sanctions, adversely and unfairly impact China's overall development.
- U.S. double standards on what is and is not acceptable when it comes to nuclear weapons and nuclear aspirations (as in the treatment of India and Iran) are having a negative effect on U.S. policy and the health of the global nonproliferation regime.
- The United States is pursuing absolute security in the international sphere, at the expense of other powers, yet even with the eradication of nuclear weapons, U.S. dominance in conventional weaponry means that the United States would not only retain but also strengthen its global hegemony.
- U.S. nuclear doctrine is shifting away from numeric superiority and increases to qualitative improvements and tactical contingencies, lowering the threshold on nuclear weapon use.
- Neither the United States nor Russia is currently willing or capable of relinquishing its reliance on nuclear deterrence, as evidenced by the U.S. threat to use nuclear weapons in retaliation for a chemical attack during the war in Iraq and Vladimir Putin's statement in 2001 regarding the centrality of nuclear weapons.
- Nuclear weapons are connected to information warfare operations in that this form of warfare would occur under the "nuclear shadow."
- U.S. missile defenses threaten China's ability to launch a nuclear counterstrike, thus potentially negating its nuclear deterrent.
- China still faces threats from accidental nuclear launches, irrational leadership behavior, and theft or sabotage of nuclear materials and equipment, as well as WMD terrorism threats that may be associated with external incidents flowing into China, Xinjiang, and Taiwan.
- Concerns remain that China's neighborhood is filled with nuclear powers and aspirants, as with the declared powers of Russia, Pakistan, India, and North Korea, as well as South Korea's nuclear related research and Japan's latent nuclear weapons potential.
- The new strategic triad proposed in the 2001 NPR is a shift toward making nuclear weapons tactical and more usable in certain conflict scenarios, thereby lowering the threshold for nuclear escalation in battle.
- Unless the United States and Russia are willing to take the first and most significant steps in timing, scale, and scope on disarmament, China is unlikely to follow suit. Moreover, China would likely denounce such moves as attempts to contain it and the developing world.

Conclusion

In conducting and editing this survey of more than fifty Chinese arms control and military analysts, one aspect that becomes apparent is the often-conflicted stance that China continues to maintain with the arms control and disarmament regime. China rhetorically lauds its position as an active and responsible participant, while its analysts criticize the fact that the arms control burden has shifted to the developing world, with China bearing a disproportionate share.

Increased pressure through sanctions, export controls, and treaties serving the interests of the United States continue to receive mention in Chinese-language analysis and are seen as leading to tension with China. Chinese analysts see loopholes in treaties and agreements like START as signifying a lack of commitment to and real headway in nuclear reductions, with qualitative advances merely replacing quantitative ones.

Chinese analysts continue to see disarmament as the ultimate goal but remain largely skeptical of its current feasibility. Wang Zhongchun, Wu Zhan, Huang Bo, and Pan Qijing, among others, see nuclear deterrence as remaining an integral part of U.S. and Russian security policies for some time to come. These analysts maintain that neither power has the psychological or physical capabilities necessary to entirely relinquish its nuclear force.

Furthermore, Chinese analysts point out that thanks to U.S. conventional military superiority, disarmament will actually benefit the United States and strengthen its global hegemonic position. Thus, many Chinese experts assert that the problem remains not with nuclear weapons quantity, but with their qualitative capabilities and intent. According to the view of Chinese analysts, "miniaturization," "specialization," and "conventionalization"—all of which the United States is perceived as pursuing—contribute to a new generation of nuclear weapons that is more advanced and more likely to be used. Combined with U.S. attempts to engage other countries in missile defense and other global security initiatives, these measures are seen as part of ongoing U.S. attempts to secure "absolute security" and "absolute nuclear advantage" at the expense of other countries.

Thus, while China generally advocates a multilateral format for any negotiation, Chinese analysts are generally uniform in advocating a largely bilateral concession on the part of the United States and Russia to start the process and begin moving toward disarmament from the top of the pyramid downward. In taking these first steps, the United States and Russia are expected to demonstrate not only a rhetorical, but also a physical, commitment to realizing a nuclear-free world.

In sum, Chinese analysts maintain that disarmament must be achieved both in terms of nuclear force structure and doctrine. Drastically drawing down nuclear weapons numbers, committing to the NFU principle, renouncing tactical nuclear weapons research, and ceasing missile defense pursuits are all frequently mentioned as behavior that Chinese analysts await from both the United States and Russia, in particular on the part of the United States.

Whether or not these perceived areas of concern are valid, understanding these perceptions is crucial to comprehending China's stance and behavior in arms control. Until some or all of these concerns are addressed through dialogue or action, Chinese analysts are loathe to even mention China's role in the process, much less advocate its active participation in global disarmament.

The Evolving Role of Nuclear Weapons in Russia's Security Policy

Nikolai N. Sokov

Three Roles of Nuclear Weapons

Nuclear weapons have three partially overlapping roles in Russian national security policy: as a status symbol; for existential deterrence; and for use under certain specific contingencies, first and foremost to deter large-scale use of conventional forces against Russia by the United States and NATO.

Status Symbol

The role of nuclear weapons as a symbol of status is quite straightforward, although rather difficult to define in clear-cut, unambiguous terms. Its status as a recognized nuclear weapon state and its permanent seat on the UN Security Council (coupled with the right of veto) are the most visible, and perhaps the only, remaining vestiges of Moscow's great-power ambitions. In part, this self-image satisfies the nostalgia—particularly widespread among the public—for the Soviet Union's place in the Cold War international system, second only to the United States with the hope of becoming the leader.

More importantly, Moscow's nuclear status fits very well with the forward-looking conceptualization of the emerging post–post–Cold War (to borrow Colin Powell's term) international system as multipolar, in which Russia sees itself as one of the centers of power and influence. It should be noted, however, that the term "multipolarity" is seriously misused in Russia,[1] and in fact when Russian leaders talk about multipolarity, they appear to mean a "concert"—a system similar to the 1815 Vienna Congress arrangements. They see the future international system as based on a consensus of key players—countries with the greatest economic and military power. In that conceptualization, Russia is accorded the place of one of the pillars of the emerging system—a state with special rights and responsibilities. Although Moscow recognizes—and welcomes—new permanent members of the UN Security Council (UNSC) beyond the current five (such as India, Germany, Japan, Brazil, etc.), it is also keen on preserving certain special privileges. For example, when Foreign Minister Sergey Lavrov, during a 2008 visit to India, listed that country as a potential new permanent member of the UNSC, he cautioned that only "old" permanent UNSC members should keep the right of veto.[2]

The prospect of nuclear disarmament puts Russian leaders in a rather awkward situation. On the one hand, they cannot question the legal (under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons) or the moral

1. For an early critique of the Russian concept of "multipolarity," see Nikolai Sokov, "Mnogopoluysnyi Mir v Zerkale Teorii Mezhdunarodnykh Otnoshenii" [The Multipolar World Reflected in the Mirror of International Relations Theories], *SShA: Ekonomika, Politika, Ideologiya* [*Journal of the Institute of USA and Canada Studies, Russian Academy of Sciences*], No. 7, 1998, pp. 19–27; No. 8, 1998, pp. 19–31. For the latest Russian critique of this concept, see Vladislav Inozemtsev, "Mechty o Mnogopoluysnom Mire" [Dreams about a Multipolar World], *Nezavisimaya Gazeta*, September 18, 2008; Aleksandr Konovalov, "Mir Ne Dolzhen Byt Mnogopolyarnym" [The World Must Not Be Multipolar], *Nezavisimaya Gazeta*, September 16, 2008.
2. Transcript of the press conference of Minister of Foreign Affairs of the Russian Federation with Russian media, New Delhi, October 20, 2008, document 1650-22-10-2008, <www.mid.ru/brp_4.nsf/2fee282eb6df40e643256999005e6e8c/168f10e1ae44dd7dc32574ea0041988a?OpenDocument>, in Russian.

obligation to disarm. On the other hand, elimination of nuclear weapons would deprive Russia of one of its key status symbols. Speaking in February 2008 at the Conference on Disarmament in Geneva, Sergey Lavrov endorsed the nuclear disarmament initiatives of George Schultz, William Perry, Henry Kissinger, and Sam Nunn, but in a rather half-hearted manner and referred to the total elimination of nuclear weapons as a long-term prospect.[3] The apparent contradiction is resolved, it seems, by postponing the final solution into a distant future.

Existential Deterrence

"Existential deterrence" refers to a general, vague notion that no rational country or alliance, including the United States and NATO, will attack Russia because Russia can respond with nuclear weapons. This is a guarantee against a threat that, for all intents and purposes, does not exist: since the end of the Cold War all policy guidance documents in Russia have stated that the threat of a global war is very low, practically nonexistent. As a result, nuclear weapons are often portrayed as a "just-in-case" deterrence for the unlikely situation when, some time in the indefinite future, the United States or another powerful country or coalition becomes deeply hostile to Russia with the intensity of conflict comparable to the Cold War period.

At a deeper psychological level, reliance on nuclear deterrence reflects uncertainty about an unpredictable international environment and a lack of confidence in Russia's power and influence. Nuclear weapons played a similar role during the Cold War: a prop for a country that sensed—more or less acutely, depending on the decade—that the enemy (the United States and the Western community in general) was too powerful. The trauma of the 1990s, when Russia suddenly found itself weak and vulnerable, transformed the role of that prop. While war with the United States was no longer regarded as imminent, the psychological need for the ultimate security guarantee remained and was perhaps even reinforced. The need for that "prop" should disappear if the place of Russia in the emerging international system becomes clearer and, especially, if Russia becomes more deeply integrated into the global economy.

The latter process has been developing reasonably well—if not smoothly—where relations between Russia and the European Union are concerned. Already today many EU states (in particular, the "Old Europe") are reluctant to enter into a conflict with Russia, while Moscow is equally reluctant to enter into a conflict with them. The U.S.-Russian relationship, unfortunately, does not have a solid economic foundation yet, and consequently political and security relations lack stability. The need for stronger interdependence is further reinforced by the belief of Russian leaders (particularly strong among the Putin and Medvedev generation) that economic interdependence is central to cooperation and war prevention; this belief was borrowed from American political science literature during the formative years of that generation in the 1970s and 1980s.

Another complicating factor is the weakness of Russia's economic and political levers of influence in the international arena. Although Russia's role as a major source of oil and gas for Europe is usually regarded as a powerful leverage, this tool is a double-edged sword: an attempt to use it could harm the most important source of revenue for the government and private (semi-private) business and cause its customers to try to diversify energy purchases, thereby eliminating Russian profit.

Instead, Moscow is trying to build a reputation as a reliable supplier and has been reluctant to even hint at interruption of exports. The fact that dependence on Russian oil and gas exports does not defrost the rather cold, sometimes even hostile, attitude of East European countries (such as Poland) toward Russia suggests that the utility of this dependence as a political lever is very limited. Seen through Russian eyes, the potential leverage is very tenuous because Russian exports actually depend on other countries—on Ukraine to provide the main transit route and on countries in Central Asia as important sources of natural gas that is re-exported to Europe. Thus, instead of using oil and gas exports as a lever, Moscow has to fight to hold onto its market against alternative routes (across the Caspian Sea and South Caucasus).

Particularly traumatic for Russia were several crises in relations with Ukraine, when transit to Europe was interrupted. In Moscow's eyes, these crises were the fault of Ukraine, but the Europeans put the blame for the first such

3. Roman Dobrokhotov, "Obezoruzhivauyshchie Argumenty" [Disarming Arguments], *Novye Izvestia*, February 13, 2008.

crisis, in 2006, squarely on Russia's doorstep and blamed both Russia and Ukraine for the second. These crises created an acute sense of dependence in Russia and a desire to build an alternative route through the Baltic Sea and the Balkans. Strong objections to that alternative by Poland, the Baltic states, and Nordic countries have only reinforced the feeling of vulnerability and the perception that some countries (in particular, the "New Europe") seek to preserve Russia's dependence on transit states, such as Ukraine.

The weakness of non-military levers and the perceived dependence on largely unfriendly post-Soviet and former Warsaw Pact states serve to enhance the relative value of military instruments of influence, including nuclear weapons, in Moscow's overall security strategy.

Deterrence of Conventional Attack

As long as nuclear weapons and the research and industrial infrastructure supporting them continue to exist, political and military planning for their use must take place. Planning for nuclear use involves development of scenario-specific missions that pit nuclear assets against real or perceived threats. These missions provide formal rationale for continued maintenance of nuclear capabilities, for distribution of targets, for posture planning, as well as for research and development. The underlying assumption of this type of planning is the belief that certain threats are difficult or even impossible to counter with non-nuclear assets or that non-nuclear assets are less reliable or effective.

At the center of nuclear planning in today's Russia is concern about U.S. and NATO conventional superiority—a reversal of the image that underpinned NATO military planning during the Cold War. Although a large-scale attack by the United States and NATO is widely regarded as improbable, the threat of superior force could, according to the logic prevalent in Moscow, be used to extract political or economic concessions. A long series of limited wars (the 1991 Gulf War, the use of force in Bosnia, the war in Kosovo, the war in Iraq) have demonstrated, in the view of Russian policy makers and elite, that: (1) U.S. conventional power vastly surpasses anything that Russia has or might hope to have in the foreseeable future, both in technological level and in sheer numbers; and (2) that the United States is prone to use that force with few second thoughts. The continuing weakness of Russian conventional forces vis-à-vis U.S. and combined NATO power, as well as the close proximity of NATO forces to Russian territory (making limited use of force both more feasible and more effective), have led Russian military planners to rely on nuclear weapons for the purposes of de-escalation—the threat of a limited nuclear strike in response to a conventional attack that cannot be repelled by conventional forces is supposed to deter the attack in the first place.

A relatively recent new concern is the deployment of U.S. missile defense, which eventually could, in theory, intercept a Russian nuclear second strike and thus undermine both the "existential deterrence" capability and the de-escalation mission. Deployment of missile defense leads Russian military planners to suspect that the United States intends to "make the world safe for conventional war." Since they regard Russia's conventional capability as weak, this analysis only serves to enhance the perceived value of nuclear weapons for Russia.

Finally, there is the emerging issue of China, which Russians rarely discuss openly. While the two countries are close partners on a broad range of issues, have solved outstanding problems (border demarcation in particular), and are expanding their economic relationship, many in Russia worry that the partnership might not survive continued growth of China's economic, political, and military power. Nuclear weapons are regarded as "just-in-case" protection against the possibility that China becomes a foe or attempts to transform Russia into a subordinate power.

Reducing reliance on nuclear weapons for deterrence of superior conventional forces is particularly difficult because the threats they are supposed to counter are regarded as real and sufficiently serious to warrant a nuclear response. Policy makers who attempt to move away from scenarios that involve the use of nuclear weapons immediately become vulnerable to accusations of putting the nation's core security interests at risk.

Two options for decreasing reliance on nuclear weapons in this ("de-escalation") category appear available.

The first is to substitute nuclear with conventional assets. This policy was officially proclaimed by Russia in the

2000 National Security Concept, which explicitly states that reliance on nuclear weapons will continue until conventional forces are sufficiently modernized to shoulder the burden of providing for the nation's security.[4] This option is time- and resource-consuming, however. The latest plan for military posture development foresees rearmament of the Russian Armed Forces by 2020,[5] meaning that at least until that time Russia will continue relying on nuclear weapons for certain threat scenarios. Furthermore, many doubt—with good reason—that Russia will ever be capable of developing its conventional capability sufficiently to fight the United States and NATO or, for that matter, China.

More importantly, the asset-substitution method effectively freezes the same kind of relationship and the same types of conflicts that made reliance on nuclear weapons seem necessary. This could set a poor example for states that perceive a need to balance a superior conventional power and could potentially lead to a resumption of reliance on nuclear weapons by Russia or another state.

The second scenario involves the removal or at least mitigation of the threats that underlie nuclear scenarios. This option is inherently difficult because underlying conflicts and threat perceptions must be addressed, but it is perhaps more feasible than it appears at first glance. The norm against nuclear use or the threat of nuclear use is quite strong in all nuclear weapon states and around the world. Consequently, nuclear threats are not a very credible way to meet real or perceived threats, and, indeed, many Russian experts question the reliability of the threat of nuclear use in response to a conventional attack.[6] Also, one does not need to solve each and every problem; while it is hardly possible to achieve complete harmony, it seems feasible to lower the perception of external threat sufficiently to make reliance on nuclear weapons seem excessive. In the end, the security situation has to be improved just enough to facilitate a change in the domestic political lineup so that "pro-nuclear" groups do not hold the veto over decision making on this issue. Then, if the political leadership decides to minimize reliance on nuclear weapons, it will be able to do so.

Where Russia is concerned, for example, this option will entail a new Conventional Armed Forces in Europe Treaty, together with a large package of confidence-building measures so that opponents of the "nuclear option" in Moscow can argue that reliance on nuclear weapons is no longer necessary even without a major increase of spending on conventional forces.[7]

It is also advisable to seriously consider alternative ways to improve security, such as enhancing the role of international law and giving more weight to international organizations, including multilateral bodies that can provide independent assurances that security treaties are implemented. While international law is hardly a panacea, unilateral approaches to ensuring national security will not suffice in the long run either.

The remainder of this paper will concentrate on an analysis of the scenario-specific nuclear missions that underlie military and nuclear posture planning in Russia. This analysis will seek to understand the underlying threats, the scenarios for use, as well as possible future developments in Russian nuclear strategy.

The 1993 Military Doctrine: Nuclear Strategy, 1993–1999

The end of the Cold War made the main mission of Russian nuclear weapons, deterrence of the United States, obsolete almost overnight. As the United States and Russia proclaimed the goal of becoming partners, the first military

4. "Kontseptsiya Natsionalnoi Bezopasnosti Rossiiskoi Federatsii" [National Security Concept of the Russian Federation], January 10, 2000.
5. "K 2020 godu Vooruzhennye Sily Nuzhno Kompleksno Osnastit Novym Vooruzheniem—Medvedev" [By 2020 Armed Forces Must be Comprehensively Equipped with New Armaments—Medvedev], RIA-Novosti, September 26, 2008; Vera Sitnina, "Voina Mozhet Vspykhnut Vnezapno" [War Could Break Out Any Time], *Vremya Novostei*, September 29, 2008; Nikolai Poroskov, "Silovaya Ustanovka" [Emphasis on Power], *Vremya Novostei*, September 30, 2008.
6. See the papers by Vladimir Dvorkin and Pavel Zolotarev written for this project and included in this publication.
7. For arguments in favor of that approach, see Rose Gottemoeller, "Russian-American Security Relations After Georgia," Carnegie Endowment for International Peace, Policy Brief No. 67, October 2008.

doctrine of Russia, which was published in 1993, estimated the risk of a large-scale global war as very low, even negligible.[8] While the 1993 doctrine is remembered now mostly for the reversal of the Soviet no-first-use policy (it implicitly allowed for a nuclear response to a conventional attack), it did not assign any specific missions to nuclear weapons and did not define any threats to which nuclear weapons were supposed to respond. The role of nuclear weapons was thus essentially reduced to that of status symbol and existential deterrence—a "just-in-case" asset that did not have a clear-cut role in the country's security strategy. Reliance on nuclear weapons was thus at its lowest level in the early 1990s.

The profile of nuclear weapons increased in the middle of the 1990s in the context of the first wave of NATO enlargement. The movement of NATO toward Russian borders elicited concern that the alliance was becoming capable of using force against Russia—perhaps not on a global scale, as during the Cold War, but for limited objectives. The talk in Moscow was about NATO "encircling" and "cornering" Russia. NATO assurances that the alliance was not a threat and that no military action against Russia was foreseen were dismissed; Russian leaders claimed that NATO had not sufficiently transformed and that it remained a threat or could become one in the future.

Deterrence of a limited conventional attack on Russia presented a conceptual challenge since Russian conventional forces were in a progressively worsening state, while the nuclear arsenal inherited from the Soviet Union had been streamlined for the mission of "core deterrence." Deterrence of a large-scale conventional attack began to emerge as a new mission for nuclear weapons that was outside the purview of the operational (1993) Military Doctrine.

Together with the mission went the search for assets capable of supporting it. It was at that time that interest in tactical nuclear weapons resurfaced, as those assets came to be seen as more appropriate for theater-level conflicts. The Russian Navy was at the forefront of those demanding the deployment of tactical nuclear weapons, even though such a step would have contradicted the unilateral political obligations announced by Mikhail Gorbachev in the fall of 1991 and confirmed by Boris Yeltsin in January 1992. In 1996, former Minister of Atomic Energy Viktor Mikhailov proposed the development of a new generation of nuclear warheads with low yields and reduced radiation emission, which supposedly would make them more "usable" than existing types.[9]

The interest in a new role for nuclear weapons was short-lived, however, and the Russian government never formalized these new missions. The NATO-Russia Founding Act signed in May 1997 helped to alleviate concerns about NATO enlargement, at least temporarily. The U.S.-Russian Helsinki summit meeting in March 1997 opened the prospect that a future Strategic Arms Reduction Treaty (START) III would address the U.S. weapons that Russia considered particularly dangerous: long-range conventional air-launched cruise missiles (ALCMs) and sea-launched cruise missiles.

In 1997 and 1998 the Russian government adopted a series of documents that reinstated the earlier view of nuclear weapons. The National Security Concept (December 1997) and several decrees signed by Boris Yeltsin in July and August 1998[10] reaffirmed the role of nuclear weapons as existential deterrence and formalized the abandon-

8. "Osnovnye Polozheniya Voennoi Doktriny Rossiiskoi Federatsii" [Basic Provisions of the Military Doctrine of the Russian Federation], *Izvestiya*, November 18, 1993, pp. 1, 4.
9. Viktor Mikhailov and Aleksandr Chernyshov, "NATO's Expansion and Russia's Security," *Vek*, September 20, 1996, p. 5.
10. The text of the 1997 National Security Concept (in Russian) can be found at <www.armscontrol.ru/START/Rus/docs/snconold.htm>. The 1998 decisions included Boris Yeltsin's July 1997 decree, "On Urgent Measures Toward Reforming the Armed Forces of the Russian Federation," and two Security Council documents: "The Concept of Development of Nuclear Forces until 2010," and "The Foundations (Concept) of State Policy in the Area of Defense Development until 2005" (July–August 1998). The texts of these documents are classified, but their general thrust can be gleaned from newspaper publications. See "Sovet Bezopasnosti RF Reshil Sokhranit Trekhkomponentnyi Sostav Strategicheskikh Yadernykh Sil" [Russia's Security Council Decided to Keep the Strategic Triad of Nuclear Forces], Interfax Daily News Bulletin, No. 4, July 3, 1998; "Russia to Be Major Nuclear Power in 3d Millennium—Official," ITAR-TASS, July 3, 1998; Ivan Safronov and Ilya Bulavinov, "Boris Yeltsin Podnyal Yadernyi Shchit" [Boris Yeltsin Has Raised the Nuclear Shield], *Kommersant-Daily*, July 4, 1998; Yuri Golotuyk, "Yadernoe Razoruzhenie Neizbezhno" [Nuclear Disarmament Is Inevitable], *Russkii Telegraph*, July 11, 1998; Yuri Golotuyk, "Moskva Skorrektirovala Svoi Yadernye Argumenty" [Moscow Adjusts Its Nuclear Arguments], *Russkii Telegraph*, July 4, 1998; Anatoli Yurkin, "Perspektivy Voennogo Stroitelstva" [Prospects of Posture

ment of mutual assured destruction as the dominant nuclear strategy. Yeltsin's decrees provided for deep reductions of the Russian nuclear arsenal—weapons were supposed to be retired as their service lives expired (that is, at a very high pace) and for limited-scale replacement.

Yet, despite the official moves reinstating earlier views of nuclear weapons, the debate of 1996–97 had other important consequences as well. It helped propel nuclear weapons into the center of attention, if only for a limited time, and created a perception that they could address specific security concerns, i.e., their role could go beyond existential deterrence.

The 2000 Military Doctrine: Nuclear Strategy, 1999–Present

The origins of Russia's present-day nuclear doctrine date to the war in Kosovo in the spring of 1999. That war revived and vastly strengthened the impression that NATO had few qualms about using force and that Russia was not necessarily immune to it. Furthermore, the war in Kosovo demonstrated that Russia's veto in the UNSC could not prevent the United States and/or NATO from using force whenever and wherever they thought necessary. At that time it was already clear that the war in Chechnya would sooner or later resume (as it did at the end of 1999) and that Russia would find itself in the same position as Serbia vis-à-vis Kosovo.

The starting point for the development of a new nuclear doctrine was apparently a meeting of the Russian Federation Security Council in April 1999, the first chaired by Vladimir Putin as council secretary.[11] The key elements of the new approach were tested in May 1999 during a large-scale exercise dubbed "West-99," which simulated a Kosovo-size and -capability NATO attack on Kaliningrad oblast, the Russian exclave between Poland and Lithuania. According to the scenario, after three days of defensive action, to avoid defeat Russian troops resorted to a limited nuclear strike (four warheads) using long-range ALCMs from heavy bombers.

Thus, the exercise for the first time put the new, "de-escalation" mission of nuclear weapons into practice. The new strategy proceeded from the assumption that a relatively limited conventional attack by a major power (the military doctrine clearly assumed the United States and NATO) cannot be deterred solely with conventional forces, but a credible threat of a limited nuclear strike could achieve that task.

The new role of nuclear weapons was formalized in the January 2000 National Security Concept and the April 2000 Military Doctrine.[12] The strategy was further refined over the course of the next few years with the finishing touches made public in its final form in a White Paper adopted in the fall of 2003.[13]

The new scenario was unthinkable during the Cold War. In the past, almost any conflict with the United States and NATO was fraught with escalation to World War III—a large-scale exchange with nuclear strikes that would result in damage that would be unacceptable to the superpowers, their allies, and the entire world. The threat of immediate escalation was based on the extremely high perceived stakes in such a conflict: the survival of the political and socio-economic system of each party. This effectively made any scenarios involving limited nuclear strikes unrealistic—immediate escalation to the strategic level was unavoidable. A comparison of two declassified documents from the 1960s illustrates this point. A U.S. document adopted in the early 1960s, when the United States still en-

Policy], *Krasnaya Zvezda*, August 5, 1998, pp. 1, 3; Oleg Falichev, "Vpervye So Vremeni Miluykovskikh Reform" [For the First Time Since Miluykov Reforms], *Krasnaya Zvezda*, August 18, 1998, pp. 1, 2.

11. For details of this meeting, see Nikolai Sokov, "The April 1999 Russian Federation Security Council Meeting On Nuclear Weapons," NIS Nuclear and Missile Database, Center for Nonproliferation Studies, Monterey Institute of International Studies, June 1999, <www.nti.org/db/nisprofs/over/rfsecmtg.htm>.

12. National Security Concept of the Russian Federation, January 2000, and Military Doctrine of the Russian Federation, April 2000.

13. "Aktualnyye Zadachi Razvitiya Vooruzhennykh Sil RF" [Immediate Tasks of Development of the Armed Forces of the Russian Federation], October 2, 2003.

joyed nuclear superiority, allowed for limited use of nuclear weapons in response to a limited conventional offensive of Soviet troops on the assumption that such a threat would force the Soviets to abandon aggressive plans and retreat. The Soviet document, in contrast, treated limited nuclear war plans as an attempt to limit damage to U.S. national territory and proposed immediate escalation—a strike with all available nuclear weapons against U.S. territory to ensure that the United States would be unable to "win" a limited war.[14]

Today the stakes are more limited, albeit still significant. Russian analysts suspect the United States intends to constrain Russian foreign policy, deny Moscow its areas of traditional influence, and control natural resources both in the vicinity of Russia and even inside it, among other things. Until the middle of the current decade Russian political and military leaders were concerned about Western interference in the conflict in Chechnya. Following the "Rose Revolution" in Georgia and the "Orange Revolution" in Ukraine in 2003 and 2004, respectively, a new concern, which subsided only a year or two ago, was about U.S. attempts to encourage domestic opposition to change the ruling elite. Seen from the Russian perspective, NATO enlargement, deployment of missile defense, support for leaders in Georgia and Ukraine who are regarded in Moscow as anti-Russian, and other similar policies point at intentions that are hostile to Russia as a state as well as to the existing government and political system (to the extent that the two can be differentiated). Key to the suspected U.S. designs is overwhelming conventional superiority, both in numbers and especially in technology, the threat of which Russia cannot credibly deter in the foreseeable future. Hence its reliance on limited use of nuclear weapons.

These perceptions have been reflected in statements at the highest levels. In the fall of 2004, President Vladimir Putin spoke openly about the desire of unnamed countries to "tear juicy morsels" from Russia.[15] A deputy chief in Putin's administration, Vladislav Surkov, talked about a "secret war" against Russia waged by "those in the United States, Europe, and the Orient, who still view Russia as an enemy."[16]

The underlying assumptions, to the extent that they can be teased out from the pronouncements of officials, expert analyses, and interviews, boil down to two points.

First, the stakes in any potential conflict are lower than during the Cold War. Consequently, the threat of a large-scale nuclear strike by Russia in response to these encroachments will not be credible and will fail to deter.

Second, and perhaps the most important feature, is the asymmetry of the stakes involved. They are very important to Russia but are less important for the United States. The latter could, theoretically, threaten the use of force under certain circumstances, but will hardly risk even a limited nuclear exchange over conflicts like Chechnya or Georgia. Russia, in contrast, could escalate to a nuclear level over issues it finds important. That is, the asymmetry of stakes creates an asymmetry of resolve.

While the United States clearly dominates the list of threats that require reliance on the threat of a limited nuclear strike, the Russian military has apparently considered a broader application of this approach. Discussing external threats in 2007 in the context of a revision of the 2000 Military Doctrine, Chief of the General Staff Yuri Baluevski said that a new threat that is potentially equal in scale and seriousness to the one emanating from the United States emanates from "developing countries, some of which have large, well-armed militaries."[17]

14. "A Study of the Management and Termination of War with the Soviet Union, Prepared by the Staff of the Net Evaluation Subcommittee of the National Security Council," November 15, 1963, Top Secret (declassified in 1997); National Archives, Record Group 59, Department of State Records, Records of Policy Planning Council, 1963–64, box 280, file "War Aims" and "Material on the Development of Military Art under Conditions of Conducting a Missile-Nuclear War According to Contemporary Views," a letter from Petr Ivashutin to Mikhail Zakharov, August 28, 1964, No. 1689c, Top Secret (available from the Center for Security Studies and Conflict Research, Zurich, <www.isn.ethz.ch/php/documents/collection_1/docs/ivashutin-I.pdf>.

15. Address by Vladimir Putin, Moscow, Kremlin, September 4, 2004, <president.kremlin.ru/eng/speeches/2004/09/04/1958_type82912_76332.shtml>.

16. Interview with Deputy Chief of the Presidential Administration Vladislav Surkov, *Komsomolskaya Pravda*, September 29, 2004.

17. Yuri Baluevski, Speech at the Academy of Military Sciences, January 2007. The full text of Baluevski's speech was

Enhanced reliance on nuclear weapons is reflected in the expansion of the types of conflict associated with possible nuclear use. The 2000 Military Doctrine distinguishes four types of warfare:

- armed conflict (primarily ethnic or religious in origin, waged inside the country; other states might be involved indirectly);
- local war (one or several states as opponents; the scope and goals of the conflict are limited);
- regional war (attack by a state or a coalition of states pursuing significant political goals); and
- global war (attack by a coalition of states; survival and sovereignty of Russia are at stake).

Whereas prior to 2000 nuclear weapons were associated only with the fourth, highest type of conflict, the 2000 Military Doctrine added the third type, regional war. An authoritative military publication at the time said that the most likely escalation path would be from the first type directly to the third type of conflict.[18] Effectively, this meant that outside interference in the "antiterrorism operation" in Chechnya risked escalation to the nuclear level. Following a statement made by Sergey Ivanov at the London International Institute of Strategic Studies in summer 2004 that nuclear weapons and nuclear deterrence are the foundation of global stability, the official journal of the Ministry of Defense classified deterrence of regional conflicts as a component of "global deterrence" and reiterated the role of nuclear weapons as an "asset of last resort" in regional wars.[19]

The limited-use scenario necessarily implies a strong strategic deterrent capability and remains a powerful stimulus to maintain and modernize a credible strategic force. Without it, the credibility of a Russian threat of limited nuclear use and the entire scheme of deterring regional wars would be undermined. An article in the official journal of the Ministry of Defense explicitly argued that the credible threat of escalation to the strategic level was also a necessary condition for effective use of Russian conventional forces in a regional conflict; conversely, strong conventional forces enhance the credibility of strategic nuclear deterrence.[20] This line of thinking brings to mind early Cold War U.S. documents, in particular NSC-68, which in the 1950s postulated a similar relationship between nuclear deterrence and conventional forces.[21]

The perceived need in credible strategic deterrence (together with the status role of nuclear capability) is the main reason for continued modernization of strategic weapons. The bulk of the existing strategic capability consists of delivery vehicles produced during the Soviet period; their service life is being extended from one year to another (most are five to ten years beyond the original service life), but this cannot continue indefinitely. Without production and deployment of new missiles and submarines, Russia is likely to lose strategic capability as early as the middle of the next decade or, at maximum, by 2020. The Strategic Rocket Force, which is comprised of land-based long-range missiles, deploys a new single-warhead Topol-M intercontinental ballistic missile (ICBM) in two basing modes (silo and mobile) and is preparing to deploy a MIRVed (multiple independently targetable reentry vehicle) ICBM RS-24 starting probably in 2010. The Navy continues work on a new submarine-launched ballistic missile (SLBM), *Bulava*, although this program is running late and at least half (and probably nearly all) tests of the new missile have failed.

---

published about two weeks after the conference. See *Voenno-Promyshlennyi Kurier*, January 31, 2007. See also Vadim Solovyov, "Voennaya Reforma Obyavlena Bessrochnoi" [Military Reform Has Been Declared Unending], *Nezavisimoe Voennoe Obozrenie*, January 26, 2007.

18. V. Prozorov, *Yadernoe Sderzhivanie v Teorii Primeneniya RVSN* [Nuclear Deterrence in the Theory of Use of the SRF], (Moscow: Pyotr Veliki Military Academy, 1999), p. 19.

19. On Sergei Ivanov's statement at the International Institute of Strategic Studies, see "Sergey Ivanov: Terrorizm Iskhodit ot Nesostoyavshikhsya Gosudarstv" [Sergey Ivanov: Failed States are the Source of Terrorism], Strana.ru Information Service, July 13, 2004; A. Khryapin and V. Afanasiev, "Kontseptualnye Osnovy Strategicheskogo Sderzhivaniya" [Conceptual Foundations of Strategic Deterrence], *Voyennaya Mysl*, January 2005.

20. Khryapin and Afanasiev, "Kontseptualnye Osnovy Strategicheskogo Sderzhivaniya."

21. "NSC 68: United States Objectives and Programs for National Security: A Report to the President Pursuant to the President's Directive of January 31, 1950," National Security Council, April 14, 1950, <www.fas.org/irp/offdocs/nsc-hst/nsc-68.htm>.

Bulava is scheduled for deployment on a new class of strategic submarines, *Borey*; the first submarine of the class is set to begin sea trials in 2009. Long-range bombers, however, take a back seat in all these programs—most likely because they can continue serving for at least the next fifteen to twenty years and need only limited modernization (primarily new navigation and targeting electronics).

At the same time, strategic weapons modernization programs, which occupy a visible place in public statements of Russian leaders, are very slow. Compared to the Soviet deployment rate for single-warhead Topol ICBMs, which reached fifty missiles per year at its peak, the current deployment rate of fewer than ten Topol-M ICBMs, is very modest. At this pace, Russia will certainly be unable to replace all the aging systems, and it is clear that Moscow tacitly plans a significant reduction of the strategic arsenal in the coming years. There appears to be a significant gap between the rhetorical emphasis on strategic nuclear weapons and the actual commitment of resources.

Another foundation of the 2000 nuclear strategy is the concept of "predetermined" or "calibrated" (*zadannyi*) damage. The 2003 White Paper defined it as "damage, which is subjectively unacceptable to the enemy and which exceeds the benefits the aggressor expects to gain as a result of the use of military force." The notion of calibrated damage is more flexible than the more traditional notion of "unacceptable damage" that was the foundation of Cold War nuclear planning. The latter is simply too massive to be credible in a conflict with relatively modest stakes. In contrast, the promise of calibrated damage conveys a message that the costs of an attack against Russia will unavoidably exceed expected gains, that the damage will be commensurate to the threat, and that there is no intention to escalate the crisis to the strategic level. Such a message is supposed to be more credible and thus should, in theory, better serve the goal of deterring conventional attack.

The transition from "unacceptable" to "calibrated" damage represents a shift from Cold War theories of nuclear deterrence, which still dominate the nuclear strategy discourse in the United States. It puts nuclear strategy in the broader context of deterrence understood as the ability to deny the enemy expected gains. The damage promised in the Russian approach is not necessarily "unacceptable," nor does it promise "assured destruction." It can be quite limited, in fact, if the goals of the enemy are limited. The underlying premise of Russia's contemporary military doctrine seems to be that in the post–post–Cold War environment, a large-scale retaliatory strike is not needed for successful deterrence; nor is the threat of mutual annihilation credible when regional-level gains or losses are at stake. The ability to deliver a small number of nuclear warheads with a reasonable degree of probability under any reasonable conflict scenario should be sufficient to deter either a large-scale nuclear attack (which is regarded as improbable) or even a somewhat more likely large-scale conventional attack. The credibility of deterrence under either of these two scenarios should neutralize attempts to use the threat of force for political ends. In many respects, one can detect close parallels between the contemporary Russian nuclear strategy and NATO's "flexible response" strategy of the 1960s.

There is no denying that the logic of de-escalation is rooted in Cold War logic and theories, and in this sense all these scenarios and calculations are purely theoretical and represent a message, first and foremost, in the best traditions of deterrence theory. Supposedly, a sufficiently credible and clear message about the resolve to up the ante can cause the opponent to abandon plans to use or threaten to use war in the first place. In this sense, the intention of Russian nuclear strategy is quite benevolent. If the Russian assessment is wrong and the United States does not intend to use or threaten force, no one is worse off—the Russian efforts are simply useless.

The obvious problem is, of course, that prevention of war that relies on nuclear weapons is inherently dangerous. Nuclear deterrence "games" are not innocent. To make the threat work, it has to be credible; that is, Russia must not only have assets applicable to the mission, but also demonstrate the willingness to use them. This serves to aggravate potential conflicts and gives license to the continued existence of nuclear weapons—it even enhances their perceived utility for other nuclear and non-nuclear states because these weapons seem useful, able to achieve certain tangible goals (such as deterring a vastly superior conventional force).

The de-escalation concept assumes the first use of nuclear weapons—a provision that has remained in force since 1993. Nuclear weapons can be used against states that possess weapons of mass destruction (WMD) or against

any states that attack Russia in alliance or together with (an ad-hoc coalition of) states that possess WMD. This language partially revises negative security assurances adopted in the context of the NPT. Although the idea of nuclear use against non-nuclear states that have chemical or biological weapons was first introduced in the United States, Russia was the first to officially endorse it in the 2000 Military Doctrine. (The United States formalized that option in its 2002 Nuclear Posture Review.)

The doctrine emphasizes strikes at long ranges. Sergey Ivanov's 2003 report (the "White Paper") attributed U.S. victories in conflicts in the 1990s and early 2000s (Kosovo, Afghanistan, and Iraq) to the use of long-range strike assets, as well as superior command, control, targeting, communications, and intelligence capabilities. In all the conflicts, key assets were far removed from the immediate area of combat; therefore, a counterstrategy must emphasize the ability to execute long-range strikes to defeat strike assets as well as command, control, and other centers.

This thinking stands in contrast to earlier attempts in the mid-1990s to find a credible "nuclear solution" to deterrence of limited conventional attacks. At that time, Russian experts considered reliance on tactical nuclear weapons as a theater-level asset commensurate to the perceived theater-level threat. Ultimately, however, the choice was made in favor of long-range assets.

In this regard, one must admit that the issue of tactical nuclear weapons, which continues to attract close attention in a variety of disarmament forums, has by and large lost relevance, except as part of a broader issue of control over nuclear stockpiles.[22] Instead, Russia emphasizes long-range delivery vehicles, which can reach targets far from the immediate combat area. Reliance on long-range strategic assets has become possible because the mission of strategic deterrence no longer requires a large number of weapons, allowing some of them to be diverted to limited-use scenarios.

In the post–post–Cold War environment, conceptual and doctrinal dividing lines between delivery systems of different ranges have almost disappeared. It is no longer possible to differentiate between strategic, intermediate-range, and tactical nuclear weapons by mission. Moreover, short-range delivery systems are increasingly denuclearized. The process began with the 1991 Presidential Nuclear Initiatives (PNIs) involving parallel unilateral declarations by Washington and Moscow with respect to non-strategic nuclear weapons. The United States has fully implemented the terms of its declaration, but the status of implementation on the Russian side remains uncertain. Russia has only acknowledged that tactical nuclear weapons were reduced by three-quarters—a figure compatible with political obligations under the PNIs. It is unclear, however, if all elements of the declaration have been fulfilled.[23]

A more recent phenomenon is a trend toward partial denuclearization of strategic weapons. The United States is considering a plan to install conventional warheads on Trident II D5 SLBMs; they would supplement conventionally armed long-range cruise missiles that have long been part of the U.S. strategic arsenal. Russia has begun deployment of conventionally armed ALCMs, and when the Russian government recently debated abrogation of the 1987 Intermediate-Range Nuclear Forces Treaty, many regarded it as indication of a desire to obtain long-range, land-based conventional assets.

22. For an elaboration of this argument, see Nikolai Sokov, "Strengthening the 1991 Declarations: Verification and Transparency Components," in Taina Susiluoto, ed., "Tactical Nuclear Weapons: Time for Control," UNIDIR, Publication No. UNIDIR/2002/11, 2002.

23. The last time an official Russian representative appears to have mentioned PNIs was in 2004 at the NPT Preparatory Committee Meeting, when Russia announced that it was "close to" implementation of PNIs. However, at the 2005 NPT Review Conference, the Russian statement only said that tactical nuclear weapons had been reduced by three-quarters. Russia has also maintained that it was under no obligation to implement the 1991 statement, as it was not legally binding. As a matter of practical policy, however, the size and composition of the Russian tactical nuclear weapons force is limited by its ability to refurbish nuclear warheads as their service life expires. According to Colonel-General Vladimir Verkhovtsev, chief of the 12th Main Directorate, ground troops no longer have tactical nuclear weapons, while their number in the Air Defense Forces has been reduced by 60 percent, in the Navy by 30 percent, and in the Air Force by 50 percent. See Viktor Yuzbashev and Pavel Krug, "Moleben Yadernomu Oruzhiyu" [A Prayer for Nuclear Weapons], *Nezavisimaya Gazeta*, September 7, 2007].

For the time being, limited use of nuclear weapons remains part of Russia's deterrence strategy, and a consistent pattern displayed by numerous maneuvers conducted since 1999 (plus the doctrine itself) demonstrates that the weapon of choice for that mission was in all cases heavy and medium bombers (Tu-95MS, Tu-160, and Tu-22M3) using long-range cruise missiles, short-range missiles, and gravity bombs.[24] In recent years, the same platforms delivered both nuclear and precision-guided conventional weapons, and each time the number of simulated nuclear strikes was small—fewer than ten warheads. The choices of targets, derived from publicly available information about these maneuvers, were:

- Airbases and other military installations (command, communications, and support centers) in European NATO countries involved in simulated attacks against Russia and, in at least one case, in Japan. New NATO members are apparently considered the most likely basing countries; in recent years the Baltic states have emerged as the likely staging areas for both ground and air assault.
- Undisclosed targets in the continental United States (strikes were launched either from the vicinity of Iceland or from the northeast of Russia), probably B-2 bomber air bases, as well as command and control centers.
- Naval targets: aircraft carrier groups in the Pacific Ocean and the Baltic Sea. Similar operations were simulated once in the Indian Ocean and once in the Black Sea and Mediterranean.
- In 2003 Russian heavy bombers simulated strikes against land targets in the Indian Ocean, presumably at the U.S. base on Diego Garcia.
- Finally, the resumption of regular air patrols by Russian heavy bombers in 2007 included one more suspected target on the list—the U.S. base on Guam.

The United States explicitly or implicitly figures in all Russian doctrinal documents and exercise scenarios. This can be attributed to the following reasons:

- The United States has demonstrated the willingness to use force, including for humanitarian interventions.
- A U.S. decision to use force cannot be overruled by the United Nations or its allies.
- It is commonly believed that a large-scale attack against Russia (regional conflict as defined in the military doctrine) can only be successful if the United States leads it.
- It is assumed that if Russia can deter the United States, it can deter any other state or coalition of states. The United States in effect serves as a benchmark.
- Finally, many among the Russian elite and especially among the military still view the United States with unease and suspicion. One often hears talk about the intent of undisclosed countries (some directly mention the United States) to partition Russia.

One last important point to make about the role of nuclear weapons in today's Russian national security strategy is that, in accordance with the 2000 National Security Concept, reliance on nuclear weapons is a temporary fix. Nuclear weapons are supposed to remain a vital part of defense policy until Russia builds up its conventional capability, especially in precision-guided weapons, command and control systems, targeting, communications, etc. Effectively, Russia is supposed to reach the technological level of the U.S. Armed Forces, at which point nuclear weapons would no longer be necessary. A more modern conventional capability together with modern reconnaissance and targeting assets should enable Russia to successfully deter, or, if deterrence fails, fight regional conflicts. Thus, at least in theory, the limited-use missions should eventually fade away.

24. For an overview of the aspects of major military exercises relevant to the analysis of nuclear doctrine, see Nikolai Sokov, "Significant Military Maneuvers," Part V of "Issue Brief: Russia's Nuclear Doctrine," Center for Nonproliferation Studies, August 2004, <www.nti.org/e_research/e3_55a.html>.

In the last decade, the Russian government has actively pursued conventional weapons modernization programs, which outpace programs concentrated on nuclear capability. These include, for example, long- and short-range precision-guided air-launched missiles; short-range land-based precision-guided missiles; new communication, command, and control assets; and GLONASS, a Russian analogue to the Global Positioning System that should enable precision strikes.

The pace of conventional rearmament is set to increase following the "five-day war," the conflict between Russia and Georgia in August 2008, which Russia was able to win primarily thanks to the sheer numbers of soldiers and armor it was able to send to battle. Speaking in September 2008, Dmitri Medvedev declared: "We must achieve superiority in the air, in high-precision strikes against land and sea targets, in prompt redeployment of troops. … By 2020 we must solve the problem of … comprehensive equipping of forces with new models of arms and reconnaissance assets."[25] The pace of conventional rearmament, even though higher than that of nuclear rearmament, is still very slow, and it is unlikely that Russia will be able to field a credible conventional deterrent in the next ten to fifteen years.

A New Military Doctrine, 2007–Present

In 2006 and 2007 the Russian military began seriously contemplating a new military doctrine. The old one, issued in 2000, was widely considered to provide inadequate guidance for fighting limited conventional conflicts. Its nuclear component, however, has not been seriously challenged.

The debate on the new doctrine was launched in earnest in 2007. It quickly revealed that the key assumptions that underpinned the threat analysis of the 2000 document remained in place. For a short while after the September 11, 2001 attacks, the Russian attitude toward the United States seemed to have changed, as evidenced by the relatively calm reaction to the second wave of NATO enlargement, to U.S. military bases in Central Asia, and to the expanding U.S. presence in several former Soviet states. However, this placid attitude did not last long. Although international terrorism, including a scenario in which a terrorist group captures an entire state, features prominently in threat analysis, the threat from the United States and NATO continues to occupy a very high, if not the top, place in Russian strategic thought.

Speaking at a conference devoted to the new doctrine at the Academy of Military Sciences, then-Chief of General Staff Baluevski declared that "the end of the ideological and military confrontation of two political systems has not led to demilitarization of world politics, as some had expected."[26] He described the international situation as "dynamic, unstable, tense, and subject to periodic crises." The United States and NATO continue to be an important focus of attention. "Cooperation with the West," Baluevski said, "has not resulted in the alleviation of military threats." The main threat to Russia, he stressed, comes from the "desire of the United States for global dominance and attempts to establish a presence in the regions where Russia has been traditionally present." NATO's eastward enlargement and the local conflicts along Russia's perimeter are the next-most important threats, Baluevski declared. He also mentioned, almost in passing, the growth of international terrorism, which he said "has become a long-term element of contemporary political life, a relatively permanent phenomenon in societal development."

The conference's keynote speaker, retired General Mahmoud Gareev, widely considered an authoritative military analyst whose views carry weight in the military establishment, predicted that "in the next ten to fifteen years ecological and energy factors will become the main cause of political and military conflicts." He said that "some states" try to control global energy resources and cited Iraq as an example of that policy. Others will have "little choice except to resist" that unnamed state "or perish."[27] In Gareev's assessment, competition for energy resources

25. Sitnina, "Voina Mozhet Vspykhnut Vnezapno."
26. Baluevski, Speech at the Academy of Military Sciences, January 2007.
27. Mahmoud Gareev, "Struktura I Osnovnoe Soderzhanie Novoi Voennoi Doktriny" [The Structure and the Main Contents of a New Military Doctrine], *Voenno-Promyshlennyi Kurier*, January 24, 2007.

will pit Russia against the United States and other developed countries in the near future and will also cause nuclear proliferation as other energy-rich countries seek to protect their resources from the United States. This could lead to a "war of everyone against everyone," said Gareev.

Presentations at the January 2007 conference on the new military doctrine clearly demonstrate that reliance on the threat of limited nuclear use for the purpose of de-escalating large-scale conventional conflicts is likely to remain part and parcel of Russia's new military doctrine. Echoing the new mission for nuclear weapons introduced in the 2000 document, Chief of the Main Operations Department of the General Staff Aleksandr Rukshin emphasized that "the purpose of strategic deterrence is prevention of aggression and the threat of force against Russia in peacetime and, during war, de-escalation and termination of hostilities on acceptable conditions."[28] Specifically, in a regional war, the armed forces should be prepared to "compel the aggressor to terminate hostilities on conditions that meet the interests of the Russian Federation and its allies."

The Academy of Military Sciences unanimously recommended continued reliance on nuclear weapons; some even talked about enhancing their role. While it would be a mistake to overestimate the role of retired generals and colonels in the drafting of the new doctrine (only a handful among them are likely to contribute to the final product), the conference demonstrated the prevailing attitudes among the military elite and the deeply entrenched commitment to the nuclear status of Russia.

The rather gloomy and generally anti-American assessment of external threats survived the presidential transition from Vladimir Putin to Dmitri Medvedev in 2008. By the summer, the new president made his view of the world official in the Foreign Policy Concept.[29] While the concept repeated the traditional refrain that "the end of the Cold War reduced the risk of a large-scale war, including nuclear war," it also claimed that the United States has engaged in a policy of "containment" of Russia as one of the key centers of power in the emerging "multipolar" world. U.S. attempts to preserve hegemony, including through the use of force, could result in multiple conflicts in the vicinity of Russia, according to the document, and could entail support for anti-Russian regimes in Russia's sphere of influence—some of these regimes were installed by Washington, the concept said, while others have become U.S. puppets.

The U.S. policy of containment presupposes the threat of force, according to Nikolai Patrushev, secretary of the Russian Security Council. As he elaborated in early October 2008, the United States and NATO have been expanding their military presence in Eastern Europe in order to achieve military superiority over Russia; Georgia and especially Ukraine, he said, were supposed to play the role of a staging ground for large-scale land-based, air-based, and naval strike groups equipped with high-precision conventional and tactical nuclear weapons. Forward deployment, especially in Ukraine, could allow NATO to hold at risk critical military and economic targets deep inside the European part of Russia, including government and military structures.[30]

Obviously, these statements have a large domestic policy component and represent a fairly standard "rally-around-the-flag" tactic intended to consolidate the elite and the public around the government through the use of the specter of external threat. Yet, there is no denying that enlargement of NATO, deployment of missile defense in Eastern Europe and elsewhere, and the perceived willingness of the George W. Bush administration to use force were regarded in Russia with serious and genuine concern. It is possible that the perception might change under the Barack Obama administration. For example, the U.S. shift in emphasis from Iraq to Afghanistan is apparently taken by Moscow with some satisfaction because it has long seen the deteriorating situation in Afghanistan (as well as the situation in Central Asia) as a major threat to international security, and, by implication, to Russia itself. Even though Russia apparently played a role in the decision of Kyrgyzstan to close the U.S. air base at Manas, Moscow simultaneously opened the land transport route to Afghanistan through its territory to supply U.S. and NATO troops

28. Aleksandr Rukshin, "Ot Strategicheskikh do Kontrterroristicheskikh Operatsii" [From Strategic and Counterterrorist Operations], *Nezavisimoe Voennoe Obozrenie*, February 2, 2007.
29. Concept of Foreign Policy, July 12, 2008, <www.mid.ru/ns-osndoc.nsf>, in Russian.
30. "Sekretar Soveta Bezopasnosti Rossii Nikolai Patrushev: 'My Preduprezhdali: Saakashvili Vedet Sebya Neadekvatno'" [Secretary of the Security Council of Russia Nikolai Patrushev: "We Warned: Saakashvili's Behavior Was Inadequate], *Izvestia*, October 2, 2008.

in Afghanistan. It is also significant that cooperation with NATO on Afghanistan was one of the very few areas that did not suffer during and in the aftermath of the war with Georgia. All this suggests that perhaps there is a chance to reduce the acute threat perception that dominated Russian discourse during the previous U.S. administration.

The perceived threat emanating from the United States and NATO became even more acute after the war in Georgia in August 2008: Georgian President Mikheil Saakashvili was widely regarded in Moscow as an "American stooge" who launched the offensive against the separatist region of South Ossetia with the at least tacit blessing of Washington. As a result, the Russian perception of an acute external threat hardened, as did its determination to resist the perceived encroachments on its interests and security. When Medvedev presented five principles of Russian security policy two weeks after that conflict, one of these principles explicitly stated that Russia had regions of "privileged interests" and warned against actions in these regions that contradicted Russian interests.[31] The Foreign Ministry subsequently emphasized that Medvedev's statement did not amount to a revision of the July 2008 Foreign Policy Concept, but rather a "regrouping" of the earlier document's approaches.[32] While this is true on the surface—a similar provision was contained in the concept—the new language suggests the determination of Russia to become even more assertive and resolute in charting its response to suspected encroachments into its sphere of influence.

The profile of nuclear weapons also increased following the conflict in Georgia. Medvedev, during a trip to the naval base of strategic submarines in Kamchatka shortly after the war with Georgia, declared that modernization of the nuclear arsenal would continue.[33] He made similar statements during his subsequent visits to Strategic Rocket Forces bases. The concept of limited nuclear strikes also figures prominently in recent pronouncements of Russian military leaders. For example, official representative of the General Staff Anatoli Nogovitsyn bluntly remarked, while the conflict in Georgia was still at its peak, that any new U.S. assets in Europe would be legitimate, high-priority targets for Russian nuclear weapons.[34] Colonel-General Boris Cheltsov, chief of staff of the Air Force, remarked that since the main threat comes from the U.S. ability to project force anywhere in the world, Russia needs an assured capability to strike with nuclear weapons at similar distances.[35]

At the same time, short-range nuclear weapons, as before, are regarded as not essential for missions assigned to nuclear assets. When rumors, apparently originating in Lithuania, spread that Russia would equip Baltic Fleet surface ships and submarines with tactical nuclear weapons in response to the deployment of U.S. missile defense interceptors in Eastern Europe, the General Staff clarified that no such plans existed.[36] A high-level meeting in Kaliningrad oblast in September 2008 ruled against the proposal to deploy nuclear weapons in the exclave; participants included representatives from the General Staff, the Administration of the President, the security services, and the Ministries of Defense and Foreign Affairs at the level of deputy minister.[37] Retired General Viktor Zavarzin, chairman of the Duma Defense Committee, explained that although such proposals exist, they do not enjoy support within the government. Preference was given instead to high-precision conventional assets, he said.[38] Proposals to deploy tactical nuclear weapons in Belarus met the same fate: Aleksandr Surikov, Russian ambassador to Minsk, announced that Russia would not return nuclear weapons to that country, but that, if necessary, tactical conventional

31. Interview of Dmitri Medvedev with three Russian TV channels, August 31, 2008, <president.kremlin.ru/text/appears/2008/08/205991.shtml>, in Russian.
32. "Konflikt v Yuzhnoi Osetii Trebuet Peregruppirovki Podkhodov" [The Conflict in South Ossetia Requires a Regrouping of Approaches], RIA-Novosti, September 1, 2008.
33. "Medvedev: Modernizatsiya Vooruzhennykh Sil Budet Prodolzhatsya" [Medvedev: Modernization of Armed Forces Will Continue], RIA-Novosti, September 25, 2008.
34. Harry de Quetteville and Andrew Pierce, "Russian Threatens Nuclear Attack on Poland Over US Missile Shield Deal," *London Daily Telegraph*, August 16, 2008.
35. Boris Cheltsov, "Voennaya Doktrina Trebuet Utochneniya" [The Military Doctrine Has to be Amended], *Voenno-Promyshlennyi Kurier*, April 25, 2007.
36. Mark Franchetti, "Russia's New Nuclear Challenge to Europe," *London Sunday Times*, August 17, 2008.
37. Vadim Smirnov, "Kalinigradskii Platsdarm September 8, 2008.
38. "RF Planiruet Razmestit Vysokotochnoe Oruzhie Okolo Bazy PRO v Polshe" [Russian Federation Plans to Deploy High-Precision Weapons Near the Missile Defense Base in Poland], RIA-Novosti, September 4, 2008.

Iskander missiles and short-range aircraft with precision-guided weapons could be deployed there.[39]

Compared to the beginning of this decade, strategic weapons and the mission of strategic deterrence as a whole have begun to enjoy greater attention. The increasingly acrimonious debate over the U.S. plan to deploy a limited missile defense in Poland and the Czech Republic indicates that the Russian military is nervous about its long-term ability to maintain strategic deterrence and that this mission is no longer considered simply a "just-in-case" capability. As noted above, a stable strategic balance is an important condition for the credible nuclear deterrence of limited conflicts; thus, the theoretical ability of the United States to weaken Russia's second-strike capability casts doubt on the entire structure of security policy. There is little reason to believe that the likelihood of a global war has been elevated in the calculations of the uniformed military; at least, all available public statements suggest that their views have remained unchanged. Thus, it is only reasonable to suspect that the crux of the concern still lies at the "regional war" level. In effect, the United States could, theoretically, deny Russia ability to deter theater-level conventional conflicts and open it to blackmail through threat of conventional attack.

The crux of the concern is not current U.S. missile defense plans. Speaking in February 2007, Chief of the Air Force Vladimir Mikhailov said that he regarded "very calmly" the planned missile defenses in Eastern Europe.[40] Russian military leaders are worried, rather, that the existing plans are just the beginning for a larger deployment. Viktor Yesin, former chief of staff of the Strategic Rocket Forces, opined that the main threat of missile defense comes from an "undefined configuration." "Will there be ten interceptors or a thousand? … It's ten now, but no one can guarantee there will not be more." He anticipated that eventually the United States will also deploy missile defense assets in Japan and Great Britain or Norway.[41] Yevgeni Buzhinski, deputy chief of the Main Directorate of International Cooperation at the Ministry of Defense, said that current small-scale deployment plans are but elements of a broader plan—a global network of missile defense around Russia's borders.[42] An analysis of public statements by Russian political and military leaders and interviews of well-informed experts clearly indicates that missile defense is emerging as the single most important issue that could derail not only nuclear disarmament, but even modest reduction efforts—the situation is simply seen in Moscow as dangerously unpredictable.

Conclusion

Speaking at the Conference on Disarmament in Geneva in February 2008, Russia's Foreign Minister Sergey Lavrov expressed support for proposals to eliminate nuclear weapons. "We hope that our negotiation partners pay attention to the call of authorities in this area," he said, referring to the article promoting nuclear zero written by four U.S. statesmen. He made it clear, however, that Russia does not see nuclear disarmament as an immediate goal.[43]

Nuclear weapons are likely to remain a status symbol, as well as the ultimate security guarantee, for a long time. These roles are a serious but not necessarily insurmountable obstacle to nuclear disarmament because they are primarily psychological and non-specific—not intended to address practical concerns. In the end, Russia's place in the international system will be defined by its economic and political roles. By 2007, it managed to become the eighth economy in the world; its future will depend on how and when it emerges from the current global economic crisis. While it has never felt comfortable in institutions comprised of great powers (including the G-8), the emergence of

39. Olga Tomashevskaya and Viktor Volodin, "Do Czhekhii i Polshi Letet Nedaleko" [Czech Republic and Poland Are Not Too Far], *Vremya Novostei*, August 7, 2008.
40. "Rossiya Perenapravit Rakety" [Russia Will Retarget Missiles], *Vzglyad*, February 19, 2007.
41. "Ekspert Schitaet Neopredelennost Oblika PRO SShA Ee Osnovnoi Ugrozoi" [An Expert Believes the Main Threat of U.S. Missile Defense System Is Its Undefined Nature], RIA-Novosti, July 24, 2008.
42. "Rossiya Gotovit Assimetrichnyi Otvet na Razvertyvanie PRO SShA v Evrope" [Russia Prepares an Asymmetric Response to the Deployment of U.S. Missile Defense in Europe], RIA-Novosti, May 27, 2008; Vadim Udmantsev, "Pautina Vokrug Granits" [A Spider's Web Around Borders], *Voenno-Promyshlennyi Kurier*, June 4–10, 2008.
43. Roman Dobrokhotov, "Obezoruzhivauyshchie Argumenty" [Disarming Arguments], *Novye Izvestia*, February 13, 2008.

the G-20 format fits well its long-standing insistence that more voice should be given to emerging economies (for example, Russia has for years promoted BRIC—a group consisting of Brazil, Russia, India, and China). The Russian elite seem to have gradually come to grips with the fact that the defining characteristic of Russia will be its economy and the role it plays in international institutions rather than its status as a nuclear power; similarly, if its economy remains weak, nuclear weapons will not assure its status in the international system.

A more serious obstacle is the third role, which emerged after 1999: nuclear weapons are regarded as a practical tool for deterring large-scale conventional wars. This threat is primarily associated with the United States and NATO, although there is reason to believe that at least some Russian military planners believe that in the future nuclear weapons could play the same role in the context of relations with China. On a broader plane, nuclear weapons are a response to the uncertainty of the current transitional shape of the international system—the sources of potential threats and challenges are vague, and the scale and intensity of these threats are unclear as well.

While this type of mission does not require a large nuclear arsenal and Moscow is set to further reduce it, elimination of the mission itself will not be an easy task. Russia has embarked on one way to reduce that reliance—the same way that the United States chose many years ago: modernization of conventional forces, or asset substitution. If and when conventional arms can support the missions currently assigned to nuclear weapons, Russia could seriously contemplate very deep reductions and eventual elimination of its nuclear capability. The road seems long, however, because conventional rearmament is slow and expensive and, judging by existing plans, will not be completed until 2020 at the earliest.

The "asset substitution" track is not only expensive and time-consuming, but also leaves untouched the same conflicts, real or perceived, that caused reliance on nuclear weapons in the first place. A more promising approach, which might take less time but would require political will and determination, envisions addressing the root causes of reliance on nuclear weapons. It will require progress on a wide range of arms control and security issues, including creating a new START treaty, resolving differences over missile defense, addressing the imbalance of conventional forces in Europe, and repairing relations between Russia and NATO, along with a host of other issues. The network of arms control and confidence-building agreements has dangerously deteriorated and must be rebuilt before meaningful progress toward nuclear disarmament can become possible. To clear the path toward elimination of nuclear weapons, one needs to address these concerns first and foremost, so that proponents of reliance on a nuclear arsenal are deprived of their arguments.

Reducing Russia's Reliance on Nuclear Weapons in Security Policies

Vladimir Dvorkin

The Current State of Nuclear Policy and Strategic Nuclear Forces

The Russian Federation's official security policy, of which nuclear policy is and integral part, is set forth in the law "On Defense," the military doctrine, and the president's annual address to the federal assembly; it is also outlined in an array of other documents such as "Immediate Tasks for the Development of the Armed Forces of the Russian Federation" presented in the fall of 2003.

While these documents posit reduced threats from the traditional form of direct military aggression against the Russian Federation, they also note that certain potential threats have continued and worsened, including territorial claims, resistance to Russia's emergence as a center of influence in a multipolar world, outbreaks of armed conflict in proximity to Russia's borders and the borders of its allies, force buildups that upset the balance of power, and the expansion of military blocs and alliances that compromise the security of the Russian Federation.

The threats list also comprises actions that undermine global and regional stability, including interference with the regular activity of the Russian government and military structures; disruption of the normal functioning and combat readiness of strategic nuclear forces, early warning systems, antimissile defense, space surveillance systems and space combat readiness, as well as various potentially sensitive assets; the proliferation of weapons of mass destruction and the means of their delivery; and international terrorism.

Russia's nuclear policy was most recently presented in a detailed version in the military doctrine, which was approved by President Vladimir Putin on April 21, 2000. The doctrine states that Russia shall maintain its status as a nuclear power and needs a nuclear deterrent capable of inflicting adequate damage on any aggressor (whether a state or coalition of states) under any circumstances.

The 2000 Military Doctrine differs from the previous 1993 "Basic Provisions of the Military Doctrine" and from the earlier Soviet pledge not to use nuclear weapons first. After lengthy deliberations, the authors of the 2000 Military Doctrine declared that "the Russian Federation reserves the right to use nuclear weapons in response to the use of nuclear or other types of weapons of mass destruction against itself or its allies, or in response to large-scale aggression using conventional weapons in situations critical to the Russian Federation's national security."

This language has effectively put Russian nuclear policy in line with the nuclear strategies of the United States, the United Kingdom, and France, which never renounced the possibility of using nuclear weapons in case of an attack by the Warsaw Pact's superior conventional forces led by the Soviet Union. Therefore, given the steep drop in the numbers of Russian conventional forces, the 2000 doctrine's first use option for nuclear weapons is amply justified.

Russia's nuclear posture policy, which reflects its actual (as opposed to declaratory) nuclear policy, has undergone significant changes in recent years as a result of the evolving limits embodied in U.S.-Russian treaties as well as ad hoc decisions. If political, strategic, or economic considerations were present at all, they do not appear to have been thoroughly considered.

Beginning in 2000, the system of setting arms limits via treaties underwent fundamental changes because U.S.

leaders decided that it was no longer advisable to maintain the approach to limiting the number of weapons that had been used during the Cold War because Russia and the United States were no longer enemies and had become partners in combating modern threats. Also the U.S. stance seemed to reflect the lack of logic in the Russian nuclear policy, due to ambiguity about its strategic nuclear forces (SNF) posture.

One of the most serious drawbacks of the U.S. policy was the associated risk that the two countries might suddenly find themselves outside the framework of a legally binding arms control regime. Naturally, it would have been senseless to seek a new treaty similar to the Strategic Arms Reduction Treaty (START I) in the radically different environment. Still, an abrupt transition to a complete lack of nuclear arms control could have had unpredictable consequences. Thus, in May 2002, the United States and Russia signed the Strategic Offensive Reductions Treaty (SORT, or the Moscow Treaty).

Obviously, the new terminology (SORT in place of START) introduced no substantive changes. The word *capabilities* (present only in the Russian title of the treaty[1]) is usually understood to mean the operational capabilities of forces under various combat scenarios. These capabilities are not necessarily defined by the number of warheads because offensive capabilities also depend on the strategic offensive posture, and the characteristics of the weapons (yield, accuracy, survivability, reliability of combat control, and many other factors); these capabilities have never been the subject of negotiations.

SORT differs from previous agreements in that it has fully incorporated the plans for Russian and U.S. strategic force development, which had been adopted by the two countries based on their own understandings about the role of nuclear weapons in national security policy, along with economic constraints. Thus, neither country was required to make any concessions or compromises, which would have required them to change their plans for the development of nuclear forces. Discussions focused primarily on the procedures and the methods for reducing deactivated forces and the related problem of the so-called "uploading capability." Although Russia succeeded in its demands that the final document did not incorporate the concept of operationally deployed weapons, the agreement does allow the parties to store dismantled warheads, making it possible to return them to downloaded delivery vehicles relatively quickly. It is generally believed, however, that only the United States has this capability.

At the same time, SORT's limit on the number of deployed warheads without any additional restrictions is still beneficial for Russia, inasmuch as it removes a number of legal and economic restrictions on the maintenance and development of Russia's SNF. First, SORT permits the parties to extend the service life of heavy intercontinental ballistic missiles (ICBMs), which were to be eliminated by 2007 under START II. Second, SORT allows for the deployment of multiple independently targetable reentry vehicles (MIRVs) on the Topol-M ICBM.

The current structure of Russia's SNF can be evaluated based on the results of data exchanges with the United States, in accordance with START I. As of January 2008, Russia's nuclear triad includes 682 launchers and 3,100 nuclear warheads. The Strategic Rocket Force has 430 missiles with 1,605 nuclear warheads; this number includes 40 new Topol-M ICBMs, the remaining missiles were produced during Soviet times. The sea-based leg of the triad consists of 14 strategic missile submarines. The Navy's ballistic missiles carry 602 nuclear warheads. The Strategic Air Force possesses 80 heavy bombers, capable of carrying up to 890 air-launched cruise missiles (ALCMs).

At the same time, the actual numbers of SNF's sea- and land-based combat-ready weapons systems are lower than the numbers given above, which are calculated using the counting rules established by START I. At any given time, a portion of the weapons are undergoing conversion, being serviced at production facilities, or being deactivated.

Official information on the relatively long-term Russian SNF modernization program is not available. For that reason, inferences on the SNF development program in Russia can only be drawn from fragmented data. Presumably, the strategic nuclear triad will be maintained in the future and the share of warheads in each component will

1. The Russian title for SORT is *Sokrashchenie Strategicheskikh Potentsialov*, or, literally, Reduction of Strategic Capabilities. The difference between the English and Russian titles (the presence of the word "capabilities") is a result of Russian grammar rules.

remain approximately the same as today. There have been periodic reports that the naval component of the triad will include up to eight new Project 955 strategic ballistic missile submarines (SSBNs) similar to the first submarine of that class, the *Yuri Dolgoruky*. However, economic constraints will likely limit the number of submarines to four. In the near future, it would be more than adequate for Russia to limit its total fleet to no more than four SSBNs (as the United Kingdom and France have done). This lower number could be justified if Russia completes the long overdue transition from an "extensive" to an "intensive" mode of combat patrol and operation of its nuclear-armed submarines.

The United States keeps no less than 50 percent of its SSBNs at sea in combat patrol zones. In the United Kingdom and France, one or two of the four vessels are constantly on alert—that is, the same number as in Russia. In the Soviet Union, due to operational problems with reliability, maintenance, etc. no more than 20 percent of the submarine fleet was on patrol at any given time. In order to deploy enough SSBNs at sea for combat missions, the Soviet Union had to build a large overall fleet reaching sixty-three submarines. This could change if the operational characteristics of the *Yuri Dolgoruky*-type SSBNs were upgraded to match those of the United Kingdom's and France's missile-carrying submarines. In that case, Russian could have the same one to two SSBNs on patrol simultaneously, but out of a fleet of four vessels instead of twelve. The air-based SNF might have to undergo a more extensive transformation.

Overall, Russian nuclear policy at the beginning of the twenty-first century can be described as rather conservative, oriented toward continued reliance on nuclear weapons as a principal source of security. Moreover, the importance of nuclear weapons as a status symbol is increasing. This can be deduced not only from periodic reports from high-ranking military and political leaders, but also from such decisions as the procurement in Ukraine of additional UR-100N UTTKh[2] ICBMs, the testing of hypersonic maneuvering reentry vehicles capable of penetrating missile defenses, etc.

Thus, any doctrinal changes that might indicate a transformation in the role of nuclear weapons in Russia should not be expected in the near future. This includes any U.S. or Russian initiatives intended to gradually phase out reliance on mutual nuclear deterrence, a concept that has become absurd in the current security environment.

Reducing Reliance on Nuclear Deterrence in Russian and U.S. Policy

The possibility of Russia's decreasing its reliance on nuclear deterrence for security can only be considered in the context of the nuclear policy of, at a minimum, the five permanent members of the UN Security Council (the United States, Russia, the United Kingdom, France, and China), all of whom possess nuclear weapons.

Doctrinal statements of the nuclear weapon states that have been published in recent years as well as discussions about the role of nuclear weapons in the twenty-first century have all regarded deterrence as the main mission of nuclear weapons. The definition of this term, however, has been expanding. Whereas during the Cold War, deterrence referred to preventing nuclear attacks or large-scale aggression using nuclear and conventional weapons, today it also includes deterrence of other WMD, including preventive nuclear strikes to destroy WMD.

It is difficult to predict how sustainable and enduring this definition of deterrence will be in the twenty-first century. Radical transformation in the foreseeable future seems unlikely given the conservative nature of military planners. The transformation will occur only if the leading democratic nuclear states undertake unprecedented efforts to significantly reduce their arsenals; first they must jointly reject reliance on nuclear deterrence as the basis of their security. In any event, the nuclear weapon maintenance and development programs of official members of the "nuclear club" will most likely define the role of these weapons until at least the middle of this century.

2. "UTTKh" stands for *Uluchshennyye Taktiko-Tekhnicheskiye Kharakteristiki* or "Improved Tactical and Technical Characteristics."

If decreasing reliance on nuclear deterrence is difficult to accomplish in the foreseeable future, is it possible to discuss a movement toward a non-nuclear world at all?

Calls for comprehensive nuclear disarmament, which Realpolitik traditionally regards as idealistic and unachievable in the foreseeable future, are now enjoying the increasing attention of the world's political leaders. Four well-known U.S. political figures who held prominent positions in the ruling elite (George Schultz, Henry Kissinger, Sam Nunn, and William Perry) have initiated calls for a world free of nuclear weapons. They regularly organize conferences in various countries to discuss concrete steps toward nuclear disarmament with full awareness that this process will be long and extremely complicated. Yet, they believe that nuclear disarmament is necessitated by the threats posed by the proliferation of nuclear weapons and the catastrophic regional and global consequences if they were ever used for any reason.

That said, it must be realized that a world free of nuclear weapons will only be possible if the global security system undergoes a complete transformation. The details of such a system are a separate issue beyond the scope of this essay. It is sufficient to note here that all concrete steps in the disarmament process must involve the strengthening of the nuclear nonproliferation regime and consequently reduction of the risk of nuclear catastrophe.

The foundation of the nuclear nonproliferation regime is the 1967 Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which has been continuously subjected to challenges such as Iran's nuclear program and the uncertainties surrounding the future of North Korea's program, among others.

The last two NPT Review Conferences effectively failed, primarily as a result of the official nuclear weapon states' (the United States, Russia, United Kingdom, France, and China) failure to fulfill their obligations under Article VI. Under this provision, all nuclear weapon states (not just the United States and Russia) must pursue continuous talks on the reduction of nuclear weapons and their complete elimination. Although Russia and the United States are reducing their SNF, the negotiations process has ground to a halt. At the meeting of the NPT Preparatory Committee (PrepCom) in 2008, negotiations on nuclear weapons reduction were not even mentioned. Thus, comprehensive nuclear disarmament, which U.S., Russian, and other leaders have proclaimed at least rhetorically and which is set out in the NPT, must be one of its primary goals of the international community. Russia and the United States must take the first steps along the following path without delay.

1. First, before the end of 2009, these two countries must conclude a new treaty on the reduction of strategic weapons to the level of 1,300-1,500 warheads complete with appropriate verification and confidence-building measures taken from START I. The Moscow Treaty on the reduction of strategic offensive reductions will remain in force until 2012, but it is completely based on START I verification mechanisms. Apart from a declaration of intent, the parties have made no real progress on the development of a verification system for the new treaty. However, experts have already prepared recommendations for the possible limits on the number of warheads, on the modernization of transparency measures, accounting system, etc. Many in the United States have come to the conclusion that a new treaty is needed, and both leading candidates for the 2008 presidential election endorsed the idea.

Unfortunately, deteriorating relations between the two main nuclear states were further aggravated by the armed conflict between Russia and Georgia, resulting in an inexcusable loss of time. It is unlikely the parties will be able to conclude a new treaty before the expiration of START I given the time consumed by the U.S. election and the time the Obama administration will need to develop new policy. One solution could be a one-year extension of START I. At the same time, there is no guarantee that one year will be sufficient to resolve all of the disputed issues and often highly complicated legal issues concerning the substance and text of the new treaty.

The problem is that the verification and confidence-building system between Russia and the United States established by START I (sixteen types of inspections and ten groups of confidence-building measures containing 152 types of notifications) were developed during the Cold War, albeit at its end, and contain excessively costly and redundant methods of inspection and confidence-building measures.

For the new treaty, these could be significantly curtailed. A mechanical reduction of the number of inspections

and notifications would be very difficult because many are an integral part of the treaty's articles. Russian officials have developed proposals on a possible new transparency system; and apparently U.S. officials have undertaken similar work. The main difficulty lies in reconciling their ideas.

Russian proposals have focused on the possibility of eliminating at least five inspection types:

i. New facility inspections, which are redundant because data on new facilities could be verified during data update inspections;

ii. Suspect site inspections, which are a mere formality because only two sites have been chosen among the facilities where ICBM assembly could be conducted;

iii. Formerly declared facilities inspections, which are duplicated by data update inspections;

iv. Post-exercise dispersal inspections because the number of ICBM launchers is also verified during data update inspections; and

v. Continuous monitoring inspections of mobile ICBM production facilities, which are superfluous as well.

The quota for annual inspections could also be reduced: from fifteen to a maximum of ten data update inspections; from ten to five inspections of the number of reentry vehicles on deployed ICBMs and SLBMs; and from three to one formerly declared facilities inspections.

It would also be a good idea to update confidence-building measures. Without describing an entire new system of confidence-building measures, one could offer as an example the exchange of telemetry tapes and decoding information. Such exchanges made sense under START I as a way to verify compliance with articles limiting modernization of ICBMs. For example, information on pressure in combustion chambers could reveal increases in the energy characteristics of missile engines and the possibility of increasing throw-weight. However, this information is not particularly relevant now given the nature of U.S.-Russian relations today.

Negotiating all these issues will take time, thus there is little hope of solving them during a one-year extension of START I without adequate political will, but Russia and the United States must at least try.

2. The second crucial step is the transition to a gradual phase-out of the mutual deterrence relationship between the United States and Russia. There are at least three main reasons why nuclear deterrence must yield its place to a new type of strategic cooperation between the United States and Russia.

The first is the conflict between the role of nuclear deterrence and the real threats and challenges that have emerged since the end of the Cold War. Today deterrence is only effective against the least likely or contrived threats, including nuclear or large-scale conventional attacks by one major power (and their alliances) against another. However, nuclear deterrence does not work against the new, real threats (the proliferation of WMD, international terrorism, ethnic and regional conflicts, drug and arms trafficking, transborder crime, illegal immigration, etc.).

The second reason is that mutual nuclear deterrence seriously limits the possibilities for genuine cooperation in addressing new threats and challenges. The limited cooperation that existed during the Cold War, when the majority of agreements on disarmament (including the NPT) were signed, is insufficient today.

It is impossible to imagine the United States and Russia reaching the necessary level of cooperation while they still maintain plans to use thousands of warheads for strikes against one another, keep missiles at high alert, and continue to modernize their nuclear weapons. Moreover, the inertia of mutual deterrence, combined with new threats and problems, may fundamentally destabilize strategic relations between the states and undermine their ability to cooperate.

The third reason to transition to a new strategic cooperation is that the maintenance of nuclear deterrence at the current, or even at a reduced level (1,700–2,200 warheads under SORT) is grossly excessive. The SORT parties assign the bulk of their strategic forces to be used against one another, and to serve as a type of insurance against future uncertainties. The costs associated with this policy are probably not particularly burdensome for the United

States. But even that country could find a better use for its resources devoted to defense and foreign policy. For Russia, maintaining a reliable nuclear deterrent is even more onerous.

3. Both the United States and the Soviet Union/Russia have adopted the policy of strike on warning of a missile attack; a crucial step toward rejecting mutual nuclear deterrence may be abolishing this policy. Although nuclear deterrence is not limited to strike on warning, this concept embodies deterrence in its most dangerous and politically unstable form. Working with information from early warning systems, national leaders have only minutes to decide whether or not to launch missiles. As a result, there is always a risk of miscalculation or technical malfunction leading to an accidental, unintended nuclear war.

Furthermore, the very practice of nuclear planning based on launch-on-warning highlights the glaring conflict that exists between the basic principles of nuclear deterrence, on the one hand, and partnership between the Russian Federation and the United States, on the other. This applies to the framework of their bilateral mutual deterrence, inasmuch as they are the only two states that possess early warning systems and are capable of launching a missile attack based on information from these systems. The same concept does not apply to China because it is unlikely that its nuclear forces will be capable of launching a counterforce strike in the near future. Consequently, even in the hypothetical situation of an attack by China, there would be no reason for an immediate launch on warning. The same applies to an immediate Russian response to a hypothetical nuclear attack by the United Kingdom or France, as long as their submarine-launched ballistic missiles are incapable of launching a counterforce strike. (This scenario changes if either of these two countries attacked as part of an all-out missile assault by the United States.) Of course, there is always the problem of vulnerability in U.S. and Russian command and control systems, even during a limited surprise nuclear strike. However, as long as a significant portion of SNF can survive, the command and control system could be reestablished sooner or later, and a counterattack would be launched against the aggressor.

The rejection of the launch-on-warning concept may initially appear to be a purely declaratory, unverifiable step. It can, however, be verified with a high degree of reliability by technical means with regard to any leg of the nuclear triad, especially the one that is primarily intended for launch on warning.

Many of the organizational and technical means to decrease the alert status of these systems were studied by experts during preparations for the implementation of START II, which provided for the "deactivation" of delivery vehicles subject to elimination. The experts studying the issue interpreted the term "deactivation" to mean that elements of the missile system of each side would be deactivated making launch impossible without rebuilding.

Russian specialists developed a number of alternative procedures for the deactivation and recovery of launch readiness, a system of inspections, and notifications about changes in combat alert status, which they considered applicable to Russia's strategic forces. The majority of these procedures are also suitable for the U.S. strategic forces, but they must be cleared with American experts first.

ICBM deactivation procedures include the following:

- removal of warheads;
- removal of power supply equipment from the delivery vehicle;
- dismantlement of gas generators used to open the silo hatch; and
- mechanical dismantlement of pneudraulic systems for prelaunch and launch operations.

SLBM deactivation procedures can only be applied to strategic submarines at bases. It would be advisable to evaluate the following technical steps for reducing the alert status of SLBMs:

- welding the SLBM silo hatches shut;
- removing warheads from ICBMs; and
- removing SLBMs from strategic submarines and placing them in base storage.

For economic reasons, preference should be given to measures that reduce alert status; these steps would be the cheapest while allowing for verification at a level the other party would consider acceptable.[3] (For a proposed agreement on preventing missile launches drafted by the author and Alexei Arbatov at the request of the Nuclear Threat Initiative, see Box 1, "Proposed Bilateral Agreement.")

Should the United States and Russia pursue the phased deactivation of their strategic offensive arms, the other three nuclear states might become a problem. If the number of combat-ready weapons is low and the time to reactivate them is long, the two leading nuclear powers may begin to worry, in theory, about the possibility of an unexpected attack by other nuclear states. To address this possible concern, one could foresee an agreement with the United Kingdom, France, and China on the application of dealerting procedures to their nuclear forces. For example, combat ready forces of all five nuclear states could be limited to an equal ceiling of 200 warheads for each of them. This type of agreement could create an opportunity to circumvent the issue of parity between the two largest and the remaining three nuclear powers. Russia and the United States would retain their advantages in terms of the overall force, while the other three would enjoy long desired equality with the two larger powers in terms of combat-ready forces.

4. One more important step must be taken simultaneously, or even before the others: achieving a compromise on missile defense, particularly in connection with the so-called "third site" in Poland and the Czech Republic. Where this issue is concerned, almost all U.S. actions appear destructive in nature. Despite the May 2002 U.S.-Russian Joint Declaration on the New Strategic Relationship, which included missile defenses, no consultations were held with Russia on the missile defense systems in Eastern Europe. After these plans were announced, U.S. representatives made multiple statements mentioning measures to address Russian concerns, including permanently stationing Russian observers at the sites, modifying hardware to limit the coverage of the radar in the Czech Republic, promising to load interceptors only if and when Iran poses a real threat, and even pledging to dismantle interceptors once that threat was removed. All of these promises made verbally by U.S. representatives disappeared into thin air when official documents were drafted!

U.S. officials' claims that antimissile systems in Poland are incapable of intercepting Russian ICBMs are met in Russia with serious mistrust. The most qualified independent experts in both the United States and Russia have used models to demonstrate that an intercept capability exists. It is a different matter that the Eastern European missile defense site will not undermine Russia's nuclear deterrence capability because Russian ICBMs are equipped with efficient defense penetration aids. Blatantly misleading statements by U.S. officials nevertheless destroy trust.

Furthermore, there is no telling how far the United States will go with its missile defense deployment plans. Will there be more sites in Europe, and what are U.S. plans for deploying laser antimissile airborne weapons to destroy missiles during the boost phase of their trajectory? Finally, does the United States plan to create space-based anti-ballistic missile systems? In the end, it is necessary to move beyond a compromise on missile defense systems in Europe.

Another important issue involves the prospects of cooperation between Russia, the United States, and Europe on the development, deployment, and joint operation of missile defense systems as set forth in the 2002 U.S.-Russian Joint Declaration on the New Strategic Relationship. Will the two countries stop at a few joint computer-assisted exercises for theater ballistic missile defense, or will efforts go much farther to include a full-scale partnership between Russia and the United States in the development and deployment of missile defense systems capable of intercepting all types of ballistic missiles?

Indeed, two powers can hardly be enemies relying on nuclear deterrence if they deploy and maintain a joint missile defense system. Moreover, they must be full-scale partners and in this respect should be even closer than NATO or Warsaw Pact allies during the Cold War. This situation would imply a much higher level of common interest in foreign and security policy than exists between the United States and Russia today, and even more than exists

3. For details related to the procedures for reducing alert status, including various options for the forces remaining on high alert, recovery timelines, and other issues, see Alexei Arbatov and Vladimir Dvorkin, *Beyond Nuclear Deterrence: Transforming the U.S.-Russian Equation* (Washington, DC: Carnegie Endowment for International Peace, 2006).

between the United States and its European NATO allies (with the possible exception of the United Kingdom) on the issue of missile defense.

To date, nothing significant has come out of the 2002 agreement between the United States and Russia on cooperation in the area of missile defense, primarily due to the impact of continuing mutual nuclear deterrence and growing political disagreements. At the same time, keeping in mind the new threats and challenges to both countries, perhaps it is not entirely far-fetched to suggest that, in the long-term, missile defense—a serious point of contention and one of the main sources of continued distrust and enmity between Washington and Moscow—could become the basis of the two countries' integration and partnership, fundamentally changing their relationship in the military realm. For example, sooner or later, the Missile Technology Control Regime (MTCR) could be transformed into an agreement or convention requiring obligatory notifications for all missile launches. In that event, a joint missile defense system could support the implementation of a strengthened MTCR by intercepting all undeclared missile launches.

In addition to technical and strategic issues, this brings up the delicate issue of participation of third parties. A joint project between Russia and the United States could not exclude their close partners. U.S. NATO allies as well as Japan, and South Korea (or unified Korea at that time) would naturally become participants in such a project and benefit from the protection afforded by the missile defense system. Russia's post-Soviet partners, from a strategic point of view, could also benefit from similar opportunities.

In contrast, states that possess missiles and/or nuclear weapons, such as China, India, Pakistan, Israel, Iran, North Korea, Egypt, Libya, Saudi Arabia, Syria, Taiwan, Yemen, and Vietnam, could present a real problem.

Box 1. Proposed Bilateral Agreement

Executive Agreement

between the President of the Russian Federation and the President of the United States of America, on urgent measures for the prevention of missile launches following false warnings

The Russian Federation and the United States, hereinafter referred to as the Parties,

Mindful of new security challenges, including the proliferation of missiles and nuclear weapons and the growing threat of a terrorist attack using weapons of mass destruction,

Considering that the Cold War and the fears of leading powers concerning the possibility of a surprise nuclear missile attack against a possible opponent's strategic forces, command and control systems, or early warning systems, to be a thing of the past,

Seeking to establish a strategic partnership based on the principles of mutual security, cooperation, confidence, openness, predictability, and required to meet new security challenges,

Recognizing the catastrophic consequences of an accidental missile launch, possible despite highly reliable methods of preventing unsanctioned launches of nuclear missiles,

Acknowledging the need for increased efforts to eliminate the danger of an accidental missile launch,

Believing that agreement on the measures to rule out an accidental missile launches will further strengthen the international community and its security,

Noting that agreement on such measures between Russia and the United States would be in the interests of promoting security and would not conflict with the interests of any other party in any way,

Agree to the following:

Article 1

1. The Parties shall immediately remove from operational plans for their strategic nuclear forces the launch of land-, sea-, or air-based missiles based on information from early warning systems (SPRN in Russia and the NCCS in the United States).

2. The Parties shall immediately discontinue any exercises of their strategic nuclear forces that include the use of their land-, sea-, or air-based missiles based on information from warning systems; they shall exchange information on ongoing and planned exercises and shall invite observers from the other Party to high-level command centers during large-scale exercises of strategic nuclear forces and at the request of the other Party, invite its observers to any other exercises of strategic nuclear forces.

3. The Parties shall consider the possibility of permanently stationing observers (liaison officers) at command centers of each other's strategic nuclear .forces.

4. Each Party shall undertake organizational and technical measures to confirm its commitment to obligations concerning the elimination of the possibility of using high alert strategic offensive weapons on the signal from its early warning systems and shall undertake measures to consistently reduce the technical ability of strategic nuclear forces to launch missiles of all basing modes on information from early warning systems.

Article 2

1. Each Party shall undertake, at its discretion, the organiza-

If China, India, and Pakistan were to remain outside the collective missile defense regime, they certainly would view a multilateral and multitier missile defense system as an effort to neutralize their nuclear deterrence capabilities and undermine their security. From the point of view of these states, such a regime would render them vulnerable and incapable of responding to an attack using nuclear or conventional weapons by one of the members of the "missile defense club." At the same time, Russia highly values its political, economic, and military (arms trade) relations with several of these potential outsiders, including China, India, and Iran. For its part, the United States is interested in the protection of Israel, Pakistan, Egypt, Saudi Arabia, and Taiwan.

The multilateral missile defense regime could be open to third parties in terms of guaranteed protection, although these parties would not necessarily be involved in the development, deployment, and operation of the system. Third parties might receive protection on the condition that they renounce first strike and strike-on-warning policies and agree to reduce their nuclear arsenals as well as accept measures on deactivation and transparency. They might also be required to join all nonproliferation regimes and arrangements, including the NPT and MTCR as well as a center on data exchange on missile launches.

There is no doubt that for a nuclear country with relatively small nuclear and/or conventional forces parting with nuclear deterrence would entail major changes in foreign and perhaps even domestic policy. In any event, each country will decide if it wants to join the multilateral comprehensive strategic partnership.

Russia has much to contribute to a multi-party missile defense system: ground- and space-based information systems, missile defense assets, test ranges, etc. Russia has greater expertise than the United States in certain missile

tional and technical steps deemed necessary to demonstrate their effectiveness during inspections carried out in accordance with the Strategic Offensive Arms Reduction Treaty (START I) between the Soviet Union and the United States.

2. Information about these measures shall be given to the other Party, and each Party shall demonstrate the measures' reliability and provide the timeline required to upgrade alert status to launch on warning. The Parties shall also agree on the possibility of periodic verification.

3. The Parties shall strive to agree on uniform and individual verifiable organizational and technical measures to confirm that missiles cannot be launched on signal from early warning systems.

4. The Parties shall jointly develop, coordinate, and accept amendments to documents, in order to ensure the effectiveness of this Agreement, including procedures and schedules for periodic monitoring of each agreed or unilateral measure.

Article 3

1. The Parties shall undertake efforts to ensure the functioning of their early warning systems in conjunction with the Center for the Exchange of Data on missiles and missile launchers for the purpose of preventing a mistaken reaction to an accidental or provoking missile launch, and shall also use national technical and other means to prevent the proliferation of missiles and missile technology.

2. The Parties shall refrain from experiments in low orbits capable of disrupting the functioning of early warning assets.

Article 4

The Parties shall use the Center for the Exchange of Data to organize uninterrupted exchange of information relevant for this Agreement and for prompt clarification of ambiguous situations related to information from their early warning systems.

Article 5

Information provided by either Party in accordance with this Agreement shall be considered confidential and sensitive.

Such information shall not be disclosed or transferred in any way to a third-party state or any legal or physical entity without the written consent of the Party that has provided such information.

Article 6

The Parties shall use the Special Consultative Commission to promote the objectives and the provisions of this Agreement, to discuss possible amendments aimed at improving, as well as for development of and negotiations on measures aimed at the implementation of this Agreement.

Article 7

1. This Agreement shall enter into force on the day of its signing.

2. This Agreement shall remain in force indefinitely.

3. Should supreme interests of one of the Parties become jeopardized by this Agreement, each Party shall have the right to terminate it 6 months after giving a written notice to the other Party. The written notice must contain an explanation of the threat to the Party's supreme interest, resulting in its incompatibility with that Party's continued adherence to this Agreement.

Done in two copies, each in Russian and in English, both texts equally authentic.

For the Russian Federation ***For the United States of America***

defense technologies. For example, the boost-phase interceptor missiles the United States could deploy are likely to have multiple drawbacks that could undermine their effectiveness. In their July 2003 report, "Boost-Phase Intercept Systems for National Missile Defense," an American Physics Society's working group demonstrated that intercept is only possible as long as the U.S. interceptor's speed exceeds the speed of the missile in the interception zone and the distance between the interceptor and the trajectory of the missile is no more than 500 kilometers (km) for the interception of a liquid-fuel missile or 300 km for interception of a solid-fuel missile. Interception becomes especially difficult if the missile that must be intercepted is launched from a location deep inside the country considered to be a potential enemy. Russian companies have developed high-speed missile interceptors and solid missile fuels that are at least ten years ahead of U.S. technology in this area. Thus, U.S. cooperation with Russian companies could be very profitable for development of a new generation of missile defense assets intended to intercept all types of missiles at boost phase.

This is not the only area where cooperation between Russia and the United States could bear fruit. Successful intercept of missiles of any range and at all stages of their flight trajectory heavily depends on the capabilities of land-, space-, and sea-based information and intelligence systems. Russian early warning radars are uniquely capable of monitoring missile launches from the "belt of instability." It would be perfectly natural to include these radars in the information circuit of a joint missile defense system once an agreement has been reached about a real (as opposed to a proposed) partnership.

The two countries could also partner on the deployment of space tracking and surveillance systems. Space vehicles for such a system, which would weigh approximately 650 kilograms (kg) each, should be equipped with infrared and optical sensors; they should go into circular orbit at an altitude of 1,350–1,400 km, with an inclination of 60–70 degrees. The appropriate launch vehicles for that purpose are the converted "heavy" missiles, developed under the joint Russian and Ukrainian "Dnieper" project. These launch vehicles weigh approximately 210 metric tons and were modeled after the RS-20 (SS-18) ICBM. The first and second stages of that missile are standard SS-20 stages that were left unchanged. The third stage—the booster stage—is the redesigned warhead bus stage. During the strategic arms race, the missile's energy characteristics were the best in the world for its class. Several such launch vehicles, converted after the expiration of the service lives established for the RS-20 ICBM, have already been successfully used in commercial projects for the launch of foreign satellites and have demonstrated excellent reliability. According to some estimates, a launch vehicle of this type with a booster stage and restartable engine can put two space tracking and surveillance satellites into a circular orbit at an altitude of up to 1,400 km with the necessary inclination. This would make it possible to deploy low-orbit assets to feed information to the global missile defense system at a much lower cost.

Thus, a partnership in the area of missile defense, if it were achieved, could become the best guarantee against return to confrontation in any form and at the same time a step toward a real, rather than declaratory, strategic partnership. For more than three decades, missile defense has been the most important element of strategic rivalry between the Soviet Union/Russia and the United States. Now, if reason and political will prevail, missile defense could play an important, positive role in the consolidation of efforts to face global security challenges.

5. One of the first steps toward nuclear disarmament should be a revival of the project on the establishment of a Joint Center for the Exchange of Data from Early Warning Systems and Notifications of Missile Launches (JDEC); the center's functions should also be expanded. In 1998, President Boris Yeltsin and President Bill Clinton made an important decision to create a joint center in Moscow for the exchange of information from early warning systems. On June 4, 2000, both sides signed a memorandum on the creation of JDEC, which was supposed to remain in force ten years, until 2010. The center was designed to prevent unintended nuclear war resulting from an accidental missile launch, and equipped to detect missile launches from any country or any ocean. Early warning systems and intelligence assets of the parties could make it possible to objectively evaluate missile programs of other countries, especially in unstable regions.

Key decisions about the center have already been made: its location, organizational structure, staff responsibilities, and equipment list. Still, it has not become operational. At first glance, it seems that the main impediments to

its operation are legal in nature (taxation and liability for possible damage resulting from the center's operation). The damage liability issue is an important part of the legal framework of joint disarmament- and nonproliferation-related projects between the United States and Russia. Nevertheless, with the necessary political will the legal impediment to JDEC's operation could be solved without creating a precedent for other programs. After all, the possible damages resulting from the center's activities are inconsequential in comparison to programs on elimination of nuclear and chemical weapons and materials.

6. U.S.-Russian cooperation on JDEC's revival is vital not only in terms of reducing reliance on nuclear deterrence, but also for fighting the proliferation of nuclear weapons and missile technologies. The missile threat from Iran, for example, should not be overestimated, but it would also be dangerous to underestimate it. Iran already has Shahab-3 ballistic missiles capable of carrying nuclear warheads, and their range is constantly increasing. The original Shahab was a replica of the North Korean Nodong-1, which was capable of carrying a payload of up to 1,000 kg to a distance of 1,500 km. If the payload is decreased to 500 kg, this missile's range increases by approximately 500 km. The Nodong-1 was built using the same technology as the Scud missile, which was the basis for assumptions about limits to the Iranian missiles' capabilities. High-level Russian officials have made statements about these limits. What they ignored, however, was that Iranian specialists had gone beyond the Scud technology, replacing the four clustered engines from the Nodong-1 with one powerful engine that they had developed themselves. The new engine supports a range of 2,200–2,300 km. On the whole, the notion that countries such as North Korea and Iran could only possess missiles developed using the Soviet Scud technology is erroneous. Notably, as early as the late 1950s, the Soviet Union developed nuclear-capable intermediate-range ballistic missiles with ranges up to 5,000 km. To believe that such technology is unattainable by other countries is a dangerous and mistaken delusion.

A U.S. intelligence report released in 2007, which claims that Iran's nuclear weapons project was discontinued in 2003, leads to a paradoxical conclusion.[4] First, it contains no references to concrete facts that support this conclusion; its findings are based instead on supposition and conjecture. Second, the report confirms that the government of Iran deceived the International Atomic Energy Agency (IAEA) and the international community on a much larger scale than previously believed when it claimed that it had never had a nuclear weapon program. Finally, it is possible that Iran's work on nuclear weapons ended because the bulk of work on the main components of a nuclear weapon, including the construction of an explosive device, missile re-entry vehicle, and aircraft bomb, had been completed. This theory is based not just on the availability of information about nuclear weapon design, but also on information on Iraqi nuclear weapon designs discovered after the first Gulf War. In the final Iraqi weapon design, the weight of the warhead was estimated to be between 415 and 868 kg; its diameter was estimated at 600–650 millimeters (mm). It was designed to include a neutron initiator, a core of highly enriched uranium (15–18 kg), a natural uranium reflector (100–250 kg), a steel membrane (50–200 kg), conventional explosives (250–500 kg), and other parts. The amount of uranium needed for one warhead is rather small (15–18 kg) and could be sought on the black market. For that reason, the possibility that Iran possesses at least one experimental warhead should not be ruled out.

7. The next step Russia and the United States could take to reduce their reliance on nuclear deterrence is to prevent the militarization of space. The likely near-term qualitative step toward the militarization of space, which involves deployment in space of assets capable of destroying or disrupting the work of space vehicles as well as surface, air, and/or naval targets, could lead to a global destabilization of the security and political situation. This danger stems from the significant experience of the United States and the Soviet Union in the research and development of space and antisatellite weapons systems. Of even greater concern is the emergence of new technologies that allow countries to build and launch into orbit large numbers of relatively cheap, and light-weight military spacecraft; to use weapons in space based on new physical principles; and to interfere in a variety of ways with objects in orbit and with ground control and communication centers.

The existing U.S. plans to monopolize or militarily dominate space, which underlie U.S. resistance to new diplomatic initiatives, are extremely shortsighted and will prove counterproductive even where America's own security is

4. U.S. National Intelligence Estimate, "Iran: Nuclear Intentions and Capabilities," November 2007, <www.dni.gov/press_releases/20071203_release.pdf>.

concerned. Currently, the United States enjoys an undisputed economic and technical superiority in space. Should a space arms race begin, however, it would inevitably draw in other countries—China, Russia, India, and others—and U.S. superiority could be undermined if not lost altogether. This is particularly true because the United States, which enjoys a clear lead in the ability to put weapons into space, depends more than any other country on the safety of space vehicles that support its military and civilian needs. Moreover, satellites are inherently vulnerable due to their technical makeup and as a result of laws of dynamics in space (predictability of orbits, easy detection, limited maneuverability, etc.). Finally, space, which lacks places to hide and does not have national borders, is extremely dangerous in terms of accidents, incidents, false alarms, and control system failures.

Currently, space weaponization programs are justified as a way of preventing the proliferation of nuclear weapons and missiles both through deployment of missile defense and through active defense of satellites and destruction of enemy satellites in case of an armed conflict with states that are engaged in proliferation of these weapons. In certain cases, such a hypothetical nonproliferation strategy might work. However, viewed in a broader and longer term perspective, the growing threat of an arms race in space and, more importantly, space conflicts, will inevitably lead to vertical and horizontal missile and nuclear proliferation and to an irreversible crisis for the nuclear nonproliferation regime. To avoid this course of events, it is urgent that an international agreement be developed and signed to prevent weaponization of space. As a first step, space-faring countries should endorse the UN Code of Conduct for Countries in Space,[5] which should later be transformed into a legally binding agreement.

8. Yet another Russian concern is the possibility that high-precision conventional weapons could be used to destroy strategic targets. Precision-guided munitions (PGMs) pose a threat to all branches of the strategic nuclear triad, including the silo and mobile launchers of the Strategic Rocket Force (SRF),[6] strategic submarines in bases, and strategic bombers. The types of PGMs to be used against each of these components, the vulnerability of assets, and operational requirements would require a separate study.

The growing counterforce capability of U.S. PGMs may present a considerable threat to the survivability of Russia's strategic forces, which the Russian government might take into account as it calculates its nuclear deterrence capability. Should this threat persist, the process of reducing nuclear weapons and strengthening the nuclear nonproliferation regime could face a serious obstacle.

This obstacle could be addressed in different ways. One way is to make sure that any new treaty between Russia and the United States on strategic arms reduction (intended to replace START I after 2009 and SORT after 2012) retains the same accounting rules for strategic delivery vehicles regardless of whether they are nuclear or non-nuclear. Other methods include prohibiting the basing of strike aircraft on the territories of new NATO members and limiting patrol areas for submarines equipped with cruise missiles to prevent deployment of a significant number of U.S. submarines in close proximity to Russia's territory. It might be possible to simultaneously solve some other problems that Russia has raised on multiple occasions at the talks on strategic arms reductions: the prohibition of concealed antisubmarine activities in Russian strategic submarines' patrol areas as well as the prevention of collisions between nuclear-armed submarines, among others issues.

This is not the only threat to the nuclear nonproliferation regime caused by large-scale deployment of PGMs. An overwhelming advantage of one country or alliance in these highly efficient types of weapons will always lead "threshold" states to the acquisition of nuclear weapons at the earliest opportunity, to be used as an asymmetrical form of defense. It is thus time to begin, without delay, consultations between leading states on issues concerning the proliferation of precision-guided weapons.

9. Russia and the United States could take yet another step toward nuclear disarmament by organizing consultations on a multilateral nuclear dialogue to bring the United Kingdom, France, and China into the system of nuclear forces verification, together with transparency and confidence-building measures established by START I.

5. This document was drafted as a joint effort between the Stimson Center and Russian specialists.
6. The Strategic Rocket Force is the branch of the Russian Armed Forces in charge of land-based long-range missiles.

The United Kingdom and France could, without much problem, make official statements or even undertake a commitment to forego any plans to increase their nuclear forces. This should be easy because it would reflect their actual plans. These two states could also voluntarily accept the START I confidence-building measures they find acceptable.

Things might be more complicated with China for a number of reasons, including the deployment of missile defense in the Far East by the United States and Japan. That missile defense system is equipped with Standard Missile 3 (SM-3), which is continually being modernized and has a strategic capability comparable to that of the ground-based interceptor (GBI). China is certain to regard missile defense as a threat to its nuclear deterrent. Chinese officials do not appear to believe that the four Japanese destroyers with missile defense capability are intended to neutralize the North Korean missile threat. One solution might be for Russia and the United States to gradually integrate China into JDEC. Also, the United States and Japan could provide assurances that the missile defense system is not meant for use against Chinese nuclear forces.

10. To reduce reliance on nuclear weapons, it will also be necessary for Russia and the United States to launch negotiations on limiting tactical nuclear weapons (TNW). Among the first steps could be an exchange of data on the numbers of TNW and an agreement on keeping all TNW in central storage facilities. (This agreement would include the removal of U.S. weapons in Europe to the territory of the United States). Such an agreement would not be hard to verify through transparency measures and, if necessary, permanent monitoring of central storage facilities. Currently, Russia only has TNW ready for deployment at airbases, all other classes of TNW are kept in central storage.

Since Russia clearly intends to rely on TNW to compensate for the weakness of its conventional forces vis-à-vis NATO and China, such an agreement would affect Russia more than other nuclear states. Moscow might find the prospect of keeping TNW in central storage facilities instead of eliminating them more palatable because it could be seen as insurance against a worst-case scenario in Europe or the Far East. Moreover, the removal of U.S. TNW from Europe would provide adequate compensation to Russia and serve as an important indication that NATO is dismantling its original mission—that of an anti-Russian military alliance.

The implementation of the Agreement on the Adaptation of the Treaty on Conventional Forces in Europe (CFE II) by all parties could alleviate Moscow's concerns about the military balance with the West. An even greater benefit could be achieved through the development of a new agreement on conventional forces in Europe, one providing for a further reduction (by at least another 50 percent) of conventional forces in accordance with the national and territorial quotas defined by the CFE II.

11. One more long overdue step toward nuclear disarmament is urgent ratification by China and the United States of the Comprehensive Nuclear Test Ban Treaty (CTBT), which is the key link between vertical and horizontal nonproliferation. Ratification by these two countries could encourage India, Pakistan, Israel, and North Korea to also abide by the CTBT and would place tangible limits on nuclear weapons modernization by governments of nuclear states. It would also erect a serious obstacle to both open and clandestine nuclear programs of proliferant states.

The George W. Bush administration's arguments against ratification of the treaty were unconvincing. Under Bush, Washington refused to seek ratification on the ground that it would be difficult to detect explosions that could be carried out in various countries. In any case, there has not been sufficiently convincing scientific proof that detection of weak nuclear explosions is impossible.

Conclusion

The aforementioned steps, which must be taken in order for Russia and the United States to reduce reliance on nuclear deterrence, are important, but not exhaustive. They are required to achieve universal nuclear disarmament in the long run and to strengthen the nuclear nonproliferation regime in the near future.

These steps could remove many of the existing obstacles to cooperation between governments in the area of nonproliferation, but these measures alone cannot stop, much less reverse nuclear proliferation. To achieve that, it will be necessary to take a range of multilateral actions that directly address the regime: making it universal and strengthening the NPT, its norms, and mechanisms. (The Appendix includes steps to strengthen the NPT and the nonproliferation regime.) Only then could an effective pursuit of targeted, "tailored" counterproliferation policies be effective. These steps also require that key world powers act jointly and abide by international law, especially where the use of force is involved.

APPENDIX

The following steps must be taken to reinforce the NPT and the nuclear nonproliferation system as a whole:

1. All members shall ratify the 1997 IAEA Additional Protocol as a requirement for any international cooperation in the area of nuclear energy.

2. All countries that have not ratified the Additional Protocol shall be prohibited (the prohibition enforced through the Zangger Committee and the Nuclear Suppliers Group) from receiving any transfer of nuclear materials and technology.

3. Countries that have renounced a full nuclear fuel cycle shall have the right to purchase fuel at the lowest market price; spent fuel will be removed by supplier states or by specially created international centers operating under the aegis of the IAEA.

4. The international community shall develop and adopt standards for accounting, physical protection, safe transport, and storage of nuclear materials with priority attention to physical protection, accounting, and monitoring of nuclear weapons and weapons-grade materials at storage sites.

5. States shall immediately conclude a Fissile Material Cutoff Treaty to ban production of fissile materials for weapons (weapons-grade uranium in particular) with appropriate verification mechanisms for all nuclear and non-nuclear members of the NPT, including the three states not party to the NPT (Israel, India, and Pakistan).

6. The participating states shall create a legal framework for the Proliferation Security Initiative to cover norms and procedures for interception and inspection of sea-, land-, and air-based illicit transportation of suspected WMD materials, including nuclear materials and technology.

7. The United States, Russia, and other technologically advanced countries shall accelerate joint programs to develop next generation nuclear reactors that feature safe operation and minimal amounts of weapons grade materials in spent-fuel. Breeder reactors and plutonium producing reactors should be abandoned.

8. The MTCR must be strengthened, especially with regard to the transfer of dual-use technologies. Great powers must collectively pressure countries not party to that regime to join it. The MTCR must be transformed into an international treaty (convention) with clear-cut definitions of its terms, verification and transparency mechanisms, and obligations of parties to make necessary changes to their national legislation and establish export control regimes in accordance with common norms.

It must be understood that complete nuclear disarmament is a relatively long-term goal that requires comprehensive solutions to nuclear programs of both known and clandestine threshold states and creation of a global security system. With that in mind, the above-mentioned steps appear a prerequisite for the achievement of that longer-term goal.

The Prospect of Universal Complete Nuclear Disarmament

Pavel S. Zolotarev

A rather paradoxical situation concerning nuclear weapons is evolving in the modern world. On the one hand, the role of nuclear weapons as a possible means of warfare is decreasing (their catastrophic consequences are becoming more evident), while on the other hand, the danger of an avalanche-like growth in the number of nuclear weapon states is increasing.

There seem to be several reasons for this paradoxical situation. Without getting into the details, these reasons can be grouped under two main categories:

1) The system of nuclear arms control agreements that was built during the Cold War years is imperfect and has been partially dismantled.

2) Motives to possess nuclear weapons continue to exist.

Constraints on missile defense that were part of the *nuclear weapons arms control system* have disappeared, including the now-defunct Anti-Ballistic Missile Treaty. The Strategic Arms Reduction Treaty (START I) is nearing expiration. The Strategic Offensive Reductions Treaty (SORT) lacks any mutual verification mechanism, does not constrain the number of delivery vehicles, and leaves open the possibility of building up stockpiles of nuclear warheads. The future of the Intermediate-Range Nuclear Forces (INF) Treaty is uncertain. The nuclear nonproliferation regime is inefficient. The prospects of inevitable development of the nuclear power industry and missile technologies (space exploration has become a prerequisite for development in the globalizing world) create a technological basis for a growing number of states to acquire nuclear weapons.

Motivations to possess nuclear weapons vary. For the *United States,* the *United Kingdom,* and *France*, the motivation to maintain these weapons is minimal. The Soviet Union has ceased to exist, and Russia, which inherited the Soviet nuclear capability, does not pose a threat to these countries. Nevertheless, the United States is striving to minimize constraints pertaining to its nuclear assets and to simultaneously strengthen its missile defense capabilities. The contradiction of the current U.S. nuclear policy lies in the fact that, objectively, the United States is interested in universal complete nuclear disarmament, yet its daily policy continues to encourage possession and proliferation of nuclear weapons.

Russia maintains a certain motivation to possess nuclear weapons primarily due to the weakness of its general-purpose forces. Moreover, this motivation persists mainly with regard to non-strategic nuclear weapons. The uncertainty about possible developments in the east of the country, given the increasing growth of China's military power and its enormous mobilization potential, compels Russia's military leadership to rely on nuclear deterrence. Russian strategic nuclear assets have lost their dominant role in defense planning; however, the likely prospect of gradual buildup of the combat capability of U.S. missile defenses, which could have the ability to target Russian missiles, could dramatically upset the strategic parity and motivate Russia to qualitatively upgrade strategic nuclear weapons.

China, which possesses nuclear weapons, has never posed any nuclear threat, especially after it ceased to be a

Communist regime. China's doctrinal provisions are based on no-first-use of nuclear weapons, and this is not simply a declaratory policy. China, which has an immense advantage over other official nuclear weapon states in mobilization of human resources, is not interested in using nuclear weapons.

India and *Pakistan* developed their nuclear weapons as part of the evolution of the conflict potential in their relationship; however, Pakistan's main problems today are domestic issues unrelated to India. And India's nuclear policy is mainly influenced by the state and prospect of the development of China's military power. Therefore, these countries' likely motivations concerning nuclear weapons are rather unclear at present.

The *Democratic People's Republic of Korea* (DPRK, or North Korea) has a solely political motivation to play the "nuclear card." The purpose of the DPRK's nuclear gamesmanship is to prolong the existence of the ruling regime and to procure economic assistance to this end.

Iran, regardless of its actual plans concerning nuclear weapons, has motivation to develop them due to the presence of an unfriendly nuclear neighbor in the region and the desire to gain regional leadership.

In addition to these countries, there are quite a few other states that have the necessary scientific and technical capability to rapidly develop nuclear weapons—and have certain motivations to do so. They could become nuclear weapon states due to the influence of external developments.

For many non-nuclear states, certain features of the current stage of globalization create motivation to possess nuclear weapons. Specifically, these features are as follows. First, globalization widens the gap between very wealthy, militarily powerful states and very poor, weak states; these weak states see nuclear weapons as one of the cheapest means of defense against any pressure that involves threats of force by a great power. Second, the absence of global bipolar confrontation and the emergence of new centers of power have made rivalry at the regional level more acute. The emergence of nuclear weapon states on the regional level can produce nuclear rivalry. For example, there is a high probability that Iran's nuclear weapons could lead Saudi Arabia to acquire them, too. A similar situation could also unfold in Latin America.

For officially recognized nuclear weapon states, the role of nuclear weapons as weapons of warfare is minimal. To these states, it is obvious that limited use of nuclear weapons would be meaningless. No matter how nuclear weapons were used at first (a single nuclear strike or a handful of strikes using tactical or strategic weapons), the transition to a massive use of nuclear weapons would be virtually unavoidable. At the same time, however, the stockpiles of nuclear weapons are so large that the consequences would be catastrophic not only for the parties to a conflict, but for all mankind. Yet, states that possess (or will acquire) single-digit nuclear stockpiles could decide to use nuclear weapons against states with similar stockpiles or against a conventionally superior non-nuclear weapon state. In such cases, it would be incorrect to assert that nuclear weapons have completely lost their military role.

Overall, from the very onset of their creation, nuclear weapons, unlike any other previously known type of armament, acquired significant political relevance. Today one can conclude that none of the officially recognized nuclear weapon states considers nuclear weapons as a means of warfare.

One can assume with a high level of certainty that, despite official doctrinal provisions, none of the nuclear weapon states will use nuclear weapons first. Nonetheless, plans for combat use of strategic nuclear weapons have remained largely the same as they were during the Cold War: in Russia, mainly against the United States, China, the United Kingdom, and France; in the United States, against Russia and China; in China, against the United States and Russia. It cannot be otherwise, since no other state has enough targets to accommodate every existing delivery vehicle. This is why on a day-to-day basis all parties have switched to maintaining strategic nuclear assets without any flight programs on board the delivery vehicles, although it is clear that command systems are able to re-enter old plans into the guidance systems in a matter of minutes. However, these few minutes are sufficient for Russia and the United States to retaliate, even in the form of a launch-under-attack strike. The maintenance of U.S. and Russian nuclear arsenals under this posture preserves the risk of inadvertent or provoked use of nuclear weapons and raises concerns over the possibility of upsetting the strategic balance.

Overall, the motivation to possess nuclear weapons has survived in the modern world. *The synergy of the emergence of a multipolar world and the threat of cascading nuclear proliferation generates serious, global-scale security threats.*

Given the current state of affairs, the initiative of four prominent U.S. political figures (George Shultz, Henry Kissinger, Sam Nunn, and William Perry) on *pursuing "nuclear zero"—universal and complete nuclear disarmament—meets not only the interests of the United States, but also the security interests of the entire global community.*

The implementation of the idea of universal nuclear disarmament is perfectly feasible; however, it requires the development of a strategy and tactics for moving toward this goal using a comprehensive approach that seeks to accomplish a wide range of tasks in different issue areas.

Top among these tasks are those that seek to remove key impediments to the nonproliferation regime and to the reduction, and complete elimination, of nuclear weapons. These tasks could include:

- the development of a system of international security, which would exclude the need for and the possibility of reliance on military power for conflict resolution, and the setting of terms and the provision of security guarantees to non-nuclear weapon states;
- withdrawal of strategic nuclear forces and command systems of Russia and the United States from the posture of mutual nuclear deterrence;
- removal of conditions that create the motivation to acquire and retain nuclear weapons for both nuclear and non-nuclear weapon states;
- abandonment by all nuclear powers of doctrinal provisions that regard nuclear weapons as key instruments of security and strategic deterrence; and
- preservation, adjustment, and development of remaining elements of the nuclear arms control system for current world conditions.

Establishing a New System of International Security

Building a new system of international security will be a long and complex process. However, current policies undertaken by leading countries suggest a step-by-step approach, which would make possible the creation of international mechanisms for coordinated action customized for each specific situation. Examples of real-world policy include mechanisms—two "groups of six"—for resolving nuclear issues involving Iran and the DPRK.

The six states working on the North Korean case are China, Japan, South Korea, Russia, and the United States, along with North Korea. It must be noted that three out of the six parties to the negotiations (Russia, the United States, and China) are official nuclear weapon states, as well as permanent members of the UN Security Council; both South Korea and, particularly, Japan are technically capable of rapidly developing nuclear weapons.

A similar format has been created for negotiations with Iran; the membership of this "group of six" includes the United Kingdom, France, Germany, Russia, and the United States on one side, and Iran on the other. Four out of six members of the talks (Russia, the United States, the United Kingdom, and France) are officially recognized nuclear weapon states (and permanent members of the UN Security Council), and Germany has the technical capability to rapidly develop nuclear weapons. Time will show whether this new group will have greater success in resolving Iran's nuclear issue than the six-party talks that have been held on the North Korean issue.

Thus, a new informal political mechanism to resolve the most acute problems in the nuclear nonproliferation area has been created. It includes all five permanent members of the UN Security Council, which, simultaneously, are

the official nuclear weapon states, and two great powers that aspire to permanent seats on the UN Security Council but are non-nuclear weapon states.

This new negotiation format is objectively contributing to the rise in status of Germany and Japan in the world hierarchy, demonstrating that possession of nuclear weapons is not mandatory for participation in the resolution of key issues concerning international security, such as the nonproliferation of nuclear weapons.

It must be especially emphasized that only two countries are represented in both groups of six: the United States and Russia. This would seem to reflect a particular responsibility of the two nuclear superpowers to maintaining strategic stability and preventing the nuclear threat worldwide. It can be concluded without exaggeration that without positive Russian-U.S. cooperation, the resolution of the Iranian and North Korean issues, as well as the problem of nuclear disarmament in general, is impossible.

The cumulative experience of the groups of six suggests that similar mechanisms could be used to achieve practical solutions to the task of complete nuclear disarmament. When such an individualized approach is applied to each nuclear power, there is a better chance of identifying and fulfilling the conditions under which it is more likely to start down the road of gradual reduction and complete elimination of nuclear weapons.

Nuclear disarmament should not be postponed until new international security institutions are established or old ones are upgraded, or until a new system of global security is created that is capable of resolving existing and future issues. It is essential that we move toward the end goal—universal nuclear disarmament—step by step, creating collective structures for each specific task. However, to do that, it is important to put relations between the two leading nuclear powers on a qualitatively new level, the level of strategic partnership, which so far has remained largely declaratory. First and foremost, it is important for Russia and the United States to step back from the posture of mutual nuclear deterrence.

Dismantling the Mutual Nuclear Deterrence Posture

As long as Russia and the United States remain locked in a state of mutual nuclear deterrence, it will be impossible to begin real progress toward universal nuclear disarmament.

The downside of the high-alert status of U.S. and Russian strategic nuclear forces and their readiness to act against each other in a launch-under-attack mode is not limited to the risks of inadvertent or provoked exchange of nuclear strikes. This posture also causes any actions of the other side with regard to modernization and development of nuclear and missile capabilities or defense against strategic missiles to be assessed as an attempt to gain unilateral advantage. And it cannot be otherwise. Based on the signals of the early warning system (EWS), the country's leadership must make a decision about retaliatory action in a very short time. Existing war plans cover only countries that were adversaries during the Cold War. There is no time to consider alternative decisions. Old plans are entered into the command system and on board strategic delivery vehicles in a matter of minutes. Missile defense assets—even if they are able to hit a certain number of detected targets (either real or false) with high precision—don't give any additional time for decision-making on the use of nuclear weapons: the risk of losing the ability to retaliate in a launch-under-attack situation would be extremely high. As long as there is even a theoretical possibility that a situation could take this course, any attempts to deploy forces or define patrol areas for strategic submarines closer to the territory of the former adversary would be regarded as a genuine threat. Similarly, attempts to deploy missile defense systems of a nuclear weapon state close to the territory of another nuclear weapon state would be viewed as an attempt to create an opportunity for a preemptive strike, thereby denying retaliation. Such decisions in the sphere of missile defense not only contradict the goal of universal and complete nuclear disarmament, but also impose threshold constraints on the feasible scale of reduction of nuclear forces. The higher the effectiveness of missile defense, the greater the impact on these threshold reductions.

From these arguments, it follows that altering the Russian and U.S. mutual nuclear deterrence posture is a top priority. Simultaneously, another task emerges: *designing and deploying missile defense systems in ways that do not undermine the reduction and subsequent elimination of nuclear arsenals*.

It must be noted that in the late 1990s and early 2000s, there were many proposals aimed at reducing risks from either the posture of mutual nuclear deterrence or the withdrawal from this posture.[1] Many of these proposals could still be helpful, but they have to be timed to the stages of withdrawal from the mutual nuclear deterrence posture. Some of those proposals could and should be implemented as a matter of priority, while others are for later stages.

Proposals to reduce the alert status of intercontinental ballistic missiles (ICBMs),[2] for instance, do not belong to high-priority measures. Land-based strategic delivery vehicles were originally designed to ensure minimal time needed for launch. This is their nominal mode of combat duty. Any technical steps aimed at reducing their alert status could cause disruption of the normal mode of operational service. The implementation of such steps would require coordinated technical decisions with the designers of these systems, and for Russia, this would mean sometimes involving design bureaus of other countries (for example, working with Ukraine on the SS-18 ICBM). If these possible solutions aimed at reducing alert status include removal of warheads, this brings about a wide range of issues. First of all, removed warheads must be stored under certain specific conditions. When the warhead is deployed on a missile, key parameters of all its elements are constantly monitored; storage facilities do not provide such conditions. This means that either instruments for parameter control would have to be developed, or alternate solutions found. The expansion of storage space for warheads would also be necessary. Furthermore, missile control systems are designed for situations in which warheads are deployed and include monitoring of warhead parameters. If the warhead is removed, it becomes necessary to install a simulation device (or equivalent) in its place, which would allow the operational service regime to be maintained similar to the nominal mode. All of this is time-consuming and expensive.

Additionally, it must be taken into account that reduction of alert status of land-based ICBMs cannot be carried out in isolation from other components of strategic nuclear forces. For instance, if one does not limit patrol areas for nuclear-powered ballistic missile submarines (SSBNs), then the United States will gain unilateral advantage over Russia if both countries reduce the alert status of ICBMs. SSBNs could have the capability to strike with minimal flight time the central authority, as well as command and control centers, from patrol areas such as the Norwegian Sea. A launch-under-attack strike mode would be impossible because ICBMs would not be ready, while a second strike would be impossible because of the decapitation of the command and control system; one nuclear submarine could cause that much damage. For its part, Russia is incapable of posing a similar threat to the United States because the highly developed U.S. submarine detection and surveillance system makes such a threat almost unrealistic.

These arguments lead us to the conclusion that for the immediate future, measures toward withdrawal from the posture of mutual nuclear deterrence should not include reduction of the alert status of ICBMs.

1. Sergey Rogov, Viktor Yesin, and Pavel Zolotarev, "Dve shesterki v shesterenke strategicheskoy stabilnosti" [Two Groups of Six in the Machine of Strategic Stability], *Nezavisimoye voyennoye obozreniye* [Independent Military Observer], September 6, 2006; A.G. Arbatov, V.S. Belous, A.A. Pikayev, and V.G. Baranovskiy, *Snizheniye boyegotovnosti yadernikh sil Rossii i SShA: Put k umenshcheniyu yadernoy ugrozi* [*Reduction of the Military Readiness of Russian and U.S. Nuclear Forces: The Path to Reducing the Nuclear Threat*] (Moscow: IMEMO RAN, 2001); Pavel Zolotarev, "Vozmozhniy oblik 'novikh ramok' strategicheskikh otnosheniy Rossii i SShA" [The Possible Guise of the "New Framework" for U.S.-Russian Strategic Relations], Report No. 1 of the Russian Government Center for Defense Information, 2002; Sergey M. Rogov, Viktor I. Yesin, and Pavel S. Zolotarev, "Mogut li Rossiya i SShA otkazatsya ot vzaimnogo yadernogo sderzhivaniya" [Can Russia and the U.S. Reject Mutual Nuclear Deterrence], *Vestnik Rossiskoy Akademii Nauk* [Bulletin of the Russian Academy of Sciences] 75 (February 2005); V.Z. Dvorkin, "'Dorozhnaya karta' yadernogo razoruzheniya" ['Road Map' to Nuclear Disarmament], *Nezavisimoye voyennoye obozreniye* [Independent Military Observer], October 17, 2008.
2. Arbatov, Belous, Pikayev, and Baranovskiy, *Snizheniye boyegotovnosti yadernikh sil Rossii i SShA: Put k umenshcheniyu yadernoy ugrozi* [*Reduction of the Military Readiness of Russian and U.S. Nuclear Forces: The Path to Reducing the Nuclear Threat*].

At the same time, there are decisions that are simple to implement and can provide significant results. In this regard, it is especially important to emphasize a solution that was discovered more than a decade ago but has not been implemented: the Russian-U.S. memorandum, which envisioned the establishment in Moscow of a Joint Data Exchange Center (JDEC) for the exchange of information from early warning systems.

To begin with, it is important to highlight several important provisions of the memorandum. First, participation in the JDEC was supposed to be open to other countries. Second, members of the JDEC were obligated to provide advance notification about upcoming missile launches (e.g., testing, training, research, space vehicle launches, and so on). Third, during the first phase the JDEC was supposed to be equipped with national technical means of displaying EWS information; for the subsequent stage a transition to real-time interface was envisioned.

In essence, the opening of the Russian-U.S. JDEC would not only practically resolve the issue of an inadvertent or provoked (by third-party action) nuclear exchange, but would also make impossible the deliberate preparation and implementation of a launch (accepting the theoretical possibility that such a level of confrontation between Russia and the United States could take place). As a result, the JDEC could directly impact the building of mutual trust between Russia and the United States. The subsequent inclusion in the center's crews of representatives from other nuclear states would promote an environment of trust among all nuclear states.

The center could also prove extremely useful for strengthening the nuclear nonproliferation regime, as well as for missile defense tasks. For example, including non-nuclear weapon states in the activities of the JDEC could remove their concerns created by proximity to a nuclear state. As a result, one of the motivations for possessing nuclear weapons would be reduced.

As for missile defense, the JDEC could serve as one of the first steps in shaping elements of joint command of strategic missile defense systems deployed outside national territories. It has already been mentioned that attempts to build a strategic missile defense system using the currently dominant approach are incompatible with both the objective of deep cuts of strategic delivery vehicles and, to an even greater extent, with universal and complete elimination of nuclear weapons.

At the same time, one must admit that as long as the threat of proliferation of missiles and nuclear weapons continues to exist, missile defense will continue to have a mission. However, it is quite feasible to find approaches to designing missile defense systems that allow the combining of missile defense missions, preventing nuclear and missile proliferation, and facilitating the abandonment of the posture of mutual nuclear deterrence.

It is important to note a number of vital features:

- Missile technologies are increasingly available to many states. Depending on changes in the political environment, *sources of missile nuclear threat could emerge in different geographic regions*.
- *A missile defense system can be efficient only if it can intercept targets at various points of the flight trajectory of the missile and warheads* (boost, midcourse, and terminal phases).
- *An effective missile defense system cannot be developed within only one national territory* because of the uncertainty of the source of incoming missiles and the need to intercept targets at various phases of the flight trajectory.
- *Dispersal of missile defense assets outside national territories requires the cooperation of many states*. Otherwise, states located near the missile defense system will be concerned about the possibility that that system is targeted at them.
- The development of a multinational missile defense system requires *a command and control system that would allow joint use of national information and combat assets*. Consequently, command and control centers must accommodate crews from several member states.

The issue of command of a missile defense system, as a rule, raises the most questions. Figuratively speaking, is

it possible to have several drivers behind the wheel, and if so, where would the car end up? Yet certain features that are specific to the task of missile defense are conducive to collective management. The missile defense system can be effective if detecting and striking a target is performed in an automatic regime—without human participation. However, the process of preparing the system to carry out its mission requires advance activities, including assessing the missile threat, identifying the assets necessary to defend against the threat, putting these assets (sea-, ground-, or air-based) into position, and switching the system into automatic mode when a target is detected. It is obvious that this process is rather lengthy because missile threats do not emerge all of a sudden. This is why the optimal solution is joint command that uses national detection and surveillance systems, mobile missile defense assets, and the use of each member's geographic position to effectively defend against the missile threat. In this regard, proposals made by the president of Russia in 2007 regarding the establishment of JDECs in Moscow and Brussels for the exchange of information from missile launch warning systems should be approved and judged beneficial for true partnership between Russia, United States, and other European countries.

While the Russian-U.S. memorandum envisioned the establishment of the center only in Moscow, the new initiative foresees a similar center in Brussels as well, which significantly widens the range of possible solutions. For example, one of the centers could remain within the framework of functions envisioned by the memorandum, but with expanded membership, and the other center could have a broadened scope of responsibilities encompassing command of European missile defense, including elements of U.S. missile defense in Europe. The composition of crews in the latter case would be determined by states participating in the European missile defense system.

One key principle of creating missile defense systems must be the independent control of missile defense elements on one's own national territory along with joint command of elements deployed outside the national territory that are capable of posing a threat to member countries.

In addition to organizational and technical measures, the downgrading of the mutual nuclear deterrence between Russia and the United States must be supplemented by a set of confidence-building measures (CBMs). These could include the following:

1) Informing parties about principles of nuclear deterrence strategy, forms and methods of employing nuclear weapons, and key principles of nuclear planning.

2) Exchange of information about the nuclear capabilities of other states, assessments of the process of proliferation of nuclear weapons and delivery systems, evaluation of other countries' capacity to pose a nuclear threat to either of the parties.

3) Exchange of information about the composition and prospects for development of strategic nuclear posture, and on possible flight time to potential targets, in particular the minimal possible time.

4) Provision of complete advance information on upcoming missile launches; ability for timely detection of missile launches regardless of launch area; and real-time exchange of complete information about detected launches and possible state of origin of the delivery vehicle.

5) Exchange of information about possible stationing of nuclear weapons delivery vehicles in areas that allow for minimum flight time.

6) Exchange of information on the transfer of strategic nuclear forces to higher alert status, including deployment and bringing into higher readiness of reserve command systems of strategic nuclear forces.

A set of CBMs like these could be limited to the Russian-U.S. format only at an initial stage. It is vital to spread such CBMs to all nuclear weapon states; yet involving other nuclear weapon states in negotiations on the reduction of nuclear weapons is not an easy task. This is why CBMs could serve as an acceptable first step for the process of working with other nuclear weapon states.

Overall, withdrawal from the posture of mutual nuclear deterrence is possible. It is rather easy to develop and

implement a practice-oriented version of a "road map." The key is political will. The fate of the Russian-U.S. memorandum on the establishment of a JDEC for the exchange of information from each side's early warning systems suggests that there are elements on both sides that are interested in maintaining the posture of mutual nuclear deterrence.

Neutralizing the Motivation to Possess Nuclear Weapons

To reduce the motivation to possess nuclear weapons, by all appearances, it is important to resolve two key issues:

- Provide security assurances to non-nuclear weapon states against possible military actions by states that have overwhelming military superiority.
- Find ways to resolve contradictions and conflicts on a regional scale, which would remove the need to possess nuclear weapons.

Actions on these issues could be limited to the political and diplomatic sphere, or complemented by a set of military and technical activities. If one considers the two most pressing cases—Iran and the DPRK—then it is obvious that other options are possible in which military and technical measures are unnecessary.

For instance, North Korea uses its nuclear program for blackmail, in order to prolong the ruling regime for as long as possible in the course of gradual transformation of its social and political system, while simultaneously receiving economic assistance from other countries. The DPRK has no claim to global or regional leadership and has no aggressive intentions that require possession of nuclear weapons. In combination with economic assistance, assurances that military means of regime change (as used in Iraq) will not be used against the DPRK should most likely be sufficient to remove any North Korean motivation to possess nuclear weapons. The basis for this assumption is the noticeable, positive change in the DPRK's position after mid-2006. As soon as the United States, perhaps with lessons learned in Iraq, stopped issuing any rhetoric about the need to change the ruling regime of North Korea, leaving at the forefront only the issue of nuclear nonproliferation, North Korea's position changed. The issues under negotiation came to depend almost exclusively on the terms and the implementation of obligations related to the provision of economic assistance. Policy toward North Korea can now remain in the realm of political and diplomatic measures and will not require reinforcement with measures of military and technical nature.

The situation could be markedly different if nuclear ambitions are caused by the desire to either enhance regional dominance or to restore the balance of power with an unfriendly nuclear state in the region—or to do both at once. In this case, attempts to acquire nuclear weapons or to attain a level of advancement of an indigenous civilian nuclear industry and fuel cycle technologies that would allow rapid development of nuclear weapons if the political situation mandates it (acquiring a "latent" capability) could bypass all restrictions of international law, International Atomic Energy Agency safeguards, international sanctions, and so forth. In this situation, one cannot rule out the need to take military and technical measures aimed at reducing the motivation to possess nuclear weapons.

It is obvious that the list of military and technical measures, including those of a preemptive nature, can differ depending on each situation. However, it is advisable to develop in advance a certain "menu" of such measures and legal conditions for their use.

To determine specific military and technical measures, it is essential to define their purpose. It is clear that these measures should be able to complement and reinforce political efforts to reduce the motivation to possess nuclear weapons. For example, in a region in which there is a nuclear weapon state, any state that is not an ally or partner of that nuclear weapon state must for its own security:

- have comprehensive information about the nuclear capability of that state and its doctrine regarding the use of that capability;

- have current information about the adversary's preparation of its nuclear weapons for use;
- have the capability to perform a preemptive conventional strike against the adversary's nuclear weapons; and
- have the capability to respond to a nuclear attack.

Obviously, each individual state can hardly attain this capability. It is more feasible to talk about states achieving this security through the pooling of military and technical capabilities. This leads to the conclusion that not only must military and technical measures complement political measures, but also that political measures must complement military and technical actions.

With regard to Iran, one cannot rule out the option of providing political assurances and military and technical assistance in the implementation of the aforementioned tasks. Among other options, one must not exclude the possibility of inviting Iranian experts to participate in the crews at the JDEC. But such an offer must go hand in hand with tough demands regarding nuclear nonproliferation. This kind of approach could become a subject of discussion of the Iranian group of six.

Taken together, the combination of political, military, and technical measures must make the possession of nuclear weapons pointless. However, as in other cases, the key role in this process belongs to Russia and the United States. They must renounce reliance on nuclear weapons for the sake of ensuring security.

Renouncing Doctrinal Provisions that Treat Nuclear Weapons as Key Security Instruments

A *sine qua non* condition of the transition to universal and complete elimination of nuclear weapons is changing the doctrinal provisions of nuclear states. First and foremost, Russia and the United States must abandon the elements of their nuclear doctrines that envision first-use of nuclear weapons. As has already been mentioned, this step will be more difficult for Russia, given the inferiority of its conventional forces. However, the problem can be resolved. The transition must take place in two key directions: improvement of conventional forces and reliance on international institutions for ensuring security. The second component is especially important for Russia, which lacks any real allies. The Collective Security Treaty Organization does not yet have a real ability to ensure security. NATO continues to operate on the post-Soviet territory from the position of dividing spheres of influence, and attempts to further restrict Russia's spheres of influence continue to take place. Under these conditions, the level of conventional forces required to ensure security is bound to become rather high, and therefore difficult to attain. The logical conclusion is that to achieve the overriding goal (i.e., nuclear disarmament), it is in the interests of the United States and NATO to change their current policies regarding Russia.

In contrast to Russia, for other nuclear states changing first-use doctrinal provisions is a matter of political will.

The Nuclear Arms Control System

As mentioned above, the system of nuclear arms control is under the threat of terminal dismantlement. At this time, the emphasis must be on negotiating a new treaty on strategic nuclear weapons. It must be developed and ratified before START I expires. Key points in the new treaty must include, unlike under SORT, limits on delivery vehicles rather than just warheads, as well as verification measures. It is clear that START I must serve as a starting point, but the new treaty should not be as excessively detailed. The warhead-uploading capability also belongs on the list of problem issues. An upload capability could exist, but the goal of nuclear disarmament requires the introduction of limits on its scope. It would be only appropriate for the new treaty on strategic offensive arms to contain provisions

regarding missile defense systems, too. For example, one could use the principle described above: all elements deployed in one's national territory should remain under national control, while all elements outside national territory should not present a threat to partners or allies. This means that all elements outside national territory must be put under joint command and control.

The next issue that requires a solution is the INF Treaty. The idea of expanding its application is right, in principle; however, it would be difficult to attain. Nevertheless, bringing other nuclear weapon states into the negotiation process has a positive impact in itself.

Overall, it is important to approach the development of the normative and legal bases in the sphere of arms control not from the standpoint of confronting nuclear weapon states, but rather from a position of preventing nuclear proliferation, as well as from the position of reducing and subsequently eliminating nuclear weapons.

Formulation of Nuclear Policy in Moscow: Actors and Interests

Mikhail Tsypkin and Anya Loukianova

This paper provides an overview of the bureaucratic landscape in Russia and identifies actors with authority over nuclear policy making, as well as possible access points for influencing Moscow's views on disarmament issues.

During his eight years as president of Russia, Vladimir Putin built a system that concentrated decisions on national security in his hands. The experience of U.S. experts leading activities involving representatives of Russian government and academic circles suggests that, when it came to nuclear policy, the buck stopped with Putin. Since Dmitri Medvedev was elected president and Putin moved to the prime minister's chair in 2008, Russian foreign and security policy has been determined by a duumvirate of those two leaders—a new phenomenon in the seventeen-year Russian history because previous prime ministers did not interfere with external relations.

At the same time, foreign and defense policy making in Russia is not completely centralized. Much of the daily technical work, including analysis of proposals by other countries and development of the Russian position on specific issues, is performed at the level of governmental agencies, primarily by the Foreign Ministry and the Ministry of Defense (MOD). As long as their proposals fall within the broad lines established at the top decision-making level, they are often approved by national leaders without a second glance. Agencies also develop proposals for more significant changes in Russian policy and submit them to Medvedev and Putin.

The decision-making system is relatively closed to outside influence, yet officials at the Foreign Ministry—and to a much lesser extent at the Defense Ministry—maintain contact with nongovernmental experts, including from outside Russia. Interest in out-of-the-box ideas can become particularly noticeable during times when changes in existing policy are warranted. Russian nongovernmental organizations (NGOs) have extensive international contacts, and although their influence on policy is limited, the NGOs provide an important setting for debates within the governmental machine.

The Nuclear Duumvirate

The president of the Russian Federation is constitutionally in charge of defense and foreign policy, as well as intelligence and other security agencies. Charting Moscow's nuclear policy making, however, became complicated after Putin reached the end of his term limit as president in 2008 and was succeeded in an election by his former aide Medvedev, who quickly nominated Putin as prime minister. Putin's new position formally takes him out of the chain of command, though he apparently retains substantial influence over national security affairs. At this point, both foreign and domestic observers are engaged in a guessing game: how much power has Putin retained? Is his relationship with Medvedev competitive or cooperative? So far, there is no clear answer, but the situation is unlikely to be easy for either man.[1]

1. For discussion of the Medvedev-Putin "tandemocracy," see Andrei Ryabov, "Tandemocracy in Today's Russia," *Russian*

The arrangements inside the Kremlin are opaque, and indicators of the decision-making process there are indirect. For example, when Medvedev meets with high-level foreign officials, aides to both president and prime minister sometimes take part.[2] It is, unclear, however, whose views and perspectives dominate. When addressing domestic issues, Medvedev sounds more liberal that Putin, sometimes remarkably so. Yet, Medvedev's tone on foreign policy and security issues has fluctuated from pessimistic in the last months of the George W. Bush's administration to moderately hopeful upon the inauguration of Barack Obama as the U.S. president. Thus, the new administration in Washington and the prospects of a more active dialogue with the United States could introduce changes into the relatively stable foreign policy of the last several years. On the one hand, there are new opportunities, but on the other, Obama might prove a much more challenging interlocutor than his predecessor and demand a more imaginative and complex response from Moscow.

The governance situation has become even murkier since Medvedev announced on November 5, 2008, his plans to amend the Russian constitution to extend the president's term of office from four to six years. The majority of Russian observers suggest that this amendment might have been necessary to return Putin to the post of president for another twelve years. The change was rushed through the parliament in a rather unseemly fashion, which might suggest that the Russian political elite is in a panic over the current economic crisis. It could also indicate that Putin no longer wants to be prime minister, a position that in the Russian political system is in charge of the economy and the public's welfare. Whatever transpires over the next few months, the Russian political system is in an obvious state of flux. The rapidly evolving situation in Moscow is likely to politicize the decision making on nuclear weapons, as Medvedev and Putin are trying to maneuver the clumsy duumvirate through the turbulence of the economic crisis.

The Bureaucracy and Nuclear Policy Making

During the late Soviet era, there was a well-established interagency decision-making mechanism for nuclear weapons and arms control policy,[3] but there are no indications that this system is still in place or that it has been replaced by a similar mechanism. While de facto interagency coordination exists today—primarily between the Foreign Ministry and the MOD—it is not formalized. The decision-making machinery of the Russian government appears to be highly dependent on the personal preferences of the top leaders and their relationships with the heads of government agencies. Moreover, Russian officialdom is extremely risk-averse. Bureaucrats tend to defer decisions to their superiors, who in turn push decisions further up the chain of command. Thus, while mid-ranking officials with proper technical expertise prepare basic positions on important matters such as nuclear weapons policy, they are not inclined to propose bold new initiatives unless they can be certain that their superiors would support them. This allows only the top policy makers, those very close to Medvedev and Putin, to bring forth new ideas on nuclear weapons policy.

The situation, however, might change if and when arms reduction negotiations shift from general political debates, which are tightly controlled by the higher levels of decision-making hierarchy, to development of a new treaty text. In that case, mid-level governmental bureaucracy would probably begin to play a more tangible role. Traditionally, Russian leaders do not busy themselves with the nuts and bolts of negotiations and tend to defer to the positions and opinions developed by experts in the Foreign Ministry and the MOD. They concentrate, instead, on regulating the pace of negotiations—slowing them down or accelerating them, depending on expediency and the broad strategic policy goals. It is possible that a formal interagency mechanism might be established for negotiations such as those to replace the Strategic Arms Reduction Treaty (START I), for example.

Analytical Digest, No. 49 (November 5, 2008).

2. When Assistant Secretary of State William Burns visited Moscow on November 12, 2008, he met with both Sergey Prikhod'ko and Ambassador Yuriy Ushakov. "Ne ochen' gosudarstvennyy sekretar'" [A Not Very State Secretary], *Kommerstant*, November 13, 2008.

3. Described in detail in Aleksandr G. Savel'yev and Nikolay N. Detinov (translated by Dmitry Trenin), *The Big Five: Arms Control Decision-Making in the Soviet Union* (Westport, CT: Praeger, 1995).

Administration of President Dmitri Medvedev

Sergey Prikhod'ko, who served as a foreign policy aide to President Boris Yeltsin, has continued in the same role under both Putin and Medvedev. He has been a professional diplomat and a high-ranking Kremlin official throughout his career, so the few public statements he has made reflect official policy. It is noteworthy that his only diplomatic posting was to Communist and post-Communist Czechoslovakia in the 1980s and early 1990s.[4]

Office of Prime Minister Vladimir Putin

Upon assuming his new post, Prime Minister Putin chose Yuriy Ushakov, a former ambassador to the United States and one of Russia's top diplomats, to serve as his foreign affairs advisor. Ushakov knows the United States well and understands the interaction of the government with NGOs in U.S. politics and society. While serving in Washington, Ushakov advocated improved relations between the two nations, even at times of considerable tension.

Deputy Prime Minister Sergey Ivanov, Putin's erstwhile KGB colleague and former secretary of the Russian Security Council (as well as a former defense minister and former possible candidate to replace Putin), is now in charge of the defense industrial complex. His political influence, however, is apparently limited. Though he does not avoid contact with Western organizations, it is not clear whether his relationship with Putin remains close enough for him to undertake new foreign policy initiatives.

Security Council of the Russian Federation

If one looks at an organizational diagram of the Russian government, it may appear that the Russian Security Council is analogous to the U.S. National Security Council. It is chaired by the president and its members include the prime minister, defense minister, heads of intelligence and counterintelligence, minister of emergency situations, and the president of the Russian Academy of Sciences. All major decisions on military policy, including nuclear issues, are at least formally taken at meetings of the Security Council.

The reality, however, is that the importance of this body has historically fluctuated, depending on the relationship between the president and the council's secretary (who runs its professional staff) and on the interests of the secretary. Unlike Sergey Ivanov, a former secretary who later became defense minister, the current secretary of the Security Council, Nikolai Patrushev, is a former director of the Federal Security Service (FSB, a successor agency to the KGB) and has spent all of his professional life in domestic counterintelligence and political espionage. Patrushev's position, however, is ambiguous: he is Putin's ally, but Putin removed him from the more powerful post of FSB director at the end of his presidency. Thus, Patrushev was apparently not the choice of his nominal boss, Medvedev. As FSB director during Putin's tenure as president, Patrushev contributed to the cultivation of anti-Western sentiment and paranoia about Western NGOs.[5] Nevertheless, Patrushev recently met with a group of prominent political and intellectual figures associated with the East-West Institute, including William Perry, the former U.S. secretary of defense. The announcement posted on the Security Council's website noted the importance of contacts between NGOs in developing positions on U.S.-Russian cooperation.[6]

Among Patrushev's deputies is a former chief of General Staff and four-star general, Yuri Baluevski. Baluevski has been characterized by Russian journalists as both intellectual and extremely cautious. He is reportedly partial to

4. "Prikhod'ko, Sergey Eduardovich," website of the President of Russia, undated, <kremlin.ru/state_subj/27813.shtml>.
5. In a widely publicized May 2005 Duma hearing, Patrushev claimed that NGOs provide a cover for foreign intelligence operations aimed at weakening Russia. For a discussion, see "Russia: FSB Director's Attack on NGOs Meets Varying Responses," May 19, 2005, Foreign Broadcast Information Service (FBIS) Document CEF20050519304001.
6. Russian Security Council, "O vstreche sekretarya soveta bezopasnosti Rossiiskoi Federatsii N.P. Patrusheva s delegatsiyei instituta Vostoka-Zapada" [On the Meeting of the RF Security Council Secretary Nikolai Patrushev with a Delegation from the East-West Institute], February 20, 2009, <www.scrf.gov.ru/news/406.html>.

traditional arms control but is unlikely to view any broad antinuclear initiatives favorably. He has been put in charge of a special working group in the Security Council to develop a new military doctrine and has already stated that the new doctrine will include references to "the legitimate use of nuclear weapons as a tool for strategic deterrence."[7] However, it is doubtful that General Baluevski has much influence in the Kremlin; he ended up at the Security Council after being forced out of the General Staff by Minister Anatoly Serdyukov, and a job at the Security Council is often a sinecure before retirement for once-important officials.

Yuriy Averyanov is a three-star general and another former military officer among the top Security Council officials; however, he has no apparent experience with nuclear weapons and for the last several years has worked on issues unrelated to military affairs.[8] Other top officials of the council staff are ex-KGB officers.

The MOD and General Staff

Defense Minister Anatoliy Serdyukov is preoccupied with reforming the structure of the military, its vast facilities, and its financial and accounting systems. Serdyukov has no experience with foreign policy issues and has said little about nuclear weapons in public. According to press reports, he is not popular among the officer corps. Serdyukov's position is secure as long as he has the support of Putin (who appointed Serdyukov, until then a little-known bureaucrat and former furniture trader, to the position of defense minister). Thus, Serdyukov is unlikely to bring to Putin's attention anything of which Putin might disapprove. Serdyukov's foreign contacts are confined to his official counterparts, and unlike his predecessors he has a small civilian staff whose expertise is limited to financial management.

The General Staff, largely unreformed since the Soviet era, continues to provide all staff support to the minister. Since the days of Mikhail Gorbachev, the General Staff has acted as a defender of the traditions of the Soviet military against civilian encroachment. The main source of information about the outside world for the General Staff is its Main Intelligence Directorate (GRU). This agency has been consistently anti-Western, impeding contact between the Russian military and its Western counterpart. The experience of U.S. experts involved in organizing Track II activities suggests that GRU's resistance complicates the participation of Russian officers in such activities. Furthermore, Chief of the General Staff Nikolay Makarov has a tendency to concur with the GRU. After Baluevski resigned from the General Staff, the arms control and disarmament expertise of the General Staff significantly decreased. The new chief, Makarov, has neither much experience in nor exposure to international security matters, nor a history of personal contact with foreign military leaders. Some of Baluevski's close associates also left the MOD and General Staff, or lost influence. As a result of these departures, the military will be less capable of assessing other parties' proposals, whether from U.S. government or NGO experts, and the parochial interests of the military are likely to rise to the top of the MOD's priorities.

An increasingly influential repository of expertise and source of advice to MOD leaders on international affairs is the MOD's Main Directorate for International Cooperation, particularly its Treaty and Legal Department, which is in charge of developing positions for and oversight of arms control talks. The role of the department has steadily risen since the early 1970s. Over the years, it has acquired a body of professional military negotiators well versed in a broad range of disarmament issues. Officers who serve in the Main Directorate for International Cooperation frequently travel abroad, participate in international negotiations, and meet counterparts from foreign militaries. With regard to negotiations on START I replacement and missile defense issues, both of which occupy top berths on the near-term disarmament agenda, this directorate is likely to be the primary source of advice for MOD leaders and thus will figure prominently in the interagency process. While the MOD will not challenge the strategic decisions of the country's leaders, it is likely to be intransigent on a host of technical issues, making it more difficult to achieve a new START or other arms control measures in a short period of time.

7. Alexander Golts, "A Military Spoiler Doctrine," *Moscow Times*, December 16, 2008.
8. "Averyanov, Yuriy Timofeevych," Russian Security Council, <www.scrf.gov.ru/persons/105.html>.

Foreign Ministry

Foreign Minister Sergey Lavrov appears to have gained influence over the past year or two. Lavrov's tenure began in 2004 as a second-tier Cabinet official without a strong voice (Putin, on one occasion in 2005, even forgot his patronymic), but he gradually became increasingly active in domestic politics and has reportedly acquired considerable influence over formulation of foreign policy. He is apparently popular with both Putin and Medvedev. In this regard, the trajectory of Lavrov's career has closely followed the path of Andrei Gromyko, the longest-serving Soviet foreign minister. Like Gromyko, Lavrov is rather (although not quite as) closed-mouthed and usually limits himself to carefully worded statements that reflect official policy. It is often difficult to fully know what goes on behind the closed doors of the Foreign Ministry, what kind of advice Lavrov gives to the political leadership, and to what extent this advice is heeded. Unlike Defense Minister Serdyukov, Lavrov is highly experienced on a broad array of international issues, including disarmament, and he has regular contacts with Western NGOs. But he is also a very cautious bureaucrat and is unlikely to carry controversial messages.

From the perspective of the Foreign Ministry, engaging in a dialogue on disarmament could be compatible with Russia's current foreign policy concept and would be a valuable public relations tool. Toward this end, Lavrov's seeming endorsement of the Gang of Four initiative in a February 2008 statement at the Conference on Disarmament is also notable.[9] ("Many of their ideas," Lavrov said about the four nations' ideas on continuing nuclear disarmament, improving nonproliferation regimes, and maintaining strategic stability multilaterally, "are in line with Russia's initiatives, though there are, of course, aspects that call for discussion in seeking agreement on specific ways of resolving these not that simple tasks.")[10] It is also worthwhile to note that Igor Ivanov, Lavrov's predecessor as foreign minister (and another former secretary of the Russian Security Council), is a signatory to the Global Zero declaration on the elimination of all nuclear weapons.[11]

The rhetorical emphasis on nonproliferation in Russian foreign policy seems to have increased. In Russia's new foreign policy concept, drafted by the Foreign Ministry and endorsed by Medvedev in the summer of 2008, nonproliferation language that had not been in previous foreign policy concept documents was inserted into the first paragraph of the "international security" section, ahead of any mention of arms control and disarmament. Moreover, the paragraph on nonproliferation now precedes the paragraph on arms control and disarmament. At the same time, Russia's as-yet-unreleased new national security concept, an interagency document curated by the Security Council, reportedly notes Moscow's willingness to discuss disarmament with all nuclear weapon states; this represents a change of language from the old concept, which stressed discussions with the United States first and foremost.

The two issues that currently occupy the primary attention of the Foreign Ministry are replacing START I (which expires in December 2009) and resolving the highly controversial problem of U.S. missile defense (which includes planned sites in Poland and the Czech Republic). Recent Foreign Ministry statements indicate cautious yet unmistakable optimism about the Obama administration and hopefulness that these issues, which remained deadlocked under George W. Bush, might now be resolved. In particular, there are hopes that new U.S. leaders might revisit the decision to deploy missile defense in Eastern Europe and either postpone or maybe even cancel it.

Russia's Foreign Service has suffered from the loss of experienced personnel (though not as much as the MOD). It continues to retain a large number of professional arms control negotiators, including the current Russian ambassador to Washington, Sergey Kislyak, a former deputy minister of foreign affairs for arms control and disarmament. Kislyak is a professional negotiator with several decades of hands-on experience; he has a reputation for closely toeing the official line, having a propensity for risk-avoidance, and maintaining close relations with the military establishment.

9. See Vladimir Orlov, "U.S.-Russian Relations on Nonproliferation after the Georgia Crisis: A Skeptical (Re-) Engagement or an (Un-) Happy Divorce?," paper prepared for the Monterey Nonproliferation Strategy Group, in Jean du Preez, ed., *Nuclear Challenges and Policy Options for the Next U.S. Administration*, Occasional Paper No. 14, James Martin Center for Nonproliferation Studies, December 2008.
10. Sergey Lavrov, statement at the Plenary Meeting of the Conference on Disarmament, Geneva, February 12, 2008.
11. See Global Zero website, "Full List of Signatories," <www.globalzero.org/full-list-signatories>.

Intelligence Agencies

The two main non-military intelligence agencies, the FSB and the Foreign Intelligence Service (SVR), have played a very important role in politics and policy making under Putin, a KGB alumnus. Both agencies are direct descendants of the KGB, and neither has undergone a serious reform since the collapse of the Soviet Union.[12] There is no public accountability system for these agencies, which leaves them free to pursue their bureaucratic self-interest, while the quality of their analytical products remains completely unknown. All the available evidence seems to suggest, however, that the two agencies see it in their self-interest to fan Russians' fears of the West. The SVR is likely to provide analytical input into decision making on arms control and disarmament negotiations, but historically its involvement in this process has been limited and will likely remain so in the future. Both agencies do have limited contact with their foreign counterparts, primarily in the areas of counterterrorism and preventing weapons of mass destruction proliferation, but this cooperation is seemingly neither as active nor as extensive as many outside the agencies hoped it would be.

State Duma and Federation Council

Russian parliament has little tangible influence on Russia's national security and disarmament policy. Parliament members' input into official discourse on nuclear arms reduction and disarmament is conservative, motivated above all by the perception that the nuclear arsenal is an important vestige of Russia's great-power status in the international arena and a vital, if not the primary, guarantee of security. It is unlikely that the Duma or the Federation Council will interfere with arms reduction negotiations that Russia plans to hold with the Obama administration or with the treaty ratification process. This stands in sharp contrast with the Duma of the 1990s, which repeatedly blocked ratification of START II.

Several parliamentary leaders are quite active on the international scene and have extensive contact with their foreign counterparts. In addition, Konstantin Kosachev and Mikhail Margelov, chairman of the State Duma Committee on Foreign Affairs and chairman of the Committee for Foreign Affairs in the Federation Council, respectively, have both signed on to the Global Zero declaration. It can be safely assumed that they and other parliamentarians act as conduits of outside views and proposals that emanate from governmental, parliamentary, and nongovernmental circles abroad, and in this regard, they can provide a modest input into the decision making on nuclear arms reduction and disarmament.

Main Actors within the Industry

The Rosatom State Nuclear Energy Corporation

Rosatom is in charge of building nuclear weapons as well as managing nuclear energy activities. Its director is Sergey Kiriyenko (who was a young prime minister at the time of the 1998 Russian financial crisis and was made a scapegoat for it). Rosatom's weapons-related mandate makes it an unlikely channel for any message of reducing their role. Alongside nuclear weapons, however, leadership on nuclear energy is another important status symbol for Russia. Toward this end, it was then-President Putin who announced Russia's foray into promoting assured nuclear fuel supply concepts (a powerful public relations tool that the Foreign Ministry has also used) and Russia's international uranium enrichment center in Angarsk. Thus, there are potential status trade-offs that could be leveraged if Russia's stature as a nuclear energy leader and promoter of peaceful nuclear energy were gradually emphasized over its status as a nuclear weapon state. Such a trade-off could bode well for prospects of engaging Russia on disarmament.

12. For discussion, see Mikhail Tsypkin, "Reforming Intelligence: Russia's failure," *Journal of Democracy* 17 (July 2006), pp. 72–85.

In the course of Kiriyenko's reform of the Russian nuclear sector, weapons design and production were transferred into a separate unit whose status and policy relevance are relatively low, even though national leadership and Rosatom continue to pay lip service to the defense component of the nuclear sector. This unit is among the very few elements of Rosatom that continue to receive state funding; Rosatom, a semi-corporate entity, is increasingly oriented toward generating profit in domestic and international markets. For this reason, the input of nuclear weapons laboratories and plants into the nuclear disarmament policy of Russia is likely to be minimal.

Defense Industry

The Russian defense industry is a complicated conglomerate of private, semi-private, and state interests. Its control has been recently consolidated under the huge state company Rostekhnologii (Russian Technologies). The director of Rostekhnologii is Putin's old friend Sergei Chemezov, reputed to be one of the most powerful individuals in Russia. The attitude of the defense industry toward the prospect of U.S.-Russian cooperation is largely negative, as a result of both the traditional perceptions inherited from the Soviet period and the acute competition in global arms markets. Furthermore, the defense industry has for years been irked by U.S. sanctions on Russia's defense enterprises; the sanctions have exacerbated the strong negative attitudes from Russian officials on the highest levels, thereby straining the bilateral relationship. The defense industry's main media outlet, *Voyenno-Promyshlennyy Kur'yer* (Military-Industrial Complex Weekly), has promoted a sharply anti-Western worldview. Without exception, the paper's commentators on nuclear policy oppose any plans to reduce reliance on nuclear weapons and promote continued—even enhanced—reliance on nuclear weapons for national security.

Since 2006, the interests of the Russian defense industry are aggregated through the *Military-Industrial Commission*, a close analogue of a similar commission in the Soviet Union, albeit with less power and influence. This commission is part of the government apparatus and is chaired by Sergey Ivanov in his capacity of deputy prime minister. There is no indication at the moment that the defense industry has an active interest in arms control and disarmament negotiations, although this could change if START I replacement talks begin in earnest. Even if the Military-Industrial Commission is brought into some sort of brand new interagency mechanism, its input is likely to be minimal. In contrast to the Soviet period, when the defense industry fought to protect large-scale production and often used negotiations to win lucrative contracts, the outcome of START I replacement negotiations will not have a direct, tangible effect on the economic interests of producers of strategic weapons, among whom there is barely any competition since the number of missile and aircraft producers decreased in the 1990s (due to the Soviet breakup and financial austerity). The volume of production is already very small; the number of strategic missiles deployed each year is in the single digits, and heavy bomber production is below even that (Russia recently produced its first heavy bomber in fifteen years). Thus, the outcome of negotiations will not force defense companies to cut production and could even leave room for a modest increase.

Quasi-Autonomous Bodies

Academy of Sciences

The president of the academy of sciences is an ex-officio member of the Security Council, which provides him with access to the president and prime minister. Membership in the academy continues to bestow a certain standing in today's Russia. Various members of the Academy of Sciences have participated with Western governmental and nongovernmental organizations in joint projects to reduce nuclear dangers. Individuals who are members of the academy have a more advantageous position regarding the promotion of new ideas than do governmental officials without that standing.

Think Tanks of the Russian Academy of Sciences

Academy think tanks, such as the Institute for U.S. and Canadian Studies (ISCRAN) and the Institute of World Economy and International Relations (IMEMO), have suffered a relative decline in status compared to their role during Gorbachev's and even Leonid Brezhnev's eras. Still, the think tanks have well-respected experts on their staff; although high-level foreign policy decisions are made without consulting them, the fact that important Western expert groups treat these Russian institutions with respect is likely to make the Kremlin take them more seriously.

Sergey Rogov, ISCRAN director, chairs the Security Studies Group of the Research Committee of the Russian Security Council. (The Security Council played an important role while it was led by Putin's ally and friend Sergey Ivanov. And while this particular group appears to be relatively unimportant when it comes to formulating nuclear policy at present, this may change in the future.) Rogov is well respected by the top staff of the Foreign Ministry and apparently also by the president; Medvedev recently sent Rogov a congratulatory message on his sixtieth birthday. Rogov assembled a small team of top nuclear weapons experts at ISCRAN that recently authored two studies on reducing the dangers stemming from reliance on nuclear deterrence.[13] ISCRAN has also been active in working with Western NGOs.

IMEMO is the home to two outstanding experts on nuclear weapons: Alexei Arbatov (former deputy chairman of the Defense Committee of the Russian Duma) and retired Major General Vladimir Dvorkin, who directed the main think tank of the Russian Strategic Forces, the MOD's Central Research Institute No. 4, in the 1990s. The duo recently published a book on moving beyond nuclear deterrence.[14] Another respected expert at IMEMO is Aleksandr Savelyev, who has also done advanced work on abandoning nuclear deterrence.

Academy of Military Sciences

Russia's Academy of Military Sciences (AMS) has hosted two recent conferences—in January 2007 and January 2008—intended to push adoption of a new national security concept and a new military doctrine. (Baluevski, then chief of the General Staff, was present at both.) However, if the AMS has any impact at all on nuclear policy making, it is only via the views of two leaders: General Makhmut Gareyev and General Varfolomey Korobushin. Both Gareyev and Korobushin view the nuclear deterrent as crucial to Russia's national security and have publicly stated that proposals to de-alert strategic forces are unrealistic, and Korobushin has called no-first-use policies unrealistic as well.[15]

The influence of the AMS on actual policy process and outcomes is minimal. For instance, the current military restructuring plan of Minister Serdyukov has never been discussed with the AMS and would definitely not be supported by its members.

13. Sergei Rogov, Viktor Yesin, and Pavel Zolotarev, "Eksperty predlagayut kompleks mer doveriya po strategicheskim vooruzheniyam" [Experts Offer a Complex of Confidence-Building Measures on Strategic Weapons), *Nezavisimoye voyennoye obozreniye* [Independent Military Observer], July 2, 2004; Sergei Rogov, Viktor Yesin, and Pavel Zolotarev, "Dve shesterki v shesterenke strategicheskoy stabil'nosti" [Two Groups of Six in the Machine of International Stability], *Nezavisimoye voyennoye obozreniye*, September 6, 2006.
14. Alexei Arbatov and Vladimir Dvorkin, *Beyond Nuclear Deterrence: Transforming the U.S.-Russian Equation* (Washington, DC: Carnegie, 2006).
15. On the proposals, see Alexei Arbatov and Rose Gottemoeller, "New Presidents, New Agreements?" *Arms Control Today* 38 (July–August 2008); Makhmut Gareyev, "Russia Must Become a Great Power Again," *Voyenno-Promyshlennyy Kur'yer,* January 16, 2008, FBIS Document CEP20080117351001.

International Groups

The Kissinger-Primakov Commission

Henry Kissinger, former U.S. secretary of state, and Yevgeniy Primakov, former Russian foreign minister, co-chair a group of veteran U.S. and Russian diplomats called the Kissinger-Primakov Commission, which was envisaged as a backchannel between the Kremlin and the White House. Although Kissinger has met with Putin on several occasions, which were trumpeted by the Kremlin's PR machine, this enterprise has so far borne no visible fruit. However, Kissinger is very well respected in Russia, and his opinions are likely to have an impact in the Kremlin.

The International Luxembourg Forum

The International Luxembourg Forum on Preventing Nuclear Catastrophe has brought together prominent experts on nuclear nonproliferation since 2007. Its leader is Viacheslav Kantor, a Russian-Israeli businessman. He probably has good connections in the Kremlin; indeed, Putin sent a statement to the first conference conducted by the forum.[16] A number of prominent Russian nuclear experts have taken part in the work of the forum.

Conclusion

Russia's nuclear arsenal has been important to the Kremlin from both a military standpoint (to compensate for the relative weakness of Russian conventional forces) and from a political one (as a superpower status symbol). Convincing the Kremlin that it should reduce reliance on nuclear weapons will be difficult. The decision-making system is centralized and relatively closed to outside influence; it is not well configured to hear or evaluate alternative opinions. At the same time, there is no reason to doubt that Russian leaders, just like their Soviet predecessors, feel the burden of their duty to make, under uncertain circumstances, a decision that may end the world.

The Russian system for decision making on arms control and disarmament has few access points, and bringing in alternative opinions or changing policy from the outside is difficult; however, the system is not impenetrable. There is a modicum of public and expert discussion on these issues, and, unlike during Soviet times, the NGO system is reasonably open to exchanging ideas and developing new approaches together with Western NGOs. There is an interaction between NGOs and Russian governmental agencies—especially the Foreign Ministry—that allows new ideas to be brought to the attention of decision makers. Yet, broaching this subject without upsetting the applecart of diplomatic protocol will require considerable diplomatic skill and knowledge of the Russian political terrain; hopefully, the above rundown of the structure and sources of influence on arms control and disarmament policy making in Russia will contribute to efforts toward achieving nuclear zero.

Important starting points for arms reduction are two near-term goals: replacing START I and resolving missile defense issues. The Russian arms control bureaucracy is preoccupied with these issues and, following the change of guard in the White House, seems ready to engage in practical, hands-on negotiations, which could pave the way to deep reduction of nuclear weapons. Progress on reaching these goals could be utilized to develop momentum for subsequent talks with the ultimate goal of complete elimination of nuclear weapons.

16. International Conference on Preventing Nuclear Catastrophe, *Proceedings of a Conference*, Luxembourg, May 24–25, 2007 (Moscow: National Institution of Corporate Reform, 2008), p. 26.

Strategic Relations between the United States, Russia, and China and the Possibility of Cooperation on Disarmament[1]

Cristina Hansell and Nikita Perfilyev

Global strategic stability, as well as any possible future for arms control and nuclear disarmament, overwhelmingly depends upon decisions in Washington, Moscow, and Beijing. Prime movers when it comes to nuclear policy, the actions of these three countries, now and in the immediate future, will determine the doctrines that set the postures for the vast majority of the world's nuclear weapons systems. Strategic doctrines also set the purpose for the maintenance of these systems (deterrence through mutual assured destruction, minimum deterrence, or the deterrence of new weapons systems or additional actors; a new strategic balance; gradual—or more rapid—disarmament; or a new form of destructive arms race). While the global polity does have some say as to whether such weapons (not just their use, but also their possession) are seen as moral, Washington and Moscow have traditionally had the most influence over global views in this arena. Increasingly, Beijing is playing an important role too, though its doctrine has yet to influence thinking in the United States and Russia. The policies of the major nuclear weapon states shape the beliefs in other capitals as to whether possession of nuclear weapons remains prestigious and/or militarily useful. Further, the United States, Russia, and China are in the best position to influence global nuclear weapons norms, including further consolidating the norm against nuclear testing, buttressing the norm against nuclear use, and establishing a norm against strategic postures that threaten the use of nuclear weapons. In the final analysis, the choices made in these three countries will determine if the world is able to start down the path toward complete nuclear disarmament.

This essay explores possible pathways to nuclear zero that lead through Beijing and Moscow. It argues that decisions on strategic deterrent forces will, for the foreseeable future, be linked not only to the nuclear posture of other states, but also to a variety of other military decisions, including missile defense, space militarization, and long-range conventional capabilities. Any attempt to engage China and Russia in discussions of nuclear disarmament or arms control that does not include negotiations on these three military issues will fail.

In order to understand the possible future trajectories for nuclear weapons doctrine, this essay begins with a brief review of the state of official thinking about nuclear weapons in the United States, Russia, and China. The essay then turns to how the three countries have reacted to recent changes in each other's military doctrine and activities, focusing especially on Chinese and Russian reactions to post–Cold War changes in the United States, such as the revolution in military affairs and the 2001 U.S. Nuclear Posture Review.

While the formulation of U.S., Chinese, and Russian nuclear posture is informed by each other's nuclear doctrines, nuclear postures are also critically determined by other, non-nuclear factors, as noted above. The essay therefore outlines Chinese and Russian concerns over missile defenses and the possible weaponization of space. It does not delve into recent improvements in cruise missiles and the possible spread of cruise missiles around the world (including, potentially, WMD-armed cruise missiles—which nuclear capabilities may be called upon to deter), al-

1. An earlier version of this paper was presented at the conference "Trilateral Relations Among China, Russia and the U.S.A.: Structure, Perceptions and Politics," Shanghai, China, September 26–28, 2008. The authors would like to thank conference participants for their comments, which helped to inform the current paper.

though these are also potentially destabilizing to the strategic balance and should be the subject of further research.

Embarking on a path to nuclear zero requires that Beijing and Moscow be confident that they will not be the object of either a first nuclear strike, or an overwhelming conventional strike. However, the evolution in U.S. strategic thought implied by the new triad, together with developments of the new technologies and systems this triad requires, could challenge the viability of other nations' strategic deterrents, China's in particular. This essay explores the implications of these changes, as well as reactions to them, to anticipate their possible influence on future nuclear doctrines. Additionally, a brief history of Sino-Russian strategic relations—nuclear relations in particular—is provided as a background to a discussion of more recent Sino-Russian interaction in this area. The final part of the essay attempts to look into the future, playing out how a variety of potential arms control and disarmament measures may be affected by possible reactions in Moscow and Beijing to changing U.S. strategic doctrine.

U.S. Strategic Policy

Since the end of the Cold War, the United States has obtained an overwhelming military superiority vis-à-vis other states, while maintaining its Cold War nuclear posture essentially unchanged. The 1994 U.S. Nuclear Posture Review, the first during the post–Cold War period, did little to alter nuclear doctrine, despite initial Clinton administration instructions to undertake a far-ranging posture review that was to take the elimination of the Soviet threat into account.[2] The administration's failure to understand how to push such changes through the bureaucracy meant that very little modification resulted from this review. Instead, the first real post–Cold War military shift was seen not in the nuclear, but in the conventional sphere: the so-called revolution in military affairs, a school of thought that embraced the evolution of U.S. military thinking, from strategy and tactics to technological and conceptual innovations, including asymmetric and information warfare. Building on similar theories elsewhere, these ideas were first tested in action during the first Gulf War in 1991 and would have implications for the use and security of nuclear forces.

Though an underappreciated fact (especially given that current U.S. nuclear doctrine includes the deterrence of chemical attacks), the 1991 war also suggested that nuclear weapons were not only unable to deter a conventional attack, but also that the ability to deter chemical attacks with nuclear arsenals is unproven.[3] More obviously, the Gulf War demonstrated that in a war that did not escalate to nuclear use, high-tech conventional weapons mated with high-tech communications, guidance, and other systems could devastate low-tech forces extremely quickly. Other nations soon realized that high-tech, guided weapons could be used against strategic targets, too. Any country that wanted to ensure its defense against the United States even in a limited conflict (including Russian, and particularly Chinese, maintenance of nuclear second-strike capabilities) would now have to consider establishing new defensive systems or expanding or reconfiguring offensive capabilities.

While the numbers of U.S. nuclear weapons overall declined dramatically throughout the 1990s, thanks to the Strategic Arms Reduction Treaty (START), the operational posture and strategic doctrine remained largely unchanged

2. For a detailed examination of the Clinton-era Nuclear Posture Review, see Janne Nolan, *An Elusive Consensus: Nuclear Weapons and American Security after the Cold War* (Washington, DC: Brookings Institution Press, 1999).

3. Notably, Israel, widely recognized as armed with nuclear weapons, was not confident that its weaponry would deter an Iraqi chemical attack during the first Gulf War. Even though some observers believe Tel Aviv may have promised Washington that it would not respond to Baghdad with nuclear weapons, it is doubtful Baghdad would have trusted such a promise. Some reports suggest Saddam Hussein was undeterred and may have authorized a chemical attack but that his generals, who believed that such an attack would result in a U.S. nuclear response, were deterred. In any event, Israel took additional measures to respond to chemical attacks, warning its citizens to expect them.

Israel is commonly considered to have an existential deterrent, not a deterrent aimed at other WMD systems. However, whether other nations' nuclear deterrents would be successful against a chemical or biological capability is questionable. For more discussion of the typology of nuclear deterrents, see Nikolai Sokov's essay in this volume, "The Evolving Role of Nuclear Weapons in Russia's Security Policy," p. 73.

through the end of the decade. The 2001 Nuclear Posture Review, however, introduced dramatic changes to U.S. military thinking, redefining the purpose of strategic forces (away from opposing the Soviet threat), as well as the types of forces to be given strategic missions. A long-term goal of reducing nuclear weapons was set, though nuclear deterrence continued to be at the center of strategic thought. The old nuclear triad of air-, sea-, and land-based weapons was reconfigured: conventional (non-nuclear) precision-guided munitions were to be added to the nuclear forces as more "usable" weapons that could hit strategic targets in the far corners of the world, forming one leg of a "new triad." This new triad also included missile defenses and a responsive defense infrastructure (new, flexible military production facilities that could quickly produce the arms and other equipment needed in the new era—including nuclear weaponry). In the short term, U.S. nuclear forces, targeting, and doctrine would not change, but in the long term the new triad was supposed to alter the role of the U.S. nuclear capability and the apparent necessity of maintaining such a large nuclear arsenal to prevent the use of nuclear weapons against the United States. Moreover, the new strategic triad was supposed to be more flexible than the old and respond to new, and possibly unforeseen, threats. This implied a new flexibility that would hinder traditional arms control.[4] As will be seen below, the official U.S. view that the United States continues to abide by its Article VI commitments under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) has not been met with the understanding of other NPT member states, and the changes envisioned in the 2001 Nuclear Posture Review—as well as actions already taken, such as promoting missile defense, ending the Anti-Ballistic Missile (ABM) Treaty, and improving cruise missiles—threaten to provoke a new arms race unless stronger disarmament measures are taken. Largely in reaction to U.S. measures, Moscow and Beijing have already launched programs to strengthen their own nuclear forces to ensure second-strike capabilities; these policies are detailed below.

Russian Strategic Policy

After the end of the Cold War, Russia entered a period of debate over the use of its nuclear forces. In 1993 Moscow formally rescinded the no-first-use (NFU) policy inherited from the Soviet Union (initially adopted in 1983) but did not issue a new nuclear doctrine until 1999.[5] In the meantime, its nuclear capabilities dramatically declined, thanks both to dismantlement required under START and to the country's economic decline. However, Russia's conventional forces faced even greater difficulties due to the combination of financial strain and two wars fought in Chechnya, all on top of the Afghan war in the late Soviet period. By 1999, when Moscow finally issued its first post-Soviet nuclear doctrine, Russia's conventional forces were significantly weaker than those of the United States, while Washington had shown itself willing to intercede in foreign conflicts (in the Balkans and the Middle East), potentially threatening Russian interests. The new Russian doctrine thus gave nuclear forces a new mission: deterring a limited conventional conflict (at least until Russia's conventional capabilities improved).

The 1999 nuclear doctrine, however, was not directed against the United States, although Russia was concerned about NATO military power—particularly given the NATO intervention in Kosovo. While Russian military training exercises since 1999 continue to be directed against a notional NATO enemy, doctrinally no clear enemy has been defined. Instead, Russia has begun to rebuild its nuclear forces and increase readiness (with greater numbers of bomber and submarine patrols the most visible evidence of this change),[6] though it is no longer seeking parity with

4. For an early discussion of the NPR's implications for multilateral arms control, see Mark Bromley, "'Planning to be Surprised': The US Nuclear Posture Review and its Implications for Arms Control," British American Security Information Council, Occasional Papers on International Security Policy No. 39 (April 2002), <www.basicint.org/pubs/Papers/BP39.htm>.

5. For more discussion of Russian nuclear doctrine, see Sokov, "The Evolving Role of Nuclear Weapons in Russia's Security Policy."

6. Russia resumed strategic bomber patrol flights over the Pacific, Atlantic, and Arctic oceans in August 2007. Strategic submarine patrols have also become increasingly regular and may lead to a return to continuous patrols. According to U.S. naval intelligence, Russia sent ten nuclear-armed ballistic missile submarines on patrol in 2008, compared with three in 2007, five in 2006, and none in 2002. "Russian Strategic Bombers Conduct Patrols over Arctic," RIA Novosti, January 21,

the United States. It has yet to issue a revised nuclear doctrine defining its new deterrent strategy; however, the topic appears to be the subject of internal debate. There have been hints in the media that Moscow may be reconsidering its view of Washington and could soon restore the United States to the place of chief enemy, but it is also possible that such a decision has yet to be taken.[7]

It is also not clear if Russia is considering any changes to the makeup of its nuclear triad or the purpose of these forces. During the presidency of Vladimir Putin, orders for nuclear weapon delivery platforms increased and Russia held missile tests to prove that it could evade any conceivable U.S. missile defense system (as indeed has been long argued by U.S. missile defense planners). However, Russia's current rate of weapons procurement is not keeping up with the rate of weapons retirement. New ballistic missile submarines are under construction and on order, but the new missiles to fit them have suffered a variety of setbacks; only in late 2007 was the *Sineva* submarine-launched ballistic missile (SLBM) officially accepted into service, while the *Bulava* remains in testing.[8] The Topol-M land-based mobile weapon system has been far more successful, but the establishment of new military units with these weapons has been much slower than originally envisioned. This means that if it is to maintain its forces at the levels implied in current doctrine, Russia will either have to improve procurement of these systems or alter its thinking about these weapons.[9]

If the Russian military is called upon to replace its reliance on nuclear weapons with other systems, its military doctrine, which has already been under consideration for several years, will have to be reconfigured soon. Otherwise, it may prove more difficult to obtain the appropriate capabilities: once new nuclear capabilities are procured, it will be harder to rethink their use. A new doctrine that is buttressed with new capabilities is also likely to be more persuasive than a doctrinal change that only promises weapons alterations years in the future. Moscow therefore finds itself facing a critical decision point. Bilateral relations with the United States surely have an effect on Moscow's worldview, as the only nation that poses an existential threat to Russia is the United States. Anti-Russian rhetoric in Washington, or a perception that NATO is not taking Russian security needs into account, can only have a negative effect on Moscow's assessment of the global strategic situation. Should Moscow move dramatically to increase defense spending, particularly on strategic forces, further instability may well result. To avoid a renewal of the Cold War nuclear rivalry, the United States must engage Russia in negotiations and develop a mutual understanding based on common goals and joint restraint. Finding solutions to Russian concerns over U.S. missile defenses and high-tech conventional weapons is also critically necessary, as discussed further below.

Chinese Strategic Policy

China's official policy is that it maintains nuclear weapons only because other nations threaten it with nuclear weapons; Beijing has long called for complete global disarmament.[10] However, China also appears to view its nuclear forc-

2009; Hans Kristensen, "Russian Strategic Submarine Patrols Rebound," Federation of American Scientists (FAS) Strategic Security Blog, February 17, 2009, <www.fas.org/blog/ssp/2009/02/russia.php#more-816>.

7. The draft "Concept for the Development of the Armed Forces of the Russian Federation through 2030," reportedly defines the West, and "the growing technological and military technology supremacy of the leading overseas countries," as the main threat to Russia. Ivan Konovalov, "The Defense Ministry Acknowledges U.S.," *Kommersant*, August 4, 2008, <www.kommersant.com/p1007705/r_1/military_defense/>.

8. For more information, see Nikolai Sokov, "Update: Russia's Recent Test of New Submarine-Launched Missile Succeeds," *WMD Insights*, September 2007, <www.wmdinsights.com/I18/I18_R3_Update-BulavaTest.htm>.

9. As Anya Loukianova of the James Martin Center for Nonproliferation Studies has rightly pointed out, procurement is not simply an issue of increased Russian military spending. Many Russian defense plants were overburdened with orders in the past few years, and Russia faced the difficult task of making these plants more efficient, improving both management and production. Since the economic crisis of late 2008, however, Russia has indeed faced severe financial shortfalls in the area of defense procurement, putting further stress on military planners.

10. China has traditionally viewed the concept of "deterrence" as negative and until recently used this term to refer to the practice employed by the United States, for example, not China itself. China's nuclear force was instead used to prevent the

es as important to its standing as a great power. The Chinese maintain a far smaller nuclear arsenal than either the United States or Russia, with fewer than 100 operational warheads, which accords with a doctrine of "minimal deterrence" or "minimum means of reprisal."[11] This doctrine is based on the belief that deterrence does not require the level of force traditionally assumed necessary under U.S. and Russian doctrines, and it is mated with a no-first-use nuclear doctrine that rejects initiating a nuclear exchange under any circumstances. Chinese forces have been kept off the "hair-trigger alert" of U.S. and Russian forces—even in crisis.[12] As explained further by Chinese Ambassador for Disarmament Affairs Sha Zukang in 2000, "as long as [a medium or small nuclear country] still possess[es] the capability of launching the second nuclear strike to inflict unbearable losses" on an attacker, a strategic balance can be achieved even with a country possessing more and better nuclear weapons.[13] Yet China's policy makers note that their nuclear policy differs even from that of the United Kingdom and France, "in terms of what nuclear weapons deter against, the amount of nuclear weapons required for a retaliatory strike that is sufficient to inflict unacceptable damage on the enemy, and other aspects."[14]

There has been much speculation by foreign experts that China might alter its nuclear doctrine as its nuclear capabilities increase—that its doctrine has been borne of necessity. Recent advances in ballistic missile submarines,[15] it is suggested, would give China the capability to back up a doctrine more similar to that of the United States or Russia. When one examines the available Chinese literature on the subject, however, it does not appear that any such change is imminent.

To deter an attack, however, Chinese planners recognize that a potential opponent must believe that China has nuclear weapons that would survive a first strike and that Beijing is willing to launch a counterstrike. A few years ago, this led some Chinese experts to argue for "limited deterrence" (*youxian weishe*), which would require new operational capabilities and putting Chinese forces on a launch-on-warning or launch-under-attack status.[16] (In the United States, some experts have put forward a similar argument to suggest that "usable" low-yield nuclear weapons are needed to make deterrence credible.) However, Beijing's military leaders appear to have decided that deploying mobile missiles and a sea-based deterrent is sufficient to ensure the credibility of China's deterrent. Most China analysts do not expect Beijing to abandon minimum deterrence at this point in time.

use of deterrent forces to attack or coerce China—"defensive" deterrence, as opposed to the "offensive nuclear deterrence of hegemonism." For a discussion of this issue, see Michael S. Chase and Evan Medeiros, "China's Evolving Nuclear Calculus: Modernization and Doctrinal Debate," in James Mulvenon and David Finkelstein, eds., *China's Revolution in Doctrinal Affairs: Emerging Trends in the Operational Art of the Chinese People's Liberation Army* (Alexandria, VA: CNA Corporation, December 2005), pp. 119–54.

11. The Chinese term *zuidi xiandu weishe* is commonly translated as "minimum deterrence"; Jeffrey Lewis more accurately translates it as "minimum means of reprisal." Jeffrey Lewis, "The Minimum Means of Reprisal: China's Search for Security in the Nuclear Age," Ph.D. diss., University of Maryland at College Park, 2004, p. 13.

12. While a U.S. (or Russian) president would have only six or seven minutes to decide whether to launch a nuclear counterattack should he be given news of a first strike launched toward U.S. (or Russian) territory, there is no evidence that the Chinese nuclear forces have ever been put on alert. See Lewis, "The Minimum Means of Reprisal," p. 16.

13. Interview with Sha Zukang, director-general of Department of Arms Control And Disarmament of Ministry of Foreign Affairs, in Tseng Shu-wan, "US Nuclear Proliferation Threatens Global Security—Sha Zukang on Ways China Should Handle It, Stressing Needs To Ensure The Effectiveness of Retaliatory Capacity," *Wen Wei Po*, June 11, 2000, Foreign Broadcast Information Service (FBIS) Document CPP-2000-0711-000024, as cited in Lewis, "The Minimum Means of Reprisal," p. 13.

14. Citation of unnamed official, Lewis, "The Minimum Means of Reprisal," p. 18.

15. China does not have a capable, blue-water nuclear-powered ballistic missile submarine (SSBN) force. However, three or four Jin-class (Type 094) SSBNs are currently under construction. This number is not sufficient to maintain one vessel on continuous patrol for deterrence purposes; should Beijing decide to create this sort of naval deterrent, several more Jin-class boats would be needed. For details on the new SSBN, see Hans Kristensen, "New Chinese SSBN Deploys to Hainan Island," FAS Strategic Security Blog, April 24, 2008, <www.fas.org/blog/ssp/2008/04/new-chinese-ssbn-deploys-to-hainan-island-naval-base.php>.

16. For an examination of Chinese writings on limited deterrence, as well as an analysis of several recently published Chinese military documents on nuclear doctrine, see Chase and Medeiros, "China's Evolving Nuclear Calculus."

The "minimum means of reprisal" does not, however, imply a particular number of weapons; it entails the minimum number of weapons that can *survive* and *retaliate* against a nuclear strike.[17] U.S. and Russian military improvements since the end of the Cold War caused China to modernize its forces in order to maintain its retaliatory capability.[18] As explained in the journal *Zhongguo Junshi Kexue* (China Military Science), global nuclear strike capabilities have been improving, while the pace of missile defense systems deployment has been accelerating. This has necessitated strengthening the capabilities of China's strategic missile units—"strategic missile units' mobile operations capability is the premise for their survival capability, strike capability, and deterrence capability."[19]

Another aspect of Chinese nuclear strategy that has not changed over the years, and which could have implications for strategic stability as well as arms control, is China's reliance on secrecy to maintain the reliability of its second-strike capability. Beijing must be certain that its potential opponents cannot locate all of its nuclear forces and take them out with a first strike, or it would be vulnerable to such an attack. Particularly since Beijing relies on the land-based nuclear capabilities of its intercontinental ballistic missiles (ICBMs), secrecy—including ambiguity about the total number of Chinese warheads (to say nothing of their location)—is thus critical to its ability to deter.[20] If additional U.S. (or Russian) technological developments threaten this secrecy, China's deterrent would be vulnerable. Moreover, this secrecy poses two additional problems for Beijing: it makes it more difficult for China to communicate its capability and determination to retaliate to a nuclear attack;[21] and it means that arms control—in particular, traditional strategic weapons treaties that include details on numbers of weapons platforms—may not be possible without either an alteration of China's strategic posture or new arms control thinking.

The View of U.S. Policy Changes in Moscow and Beijing

As noted above, the December 2001 Nuclear Posture Review suggests a fundamental change to U.S. strategic doctrine, transforming the nuclear triad of the Cold War era into a new triad that includes, along with a nuclear leg, more "usable" conventional precision-strike systems as well as missile defenses (to reduce vulnerability to a nuclear strike). This is meant to shore up strategic stability while making it possible to reduce numbers of nuclear weapons still further; the assumption is that non-nuclear weapons will take on some of the strategic deterrent role of current nuclear forces and will increase the credibility of the U.S. deterrent, since top decision makers are more likely to be willing to launch conventional strike weapons than nuclear warheads. However, even though the Nuclear Posture Review does specify the goal of downsizing the number of nuclear warheads deployed to operational forces by two-thirds by 2012 (a level recently achieved), Russia and China see several aspects of U.S. nuclear posture as destabilizing.

17. Jeffrey Lewis in an essay in this volume cites Sun Xiangli, deputy director of the Arms Control Research Division, Beijing Institute of Applied Physics and Computational Mathematics, who points out that the size of a limited nuclear force is determined by its survivability, noting that "one guide to the size required of China's nuclear force is to be able to mount a nuclear strike that can penetrate an enemy's missile defense system after surviving a first strike." Sun Xiangli, "Analysis of China's Nuclear Strategy," *China Security*, No. 1 (August 2005), pp. 23–27, as cited in Jeffrey Lewis, "Chinese Nuclear Posture and Force Modernization," p. 37.
18. For more on China's nuclear posture and force modernization, see Lewis, "Chinese Nuclear Posture and Force Modernization."
19. "PRC: PLA Must Improve Capabilities, Safeguard Party's 'Ruling Status' in New Era," FBIS Document CPP-20080618436001, translation of Jun Xue, "Views on Improving the Capabilities of the Military in Implementing Its Historic Mission," *Zhongguo Junshi Kexue* (China Military Science), October 20, 2007, pp. 104–108, 124.
20. As Tsinghua University's Li Bin has noted, "it is difficult for the U.S. to rule out some errors in its estimate" of Chinese nuclear forces and be confident that a preemptive nuclear strike did not leave out some undetected ICBMs. Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization," Pugwash, April 2001, p. 2, <www.pugwash.org/reports/rc/rc8e.htm>.
21. A detailed discussion of the secrecy issue can be found in Chase and Medeiros, "China's Evolving Nuclear Calculus."

The concept of preemption, the maintenance of nuclear weapons at the core of U.S. strategic deterrence, and the addition of long-range conventional capabilities that could strike strategic targets, along with missile defenses that could also threaten an opponent's deterrent force, all may be seen as threatening potential U.S. foes. The extension of the role of U.S. nuclear forces from deterring a nuclear attack on the United States and its allies (something that is, in the U.S. view, similar to the Chinese position), to their possible use in a preemptive strike (thus making a no-first-use commitment impossible) broadens the realm of the usefulness of these weapons. The lack of clarity on the doctrine of preemption—regarding exactly which weapons nuclear weapons might be called upon to deter and what evidence might be required before preemption is undertaken, a particularly sensitive question since the 2003 invasion of Iraq—appears particularly threatening abroad. Additionally, talk in the early part of the first term of the George W. Bush administration about the development of "bunker busters," other new nuclear weapons types, and new nuclear roles further alarmed observers that the uses for nuclear weapons were expanding.

Despite the U.S. congressional decision not to fund development of new nuclear weapons, including the program for the Reliable Replacement Warhead (which in the official U.S. view is not a new nuclear weapon type but was seen as such by many),[22] and plans for very sizable reductions in nuclear weapons, the United States is widely seen as improving its strategic capabilities and thus becoming more threatening. Not only is the U.S. force to remain quite sizable, despite the two-thirds reduction codified in the Strategic Offensive Reductions Treaty (the Moscow Treaty), but many weapons components are to be stored, not dismantled, which—together with the new "responsive infrastructure"—makes the reformation of a large U.S. nuclear force seem quite possible. These alterations to the U.S. nuclear force have been much commented on in Russia and China. However, the reaction to non-nuclear strike plans and missile defenses has been even more dramatic.

New conventional precision-strike capabilities (the Quadrennial Defense Review includes plans to modify about 10 percent of Trident II SLBMs to carry non-nuclear warheads, for example) and missile defenses will significantly enhance U.S. strategic capabilities. The intent of these changes is not to destabilize or negatively affect the deterrent forces of other major nuclear countries, Russia and China first and foremost. Instead, Washington sees these capabilities as needed to deter new threats, such as terrorism or "undeterrable" states (those with leaders willing to risk the very survival of their states). However, these changes have been viewed by Russia in particular as aimed at it.[23] Even some U.S. scholars have appreciated how the changes may look from abroad: Keir Lieber and Daryl Press famously explored the possibility of the development of a U.S. first-strike capability,[24] while George Lewis and Theodore Postol have stated that U.S. missile defense interceptors launched from Poland could indeed intercept Russia's SS-25 ICBMs based in Vypolzovo, roughly 340 kilometers (km) northwest of Moscow (though with Russia's countermeasures, current interceptors are unlikely to threaten Russian ICBMs, and Russia's weapons far exceed the number of planned U.S. interceptors).[25] The most extreme scenario explored in Lieber and Press and elsewhere is that robust missile defenses could be used to take out the few missiles that remain after a nuclear and non-nuclear first strike on strategic targets in another state. It should be noted, of course, that the 2001 Nuclear Posture Review rejects a first-strike policy while missile defense, as defined in National Security Presidential Directive/NSPD-23 of 2002, is aimed at defending against limited missile threats from "rogue" states (known during the Clinton administration as "states of concern") and non-state actors, not large-scale attacks, as would arguably be the case if Washington sought a true first-strike option.[26]

22. For details on RRW, see Jeffrey Lewis, "After the Reliable Replacement Warhead: What's Next for the U.S. Nuclear Arsenal?" *Arms Control Today* 38 (December 2008).
23. Moreover, the United States has been moving forward with these while backing out of the Data Exchange Center in Moscow. Chances of misperception are very high.
24. Keir Lieber and Daryl Press, "The Rise of U.S. Nuclear Primacy," *Foreign Affairs* 85 (March/April 2006). The article was much commented on in the Russian and Chinese press, including several articles in the Autumn 2006 *China Security*, <www.worldsecurityinstitute.org/showpublications.cfm?id=149>.
25. George N. Lewis and Theodore A. Postol, "European Missile Defense: The Technological Basis of Russian Concerns," *Arms Control Today* 37 (October 2007).
26. National Security Presidential Directive/NSPD-23, December 16, 2002, <www.fas.org/irp/offdocs/nspd/nspd-23.htm>. For the official, publicly released document on this topic, see "National Policy on Ballistic Missile Defense," White House

Nevertheless, Moscow probably fears that acceding to a small missile defense system (at least one that does not involve strong cooperation with Russia) could let the United States establish a basis for further expansion of the system—an extension that could become difficult to impede. Russian scholars also fear that the U.S. defense interceptors could themselves be used as attack weapons, something to which Lewis and Postol give credence, writing:

> The ground-based interceptors in some ways resemble ICBMs themselves. They are extremely large, two-stage ballistic missiles, weighing roughly 21,500 kilograms each, with the two stages derived from the Minuteman series of ICBMs. They boast the same diameter as the Minuteman III's two upper stages and even use the same shroud. Indeed, if an interceptor were armed with a typical 1,100-kilogram Minuteman III payload of a missile bus and three nuclear warheads, it could carry that payload more than 6,000 kilometers.[27]

Russia and U.S. Missile Defense

After withdrawing from the 1972 ABM Treaty in 2002, the Bush administration embarked on developing full-scale missile defense capabilities. This included agreements on placing a radar system in the Czech Republic and ten interceptors in Poland. The issue of missile defense, especially its elements in Europe, has strained U.S.-Russian relations. Russia does not agree with the U.S. assessment of the threat posed by Iranian missiles and does not appear to agree that the way to prevent Iran from developing new missile capabilities is to develop a defensive system that would nullify any such capabilities. Although the U.S. system in its declared configuration would not pose a direct threat to the Russian deterrent, the trust deficit between Washington and Moscow makes the latter question the real intention of the former.

Commenting on the results of one interceptor test, Colonel General Viktor Yesin, former head of Russia's Strategic Rocket Forces, stated that it was clear the United States was testing interceptors aimed at Russian and Chinese missiles. He said, "This American ABM system is universal, it covers all spectrum of missiles, including of course those of Iran and North Korea. The thing is, however, that only Russian and Chinese ICBMs are equipped with the false decoys which were included in this test. Our ICBMs have been equipped with decoys for many years; Chinese introduced them recently in response to the US expansion of global ABM defense system. Neither Iran nor North Korea equip their missiles with such decoys and will be able to do it in a foreseeable future."[28]

Russia has several options for countering U.S. missile defense. Moscow has said it would undertake asymmetric countermeasures but may also explore Russian ABM capabilities along with increasing (or at least maintaining) nuclear armament levels. In the 1960s, Moscow conducted advanced research on missile defenses. Nevertheless, it agreed to the ABM Treaty, under which the United States and the Soviet Union agreed not to develop national missile defenses and limited them to one location. The United States chose a military base in North Dakota, while the Soviet Union deployed ABM defenses around Moscow. This froze the situation of mutual assured destruction by ensuring both the United States and the Soviet Union remained mutually vulnerable.

The ABM defense deployed around Moscow in the 1980s relied on nuclear-tipped interceptors, which were supposed to produce an explosion that would take out incoming missiles. Today, the system deploys thirty-two Gorgon (51T6) interceptors capable of carrying a 1-megaton warhead up to 350 km and sixty-eight Gazelle (53T6) interceptors capable of carrying a 10-kiloton warhead up to 90 km.[29] While it is unclear if the former are still operational, Russia regularly conducts tests of the Gazelle interceptors, although the effectiveness of the system is questionable. In addition, Stanford University's Russian weapons expert Pavel Podvig has argued that nuclear warheads might have been dismounted from the interceptors.

Fact Sheet, May 20, 2003, <georgewbush-whitehouse.archives.gov/news/releases/2003/05/20030520-15.html>.
27. Lewis and Postol, "European Missile Defense."
28. "SShA issleduyet vozmozhnosti i sistemy PRO po unichtozheniyu rossiyskikh i kitayskikh raket—ekspert RVSN" [U.S. Studies Missile Defense Capabilities and Systems for the Destruction of Russian and Chinese Missiles—Strategic Rocket Forces Expert], ARMS-TASS, December 8, 2008.
29. Eric Hundman, "Russian Nuclear Arsenal," Center for Defense Information, July 30, 2008, <www.cdi.org/friendlyversion/printversion.cfm?documentID=2967>.

An area where Russia is on the cutting edge of modern technology is theater missile defense. The Russian S-400 surface-to-air missile system complex (SA-20 Triumf), a modernization of its S-series complexes, is reported to be capable of hitting aircraft, cruise missiles, and short- and medium-range ballistic missiles at ranges of up to 400 km (twice the range of the U.S. Patriot system).[30] Deployment began in 2007, with twenty-three divisions scheduled to be deployed by 2015.[31]

While Russia has the technical capability to compete with the United States on missile defense, it has indicated that it is not willing to make the expenditures to do so. Instead, Russia continues to work to persuade Washington to change course. Should this fail, Moscow's first choice for ensuring the continued credibility of its deterrent is to continue to increase its nuclear patrols and build up its nuclear missile forces. It may also further expand its own current missile defense plans, and even revisit the idea of cooperating with China on missile defense, should it not be engaged in joint missile defense with NATO.

China and U.S. Missile Defense

Given China's relatively small nuclear force, missile defenses are an even greater threat to Beijing than to Moscow. Ambassador Sha has noted China's grave concern, saying that U.S. missile defense "will seriously undermine the effectiveness of China's limited nuclear capability from the first day of its deployment."[32] Initial missile defense plans focused largely on the Pacific, with a proposed missile defense radar on the remote Alaskan island of Shemya and one hundred interceptors in Alaska that, while nominally meant for North Korean missiles, would have threatened China's entire deterrent force. These plans evolved into placing a sea-based radar in the Pacific and a radar in the Czech Republic, plus fewer Alaskan interceptors (initially), and new interceptors in Poland—yet the defense systems remain more of a threat to China's deterrent than to Russia's. Ensuring that Beijing has enough missiles to penetrate U.S. defenses, and thereby deter the United States from threatening China, implies either employing the technical means to ensure that defense interceptors cannot be counted upon to destroy the weapons or increasing the number of nuclear missiles to ensure that not all can be destroyed by the combination of attack and defensive systems.[33] Indeed, Chinese understanding of possible nuclear postures includes the concept of "maximum deterrence" (*zuida xiandu weishe*), which could theoretically rely both on overwhelming nuclear superiority as well as a "perfect strategic defense system" (*wanshan de zhanlüe fangyu xitong*).[34]

Improvements to U.S. strategic capabilities—including improved network-centric warfare; the use of space for command, control, and communications, or even for the basing of weapons or missile defense interceptors; missile defenses more broadly; and long-range non-nuclear weapons systems—all pose threats to Chinese and Russian nuclear forces. While the long-term aim of these U.S. changes is to diminish the need for nuclear weapons—an

30. "S-400 (SA-20 Triumf)," Missilethreat.com, Claremont Institute, <www.missilethreat.com/missiledefensesystems/id.52/system_detail.asp>.
31. "Vozmozhnosti i perspektivy novykh zenitnykh raket S-400" [Capabilities and Prospects for the New S-400 Anti-Aircraft Missile], RIA Novosti, July 13, 2007.
32. Sha Zukang, "The Impact of the U.S. Missile Defense Programme on the Global Security Structure," CPAPD/ORG Joint Seminar on Missile Defense and the Future of the ABM Treaty, March 13–15, 2000, Beijing, as cited in Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization."
33. Li Bin categorizes the various options that have been discussed in four groups, as follows. The first group aims to overwhelm the defense by: building more ICBMs; MIRVing the Chinese ICBMs to multiply the number of warheads; releasing decoys from the missiles; or dispersing chaff to fool the sensors of the defense. The second group aims to lower the observability of the warheads by applying stealth technology, such as radar stealth and infrared stealth. The third group creates a rivalry between the warheads and the interceptors during the flight, for example, by making the warheads maneuver. The fourth group raises the survivability of the Chinese ICBMs by deploying mobile ICBMs and/or SLBMs; building a missile defense; or putting the Chinese nuclear weapons on hair-trigger alert. Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization."
34. For the Chinese typology of nuclear deterrence, as well as its link to defensive systems, see Chase and Medeiros, "China's Evolving Nuclear Calculus," pp. 137–39.

eventuality that, if realized, certainly would decrease the threat U.S. nuclear munitions pose to other states' nuclear forces—in the short term, U.S. efforts to improve the non-nuclear component of its strategic capabilities are destabilizing. In order to maintain stability while working toward a new strategic balance, these developments must be considered in mutual negotiations on nuclear topics. They are not separate issues; in fact they interact critically with nuclear strategic forces.

China and Russia joined together to voice their concerns about missile defenses in their May 2008 joint statement on international issues, which states that:

> The two sides believe that the establishment of a global anti-missile system, including the deployment of the system in some parts of the world and related cooperation, is not in the interest of maintaining strategic balance and stability. It is neither conducive to global arms control and nonproliferation efforts nor favorable to building mutual trust among states and regional stability. The two sides express their concern over it.[35]

Nevertheless, Russia has suggested the possibility of a joint missile defense system in Europe. Should such a system be initiated, it is not clear what the response might be in Beijing. As noted above, the ramifications of missile defense are more serious vis-à-vis the Chinese deterrent than the Russian. While a European system may not directly impact China's nuclear deterrent, the precedent—along with the likelihood that the United States and Russia might extend such cooperation to the Pacific, ostensibly to target a North Korean threat—would likely be looked at nervously from Beijing. Washington should engage Beijing in a discussion of any multilateral missile defense, wherever it is located, to understand how to make it less of a threat to China and to see how China might be engaged in the effort. A serious engagement, however, could prove difficult because Washington has been particularly concerned about the transfer of missile technologies to China over the past couple of decades. Nevertheless, China may be able to bring something to the table on missile defense, whereas failing to engage Beijing is likely to push it toward increasing its nuclear deterrent force.

Russian and Chinese Views of Their Mutual Strategic Interactions

While the United States is the chief strategic security concern in both Beijing and Moscow, the relationship between these two capitals has been slowly changing. Before discussing the possibility of engaging them in disarmament discussions, it is important to understand the background of their relationship and its changing nature.

Sino-Russian strategic relations have witnessed both high and low points over the years. In the 1950s, China was largely politically subordinate to the Soviet Union, receiving economic and military assistance and generally following Moscow's lead in its strategic relationship with the West. The two countries also embarked on cooperation in the nuclear sphere, with the Soviet Union providing some technical know-how to China. Despite multiple Chinese requests to share nuclear weapons, however, the Soviet Union refrained from direct sharing. Nevertheless, the foundations for China's military nuclear program were laid by the Soviet Union. Many Chinese scientists were educated in the Soviet Union, and at one point there were even preparations to send blueprints of actual nuclear weapons and a model of an atomic bomb to China. The shipment, however, was stopped at the last moment by the order of Soviet leader Nikita Khrushchev. Dissatisfied with the Soviet policy on numerous issues, China eventually began to take a more active role in criticizing the Soviet Union. As relations between the two countries deteriorated in the 1950s, technical assistance from the Soviet Union faded away, and Soviet specialists were ordered to return home in 1960.

At the time, China viewed attempts to limit the proliferation of nuclear weapons as part of a U.S.-Soviet conspiracy. In this respect, it is interesting to note that the United States reportedly suggested a joint U.S.-Soviet strike

35. "Joint Statement of The People's Republic of China and the Russian Federation On Major International Issues," Chinese Foreign Ministry, May 23, 2008, <www.fmprc.gov.cn/eng/wjdt/2649/t465821.htm>.

on Chinese nuclear facilities to prevent China from testing its bomb.[36] Although the Soviet Union's relationship with China was already conflictual by that point, it rejected the idea of such an undertaking. Sino-Soviet relations did not reach their lowest point until the bloody border conflict of March 1969, which remains the only direct military confrontation between two official nuclear states.

Relations between Moscow and Beijing started to improve steadily in the 1980s. After the dissolution of the Soviet Union, Russia became China's main arms supplier. Political relations between the two countries improved apace. In September 1992, the countries made a declaration of friendship, and in January 1994 they agreed to establish a constructive partnership for the twenty-first century.[37] By September 1994, when Chinese President Jiang Zemin visited Russia, they had approved of language on non-confrontation, non-alignment, and Five Principles of Peaceful Coexistence as the basis for this partnership and announced that they would never aim their nuclear weapons at each other.[38] During Russian President Boris Yeltsin's second trip to China in April 1996, the two countries announced the formation of a "strategic cooperative partnership," agreed to establish regular meetings between the two nations' leaders, and established a hotline between Beijing and Moscow. The exact nature of the strategic partnership, however, is not clearly defined. As noted by Yang Jiemian of the Shanghai Institute for International Studies, "the Sino-Russian strategic partnership is not an allied relationship, nor directed at any third country."[39] Nevertheless, both parties appear to view their agreement as bringing them closer together than do the talks or agreements either has with Washington.

Moscow and Beijing share extremely close opinions on the need for a multipolar international system and on opposition to U.S. missile defense. They outlined their views on the international system in the Joint Statement of the People's Republic of China and the Russian Federation on a Multipolar World and the Establishment of A New International Order, signed on April 23, 1997. The 1999 NATO bombing of Serbia further served to bury Russia's brief honeymoon with the West; the same conflict led to a dramatic anti-U.S. backlash in China after NATO mistakenly bombed the Chinese Embassy in Belgrade. While the West continued to be of critical importance, Moscow paid more and more attention to the East. Some Russian politicians began to note that Russian and Chinese approaches to many international issues were very similar, in particular on disarmament, arms control, and nonproliferation of nuclear weapons.[40] In early 2000, as the United States continued to seek amendment to the ABM Treaty to allow missile defense development and suggested it might withdraw from the treaty,[41] China and Russia also discussed the possibility of constructing a joint missile defense shield.[42] However, such talk does not appear to have gone forward and may have been largely political. Indeed, Moscow has been wary of just how far it goes in military cooperation with China. Though Moscow has allowed Beijing access to its GLONASS global satellite navigation system (a Rus-

36. Roland Timerbaev, *Rossiya i yadernoye nerasprostraneniye, 1945–1968* [Russia and Nuclear Nonproliferation, 1945–1968] (Moscow: Nauka, 1999).
37. The information in this paragraph is largely derived from *Shizilukou Shang de Shijie* [The World at a Crossroads] (Beijing: Zhongguo Renmin Daxue Press, 2000), "Excerpt of PRC Book on International Strategy," FBIS Document CPP20070110320011.
38. Ibid. The agreement, "On Not Aiming Guided Missiles at Each Other and Not Using Nuclear Weapons Against Each Other First," was promulgated in August 1994.
39. Yang Jiemian, *Dahezuo* [Grand Cooperation] (Tianjin: Renmin Chubanshe, 2005), as translated in "Excerpt of PRC Book on China's Global Strategy," FBIS Document CPP20070618320001.
40. Statement by Amur region Senator Igor Rogachev, "Russian-Chinese Relations—Together on the Road of Partnership and Cooperation," Xinhua, January 12, 2002.
41. See, for example, briefing by Secretary of Defense William S. Cohen, January 20, 1999, <www.fas.org/spp/starwars/program/news99/t01201999_t0120md.htm>, at which Cohen stated that "[missile defense] deployment might require modifications to the [ABM] treaty and the Administration is working to determine the nature and the scope of these modifications…. The ABM Treaty also provides, of course, for right of withdrawal with six months notice if a party concludes it's in its supreme national interests."
42. A joint regional missile shield was reportedly discussed during both Chinese Defense Minister Chi Haotian's January 16–18, 2000 visit to Moscow and Russian Deputy Prime Minister Ilya Klebanov's February 2000 visit to Beijing. Vladimir Kucheren, "Ne tolko v oblasti baleta" [Not Only in the Sphere of Ballet], *Rossiyskaya Gazeta* May 25, 2000.

sian equivalent of the U.S. global positioning satellite system) for civilian and military use, Russia did not respond to all of China's overtures for military cooperation.[43]

Politically, however, the two countries have continued to consolidate their relationship. Their most important bilateral strategic agreement was the July 2001 Treaty of Good-Neighborliness and Friendly Cooperation between the People's Republic of China and the Russian Federation. This agreement notes that the two countries seek "a just and fair new world order based on universally recognized principles and norms of international laws"—clearly meant to contrast with the idea of a U.S.-dominated unipolar world. Not only did China and Russia commit to not using or threatening to use force against each other, but they also recommitted to not being "the first to use nuclear weapons against each other nor target strategic nuclear missiles against each other."[44] Thus, while Russia does not have a general NFU policy, it has made this commitment to its large eastern neighbor.

The View from Moscow

Despite these improvements, the future prospects for Sino-Russian relations remain unclear. Russian military analysts are paying close attention to Chinese military improvements; there is a wide variety of opinion as to what these improvements mean for Russia. As noted above, early post–Cold War military interactions were particularly strong in the area of procurement: China has bought a great deal of Russian weaponry (though Russia has not sold its very best technologies). However, with improvements in China's own defense industry, in part based on technology transfer from Russia and reverse-engineering Russian defense products, these sales are now waning (and have certainly not involved the nuclear weapons sphere). Additionally, the two countries' militaries have held both bilateral and multilateral joint exercises under the framework of the Shanghai Cooperation Organization; Chinese military specialists are being educated in Russian defense institutes; and the two militaries hold strategic consultations (China also engages in strategic dialogues with other countries it considers important in the international arena). These increasing interactions improve transparency and understanding and could be a first step toward the sort of interactions required to initiate arms control discussions. However, Beijing and Moscow are still far from engaging with Washington in this sort of negotiation at the present time, and there appear to be no plans for any such talks.

It should be noted that some Russian observers do indeed view the rise of China's military—including improved nuclear capabilities—as benign, or even helpful for Russian security (though this may well not guide current Russian strategic thought). Sergei Brezkun of the Academy of Military Sciences and Victor Mikhailov, former minister of atomic energy and current director of Rosatom's Institute of Strategic Stability, have argued that Russia has nothing to fear from a growing Chinese arsenal (they also note that common sense says that the arsenal will grow, noting that if the United States deploys missile defense, China's best answer is amassing warheads).[45] Brezkun and Mikhailov view Russia's nuclear arsenal as critical to maintaining global strategic stability (and China's as not essential), but they do think that China's nuclear weapons can add to the effect of Russia's in balancing U.S. forces.[46] They note that China's investments in the sea leg of the nuclear triad and deployment of missiles with multiple independently targetable reentry vehicles (MIRVs) are largely targeted at the United States.

Overall, it seems that most Russian analysts accept the official explanation provided by the Chinese military for upgrading its nuclear arsenal: to increase China's capabilities for global strategic deterrence and guarantee a second-strike capability in case of a global nuclear war.[47] Generally speaking, it is nearly taboo in Russian political circles to

43. For example, Russia was wary of selling the most modern fighter aircraft (such as the Su-37) and advanced air defense systems. Some Russian experts have argued that the weapons systems sold to China have already been excessive.
44. Treaty of Good-Neighborliness and Friendly Cooperation Between the People's Republic of China and the Russian Federation, July 16, 2001, Chinese Foreign Ministry, <www.fmprc.gov.cn/eng/wjdt/2649/t15771.htm>.
45. Sergei Brezkun and Victor Mikhailov, "Kak uderzhat globalnyy treugolnik" [How to Maintain the Global Triangle], *Voyenno-Promyshlennyy Kuryer* [Military-Industrial Courier], October 12–18, 2005.
46. Brezkun and Mikhailov, "Kak uderzhat globalnyy treugolnik" [How to Maintain the Global Triangle].
47. Vyacheslav Baskakov and Aleksandr Gorshkov, "Raketno-yadernyy arsenal Pekina" [Beijing's Nuclear Arsenal], *Nezavisimoye Voyennoye Obozreniye* [Independent Military Observer], April 5, 2002.

speak about Sino-Russian differences, in particular any potential Chinese threat to Russia. Top political circles have been concerned with improving relations, even naming 2006 the official "year of Russia" in China, and 2007 the "year of China" in Russia. Further lessening the possibility of any future disputes, in 2008 the demarcation of the last piece of disputed Sino-Russian border was finalized, with two islands transferred to China.

While Russian commentators on strategic developments largely ignore the East and focus on the United States as a threat, a few look eastward. These observers tend not to worry about Chinese threats today, but rather about possible future aggression toward Russia—carried out by either military or non-military means. In particular, the Chinese concept of "living space" has elicited a great deal of interest. Last year, Aleksandr Khramchikhin (head of the Analytical Division of the Institute of Political and Military Analysis) argued that China's only options for acquiring more "living space" are Russia and Kazakhstan. Khramchikhin noted that although both Beijing and Moscow have officially stated that they have no pretensions to each other's land, Chinese "propaganda is not changing": the view of Russia as historically having taken Chinese territory and the idea that the historical agreements ceding Chinese land were unfair continue to be promoted.[48] While Khramchikhin did not suggest that military action was likely (instead, he painted a scenario whereby migration[49] was followed by economic dependence and the eventual redrawing of borders to recognize the facts on the ground), he did note that some Chinese military training exercises have been clearly anti-Russian.[50]

Another analyst, Vitaly Tsygichko, a department head in the System Analysis Institute of the Russian Academy of Sciences, took a similar line when he noted that China's clear hegemonic intentions in Asia threaten Russian interests. Tsygichko argued that military exercises carried out in the Beijing and Shenyang military districts in 2006 simulated a military conflict with Russia and Kazakhstan and were meant to signal the Russian government that if Beijing is unsatisfied with Russia's foreign policy, it would be willing to start a war.[51]

However, the views expressed by Khramchikhin and Tsygichko remain outliers. Any disagreements between China and Russia today are less important than their common effort to avoid succumbing to what both view as excessive U.S. pressure, though this calculation may well change in the future. Yevgeny Bazhanov, in a 2007 monograph, provides an overview of a variety of areas in which China and Russia could potentially clash in the future.[52] In the strategic area, nuclear preparations in India and Pakistan are of particular interest. As Bazhanov notes, Russia is not particularly worried by nuclear weapons in India because it does not see them as a threat to itself, while China views them as a direct challenge to its own security (particularly since India has declared that its weapons program was caused by China's nuclear test and is aimed at deterring China).[53] The changing balance of power between Russia and China is likely to continue, Bazhanov argues, and could well lead to the projection of Chinese power in the region—including into the Russian Far East and Siberia (citing Thucydides, Bazhanov notes that alterations in the balance of power have been generally destabilizing throughout history because they create fear).[54] Indeed, fear of external enemies already abounds in Russia, with China playing an important role. As an extreme example, Major General A.I. Vladimirov has written not only about Chinese expansion to the north, but even the possible extinction of Russia as an independent civilization.[55]

More mainstream Russian military analysts are paying close attention to China and its military doctrine and strategy as well. For instance, *Voyennaya mysl'* (Military Thought), the official publication of the Russian Academy of

48. Aleksandr Khramchikhin, "Ugroza, kotoraya sama po sebe 'ne rassosetsya'" [The Threat that Will 'Not Be Resolved' by Itself], *Nezavisimaya voyennoye obozreniye* [Independent Military Observer], February 22, 2008.
49. It should be noted that while Khramchikhin is far from the first Russian to be interested in Chinese emigration northward, most do not speak of actual border changes. A detailed review of Russian views of China and vice versa can be found in Yevgeny Bazhanov, *China: From the Middle Kingdom to a Superpower of the XXI Century* (Moscow: Izvestia Press, 2007).
50. Khramchikhin, "Ugroza."
51. Dmitry Trenin and Vitaly Tsygichko, "China to Russia: Comrade or Master?" *Security Index* 2 (2007).
52. Bazhanov, *China: From the Middle Kingdom to a Superpower of the XXI Century.*
53. Bazhanov, *China: From the Middle Kingdom to a Superpower of the XXI Century,* p. 329.
54. Ibid., p. 331–32.
55. Cited in Bazhanov, *China: From the Middle Kingdom to a Superpower of the XXI Century,* p. 333.

Military Sciences, continues to monitor China; in 2007 it published an article that thoroughly analyzed China's military strategy. According to the authors, Chinese strategists believe that a global war could only be started through the use of conventional weapons, but that there is a continuing threat of nuclear escalation.[56] China's unfavorable balance of nuclear weapons vis-à-vis Russia and the United States explains the cautious attitude of the Chinese leadership toward the possibility of the use of nuclear weapons. At the same time, they write that local war is described in Chinese statements as "the most effective and safest way of reaching political objectives by military means, the only acceptable type of war."[57] However, given increasing Chinese conventional capabilities, this view does not necessarily ensure stable Sino-Russian relations. The 2000 Russian Military Doctrine envisions the possible use of nuclear weapons in a conflict with a conventionally superior state. While this has generally been perceived as aimed at NATO, it could also cover a possible military conflict with China if the conventional balance is undermined.

The View from Beijing

The Chinese view of Russia, in the main, appears more benign. While recognizing that Russia continues to maintain a huge nuclear arsenal, Beijing does not generally appear to believe that Russia poses a threat to China.[58] Instead, the possibility of working together with Russia to balance the United States is seen as central. Indeed, Chinese analysts have explained Moscow's strategy as "joining with China to constrain the U.S."[59] Although noting that Russian military spending is rising and that Moscow has "stopped disarmament, strengthened its nuclear and anti-crisis capabilities, and has announced that it will not abandon the nuclear first-strike option," this is seen by most Chinese experts as driven by U.S. "expansionist policies," as is the involvement of Russia (and other states) in a "new arms race"; Russian military improvements are not seen as directed against China.[60] However, not all Chinese analysts believe that a "new Cold War" between the United States and Russia is at hand, though such observers do believe it might emerge.[61]

56. V.L. Sedelnikov, "Military and Economic Strategy and the Restructuring of China's Armed Forces," *Military Thought*, Issue 9 (2007), p. 68.
57. As quoted in Sedelnikov, "Military and Economic Strategy and the Reform of China's Armed Forces."
58. For additional Chinese views of Russian nuclear capabilities, see the essay by Lora Saalman in this volume, "Chinese Analysts' Views on Arms Control, Disarmament, and Nuclear Deterrence after the Cold War," p. 47. Saalman notes, for example, that Qian Shaojun argues that Russia's work to miniaturize low-yield nuclear weapons and pursue new weapons designs, along with U.S. actions, has lowered the threshold for nuclear conflict. Qian Shaojun, ed., *Hewuqi Zhuangbei* [Nuclear Weapons Equipment] (Beijing: Zongzhuangbeibu Dianzi Xinxi Jichubu, Yuanzineng Chubanshe, Hangkong Gongye Chubanshe, and Bingqi Gongye Chubanshe, July 2003), p. 153, as cited in Saalman.
59. *Guojia Anquan Gongmin Shouce* [Public Handbook on National Security] (Beijing: Shishi Chubanshe, 2003), as translated in "Excerpt of PRC Handbook on National Security," FBIS Document CPP20070911320005.
60. *Guojia Anquan Gongmin Shouce*. See also Ren Xiangqun, "World Military Security Becoming More Complex by the Day," *Liaowang* [Outlook], October 2, 2006 (as translated in "PRC Expert Analyzes Increasingly Complex Global Military Security," FBIS Document CPP20061011718014), for yet another military expert's assessment of the current U.S.-Russian "strategic arms race."
61. An entire session of a Chinese-Russian-U.S. conference on trilateral relations, "Trilateral Relations Among China, Russia and the U.S.A.: Structure, Perceptions and Politics," held in September 2008 was devoted to the topic of a new Cold War. Shen Dingli of Fudan University averred that a new Cold War had indeed already begun, with actual hot conflicts involving states linked to Moscow and Washington already fought (in Serbia and Georgia). However, he noted that this Cold War did not have to continue and that from the Chinese perspective, a new Cold War was not positive ("if the U.S. loses, China loses"). Instead, he called for a strategic dialogue between the United States and China, like the strategic dialogue Beijing has with Moscow. In the same session, Pan Xingming of the East China Normal University School of Advanced International and Area Studies defined "Cold War" as "international containment" with a struggle over interests, influence, and power and noted that this was what U.S. policy looks like today, though his judgment was that the current situation could not be defined as a Cold War (though one might well emerge). U.S. and Russian conference participants did not share the view that a Cold War had already or would soon emerge. "Trilateral Relations Among China, Russia and the U.S.A.: Structure, Perceptions and Politics," Shanghai, China, September 26–28, 2008. On this topic, see also: Lu Gang, "No Gain for China if Cold War Erupts Between the United States and Russia," *Huanqiu Shibao* [Global Times], August 30, 2007, p. 11, as translated in

Thus, China views security cooperation with its neighbor as both possible and necessary, though the two states' security interests are not always perfectly aligned. Russian plans to further upgrade its missile and space capabilities worry Chinese analysts, while Beijing cannot support Moscow in South Ossetia and Abkhazia, given China's own restive western regions. Indeed, as a member of the Asian Development Bank, China was recently party to a new loan made to Georgia on extremely preferential terms, and China has expressed its "concern" about Russia's actions in Georgia in August 2008.[62] Indeed, Central Asia may well become an area of Sino-Russian competition in time, though to date the Shanghai Cooperation Organization has been fairly successful at doing just that: organizing cooperation. In the Northeast Asian region, Chinese experts see Russian concerns about the security of its territory in Asia as derived from "historical territorial disputes with its neighbors in the region, the scarcity of and decrease in population in its vast Asian territory, and other domestic and international factors," and believe that Moscow's current answer to these problems is increasing regional integration and participation.[63] The economic and other interests of the two countries are thus aligned for the foreseeable future in this part of the world. They are in general agreement on most policies in the strategic sphere and often back each other up in the UN Security Council. However, they are not allies and are not likely to reach this degree of cooperation any time soon. In fact, as the next section argues, the future Sino-Russian relationship is far from clear.

The United States, Russia, and China: Is Trilateral Strategic Cooperation Possible, or Is A New Nuclear Arms Race Inevitable?

While nuclear weapons capabilities and nuclear doctrines have changed somewhat since the end of the Cold War, the changes have been relatively small. The numbers of U.S. and Russian nuclear weapons have decreased significantly, yet their use—their doctrine and targeting—has either remained unchanged or slightly expanded (if one believes that preemptive use of these weapons is possible or that they might be useful in deterring conventional conflict). The 2001 U.S. Nuclear Posture Review suggests a significant doctrinal change but has not led to any changes in the nuclear forces—the changes have all been to other parts of the new triad. Similarly, the improvements in Chinese weaponry have not yet led to a new strategic balance or to doctrinal-level changes in Russia or the United States. One might wonder, therefore, if there is an issue to discuss at all, or if the situation a decade or two from today may have the same general outlines as the present. However, even a cursory examination of current trends indicates that this is extremely unlikely.

The present status quo cannot be maintained unless current policies are altered. The trajectories—in terms of weapons dismantlement as well as procurement, missile defense, and high-tech weaponry—are not sustainable without having a major effect on doctrine. Indeed, if the current rate of removing nuclear weapons from U.S. and Russian arsenals is maintained, both nations would have no operational weapons in little over a decade. This is clearly unlikely. But if the rate of reductions slows down too much, it will have a variety of effects, including on the NPT and on how the two nations view each other. Similarly, U.S. missile defense and long-range conventional guided weapons have caused worries in Moscow and Beijing, but much of this capability is not yet operational—only in the future will these systems have a real impact. The more these systems are improved, the more Moscow and Beijing are likely to see them as an urgent threat to their nuclear deterrents—and react militarily.

Since these trajectories cannot be maintained, Washington, Beijing, and Moscow will soon find themselves at a critical decision-making juncture. They must either cooperate to reduce mutual threats or unilaterally halt problematic programs (such as missile defense or long-range conventional weapons), or they will have to find ways to counter each other's programs. Over the long run, Russia may develop the missile defenses needed to protect its

"PRC Commentary Argues Russia-US 'New Cold War' Will Not Benefit China," FBIS Document CPP20070918329001.

62. Keith Bradsher, "Loan to Georgia Illustrates Asian Dismay With Russia," *New York Times*, September 13, 2008, p. A9.

63. Cui Liru, ed. *Dongbeiya Diqu Anquan Zhengce Ji Anquan Hezuo Guoxiang* [Regional Security Policy and Security Cooperation Blueprints for Northeast Asia] (Beijing: Shishi Chubanshe, 2006), as translated in "Summary of PRC Book on Security Cooperation in Northeast Asia," FBIS Document CPP20071016320001.

ICBMs from U.S. conventional weapons or find other means of protecting its deterrent force, but in the short term the most likely solution is to MIRV existing weapons. China, in the long term, may move to a sea-based deterrent but faces even tougher choices than Russia in the short term—possibly involving the development of new, maneuverable warheads, fielding more ICBMs, or other measures.

In recent years there has been a push in the United States to reinvigorate disarmament, most notably thanks to two editorials in the *Wall Street Journal* written by George Shultz, William Perry, Henry Kissinger and Sam Nunn. The thoughtful editorials, however, are chiefly aimed at a U.S. audience and do not address the question of how to deal with missile defenses and precision-strike munitions during the period of transition to a world without nuclear weapons. The sections below, therefore, will examine some of the arms control and disarmament measures suggested by the editorials and other sources (including Chinese and Russian officials and nongovernmental experts), paying particular attention to how U.S. policies on missile defense and conventional weapons would affect the proposals in Chinese and Russian eyes, as well as Chinese and Russian views on the proposals more generally.

"Engaging More Nations in Arms Control"

In response to written questions during the 2008 presidential campaign, Barack Obama stated, "I will initiate a high-level dialogue among all the declared nuclear-weapon states on how to make their nuclear capabilities more transparent, create greater confidence, and move toward meaningful reductions and the eventual elimination of all nuclear weapons."[64] This embraces the call by Shultz et al. for "continuing to reduce substantially the size of nuclear forces in all states that possess them."[65] Indeed, while bilateral U.S.-Russian arms control may continue to provide fruit in the short term, it will soon be necessary to involve additional nuclear weapon states in this process.

Russia has already called for engaging more nations in arms control. While this is most often interpreted to mean counting U.K. and French forces together with U.S. forces as a common, NATO force, Russia has periodically made it clear that it thinks China, too, should be engaged. China is not, it must be noted, against engagement in arms control; indeed, it has a long-stated policy of support for disarmament. However, Beijing does not believe that Chinese forces should be reduced until U.S. and Russian stockpiles descend to levels comparable to the Chinese. Indeed, some increases in Chinese force levels would not contradict China's stance that it takes its NPT Article VI commitment seriously and seeks global disarmament, but in the meantime requires nuclear weapons to counter the weapons of other countries.

At the same time, engaging China in arms control talks is possible. Beijing increasingly views itself as a major world power and is interested in enhancing its status. While China is unlikely to reduce the numbers of its nuclear weapons in the near term, it should be interested in a seat at the table—and the prestige of being engaged in nuclear talks with Washington and Moscow.

Colonel Wang Zhongchun of China's National Defense University has noted that "China will sooner or later join bilateral or multilateral nuclear disarmament negotiations," though he goes on to say that "as China's participation … will unavoidably lead to a reduction and weakening of its strategic deterrent force, we should improve the base number of our nuclear force before participating in any nuclear disarmament negotiations."[66] Wang's argument is not, however, to give China an advantage, but to enable it to engage in arms control without losing its deterrent force prematurely (while the United States and Russia continue to have their own nuclear forces). Further, he notes that China should give "firm support and full cooperation" to U.S. policies and actions against nuclear proliferation to "separatists, extremists and terrorists."[67]

64. "*Arms Control Today* 2008 Presidential Q&A: President-elect Barack Obama," responses received September 10, 2008, <www.armscontrol.org/2008election>.
65. George P. Shultz, William J. Perry, Henry A. Kissinger, and Sam Nunn, "A World Free of Nuclear Weapons," *Wall Street Journal*, January 4, 2007, p. A15.
66. Wang Zhongchun, "Nuclear Challenges and China's Choices," *China Security*, Winter 2007, pp. 52–65.
67. Further discussion of Wang Zhongchun's views and his book *Hewuqi, Heguojia, Hezhanlue* [Nuclear Weapons, Nuclear

Engaging China in arms reductions is difficult, but engaging it with confidence-building measures can and should begin now. This will require the development of some new methods, while others can be borrowed from the U.S.-Russian experience. The U.S. and Russian (Soviet) methods of accounting and verification could be very problematic for the Chinese deterrent, given its reliance on a lack of transparency, although Beijing has traditionally been a supporter of verification in international arms control treaties. Additionally, if the United States (or Russia) continues to improve its non-nuclear strategic force, particularly together with missile defense, China would have to either increase the quantity or quality of its weapons systems (the latter could be considered vertical proliferation) and may well rethink its no-first-use pledge.[68] To avoid this eventuality, missile defense and long-range non-nuclear weapons would have to be the subject of arms control talks and subject either to controls or, possibly in the case of missile defense, internationalization.

Confidence-Building Measures

Either in tandem with arms control talks, or possibly as a preliminary step to such talks, confidence-building measures should be considered. Several of the U.S.-Russian measures that were initiated under START could be undertaken trilaterally. Although China's official position is that it will consider joining the multilateral nuclear arms reduction process only after dramatic cuts in the arsenals of the two nuclear superpowers, nothing prevents it from engaging in confidence-building measures related to nuclear arsenals. START contains sixteen types of inspections and ten groups of confidence-building measures with 152 types of notifications.[69] Given the level of secrecy surrounding the Chinese nuclear arsenal, it seems very unlikely that Beijing would consider granting any kind of inspection at a military installation. The 152 types of confidence-building measures, on the other hand, provide a wide selection of measures, many of which may be appropriate for China. The following notification provisions, for example, could be accepted by China without compromising its security:

- notification of the location of a production facility at which production of ICBMs, SLBMs, or their first stages is planned;
- notification of production of new types of strategic bombers, ICBMs, SLBMs, and air-launched cruise missiles (ALCMs);
- notification of the deployment of new types of strategic bombers, ICBMs, SLBMs, and ALCMs;
- notification of exercises involving strategic bombers, ICBMs, SLBMs, and ALCMs; and
- notification of conversion and/or elimination of existing facilities and means of delivery (ICBMs, SLBMs, strategic bombers, and ALCMs).

This data could include technical characteristics of the facilities, missiles, and strategic bombers that would be

Powers and Nuclear Strategies] can be found in Saalman, "Chinese Analysts' Views on Arms Control, Disarmament, and Nuclear Deterrence after the Cold War."

68. Evidence that Second Artillery planners are concerned about the vulnerability of China's silo-based missiles to an attack by conventional precision-guided munitions is discussed in Wang Houqing and Zhang Xingye, eds., *Zhanyixue* [The Science of Campaigns] (Beijing: Guofang Daxue Chubanshe, May 2000); an internal military circulation volume is provided in Chase and Medeiros, "China's Evolving Nuclear Calculus," pp. 144–45. Chinese experts, too, see that future military combat is likely to involve conventional precision-guided capabilities. Should China acquire a great number of these munitions at some point in the future, Russia's deterrent force could conceivably be affected. It should be noted that there have been periodic expert debates over whether China has already been considering changing its NFU pledge. Indeed, Wang Zhongchun argues that nuclear weapons might be used "at a time when China's core national security and development interests are fundamentally undermined." Wang, "Nuclear Challenges and China's Choices." However, the danger of China facing such a threat is seen by Chinese analysts highly unlikely, and China has repeatedly stated that it remains committed to NFU.

69. See the essay by Vladimir Dvorkin in this volume, "Reducing Russia's Reliance on Nuclear Weapons in Security Policies," p. 89.

agreed by contracting parties. Engaging China in discussions on possible confidence-building measures in and of itself is a promising pathway toward building the understanding and trust needed to engage in arms control talks at some point in the future.

No-First-Use Treaty

Nonproliferation experts seeking ways to increase stability and decrease the risk of nuclear accidents highlight the Chinese NFU initiative. Both U.S. and Russian nuclear doctrines run contrary to the agreement of a No-First-Use Treaty: the United States because it employs its nuclear weapons as a deterrent to chemical attacks and because it believes an NFU policy could undermine deterrence;[70] Russia because its nuclear forces are called upon to deter conventional conflicts. But should the new U.S. administration seek to implement the recommendations of Shultz et al., there could be consideration of promoting an NFU Treaty in Washington. John Holdren, the new head of the White House Science and Technology Office, has urged a U.S. NFU policy.[71]

Agreeing the general concept of NFU still leaves a good deal of room for negotiation, however, as the definition of "first use" is far from obvious. For example, would a strike using conventional means on a nuclear target count as first use (making a retaliatory nuclear strike possible), or a strike using chemical or biological weapons (something Holdren has argued against)?[72] Broadening the concept still further (to a degree that could make such a treaty meaningless), some might argue for including strikes with a "WMD-like effect"—such as a strike on the Three Gorges Dam—as a "first-use" strike requiring nuclear retaliation. While the idea of deterring chemical and biological weapons or extreme conventional attacks would be more akin to current Russian and U.S. than to Chinese understanding, it is not impossible that Beijing would also consider the adoption of such notions in such an agreement. However, an NFU Treaty that adopted a broad definition of first use would serve to codify the increased range of uses for nuclear weapons, consolidating a norm of their usefulness—and would take the world further from the possibility of disarmament. Thus, until all three countries can find ways to protect themselves that do not include nuclear weapons, it is not self-evident that negotiations on an NFU Treaty will be helpful. Instead, efforts to this end should begin by dealing with the threats that the United States and Russia have said their nuclear weapons are meant to deter; reducing worries about these threats is necessary to create the possibility of a true NFU Treaty (whereby nuclear weapons would be used only to retaliate for a nuclear strike).

Negative Security Assurances

Still another area of possible future cooperation in arms control involves the provision of assurances to non-nuclear states that the nuclear weapon states will not strike them with nuclear weapons. Such assurances have been provided under the auspices of nuclear-weapon-free zone treaties but have yet to be codified in a more general document. Moreover, not all nuclear weapon states have signed the protocols to each of these treaties; Beijing is ahead in this regard. However, one of the policies suggested by Shultz et al. as a step on the way toward disarmament is diminishing the role of nuclear weapons in nuclear security policy. Along with doctrinal changes, codifying negative security assurances are certainly a step in this direction and could be looked upon more favorably by the Obama administration. Even more so than an NFU Treaty, however, negative security assurances require changes to current U.S. and Russian strategic policy: nuclear forces could no longer be used to deter a chemical or conventional attack from non-nuclear states (though, conceivably, they could still be

70. Walter Pincus, "Pentagon Revises Nuclear Strike Plan: Strategy Includes Preemptive Use Against Banned Weapons," *Washington Post*, September 11, 2005, p. A1.
71. Stephen Dinan, "Obama Science-Tech Team Takes Aim at Global Warming," *Washington Times*, December 21, 2008; "Obama Taps Nonproliferation Expert as Science Adviser," Global Security Newswire, December 22, 2008, <gsn.nti.org/gsn/nw_20081222_5906.php>.
72. Ibid.

used to deter a non-nuclear attack from nuclear weapon states). Beijing has suggested negotiating a protocol on security assurances under the NPT framework, though trilateral negotiations would likely be welcomed as well.[73]

Changing the Cold War Posture of Deployed Nuclear Weapons to Increase Decision-Making Time

Currently, the top levels of leadership in nuclear weapon states have an estimated six to seven minutes to decide whether or not to launch nuclear weapons in response to the detection of incoming missiles (though Chinese policy appears to require evidence of an actual nuclear explosion, not simply incoming missiles).[74] This increases the possibility of accidents—from misinterpreting a rocket launch as a missile, to radar error, to computing or other mistakes. Such errors have happened on multiple occasions and are likely to increase if more nations develop long-range missile arsenals. Thus, various experts have suggested that measures must be taken to increase the time policy makers have to make a nuclear launch decision.[75] Moscow in particular has worried about verifying the non-nuclear status of new U.S. long-range conventional precision-strike systems and would certainly be wary of reducing its nuclear arsenal's readiness unless worries about the new conventional strike forces can be assuaged. New Chinese long-range conventional weapons, too, are externally indistinguishable from their nuclear counterparts. Beijing does not keep its nuclear forces on "hair-trigger" alert, but it could be wary of an agreement to codify new deployment modes that increase warning time if the survivability of its nuclear forces is threatened by new U.S. (or other) conventional weapons. While China does not currently possess the early warning systems needed to complement a launch-on-warning posture, it could develop such systems if pushed, which, in turn, might fuel an arms race in space.[76] If more decision-making time cannot be provided in some other manner, then it is in the interest of all states possessing nuclear weapons to cooperate in establishing better early warning systems so that these systems do not result in false positives that could trigger a nuclear exchange.

Fissile Material Cutoff Treaty

Another arms control measure that has been under consideration for years is the Fissile Material Cutoff Treaty (FMCT), which covers future production of fissile material only, not stockpiles. While Washington, Beijing, and Moscow all officially support an FMCT, what the treaty might entail and how much they are willing to push for it in the future differs. All three, however, agree that they seek a cutoff treaty that would ban new production and would allow them to maintain current fissile material stockpiles; by contrast, some other states seek a treaty that also covers past production.

Aside from general support for an FMCT—and the fact that they have not been pushing very hard to overcome the deadlock in negotiating such a treaty at the Conference on Disarmament (CD)—there are some major differ-

73. For a recent official Chinese statement, see the May 9, 2007 Chinese statement, available via "Statements from the Nuclear Non-Proliferation Treaty Preparatory Committee: April 30–May 11, 2007," Reaching Critical Will, <www.reachingcriticalwill.org/legal/npt/prepcom07/statements/9mayChina_morning.doc>. For more information, see Shen Dingli, "China's Negative Security Assurances," Eliminating Weapons of Mass Destruction: Electronic Essays, Stimson Center, October 1998, as cited in Chase and Medeiros, "China's Evolving Nuclear Calculus," p. 140.
74. Although it may be argued that China has no other option, since it currently lacks the early warning system necessary to ensure an earlier response, the authors believe that even with a better satellite system, China would continue to maintain its current policy due to its overarching concept of its nuclear posture, which calls for the use of nuclear weapons in retaliatory strikes only.
75. This proposal is also included in the recommendations of Shultz et al.
76. Current Chinese systems, except for the DF-31 and DF-21, are structurally de-alerted, given that warheads and missiles are separated and that it takes hours to get them ready with liquid-fueled propellants. As China upgrades to solid-fueled missiles, analysts have questioned whether they too will be kept separately from their warheads; at present, this appears to be the case. See Hans Kristensen, "China Defense White Paper Describes Nuclear Escalation," FAS Strategic Security Blog, January 23, 2008, <www.fas.org/blog/ssp/2009/01/chinapaper.php#more-701>.

ences among the United States, China, and Russia regarding a ban on fissile material production. In particular, without an improvement in the international security climate, China could be quite disadvantaged by such an agreement because it has a far smaller fissile material stockpile than the United States and Russia.[77] Furthermore, some Chinese analysts believe that the United States is likely to resume fissile material production in the next fifteen years[78] and thus do not believe Beijing can afford even a unilateral announcement of a production moratorium[79]—only an FMCT involving a U.S. commitment will do.

As noted by Li Bin, director of the Arms Control Program at Tsinghua University, if U.S. missile defenses were to be realized to the degree that China requires additional weapons to ensure a reliable deterrent, "China may need to produce additional fissile materials for the new warheads, especially if China chooses to add silo-based ICBMs. This factor would make China reluctant to join a FMCT if it wants to keep open the option of such a buildup."[80] Another possible difficulty for China (and several other countries) is verification of an FMCT: intrusive inspections at defense industry plants might be difficult. The current U.S. position is that an FMCT would be unverifiable, but the Obama administration might well have a different view. Moscow's position, in contrast, is that an FMCT must be verified and that this verification should include international monitoring. However, in order to make verification technically and financially feasible, the Russian proposal is to undertake verification at fuel cycle facilities, not all civilian nuclear enterprises (given that there are quite a few facilities in Russia with both military and civilian applications, the "comprehensive" verification approach would be particularly difficult).[81]

As a presidential candidate, Barack Obama stated that he would support an FMCT and that the treaty should be verifiable.[82] It is not clear, however, what priority level an FMCT might have in the Obama administration, or whether the new president will devote the necessary time and effort to promoting such a treaty. Furthermore, to persuade other countries to go along with an FMCT, the United States would likely have to give up some positions on other issues being negotiated in the CD, as well as make adjustments in other areas of strategic policy, such as missile defense.

Also unclear is whether China will seriously engage in negotiating an FMCT without first seeing progress in the negotiation of a treaty on outer space (examined below). While it no longer links the two issues directly, it continues to link them indirectly. For example, in November 2008 an official Chinese statement noted: "China supports the CD to reach a comprehensive and balanced program of work and to start negotiations on a multilateral, non-discriminatory and internationally verifiable FMCT on the basis of that."[83] This balanced work program apparently entails at least some agreement on the need to negotiate a space treaty.

---

77. As of 1997, the United States was estimated to have 100 metric tons (MT) of plutonium and 635 MT of highly enriched uranium (HEU); Russia had 130 MT of plutonium and 1,010 MT of HEU; and China had 4 MT of plutonium and 20 MT of HEU. "World Inventories of Plutonium and Highly Enriched Uranium," in David Albright and Kevin O'Neill, eds., *The Challenges of Fissile Material Control* (Washington, DC: Institute for Science and International Security Press, 1999), Institute for Science and International Security, <www.isis-online.org/publications/fmct/primer/Section_VI.html>.
78. Wang Zhongchun, *Hewuqi, Heguojia, Hezhanlue*, p. 430, as cited in Saalman, "Chinese Analysts' Views on Arms Control, Disarmament, and Nuclear Deterrence after the Cold War."
79. High-ranking Chinese arms control official, October 2008, as cited in Saalman, "Chinese Analysts' Views on Arms Control, Disarmament, and Nuclear Deterrence after the Cold War."
80. Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization."
81. The above discussion draws largely upon Anatoli Diakov, "Russia," chapter in *Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty* (Princeton: International Panel on Fissile Materials, 2008).
82. Fred McGoldrick, "United States," chapter in *Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty* (Princeton: International Panel on Fissile Materials, 2008).
83. Statement by Kang Yong, representative of the Chinese Delegation at the Thematic Debate on Nuclear Weapons, 63rd Session of the UN General Assembly First Committee, November 10, 2008, Chinese Foreign Ministry, <www.fmprc.gov.cn/eng/wjb/zzjg/jks/kjfywj/t521626.htm>.

There are several reasons why an FMCT would be in the interest of Russia, China, and the United States. For Moscow and Washington, a treaty would reinforce the commitment to nuclear reductions (though without seriously threatening weapons numbers, unless the treaty considers past, and not just future, production). An FMCT is also a way to involve China in arms control without reducing China's already very small number of weapons. For Beijing, it would be a way to signal that the goals of its nuclear modernization are limited, and it would help to support Beijing's promotion of disarmament with concrete action.

Comprehensive Nuclear-Test-Ban Treaty

Yet another arms control measure that will be critical to moving toward disarmament (and away from an arms race) is the conclusion and ratification of a Comprehensive Nuclear-Test-Ban Treaty (CTBT) by all key states. As a presidential candidate Barack Obama was quite positive with regards to giving ratification another look. In October 2008 he noted, "As president, I will reach out to the Senate to secure the ratification of the CTBT at the earliest practical date and will then launch a diplomatic effort to bring onboard other states whose ratifications are required for the treaty to enter into force."[84] While Russia has both signed and ratified a CTBT and has little need to rethink this commitment, Beijing has yet to ratify. However, as recently as last November, Kang Yong, China's representative to the UN General Assembly First Committee, stated that "China actively promotes the early entry into force of the CTBT. China commits itself to the early ratification of the CTBT."[85] He also reaffirmed China's moratorium on nuclear tests.

For China, though, U.S. missile defense plans could make joining the CTBT problematic: if Chinese military experts decide that China needs the capability of a maneuvering warhead to evade missile defense interceptors, they may need to test the redesigned warheads.[86] It is not clear that the Obama administration, however, will be willing to back down on missile defense in order to obtain Chinese agreement on a CTBT. However, without a CTBT, further progress toward disarmament is unlikely; the nuclear weapon states' commitment to NPT Article VI will not be taken seriously by non-nuclear weapon states, and the possibility of a future arms race (instigated in large part by the fear of U.S. missile defenses and precision weapons) is increased.

Treaty on the Prevention of the Deployment of Weapons in Outer Space

Preventing the use of outer space for the deployment of weapons[87] (or missile defenses) is another controversial issue between the United States on one side and Russia and China, which link the issue to strategic deterrence, on the other. The United States relies heavily on its space assets for both civilian and military applications. Calls for the prevention of a "Space Pearl Harbor"[88] from high-ranking U.S. officials were later transformed into the concept of "space control"—denying access to space as a part of U.S. defensive strategy. Operationalizing this concept, however, would likely involve weapons that are inherently capable of being used for offensive purposes. Short of the goal of space control are plans for the possible deployment of missile defense elements in space, including interceptors. The

84. "*Arms Control Today* 2008 Presidential Q&A: President-elect Barack Obama."
85. Statement by Kang Yong, November 10, 2008.
86. Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization."
87. Existing treaties regulating outer space include the 1963 Partial Test Ban Treaty, the 1967 Outer Space Treaty, the 1979 Moon Agreement, and some bilateral agreements; they prohibited nuclear testing, deployment of weapons of mass destruction, and certain military activities in outer space. The now-abrogated Anti-Ballistic Missile Treaty of 1972 required parties not to develop, test, or deploy space-based antimissile systems. Russia and China view these instruments as playing a positive role in promoting the peaceful use of outer space but inadequate to prevent its weaponization, since they fail to address the issue of deployment in outer space of conventional weapons that could be used to attack both ground and space targets; additionally, they do not prevent potential attacks on objects in outer space from the ground.
88. Jean-Michel Stoullig, "Rumsfeld Commission Warns Against 'Space Pearl Harbor,'" Agence-France Presse, January 11, 2001.

idea of missile defense elements in space, in particular, has been met with distrust in Beijing and Moscow. Unless an agreement codifying the agreed parameters for the use of space—whether for missile defense or other defensive purposes—can be concluded, space issues may not only derail current disarmament progress, but also effectively prevent Washington, Moscow, and Beijing from engaging in multilateral arms control discussions.

In recent years China and Russia have launched coordinated diplomatic efforts to mitigate what they view as negative aspects of U.S. space policy and to address the issue of the prevention of an arms race in outer space (PAROS). In 2002, together with Belarus, Indonesia, Syria, Vietnam, and Zimbabwe, they introduced to the CD in Geneva a draft outline for a "Treaty on the Prevention of the Deployment of Weapons in Outer Space, [and of] the Threat or Use of Force Against Outer Space Objects." It included major responsibilities to be undertaken by prospective states parties: 1) "Not to place in orbit around the Earth any objects carrying any kinds of weapons, not to install such weapons on celestial bodies, or not to station such weapons in outer space in any other manner"; 2) "Not to resort to the threat or use of force against outer space objects"; 3) "Not to assist or encourage other states, groups of states, international organizations to participate in activities prohibited by this Treaty."[89]

In 2004 Russia and China submitted two "non-papers," on the "Verification Aspects of PAROS"[90] and "Existing International Legal Instruments and Prevention of the Weaponization of Outer Space,"[91] to stimulate the work of the CD's Ad Hoc Committee on PAROS. Submission of a draft "Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects" (PPWT) in February 2008 was the culmination of Chinese-Russian bilateral cooperation on PAROS. Russian Foreign Minister Sergey Lavrov stated, "The draft PPWT prohibits the deployment of weapons of any kind in space, and the use or threat of force against space objects." He added, "The Treaty is to eliminate existing lacunas in international space law, create conditions for further exploration and use of space, preserve costly space property, and strengthen general security and arms control."[92]

Although U.S. reluctance to address this issue, which both China and Russia see as crucial, is affecting strategic relations between the three countries,[93] the Chinese and Russian situations are not identical. Russia is one of the few countries that possesses and continues to develop a full range of space capabilities, including early warning satellites, optical reconnaissance, naval reconnaissance, signal intelligence, navigation and communication satellites, as well as relevant supporting infrastructure.[94] Although Russia has experienced some difficulties in maintaining all the systems that it inherited in operational mode since the dissolution of the Soviet Union, it has managed to sustain the key infrastructure and satellite constellations crucial to national security. In the 2000s Russia even started to expand its GLONASS navigation satellite program.

While the Russian military is nowhere near as dependent on space assets as are U.S. forces, Russia possesses

89. "Russia-China CD Working Paper on New Space Treaty," Acronym Institute, June 27, 2002, <www.acronym.org.uk/docs/0206/doc10.htm>.
90. "Verification Aspects of PAROS," Permanent Mission of the People's Republic of China to the United Nations Office at Geneva and other International Organizations in Switzerland, August 26, 2004, <www.china-un.ch/eng/cjjk/cjjzzdh/t199364.htm>.
91. "Existing International Legal Instruments and Prevention of the Weaponization of Outer Space," Permanent Mission of the People's Republic of China to the United Nations Office at Geneva and other International Organizations in Switzerland, August 26, 2004, <www.china-un.ch/eng/cjjk/cjjzzdh/t199363.htm>.
92. "China, Russia Present Joint Initiative on Space Arms Race Control," *People's Daily*, February 13, 2008, <english.peopledaily.com.cn/90001/90776/90883/6353226.html>.
93. The UN General Assembly has consistently voted in favor of negotiating a treaty on PAROS; the United States and Israel have abstained on these votes. The United States is the only country that is blocking further discussion on this issue at the CD. In 2002, John Bolton, then U.S. undersecretary of state for arms control and nonproliferation, stated to the CD, "The current international regime regulating the use of space meets all our purposes. We see no need for new agreements." John Bolton, statement to the CD, Geneva, January 24, 2002, <www.acronym.org.uk/docs/0201/doc09.htm>.
94. For detailed analysis, see Pavel Podvig, "Russia and the Military Use of Space," in Pavel Podvig and Hui Zhang, eds., *Russian and Chinese Responses to U.S. Military Plans in Space, A Report of the Reconsidering the Rules of Space Project* (Cambridge, MA: American Academy of Arts & Sciences, 2008).

advanced space capabilities and a competitive space industry. It believes that it can and should use space assets to maintain parity with the United States. Stanford's Pavel Podvig has written that this parity may be destroyed if space assets are incorporated into the U.S. missile defense program because Russia would have to react to mitigate the consequences of such developments. Podvig wrote, "Russia does not have many options for the development of its own weapon systems in space or for its reaction to the deployment of this capability by other countries. … However, this does not mean that there will be no reaction."[95] "Asymmetric response" could include measures targeting new space systems developed by the United States. To counter the expansion of U.S. space-based weapons, Russia might also contemplate measures like further extending the service life of its multiple-warhead ballistic missiles, as it did in response to the U.S. withdrawal from the ABM Treaty.

For China, the issue of space weaponization is far more sensitive than for Russia; unlike Russia, it sees the main U.S. aim to be denying China access to space and thus hindering its "peaceful rise." Further, China sees missile defense as part of a U.S. plan for space denial. The implications of U.S. space policy for China include the potential loss of its strategic nuclear deterrent capability vis-à-vis the United States, complication of reunification efforts with Taiwan, and limitations on China's civilian and commercial space activities. It could also cause a space arms race and damage arms control, disarmament, and nuclear nonproliferation regimes. As Chinese Ambassador Hu Xiaodi put it:

> "It should be stressed that efforts to prevent an arms race in outer space and those on nuclear disarmament go hand in hand. In this perspective, it is of crucial importance for nuclear disarmament that a missile defense system undermining strategic stability should not be developed, and that no weapons should be deployed in outer space. It is hard to imagine that once a full-fledged missile defense system is put in place or weapons have been introduced into outer space there can be business as usual in nuclear disarmament. At best, such moves would never be conducive to nuclear disarmament."[96]

Indeed, to counter the deployment of space systems as part of a missile defense shield, China could consider expanding its ballistic missile capabilities. China possesses some twenty ICBMs (DF-5As) capable of striking the continental United States.[97] Hui Zhang, a research associate at the John F. Kennedy School of Government at Harvard University, suggests that in the absence of U.S. missile defense plans, "China might be expected to build no more than 50 ICBMs by 2015."[98] In contrast, a 2001 U.S. National Intelligence Estimate projected that by 2015 China could have as many as "75 to 100 warheads deployed primarily against the United States,"[99] while a February 2008 assessment simply stated that China's nuclear capabilities would increase rapidly over the next decade.[100] Zhang argues that were a limited missile defense deployed, China could be expected to boost its arsenal to 100–300 ICBMs. According to his calculations, with the 250 interceptors originally envisioned by the Clinton administration "China would need at least 270 ICBMs" to maintain the current level of deterrence capability.[101] He further argues that it could be economically feasible for China to build 200 more ICBMs, as it would cost about $2 billion spread over several years. "The cost would be less than one tenth of the expense to the United States of maintaining parity between Chinese

95. Podvig, "Russia and the Military Use of Space," p. 29.
96. Ambassador Hu Xiaodi, statement at the Plenary of the Second Part of the 2005 Session of the CD, Geneva, June 23, 2005, <www.reachingcriticalwill.org/political/cd/speeches05/June23China.pdf>.
97. "Chinese Nuclear Forces, January 2008," *SIPRI Yearbook 2008: Armaments, Disarmament and International Security* (Oxford: Oxford University Press, 2008), p. 386.
98. Hui Zhang, "Action/Reaction: U.S. Space Weaponization and China," *Arms Control Today* 34 (December 2005), p. 9.
99. National Intelligence Council, "NIE: Foreign Missile Development and the Ballistic Missile Threat through 2015," Unclassified Summary, December 2001.
100. J. Michael McConnell, director of National Intelligence, "Annual Threat Assessment of the Intelligence Community for the House Permanent Select Committee on Intelligence," February 7, 2008, <www.dni.gov/testimonies/20080207_testimony.pdf>. For additional assessments of Chinese nuclear and missile capabilities, see Lewis, "Chinese Nuclear Posture and Force Modernization."
101. Hui Zhang, "Chinese Perspectives on Space Weaponization," in Pavel Podvig and Hui Zhang, eds., *Russian and Chinese Responses to U.S. Military Plans in Space, A Report of the Reconsidering the Rules of Space Project* (Cambridge, MA: American Academy of Arts & Sciences, March 2008), p. 51.

missiles and U.S. missile interceptors."[102] In addition to building more warheads and ICBMs, other elements of a Chinese response could include instituting measures to counter boost-phase, midcourse, and terminal-phase missile defenses; MIRVing ICBMs; introducing antisatellite (ASAT) weapons; and reconsidering China's commitment to arms control agreements.[103]

For the moment, though, China is pursuing diplomacy, trying to preempt space weaponization by promoting the conclusion of a multilateral, legally binding agreement before the problem worsens. In this respect, the ASAT test performed by China on January 11, 2007 is worth special mention. Only after the U.S. government revealed the incident on January 18 did China publicly acknowledge the test (on January 23), noting that "the test was not targeted against any country and does not pose a threat to any country."[104] Despite these reassuring words, the ASAT test generated substantial controversy. Some commentators considered the destruction of China's aging weather satellite as evidence that China is pursuing an ASAT capability that could threaten U.S. space assets. Others, while recognizing a likely Chinese intent to demonstrate that U.S. space assets could be vulnerable to attack, argued that the primary goal of this exercise was probably to encourage the United States to abandon its long-standing opposition to negotiations on PAROS.[105] China certainly appears to have demonstrated that the United States may have more to gain than to lose from a new space treaty. In February 2007, Russia joined China in its effort to recruit the United States to PAROS; a year later they submitted the draft PPWT.

This effort has not met with much success. On February 13, 2007, U.S. Ambassador Christina Rocca told the CD, "Despite the ASAT test, we continue to believe that there is no arms race in space, and therefore no problem for arms control to solve."[106] Further, on February 15, 2008, just two days after Russia and China submitted the draft treaty, the U.S. Navy announced that it planned to shoot down a crippled spy satellite.[107] The USS *Lake Erie* did indeed hit the satellite with a single modified tactical Standard-3 missile on February 20, 2008, confirming that the U.S. sea-based missile defense system possessed inherent ASAT capabilities. The timing did not suggest U.S. support for the Sino-Russian treaty endeavor.

Continuing a tit-for-tat policy could have a disastrous effect on the disarmament process. If Beijing believes that the United States is pursuing missile defenses without considering Chinese interests, it may change its positions on the FMCT, CTBT, or other arms control agreements. As noted in an official Chinese statement in November 2008, "to prevent the deployment of weapons in outer space is conducive to maintaining global strategic balance and stability, and will prevent arms race including nuclear one."[108] Moscow, for its part, is likely to work toward negating U.S. achievements in space and will be less likely to make concessions in other areas of common security interest.

Cooperative Missile Defense

One issue that was neither mentioned in the Shultz et al. initiative nor explored at the CD in Geneva is the question of missile defense and its relation to other strategic issues. Yet bilateral or multilateral cooperation—or some form of political agreement limiting or otherwise managing defense architectures—involving Washington, Moscow, and Beijing is clearly needed. As detailed earlier in this essay, improvements to U.S. missile defenses are a top concern in both Beijing and Moscow. To date, there have been no proposals for a global missile defense architecture or replacement for the ABM Treaty. Instead, Russia has proposed cooperative missile defense in Europe, and there were

102. Hui Zhang, "Chinese Perspectives on Space Weaponization," p. 52.
103. For detailed analysis see Hui Zhang, "Chinese Perspectives on Space Weaponization."
104. Edward Cody, "China Confirms Firing Missile to Destroy Satellite," *Washington Post*, January 24, 2007, p. A8.
105. Wade Boese, "Chinese Satellite Destruction Stirs Debate," *Arms Control Today* 37 (March 2007), p. 27.
106. Ambassador Christina Rocca, statement to the Conference on Disarmament on Prevention of the Arms Race in the Outer Space, February 13, 2007, <www.reachingcriticalwill.org/political/cd/speeches07/1session/Feb13USA.pdf>.
107. According to U.S. officials, the satellite carried hazardous toxic fuel. Another concern voiced in the media was that the pieces of spacecraft could survive the fall and reveal military secrets. Thom Shanker, "U.S. to Attempt to Shoot Down Faulty Satellite," *New York Times*, February 15, 2008.
108. Statement by Kang Yong, November 10, 2008.

reports of preliminary discussions of Sino-Russian cooperation in this area in 2000, as mentioned above. Given the sensitivity of the technologies involved in missile defense systems, as well as the difficulties of organizing decision making over a joint system, a global architecture is difficult to imagine. Perhaps two systems—one in Europe, one in Northeast Asia—could be established. In any event, it is clear that engaging Beijing and Moscow on this issue is essential to any movement forward on nuclear disarmament.

Conclusion

In 2009, the Obama administration will have to shepherd through another Nuclear Posture Review, the third since the end of the Cold War and the second to be mandated by Congress. Past experience indicates that this review is unlikely to change U.S. strategic posture definitively, unless there is a concerted effort on the part of the new administration to push for major changes. It is, however, the perfect opportunity to make such a doctrinal shift, since many of the new technologies and equipment envisioned under the 2001 U.S. Nuclear Posture Review have yet to be created, while Russia and China similarly have not yet had the sort of strategic forces buildup that would make maintaining a small nuclear force into the future less plausible.

Additionally, according to the 2008 National Defense Authorization Act, the Nuclear Posture Review is to be a basis for establishing future U.S. arms control objectives and negotiating positions.[109] Thus, it will set the U.S. posture—including the future role of missile defenses, long-range conventional weapons, and the like—to which Russia and China will react, and it will help determine the U.S. position at relevant negotiations for years to come.

The review, along with other U.S. measures in the area of missile defense, space, and conventional weapons, is intimately linked to policy movement on nuclear disarmament. Linkages between various treaties and agreements must be recognized and dealt with, not ignored. Several relevant agreements are the subject of negotiations at the CD, which has been deadlocked by disagreement over an agenda, particularly between the United States and China. The real issue is the interaction between the agreements at issue. Beijing initially insisted that the CD should progress simultaneously on multiple issues, and it tied negotiation of an FMCT to progress on PAROS. Then, in 2003, China agreed to the "A5 Proposed Agenda" (a proposal by five ambassadors),[110] which was to establish subsidiary bodies and ad hoc committees to independently deal with such issues as negative security assurances, nuclear disarmament, an FMCT, and PAROS. A year later the Chinese remained "not satisfied with the 'A5 Proposal' since its mandate on PAROS is too weak," but noted that it "at least strikes a delicate and acceptable balance between various issues."[111] By 2005, the Chinese position was that the FMCT and space issues were not directly linked, yet China still said that it expected the CD to work on all issues simultaneously.[112] It is clear that PAROS remains an issue of top priority for China: U.S. unwillingness to compromise on this issue is likely to have repercussions on issues of interest to the United States.

The interlocking issues at the CD are not the only issues that must be tackled simultaneously if disarmament is to move forward, however. As discussed in this essay, missile defenses, conventional weaponry, nuclear doctrines, and a host of other issues are also intricately linked to arms control options. In the view of Chinese experts, the future of arms control lies in a comprehensive framework over all aspects of nuclear forces, since they see future nuclear

109. For more on the 2009 Nuclear Posture Review, see Andrew Grotto and Joe Cirincione, "Orienting the 2009 Nuclear Posture Review: A Roadmap," Center for American Progress, November 2008, <www.americanprogress.org/issues/2008/11/pdf/nuclear_posture.pdf>.
110. "Initiative of the Ambassadors Dembri, Lint, Reyes, Salander and Vega," Conference on Disarmament, CD/1693/Rev.1, September 5, 2003, <www.reachingcriticalwill.org/political/cd/A5.pdf>.
111. Ambassador Hu Xiaodi, statement at the Third Part of the 2004 Session of the CD, August 26, 2004, <www.reachingcriticalwill.org/political/cd/speeches04/26AugustChina.pdf>.
112. Ambassador Hu Xiaodi, statement at the Second Part of the 2005 Session of the CD, June 28, 2005, <www.reachingcriticalwill.org/political/cd/speeches05/June28China.pdf>.

capabilities not in terms of warhead quantity, but overall strategic capability. Qualitative improvements in nuclear weapons, including new uses of information technology, along with advanced conventional weapons, missile defenses, the use of space, and other new war-fighting capabilities mean that arms control can no longer be based on restricting certain types of delivery systems as was done in START,[113] though in the near term Beijing supports the continuation of U.S.-Russian reductions in this format in addition to the launch of broader endeavors. Moscow, too, appears to be willing to work on both traditional and new arms control agreements, though like Beijing it is unlikely to want to discuss a road to nuclear zero unless it includes control of missile defenses and long-range conventional weapons, among other issues.

The current opportunity to improve U.S.-Russian, U.S.-Chinese, and trilateral cooperation may disappear if the U.S. trajectory of the past few years is not dramatically altered. While Chinese actions to date remain inconclusive, the Russian military appears to be coming closer to a decision that could mean a substantial buildup of nuclear forces in the near future, though the current economic crisis may provide some additional breathing space. The draft Russian "Concept for the Development of the Armed Forces of the Russian Federation through 2030" reportedly may acknowledge the "growing technological and military technology supremacy of the leading overseas countries" as the main threat to the nation, a threat that the military reportedly views as increasing (at least, according to excerpts of the draft concept leaked to the press).[114] However, it is not clear that the draft concept is the final version; the stance toward the United States might soften. Nor is it clear what view Russia might be taking of China, if any—though Anatoly Tsyganok, head of the Center for Military Prognosis, has noted that China is in fact Russia's main potential opponent, but that Russia's increasing opposition to NATO is "pushing [Russia] into China's embrace."[115] China, for its part, has been working steadily to improve its nuclear capability and thereby ensure a continued deterrent, but it has apparently not taken any decision to dramatically increase its forces or "catch up" to Russia and the United States.

All eyes are on the new administration in Washington, which has a short window of opportunity to influence the future course of events. While the vision of a world that depends upon conventional weapons and defenses appears preferable to one based on nuclear deterrence, recent U.S. moves toward this vision have in fact increased the likelihood of a nuclear arms race. Moscow and Beijing are unlikely to try to match U.S. moves in the areas of missile defense and conventional weapons, even though they have made some steps toward improvements in both areas, because of the great expenses involved. Instead, they are deterring U.S. nuclear attack through their own nuclear forces and speak of developing additional asymmetric measures. The United States faces two alternative choices to the status quo. The first alternative is to engage Beijing and Moscow in talks about missile defense and the control of weapons in other areas (including not just long-range conventional forces, but also cruise missiles and weaponization of space). The second alternative is for Washington to slow down efforts in all of these areas until nuclear disarmament measures have moved forward. If neither of these choices is taken, then progress on arms control, to say nothing of nuclear disarmament, is likely to prove impossible. And without continuing arms control, the nuclear nonproliferation regime itself will be endangered.

113. For a detailed review of Chinese views of U.S. and Russian improvements of their nuclear arsenals and the implications for China joining in arms control measures, see Saalman, "Chinese Analysts' Views on Arms Control, Disarmament, and Nuclear Deterrence after the Cold War."
114. Konovalov, "The Defense Ministry Acknowledges U.S."
115. Tsyganok, as quoted in Konovalov, "The Defense Ministry Acknowledges U.S."

CONTRIBUTORS

Vladimir Dvorkin, doctor of military sciences and major-general (retired), is a consultant with the Carnegie Moscow Center. He participated in preparing the Strategic Arms Limitation Talks II, the Intermediate-Range Nuclear Forces Treaty, and Strategic Arms Reduction Treaties I and II; he also coauthored most major documents related to the Russian Strategic Nuclear Forces and the Strategic Missile Forces. The former head of the 4th Central Research Institute of the Russian Defense Ministry, Dvorkin participated in and directed fundamental research in mathematical modeling in nuclear planning; development of prospective missile systems; and complex experimental testing of missile weapons, among other areas. He took part in the first Soviet tests of nuclear-powered ballistic missile submarines and in the first underwater test-launches. Among other honors, he is a full member of the Russian Academy of Missile and Artillery Sciences, the Academy of the Military Sciences, the Russian Engineering Academy, the International Engineering Academy, and the Academy of Astronautics.

Cristina Hansell is director of the Newly Independent States Nonproliferation Program at the James Martin Center for Nonproliferation Studies and an adjunct professor at the Monterey Institute of International Studies. She has published many articles on nonproliferation topics and is the co-editor of *The Global Politics of Combating Nuclear Terrorism: A Supply-Side Approach* (forthcoming, 2009). Her most recent writings include "Nuclear Terrorism Threats and Responses," for a joint National Academies/Russian Academy of Sciences project. A Ph.D. candidate in international affairs at the University of California at San Diego specializing in center-region relations in Russia and China, Hansell received an M.A. in Russian and Chinese history at the University of Hawaii in 1990 and an A.B. in Soviet studies from Harvard University in 1987.

Jeffrey Lewis is director of the Nuclear Strategy and Nonproliferation Initiative at the New America Foundation and publishes the leading blog on nuclear arms control and nonproliferation, ArmsControlWonk.com. He is the author of *Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (MIT Press, 2007). Before joining the New America Foundation, Lewis was executive director of the Managing the Atom Project at the Belfer Center for Science and International Affairs. He received his Ph.D. in policy studies (international security and economic policy) from the University of Maryland and his B.A. in philosophy and political science from Augustana College in Rock Island, Illinois.

Anya Loukianova is a research associate in the Newly Independent States Nonproliferation Program at the James Martin Center for Nonproliferation Studies at the Monterey Institute of International Studies. She manages several databases on nonproliferation for the Nuclear Threat Initiative. Her work has appeared in the *Nonproliferation Review*, *WMD Insights*, the web edition of the *Bulletin of the Atomic Scientists*, and *Eksport Vooruzheniy*. Loukianova received an MPIA in security and intelligence studies from the University of Pittsburgh in 2007.

Nikita Perfilyev is a Fulbright fellow at the Monterey Institute of International Studies, where he is studying toward an M.A. in international policy studies and a Certificate in Nonproliferation Studies. In 2007–2008 Perfilyev worked for the PIR Center for Policy Studies in Moscow as a researcher and editor. During the fall of 2006, he was an intern at the Center for Strategic and International Studies in Washington, DC, under the sponsorship of Washington Group International. His articles have been published in *Security Index* and on the Center for Strategic and International Studies website. He graduated with distinction from Tomsk State University in 2007.

William C. Potter is Sam Nunn and Richard Lugar Professor of Nonproliferation Studies and director of the James Martin Center for Nonproliferation Studies at the Monterey Institute of International Studies. He is the author or editor of fourteen books, the most recent of which are *The Four Faces of Nuclear Terrorism* (2004) and *The Global Politics of Combating Nuclear Terrorism: A Supply-Side Approach* (forthcoming, 2009). Potter serves on the Nonproliferation Panel of the U.S. National Academy of Sciences Committee on International Security and Arms Control. He is a member of the Council on Foreign Relations and served for five years on the UN Secretary-General's Advisory Board on Disarmament Matters.

Lora Saalman is a Ph.D. candidate in Tsinghua University's Department of International Relations, working toward becoming the first American to graduate from the department with all of her work conducted in Chinese. In addition to her doctoral research on the impact of export controls on Sino-Indian military modernization, she also serves as a freelance translator for the National Defense University and various Tsinghua University academic publications. She has also acted as a research associate at the Wisconsin Project on Nuclear Arms Control, as a research intern in the Department of Safeguards and Information Technology at the International Atomic Energy Agency, and as a graduate research assistant at the James Martin Center for Nonproliferation Studies.

Nikolai N. Sokov is a senior research associate at the James Martin Center for Nonproliferation Studies. He graduated from Moscow State University in 1981 and subsequently worked at the Institute of U.S. and Canadian Studies and the Institute of World Economy and International Relations in Moscow. From 1987 to 1992 he worked at the Ministry for Foreign Affairs of the Soviet Union and later Russia; he participated in negotiations on Strategic Arms Reduction Treaties I and II, as well as in a number of summit and ministerial meetings. He has published extensively on international security and arms control, including numerous articles and monographs. He is the author of *Russian Strategic Modernization: Past and Future* (2000), and the co-author and co-editor of *Yadernoe Nerasprostranenie,* the first Russian-language college-level textbook on nuclear nonproliferation.

Mikhail Tsypkin is an associate professor in the Department of National Security Affairs at the Naval Postgraduate School (NPS) in Monterey, California. In 1985–1987 Tsypkin served as the Salvatori Fellow in Soviet Studies at the Heritage Foundation in Washington, DC. He joined NPS in 1987, two years after completing his Ph.D. in political science at Harvard University. He is a member of the Scientific Board of the *Journal Of Power Institutions In Post-Soviet Societies*, an online social sciences publication. Tsypkin has published numerous articles on Soviet and Russian military affairs.

Jing-dong Yuan directs the East Asia Nonproliferation Program at the James Martin Center for Nonproliferation Studies and is associate professor of international policy studies at the Monterey Institute of International Studies. A graduate of the Xi'an Foreign Language University, People's Republic of China, he received his Ph.D. in political science from Queen's University in 1995 and has had research and teaching appointments at Queen's University, York University, University of Toronto, and the University of British Columbia, where he was a recipient of the prestigious Izaak Killam Postdoctoral Research Fellowship. He has published more than sixty monographs, journal articles, book chapters, and op-eds. He is the coauthor of *China and India: Cooperation or Conflict?* (2003) and is working on a manuscript on post–Cold War Chinese security policy.

Pavel S. Zolotarev, major-general (retired), is deputy director of the Institute for U.S. and Canada Studies of the Russian Academy of Sciences, and professor of the Academy of Military Sciences. He is president of the Interregional Fund for Military Reform Support and a member of the Council on Foreign and Defense Policy. Zolotarev is former head of the Information and Analytical Center of the Russian Ministry of Defense, and he retired in 1998 from his position as deputy head of the administration of the Russian Defense Council. He served in the Main Staff of the Strategic Rocket Forces prior to working at the Center for Operational and Strategic Research of the General Staff. Zolotarev has also taught at the Serpukhov High Command Institute. He graduated from the Kharkov High Command and Engineering Institute of the Strategic Rocket Forces with a major in automated control and communication systems in 1971 and from the Academy of the General Staff of the Russian Federation Armed Forces.

OCCASIONAL PAPERS AVAILABLE FROM CNS

online at http://nonproliferation.org/category/topics/cns_papers

#33 **Evaluating WMD Proliferation Risks at the Nexus of 3D Printing and Do-It-Yourself (DIY) Communities**
Robert Shaw, Ferenc Dalnoki-Veress, Shea Cotton, Joshua Pollack, Masako Toki, Ruby Russell, Olivia Vassalotti, Syed Gohar Altaf • 2017

#32 **Taiwan's Export Control System: Overview and Recommendations**
Melissa Hanham, Catherine Dill, Daniel Salisbury, P. Alex Kynerd, Raymond Wang • 2017

#31 **Revisiting Compliance in the Biological Weapons Convention**
James Revill • 2017

#30 **Crowdsourcing Systems and Potential Applications in Nonproliferation**
Bryan Lee • 2017

#29 **The Verification Clearinghouse: Debunking Websites and the Potential for Public Nonproliferation Monitoring**
Bryan Lee, Kyle Pilutti • 2017

#28 **Geo4nonpro.org: A Geospatial Crowd-Sourcing Platform for WMD Verification**
Melissa Hanham, Catherine Dill, Jeffrey Lewis, Bo Kim, Dave Schmerler, Joseph Rodgers • 2017

#27 **Searching for Illicit Dual Use Items in Online Marketplaces: A Semi-Automated Approach**
Bryan Lee, Margaret Arno, Daniel Salisbury • 2017

#26 **2016 Symposium Findings on Export Control of Emerging Biotechnologies**
Steven Fairchild, Caroline R. M. Kennedy, Philippe Mauger, Todd J. Savage, Raymond A. Zilinskas • 2017

#25 **Outlawing State-Sponsored Nuclear Procurement Programs & Recovery of Misappropriated Nuclear Goods**
Leonard S. Spector • 2016

#24 **Strengthening the ROK-US Nuclear Partnership**
Miles A. Pomper, Toby Dalton, Scott Snyder, Ferenc Dalnoki-Veress • 2016

#23 **Replacing High-Risk Radiological Materials**
George M. Moore, Miles A. Pomper • 2015

#22 **A Blueprint to a Middle East WMD Free Zone**
Chen Kane, PhD • 2015

#21 **Biotechnology E-commerce: A Disruptive Challenge to Biological Arms Control**
Raymond A. Zilinskas, Philippe Mauger • 2015

#20 **Countering Nuclear Commodity Smuggling: A System of Systems**
Leonard S. Spector, Egle Murauskaite • 2014

#19 **Alternatives to High-Risk Radiological Sources**
Miles Pomper, Egle Murauskaite, Tom Coppen • 2014

#18 **Stories of the Soviet Anti-Plague System**
Casey W. Mahoney, James W. Toppin, Raymond A. Zilinskas, eds. • 2013

#17 **Ugly Truths: Saddam Hussein and Other Insiders on Iraq's Covert Bioweapons**
Amy E. Smithson, PhD • 2013

#16 **Rethinking Spent Fuel Management in South Korea**
Ferenc Dalnoki-Veress, Miles Pomper, Stephanie Lieggi, Charles McCombie, Neil Chapman • 2013

Older Papers

#15 Engaging China and Russia on Nuclear Disarmament • *2009*

#14 Nuclear Challenges and Policy Options for the Next US Administration • *2009*

#13 Trafficking Networks for Chemical Weapons Precursors: Lessons from the 1980s Iran-Iraq War • *2008*

#12 New Challenges in Missile Proliferation, Missile Defense, and Space Security • *2003*

#11 Commercial Radioactive Sources: Surveying the Security Risks • *2003*

#10 Future Security in Space: Commercial, Military, and Arms Control Trade-Offs • *2002*

#9 The 1971 Smallpox Epidemic in Aralsk, Kazakhstan, and the Soviet Biological Warfare Program • *2002*

#8 After 9/11: Preventing Mass-Destruction Terrorism and Weapons Proliferation • *2002*

#7 Missile Proliferation and Defences: Problems and Prospects • *2001*

#6 WMD Threats 2001: Critical Choices for the Bush Administration • *2001*

#5 International Perspectives on Ballistic Missile Proliferation & Defenses • *2001*

#4 Proliferation Challenges and Nonproliferation Opportunities for New Administrations • *2000*

#3 Nonproliferation Regimes at Risk

#2 A History of Ballistic Missile Development in the DPRK • *1999*

#1 Former Soviet Biological Weapons Facilities in Kazakhstan: Past, Present, and Future • *1999*

nonproliferation.org

Middlebury Institute *of*
International Studies at Monterey
James Martin Center for Nonproliferation Studies